UNIV. OF
TORONTO

UNIVERSITY OF TORONTO
By. OCT 1 1916
DEPT. OF
MINING ENGINEERING

DEPARTMENT OF MINING ENGINEERING
Library Number: 1207
Return this book to
Cupboard: J
Shelf: 3
All books are to be signed for in the loan book when borrowed, and when returned.
Books must be returned within One Week, unless special permission is given for a longer loan.

Digitized by the Internet Archive
in 2007 with funding from
Microsoft Corporation

http://www.archive.org/details/financialstan49a50melbuoft

P
Techno.

Supplement to the "Australian Mining Standard, Engineering and Electrical Record," July 10, 1913.

Industrial Australian and Mining Standard

UNIVERSITY OF TORONTO LIBRARY

# INDEX.

Financial standard

# THE AUSTRALIAN MINING STANDARD ENGINEERING & ELECTRICAL RECORD

## VOLUME XLIX.

## JANUARY TO JUNE, 1913.

138681
31/5/16

CRITCHLEY PARKER, Pty. Ltd.
MELBOURNE. SYDNEY. LONDON. NEW YORK.

HG
51
F5
v.49-50

# INDEX.

Where numbers are enclosed in parentheses a crosshead article is indicated.

Page
Al Gold M. (449)
Accidents Caused by Electricity (Prevention of) 484
Accumulation of Wealth, The (298)
Adelaide Electric Supply Co. Ltd. 26, 55
Adelaide Municipal Tramways (221)
A.I.M.E. Conference (367), (422), (488), (467), (493), (513)
Ajax Central G.M. Co. (280), (508)
Alloys Magnetic Prop. of (175), (197)
Allotropic Gas 66
A.M.P. Society 393
Amalgamated Hill End Ltd. 84
Amalgamated Pictures (442)
Amalgamated Society of Engineers 31
Amalgamated Zinc (De Bavay's) Ltd. 50, (281), (476)
Amalgamation Victorian E. E. and American Coal Trade Competition with N.S.W. (199)
Anakie Gem Field (Q.) (494)
A.N.A. and River Pollution 171
Approved Safety Lamps (458)
Apprenticeship, Substitute for (169)
Apprenticeship, New South Wales (286)
Ardlethan Tin Field (199), (264), 361, (381), 507
Ardlethan Cats. 211
Ararat, Geology of 545
Argo Dredging Co. (V.) (387)
Ashfield Electric Supply 31, 55
Associated Chambers of Commerce 519
Auckland Electric Trams (51)
Australasian Association for the Advancement of Science .. (29), ( (I.), Supplement, Jan. 16)
Australian Engineers, A Word for (233)
Australian Engineers, A Word Against (244)
Australian Coking Co. (381)
Australian Built Road Roller 392
Australian Gaslight Co. 31
Australian Manufacturers' Exhibition 34
Australian Notes in Circulation 36
Australian Wood Pipe Co. 171
Australian Timbers 41
Australian Metal Co. 479
Austral Malay Tin Co. 527
Automatic Telephones, N.Z. 55
Australian Metal Co. 539
A Word for Australian Engineers (233)
A Word Against Australian Engineers (244)

B. and K. Electric Restaurant 518
Ballarat Quarterly Gold Yields 66
Ballarat Mining Managers (Federation) 486
Balkans, Mineral Resources of (242)
Bank Clearings from 1912 37
Bank of N.S.W. (477)
Barrier Strike (319), (339)
Barrier Wharf Ltd. 66
Bendigo Mining (Yearly Reserve) (12)
Bendoc Welcome Stranger G.M. Co. 487
Bendigo, Trouble (non union) at .. (339), (449), 487
Bererny Lead (422)
Bigelow, J. C. 19
Billson's (Mr.) Errand (293)
Birmingham (E.) Power Station 497
Bischoff and Mr. Bischoff 177
Bitumen on the Beach (401)
Blackpool (England) Electric Supply 496
Black Range Mining Co. (241)
Blackwood District 89
"Blocking Out" Alluvial (382)
Blow Reef Mine 71
Boiler Water, Softening of (181)
Border Railways, Mr. Billson and (293)
Border Railways (52)
Botany Electric Lighting 55
Brandenburg Electrical Works 484
Breach of Contract (United Silver Co. v. Caldwell Vale Co.) (362)
Bright Prospecting Association 441
Brighton Line (517)
British Association (371), 428
British Aust. Oil Co. (420), (502)
British Board of Trade Returns 66
British Broken Hill Pty. Co. Ltd. 21, (475), (508), (529)
Page
British Columbia Elec. Railway Co. Ltd. 53
British Commercial Apathy (327)
British and European Developments (180), (203)
British Gen. Electric Co. (Magnet House) (391)
Broken Hill (473)
Broken Hill Mineral Yield, 1912 67
Broken Hill Mining 70
Broken Hill Mining in 1912 (325)
Broken Hill Pty. Block 10 74, (478)
Broken Hill Pty. Co. 24, 74, (90)
Broken Hill Pty. Co. Iron Works (319), (475), 479
Broken Hill Silver City Co. 361
Broken Hill South Extended (476)
Broken Hill South S.M. Co. 50, (215), (476)
Broken Hill Treatment Methods (534)
Broken Hill Ventilation Suit (243)
Broken Hill Water Supply (194)
Brokers' Conference (491)
Bullfinch G.M. Co. (259)
Bullfinch Robbery (Leaderette) 380
Bulli Shire Lighting 452
Burnt Creek G.M. Co. 93, (304)
Bus v. Tram (180)
Bygoo Tin Syndicate (448)
By-Product Works at Newcastle (381)

Cables, Week-end Messages (8), (30)
Call Indicators 376
Caldwell Vale Motor and Traction Construction Co. 31
Canberra Lighting, Etc. 453
Cardross (Q.) Copper Mine 487
Carlisle Gold Mine 47, 70
Casley's Red, White and Blue Co. (Application for grant) 492
Cast Steel, manufacture of (310)
Cathcarts G.M. Co. (V.) 172, (341)
Cathcart Central G.M. Co. (V.) 172
Central Plateau G.M. Co. 66
Central Red, White and Blue Mine (73), 88
Cheaper Cable Rates (536)
Cheaper Electricity (327)
Chillagoe Co. Ltd. 187, 507
Chiltern Valley G.M. (6), 383
Chinese Miners in Northern Territory 74
Chinn, Mr. H., Charges Against 43
Christensens Ajax Co. (426)
Clarence United Co. (427)
Clarence United Mine (93), (427)
Clerks' Wages (17), (287)
Closer Settlement Inquiry 171
Cloncurry (Q.) Strike 487
Clunes Goldfield Co. 3
Coal Crisis, A (41)
Coalfields of N.Z. (300)
Coal for Melbourne Harbor Trust 43
Coal Sampling (Standardisation) 345
Coal Strike S. Coast (N.S.W.) 339
Coal Miners' Wages in Victoria 72
Coal Mining Industry of New South Wales 72
Coal Mining in Victoria 72
Cocks Pioneer Electric Co. (421)
Colliery (Jumbunna) Dispute (Slow Workers) (362)
Colin E. Begg Ltd. 519
Colorado, New Ore Discovery (458)
Commercial Banking Co. of Sydney (97)
Commodore G.M. Co. 85
Commonwealth Cement Co. (52)
Commonwealth Coins in New Zealand 18
Commonwealth Court of Arbitration 43
Commonwealth Oil Corporation (5), (236), (345), (512), (515)
Commonwealth Public Works and State Departments 96
Commonwealth Small Arms Factory .. (8), (75)
Companies Floated in W.A. 44
Conciliation Board 89
Contracting in Mines (401)
Confessions of a Labour Leader (92)
Constellation Mine 89
Constitutional Amendments (439)
Cope's Creek Central (N.S.W.) (194)
Copper Output (World) (458)
Cosmopolitan G.M. Co. 5
Page
Cost of Living (Commonwealth) (340)
Costs in Low-grade Mines (265)
Corryong (V.) Minerals in 245
Country Roads Board (311)
Cowell Silver deposits (534)
Cry "Halt" (277)
Current Charging Systems (269)
Cyanide and Electric Currents (190)
Cyanide Test 502

Dandenong Electric Supply 77
Darwin (N.T.) Strike (494)
Daylight Cinema (Supl., IX., 19/6/13)
Delaney's Dyke (Survey) 361
Delport, G.D. (E.T.C., evidence) 441
Derby United Company 48
Devil Takes the Hindmost, The (83)
Determination of Platinum Metals (175)
Diamond Creek G.M. Co. 93
Diamond Cutting in N.S.W. 463
Diamond Matrix Exhibit 361
Discovery of Refined Oil 515
Distance Seeing, Electric (354)
Distribution of Population (359)
Dredging in N.S.W. in 1912 (325)
Dredging Board (V.) 339, (367), 401, (449), (494), (516), (527)
Dredging Board (Payment of) 462, 486
Driverless Accumulator Locomotives (95)
Drumlish Hill T.M. Co. (448)
Duke Extended Co. (V.) 362

Eaglehawk Electric Lighting 9
Earthed v. Unearthed Neutrals on A.C. Systems 25
Ebbott, J., J.P. 3
Edna May Mine (W.A.), 73 (194), (214), (301), (442), (451), (492)
Edwards Thos., Will of (198)
Election Irregularities (485)
Election of Mine Inspector (T.) 171
Electric Cooking .. ( (III.), Supplement, Jan. 16) (369)
Electric Current for Cyanide Solutions (190)
Electric Reversing Mill 518
Electric Winch, New 95
Electric Wiring, Modern Methods 76
Electrification Car (517)
Electrification of Rand G. Prop. (223)
Electrification Railway (224)
Electrification (from Foreign Sources) 313
Electrical Association of N.S.W. 497
Electricity in Mines (331)
Electricity in N.S.W. Coal Mines (329)
Electricity by Wind Power (225)
Electricity by Compressed Air (252)
Electric Destructors 539
Electric Furnaces, Construction of (184)
Electric Furnace at Cockle Creek (422)
Electrical Engineers' Tour in Australasia (429), (451)
Electric Distance Seeing (354)
Electric Railways in England (312)
Electrification of Rand Mine (204), (223)
Electrical Endosmose (352)
Electricity Supply in London .. (351), (391,ctd.)
Electric Light and Power Corporation 519
Elements of Field Geology and Surveying 305
Elsinore Tin Co. (N.S.W.) (237)
Empire Trade Commission (N.T.) (340), 441
Empire Wireless Chain 31, (75), 94
Emmaville (N.S.W.) Deep Leads (368)
Emu Bay Railway Co. 78, (304), (307), (487), (491)
Endosmose, Electrical (352)
Engineering Features of Electric Furnaces (184)
Engineering Association of N.S.W. (246)
Enginedrivers' Wages Award (245), (286), (294), (325), (349), 462
Engineering, Status of (224)
Engineering of the Future (392)
Engineers and Study (255)
Engineers, Registration and Training of (266)
Engineers, Oil (393)
Extending Austn. Rule (400)

Page
Extraction of Metals (Laxiviation Without Roasting) (262)
Extraction of Potash from Silicate Rocks (347)
Explosion at Broken Hill 87

Fatalities at Broken Hill 87
Federal Capital Designs 2
Federal Capital Electric Plant 431
Federal Capital Name 65
Ferry Systems (Correspondence) (539)
Federal Arbitration Court (Engineers) 389
Festina Lente (506)
Fitzroy Dock, Purchase by Commonw'lth Gov. 31
Flowmeter, The (351)
For Australia, Peace 485
Forbes, Stockinbingal Ry. (N.S.W.) 479
Foreigners in Mines 380
Forest Creek (V.) Co. 380
Forest Preservation ( (III.) Suppl. Jan. 16)
Frankston Gold Reef 441
Freeburgh (V.) Dredge 487
Frenchman's Reef G.M. Co. (V.) (421)
Frenchman's Reef (Theft at) 487
Future of Oil Fuel (285)

Galloway Mines 99
Garden Gully Mine 46, (388)
Gallett Wireless System (B. and E. Dev.) 479
Geology, Field and Surveying (305)
Generation and Electrical Transmission of Power for Marine Transportation (353)
General Electric Co.'s At-Home (369)
German Silver Castings (Suppl. 5/6/13) XVIII.
Geological Survey Waihi-Tairu (N.Z.) 257
Gippsland Copper and Platinum Mines 265
Gilt-edged Stocks (Investors' Column) (341)
Glacial Geology in Aust. ( (III.) Sup., Jan. 16)
Glenbrook Ry. (428)
Golden Age Mine 71, (528), (533)
Golden Pike G.M. Co. (280)
Golden Pyke Leases 491
Golden Pyke Mine 89 (492), (533)
Golden Ridge G.M. Co. Ltd. 74
Gold Recovery, New Process 84
Gold Stealing (285), (345), 361
Grants for Mines (Ballarat) (535)
Great Crest G.M. Co. 463
Great Cobar Co. 420
Great Extended Hustlers Mine 89, (285)
Great Fitzroy Mines, Ltd. 56
Great Langi Logan Co. (465), (491)
Great Northern G.M. (320)
Greenstone (N.Z.) 382
Gympie Mining in 1912 (95)

Halliday's Mine 42
Hampden-Cloncurry Copper Mine 24, (426)
Hampden Co. (Q.) (402), (487)
Hannan's Reward Mine 44
Hainault, So. Kalgurli Amalgamation (259)
Hart-Ebott Suction Gas. Co. 479
Heat Accumulators 538
Heating and Cooling of Electrical Machinery 26
Hercules Ores (Mr. Mores's report) (488)
Hercules G. and T. Co. (T.) (340)
Hoadley's Chocolate (Prospectus for) (293)
High Tension Currents in Mines (262), (308)
Hobart Electric Trams (IV., Supplement, Jan. 16), 77, (389)
Hope Extended Co. 507
Hope and Morning Star Co. 441
Hope (Beaufort) G.M. (321)
Hope for Ballarat (535)
Horsham Electric Supply 430
House Removing and Electric Supply Wires 77
Hustler's Reef Mine, Accident Case 3
Hydro-Electric Plant for Mt. Lyell 289
Hydrogen, Allotropic 66

I.E.E. Awards 538
I.E.E. Paris Conference 538
Imperial Commission (X.)
Imperial Oil Tractor 477
Indicator (Electrical), Errors of (180)
Ingliston Extended Mine 6
Ingrey Weighing Machine (453)
Institution of Electrical Engineers (Eng.) 8, (9), (26)
Insulating Lacquer (Siemens and Halske) 484
International Electro-Technical Commission 95
Inventors' Institute 478
Inverell Electric Supply 10
Invincible Engineering Co. 480
Investment Stocks During 1912 (4), (20), (68), (87)
Iowa Engineering Exper. Mot. Bull. Nos. 26, 27, 28
Iron Trade Federation (311)
Iron and Steel Works, Lithgow (52)
Iron Pipes, Manufacture of (267)
Is it to be Mob Law? 318
Ivanhoe Gold Corporation (464)

Jameson, K. J. 85
Johnson's Reef Mine 71
Jubilee G.M. Co. (V.) (219)
Junction North Mine (442), (444)
Jukes-Darwin Field (T.) 493
Justice and a Mr. Justice (1)

Kampong-Kamunting Tin Co. 486
Kangaroo Island, Oil on (401)

Page
Katoomba (N.S.W.), Tramways for 221

Labour Unions and The Press 85
Lake Hochstetter Gold Fields (N.Z.) 507
Lake Rollison (T.) Power Scheme 486
Lamberton Electric Mill 518
Lapstone Tunnel (517)
Lessons in Geography (461)
Life Factor in Mine Valuations 258
Lighting Batteries 180
Limestone Deposits at Lithgow 88
Lithgow Industries 537
Lithgow Iron-workers' Wages Board 75
Lithgow Lime Deposits 88
Lithgow Mining District Outlook 47
Liquid Fuels 372
Lixiviation Without Roasting (Extraction of Metals) 263
Lloyd Copper Co. 42
Locomotives, Order for 507
Lodge, Sir Oliver and Wireless Patents (349)
Long Tunnel G.M. Co. 65, 171, (199)
Long Tunnel (New Co.) 233, (265), (319), (326)
Low Grade Copper Ores, Treatment of (346)
Low Grade Mines, Costs in (265)
Low Grade Ores (W.A.) 449

McBride, Hon. P. 42
McKenzie, Wm. J. 18
Magnetic Properties of Alloys (175), (197)
Manchester, Street Lighting in (310)
Manufacture of Iron Pipes (267)
Mararoa G.M. Co. 7, 74
Marconi Co. and Imperial Agreement 180, 187
Marconi Patent Litigation 31 (75) 77 (327)
Marketing of Mines (307)
Marrickville Electric Installation (53)
Marvel Loch G.M. (348), (465)
Mackay Harbor Loan 452
Magnet House, Visit to 391
Main Reef G.M. (V.) 383
Marconi Scandals, The (525)
Mararoa G.M. Co. (284)
Mechanical Handling of Coal 25
Melbourne Branch Royal Mint (Mint Gold Receipts) 97, 171
Melbourne City Council Shortage of Revenue 31
Melbourne Electric Supply Co. 9, 95
Melbourne Suburban Railways Electrification 2
Melbourne University (Examination Results) (8), (30), 43, ( (IV., Sup., Jan. 16), 269, (372)
Melbourne Elec. Supply Co. (Machinery for) 487
Mercury Cadmium Lamp (52)
Mercury Switches 484
Metals Extraction of Laxiviation without Roasting) (262)
Miners' Accident Relief (N.S.W.) 169, 177
Miners' "Complaint" Conference 527
Miners' Wages (T.) (67)
Miners' Wages (V.) (67)
Mine Development (Grant to Gippsland G. and P. Co.) (265)
Mine Managers and Federation 486
Mine Valuations, Life Factor in (258)
Mines Amendment Bill (N.S.W.) (477)
Miners' Plant 477
Mining in New Guinea (301)
Mining in New Zealand 201
Mining in Papua (283)
Mining in N.S.W. (1912) (307)
Mining in Queensland (304)
Mining or Agriculture (202)
Mineral Resources of Balkans (243)
Mining Speculation (505)
Minerals in Antarctica (367)
Minerals in Corryong District (245)
Mineowners and Federation 381
Mitchell, Wm. 44
Motherwell, Wm. 44
Mount Bischoff and Bischoff Extended (177), 420
Mount Bischoff Co. and Employes' Plant 462
Mount Carrington Co. (N.S.W.) 465
Mount Cuthbert Co. (301), (492)
Mount Elliott Co. (236), (259)
Mount Grainger Goldfield (S.A.) 407
Mount Jasper Copper Mining (T.) Co. 171
Mount Lyell Hydro-Electric Contracts (318)
Mount Lyell Hydro-electric Scheme (4), (289)
Mount Lyell M. and R. Co. (23), 24, 71, 171, (443), (477)
Mount Lyell Disaster (Report on) 408
Mount Lyell Disaster Fund 487
Mount Morgan G.M. Co. 24, (45), (280), (363)
Mount Morgan (Imp. Comn. Visit) (X., 10/4/13)
Mount Oxide Mines Ltd. 66, 462
Mount Milligan Coal 507
Moore Filter Patents, Result of Litigation (49)
Mount Ross Diamond and Tin Mining Co. (37)
Mount Toppers Tin M. Co. 527
Morse (Mr.), Report on Hercules Ores (488)
Municipal Tramways, Adelaide (221)

National Physical Laboratory (Brit. and European Developments) 479
National Telephone, C. 77, 80
Naval Dockyards, The (IV., Sup. 19/6/13)
Nelson, A. D. 19
Newcastle Coal Strike, Pay for Miners 2
Newcastle Prospects 23
New Guinea, Mining in (301)
Neglected Minerals in N.Z. (219)

Page
New Imperial Mine 507
New Langi Logan Mine 66, 86 (421), (491)
New Ore Discovery in Colorado (458)
New Patent Fuel (236)
New Specimen Hill G.M. Co. (V.) (172), (341), 527 (536)
New South Wales Dredging in 1912 (325)
New South Wales Exports 421
N.S.W. Engineering Achievement (517)
N.S.W. Factories 431
N.S.W. Mines Amendments Bill (477)
N.S.W. Mining in 1912 (307)
N.S.W. Min. Industry (1912 output) (36), (200)
N.S.W. Pipe Contract (Sup.), IX., 19/6/13
N.S.W. Public Works (94)
N.S.W. Pipe Works (422)
N.S.W. Railways (Engines for) 479
N.S.W. Telephones (517)
N.S.W. Wages Board Judgment (367)
New Tasmanian Coalfield (477)
New Thermit Treatment of Steel Ingots (267)
New Zealand, Coalfields of (300)
New Zealand Greenstone (382)
New Zealand Gold Output 486
New Zealand's Resources (255), (264)
Niagara (Oil Steamer) (371)
Non-Unionism (Bendigo) (427), (449)
Non-Unionism (Vict. Employees and) 462
North Broken Hill Co. (N.S.W.) (237), 476
North Mt. Lyell Disaster 66
North Mt. Lyell Disaster Inquiry (19), (50), (73), 91
North Mt. Lyell Mine 91
North Nuggety Ajax Co. (363), (529)
North Queenslnad Mining Fields (92)
North Sydney Electric Lighting 55, 97
Northern District Coal Owners 46
Northern District Coal Miners' Labour Dispute 46
Northern Engineering Institute (N.S.W.) 498
Northern Nigeria 261
North Sydney Bridge 463
Northern Territory Appointments 42
Northern Territory, Assistance for Settlers (406)
Northern Territory Development (5), (30), (325)
Northern Territory, New Harbour (349)
Northern Territory Petroleum (91)
Northern Territory, Proposed New Capital 84
Northern Territory Prospecting Ordinance (382)
Northern Territory, Royal Commissioner in 340, (478)
Northern Territory Strike 381, (494)
Northern Territory, The Vacant (536)
Northern Territory Survey (300)
Nor'-West Syndicate (363)
Nuggety Ajax (V.) (402)

Obituary—
  Bigelow, J. C. 19
  Ebbot, J., J.P. 3
  Jameson, K. J. 85
  Mitchell, Wm. 44
  Nelson, A. D. 19
Occidental Gold Mine 42
Oil Activity at Roma (Q.) (403)
Oil at Diamond Head 515
Oil Burning Steamer 371
Oil Corporation, The Commonwealth (5), (236), (345)
Oil, Engineers (393)
Oil Era, The (285)
Oil Explosions in Transformers and Switches (331)
Oil Fuel, Future of (285)
Oil in Papua 441, 524
Oil in the North (236)
Oil in Victoria (367)
Oil on the Shore (419)
Oil-shale, Sale of (93)
Olympic Tin Mine 90
One Man Mine 458
One-shift System at Bendigo 18
Orders-in-Council Granted for Electric Supply in Victoria during 1912 31
Oroya Links Mine 73
Osmiridium in Tasmania (319), 339, (379), (388)
Osmium for Alloy 540
Our Big Mines (21), (45), (69), (215), (241)
Outtrim, Howitt and British Consolidated Coal Co. 3
Ovens River Dredging (202)
Overwinding, Prevention of (268)
Oxide Creek Mine 441

Papua Administration (265), (536)
Papua, Mining in (283), (536)
Papuan Affairs (536)
Papuan Oil 524, (536)
Papuan Petroleum Area ( (II.) Supplement, Jan. 16th) 441
Patent Fuel, New (236)
Peacock (S. Alex.) and Trades Hall (287)
Perkins (S.) 19
Perks, Dane and Co. 453
Perth Branch, Royal Mint 97
Perth Electrical Scheme 55
Petroleum in Northern Territory (91)
Philippine Dredging Co. (363)
Pitfield Prospecting Co. (V.) (XIV., Mar. 27/13)
Platinum Metals, Determination of (175)

Page
Plea for High Tension, Assistant Continuous Currents on Mines .. (262), (308)
Politicians and the Press .. (359)
Population, Distribution of .. (359)
Port Melbourne Electric Supply .. 431
Postal Control .. (12)
Poseidon Alluvial Co. (V.) .. (214)
Potash, Extraction of .. (347)
"Power Policemen" .. (327)
Power from the Tides .. (293)
Prahran-Malvern Tramway Trust .. 79
Prahran and Malvern Tramways .. 497
Prahran Refuse Destructor .. 497
Precipitation by Zinc Plates .. (316)
Preference to Unionists .. (512)
Preolenna Coalfield (T.) .. (477)
Preston (V.) Elec. Supply .. 431, 498
Prevention of Overwinding .. (268)
Prices, Price Indexes and Cost of Living in Aust. (Commonwealth Statistician) .. 98
Princess Dagmar Co. .. (533)
Problems in Traction Developments .. 53
Producer, Gas .. 54
Production and Distribution of Wealth ( (II.) Supplement, Jan. 16).
Progress of Chemistry ( (II.) Supplement, Jan. 16).
Prospective Metal Supply Co. .. (341)
Provincial Electric Development Co. (Contract) .. 497
Pyrmont Power House .. 519

Queensland Mining Industry in 1912 .. 263
Queensland, Mining In .. (304)
Queensland Output in 1912 .. (297)

Radium Hill Co. .. 3, (5)
Radium Prospects .. (5)
Railless Traction Ex. .. 453
Rail Making at Lithgow .. (30)
Rail Motors .. (53)
Railway Construction in N.S.W. .. (461)
Railway Electrification in England .. 54
Railway Electrification (Storage Battery System) .. (25)
Railway Electrification (American Scheme) (268)
Railway Electrification (311), (312), 372, (389)
Railway Electrification (Contracts) .. 224
Railway Gauge .. (371)
Rapid Transit in Germany .. 96
Registration of Engineers .. (266), (313)
Reserve Shares .. 171
Resistivity of Metals .. (329)
Revolutionising Telegraphy .. (202)
Rill Stoping (B. V. Barton) .. 493
River Pollution (A.N.A. and) .. 171
River Pollution (Mining or Agriculture) .. 202
Road Roller, Australian Built .. (392)
Rookwood (N.S.W.) Railway .. 479
Royal Bank .. (393)
Royal Show (Sydney) .. (268)
Ruby Well Nugget .. 318

Safety Lamps for Mines .. (458)
Sawdust as Fire Extinguisher .. 502
Saxony Electric Railways .. 97
Scientific Congress .. 361, (312)
Scientists' Visit .. (312)
Sea Lake .. 77
Selective Flotation .. (534)
Selenium, Market for .. 463
Share Market Prospects .. (17)
Shipbuilding, State (V.) .. (300)
Silver Find, A .. (534)
Silverton Outbreak .. (317)
Silverton Tramway Co. .. (194)
Silverton Tramway Co.'s Wages Board Award .. 487
"Slow Workers" (Colliery Dispute) .. (362)
Sludge Abatement Report (V.) .. 516
Sluicing of Scenery .. (191)
Smelting Employees (N.S.W.) Award .. (200)
Soapstone .. (403)
Softening of Boiled Water .. (181)
South Australian Railways .. (52)
South Australian Geology ( (I.), Supplement, January 16).

Page
South Australian Mining .. (265), (511)
South Australia's Mining Review .. (337)
South Aust. Mineral Production .. (337)
South Berry Co. (V.) .. 237
South Kalgurli-Hainault Amalgamation .. (259)
Southern Hope Co. (V.) .. (214), (321)
Squeeze .. (419)
Standardisation (Coal Sampling) .. 345
State Shipbuilding (V.) .. (300), (392)
Status of Engineering .. (224), (329)
Steam Gas Turbine (Ferranti) .. (180)
Steel Ingots, Thermit, Treatment of .. (267)
Steel Rail Making at Lithgow .. 30
Steel Works at Lithgow .. (52)
Street Cleaning by Electricity .. 519
Street Lighting in Manchester .. (310)
Stringer Memorial .. 527
Sulphide Corporation Ltd. .. (69)
Sulphide Ores of Copper .. (345)
Superphosphates (Mt. Lyell M. and R. Co.) (173)
Sydney Branch Royal Mint .. 97
Sydney Bridge (North) .. (463)
Sydney City Council Electrical Undertaking (51), 230, 744, (370), (409), (451), (478), (536)
Sydney Council Contracts .. (308)
Sydney Ferry Strike .. 258
Sydney Gas Strike .. (193), (230)
Sydney Royal Show .. (268)
Sydney University Examination Results .. (6)
Switch Lock .. 348

Tailing Pumps and Wheels .. 535
Tasmanian Coalfield, New .. (477)
Tasmanian Exhibition .. (30)
Tasmanian Oak (Correspondence) .. 41, 90
Tasmanian Smelters (Govt. Help For) .. 486
Technical Education in Tasmania .. (28)
Technical Education in Victoria ( (27), IV. Supplement, Jan. 16).
Technical Education in Victoria (Examination Results) .. (7), (27)
Telegraphy, Revolutionising of .. (202)
Telephone Service, Sydney .. 2
Telephone Toll .. (287)
The Awamuta Railway .. 96
Thames (N.Z.) Re-Union .. (200)
Thermit Treatment of Steel .. 267
Thompson's Ltd. .. (53), (76)
Tides, Power from .. (293)
Tin at Corryong .. 2
Tin Companies .. (448)
Tin Discovery in Chiltern (V.) .. 171
Tingha Tin D. Co. .. (388)
Tin Mining in Siam .. (92)
Toora (V.) Lighting Order .. 497
Toll Telephones .. (287)
Tongkah Compound T.M. Co. .. 7
Tour in Aust. Electrical Engineers .. (429)
Toxic Action of Elec. Discharges .. 539
Trades Unions as Employees .. 18
Training of Engineers .. (266)
Tree-planting at Railway Station .. 18
Tramways, Adelaide Muncipal .. (221)
Tramways Arbitration Case ( (28), (IV.) Supplement, Jan. 16)
Tramways Arbitration Case, Results of .. 9
Tramways Bill (V.) .. 539
Tramways for Katoomba .. (221)
Tramways and Trees .. 2
Trans-Australian Railway .. (51)
Transvaal Gold Output .. 462
Transvaal Mineral Output .. 93
Treatment of Low-grade Copper Ores .. (347)
Trespass (High Court of Aust. Decision) (177)
Turbines v. Reciprocating Engines for Current Generation .. 26
Turbines, Unwatering in Elec. .. 270
Turbo-Alternator Plant for N.S.W. Govt. (248)

Unclaimed Dividends .. 44
Underground Elec. Railways .. 497
Uniform Company Law .. (539)
Uniform Gauge .. (526)
Union Trustee Co. of Aust. .. (284)
University of Melbourne .. (8), (30), 43
University of Sydney Passes, etc. .. (327), (350)
Unwatering with Electric Turbines .. (270)

Page
Vacant North, The .. (526)
Valila (Papua) Oil Fields .. 502
Ventilation of Mines (Legal Case) .. (243)
Verdigris, Neutralisation of .. 463
Victoria Coal, Ore and Shale Co. .. (213)
Victoria Consols Co. .. (421), (448)
Victorian Central Coal and Iron Mining Co. 85
Victorian Employers' Federation .. 462
Victorian Electrical Engineers .. 286, (389)
Victorian Geology .. 545
Victorian Government Programme .. (293)
Victorian Imports and Exports .. (427)
Victorian Minister of Mines .. (83)
Victoria's Oversea Trade .. (368)
Victorian Railway Employees' Wages .. (76)
Victorian Railways .. (29), (52), (76), (300)
Victoria's Shipyard (See State Shipyard) 311
Victorian State Coal Mine .. 24, 47, 90
Victorian State Coal Mine Labour Dispute 85, 90
Virginia G. M. Co. .. (320)
Voting Systems on Trial .. (105)

Wagga Pump Installation .. 431
Wages Board Award (Engine-drivers) .. 349
Wages Board (N.S.W.) Award (Mine-owners) .. 367
Wages Board and Crown .. (179)
Waihi G.M. Co. (N.Z.) Output .. (171)
Waihi-Tairn, Geo. Survey of .. (257)
Walkers Ltd. .. (390), 507
West Australian Bank .. 431
West Australian Prospects .. (285)
Western Star Ltd. .. 441
Whim Well Copper Mine (W.A.) .. 22, (219)
Williamstown (V.) Elec. Scheme .. 431
Wild Cherry T. Mine .. 380
William Tell G.M. Co. (V.) .. (194), (491)
William's United Mine .. 71
Wilsmore, Dr. N. T. Y. .. 3
Wind Power, Electricity by .. (225)
Wireless Marconi, British Agreement .. 180
Wireless (W.A.) Record .. 497
Wireless Hinge Co. .. 479
Wireless Inquiry (British Com.) .. 181 (495)
Wireless Patents, Sir O. Lodge .. (349)
Wireless System (Report on) .. 518
Wireless Telegraphy, Empire Chain .. (28), (94)
Wireless Telegraphy in Australia .. (29)
Wireless Telegraphy in N.Z. .. 55
Wireless Telegraphy, New French System .. (28)
Wolfram and Gold Claim .. (48)
Wollongong Electric Lighting .. 3
Wollongong Harbour Improvements .. 3
World's Copper Output .. (459)
Wyalong, Lake Cudgellico Ry. .. 519
Wyalong, Sanitation in .. 171
Wycheproof Electric Lighting .. 77

Yalgogrin Tin Field .. 487
Yarrandera Field (N.S.W.) .. 441
Year 1912 .. (1)
Yelta State Mine, S.A. .. (326), 441
Yukon in 1912 .. (346)

Zinc Corporation .. 50
Zinc, Sheets, Precipitation by .. (316)

## PUBLICATIONS RECEIVED.

Adelaide City Year Book (1913) .. 321
American Mine Accounting (McGraw-Hill Book Co.) .. 244
Bulletin VI., Commonwealth Statistics .. 454
Commonwealth Production Census .. 321
Contributions to Kalgoorlie Geology (Simpson and Gibson) .. 454
Engineers' Counting Book (W. Laidley and Co., Sydney) .. 454
Iron Ores of Missourie, by G. W. Crane .. 284
Land and Mining Surveying (Crosley, Lockwood and Son) .. 244
Metal Charts, by W. E. Figgis ("M.S.") 300
Mining Manual and Mining Year Book, 1913 (W. R. Skinner, London) .. 244
N.S.W. Statistics .. 384
Petroleum in South California .. 464
Universal Electrical Directory (Alabaster, Gatehouse and Co. Ltd.) .. 284
Vickers' Newspaper Gazetteer .. 384

**JOINT STOCK COY.'S YEAR BOOK OF AUSTRALASIA.**

Edited by R. L. NASH (Financial Editor of "Sydney Daily Telegraph.").

The EIGHTH EDITION will record an expansion in joint stock enterprise quite unprecedented. The Australian capital dealt with (including the London contributions thereto) will be between £600,000,000 and £700,000,000 (six hundred millions and seven hundred millions), and the dividends and interest payments for 1912 exceed £30,000,000 (thirty millions), while no less than 2500 (two thousand five hundred) new companies are added to the enumeration, and the new issues by the older companies have been enormous. The dimensions of the volume are, of course, greatly extended. THE AUSTRALASIAN JOINT STOCK COMPANIES' YEAR-BOOK is the only work giving such a record, and the vast growth of joint stock enterprise throughout these States and colonies renders it an indispensable book of reference.—Published by CRITCHLEY PARKER, MINING STANDARD.

## CONTENTS.

MAY 29.

EDITORIAL—
Constitutional Amendments .. .. 439
Leaderettes .. .. .. .. .. .. .. .. .. 440
News and Notes .. .. .. .. .. .. .. .. 441
Yerranderie Field (N.S.W.) .. .. .. 441
Personal .. .. .. .. .. .. .. .. .. .. 442
Metal Quotations .. .. .. .. .. .. .. 442
Investor's Column—
Junction North Broken Hill .. .. 442
Amalgamated Pictures .. .. .. .. 442
Edna May (W.A.) .. .. .. .. .. .. 442
Our Big Mines .. .. .. .. .. .. .. .. 443
Mining in New South Wales .. .. .. 444
Tasmanian Mining .. .. .. .. .. .. 445
Mining in Western Australia .. .. 445
The Coal Mining Industry .. .. .. .. 446
Victorian Mining Activities .. .. .. 447
A.I.M.E. .. .. .. .. .. .. .. .. .. .. 448
Victoria Consols Co., Bendigo (V.) .. 448
More Tin Companies .. .. .. .. .. .. 448
Bendigo Miners .. .. .. .. .. .. .. 449
Low Grade Ores .. .. .. .. .. .. .. 449
The Dredging Board .. .. .. .. .. .. 449
Reports of Companies .. .. .. .. .. 449
Industrial .. .. .. .. .. .. .. .. .. 453
Meeting of Creditors .. .. .. .. .. 453
Publications Received .. .. .. .. .. 454
Tenders Invited and Accepted .. .. 454
Approved Safety Lamps for Mines .. 458

### Engineering and Electrical Record.

British and European Developments 450
Sydney City Council .. .. .. .. .. .. 451
An Electrical Engineer's Tour in Australia .. .. .. .. .. .. .. .. .. .. 451
Miscellaneous .. .. .. .. .. .. .. .. 452

WELSBACH
WIRE LAMPS,
BRITISH MANUFACTURE.
SEND FOR CATALOGUE.
Welsbach Light Co. of Aust. Ltd.
302 Pitt Street, SYDNEY.
380 Lonsdale Street, MELBOURNE.
Creek Street, BRISBANE.
102 Victoria Street, WELLINGTON, N.Z.

FIRE. . BRICK
Our Products have proved their superiority.
FIRE CLAY GOODS For Every Purpose.
Darley Fire Bricks will withstand the most intense heat, and will not shrink. Our bricks are made near Bacchus Marsh, Victoria, and we supply all the States.
Specialities
High-Grade Firebricks & Retorts.
Prompt Delivery. For Prices, etc., write to—
DARLEY F. B. Co.,
Oliver's Lane, Flinders St. Melbourne

COKE!
NORTH BULLI COLLIERY
Limited
Supplies best quality hard
SOUTHERN
SMELTING COKE.
(Weekly output 1250 tons.)
H. G. Hyde, Secretary.
Royal Insurance Building, 16 Spring-street,
SYDNEY.

AUSTRALIAN MINING STANDARD.
Forwarded Post Free to any Address.
Australasia .. .. .. .. .. .. .. .. .. .. .. .. .. 26/- per
Abroad .. .. .. .. .. .. .. .. .. .. .. .. .. .. 30/- Annum.
Payable half-yearly or yearly, in advance.
All amounts should be made payable to order of "CRITCHLEY PARKER, Bank of Australasia."
12 O'Connell-street, Sydney.
376 Flinders-lane, Mebourne.

**BACK NUMBERS OF THE "MINING STANDARD."**

The following is the rate for back copies more than a month old. Applications by post must be accompanied with cash and postage added. In no case can we guarantee to supply copies, as our storage accommodation is limited.

A postcard will be sent if the number required is out of print.

For copies three months old, ninepence; six month, one shilling; and beyond that period, one penny per month per copy.

As there is a regular demand for back copies of the "Mining Standard," newsagents are requested to send back all returns uncut and in good condition, otherwise they will not be accepted.

All Returns from Newsagents must reach us by the end of each month (the whole paper must be sent). No credit will be allowed beyond this term.

Postage — British, 1d.; Foreign, 1½d.; Australasia, ½d. per copy.

Stamps will be accepted as pre-payment.

Address communications: Publishing Department, "Mining Standard."

**ALTERATION TO ADVERTISEMENTS.**

As our publishing arrangements necessitate the "Mining Standard" being issued simultaneously in Sydney, Melbourne and Adelaide on the same day each week, advertisers wishing to change their advertising matter must suppty same ten days in advance of publication.

**CASUAL ADVERTISEMENTS.**

The rate for this class of advertisement is governed by the position it occupies.

If it appears on leader page or amongst or next to reading matter, the rate is 15s. per inch (nonpariel) per insertion.

Towards end of reading section, set in brevier, 16 ems width, 6s. per inch per insertion.

If set in nonpariel the rate is 4s. per half inch.

**ADVERTISEMENT PROOFS.**

Proofs are submitted to advertisers in order to give them an opportunity of going over the advertisements before printing. Any alterations from the original copy will be charged for. Advertisers are specially requested to instruct their publicity departments, advertisement writers, etc., to give clear and definite instructions respecting changes of matter or new copy, to avoid incurring extra charges.

Advertising Copy must be typed and so arranged as to clearly indicate the display required for the more important features of the advertisement.

---

THE AUSTRALIAN MINING STANDARD.
ESTABLISHED 1888.
It is requested that all business communications be Addressed to Critchley Parker.
THURSDAY, MAY 29, 1913.

## CONSTITUTIONAL AMENDMENTS.

The "Mining Standard" is not a political paper, and does not concern itself directly with the elections which are about to take place; but the Referenda, or as they are officially termed, Referendums, to be taken on the proposals of the Government for the amendment of the Commonwealth Constitution, are too important to be passed over without notice. They belong to party politics to this extent, that they are put forward by one party and are opposed by another, but they are above and apart from party in this respect, that they may be rejected without driving the present Government from power, and may be agreed to even if the party that has fathered them be denied a majority in Parliament; hence, even were they of little importance, there would seem no reason why our self-imposed restriction should apply to them; and, inasmuch as they are of very first rate consequence, we should be failing in our duty if we ignored them. At the same time, we have no desire to treat them in a party spirit, but wish to judge each one upon its merits and to consider what the result of its adoption would be.

The first proposed amendment is intended to give the Commonwealth power over all trade and commerce except upon Government railways within the limits of a single State; but it is, as a matter of fact, so badly worded that it would, we believe, lead to endless complications and to an almost certain division of opinion amongst the two sections into which the High Court of Australia is unhappily divided.

The second gives power over all Corporations other than municipal, governmental, or such as are not formed for the financial benefit of the corporation or its members. There is one insuperable objection to the acceptance of this amendment; that is, that companies would thus be subject to Federal law, while private firms conducting exactly similar businesses would remain under State control.

The third is the most important and comprehensive of all, proposing as it does to give to the Commonwealth Parliament control over labour, employment, and unemployment, the terms and conditions of labour and employment, the rights and obligations of employers and employees, strikes and lock-outs, the maintenance of industrial peace, and the settlement of industrial disputes being all specifically mentioned as included in the power proposed to be given. If this amendment be agreed to, Mr. Justice Higgins will no longer have any difficulty in ruling any industrial dispute as coming within his purview. That fact alone is a sufficient reason why this suggested amendment should not be carried.

The fourth matter on which the public is to be consulted is the transference to the Federal authorities of the power of "conciliation and arbitration for the prevention and settlement of industrial disputes in relation to employment in the railway service of the State." One naturally asks, why only the railway service? Why not any other State service? Why are not public works, or education, or water supply employees to be similarly favoured? The answer would seem to be that it is because of the immense power that railway men would exercise in the event of labour troubles if they threw in their lot with men on strike. It doesn't matter about the others, but the railway men must be brought under Federal rule—that is to say, nominally under Federal rule, but actually must be given the opportunity of ruling themselves. One result of this would doubtless very soon be that the States would throw up their railways in disgust, and that they would all fall into the hands of the Commonwealth. Is it not outrageous that it should be proposed that all the responsibility for the upkeep of the railways and for the meeting of the interest on the money borrowed for their construction should rest upon the individual States, while the power to regulate the conditions of employment on the railways should rest with the Federal Parliament? It could thus be made absolutely impossible for the States to carry on their railways at anything approaching a profit, and if the workers chose to raise disputes on the subject of control, they might, with the help of a complacent Federal authority, get the entire administration into their own hands. Most of all should the answer to this proposed amendment be in the negative.

The fifth proposal deals with trusts, combinations, and monopolies, and is assuredly the one to which least exception may be taken. If it only stipulated that the amendment referred merely to trusts operating in more than one State, we would see no objection to it at all. As regards a trust operating within the limits of a single State, it seems to us that that naturally should be regulated by the State Government. Still, the amendment is one on which the commonsense non-party man may very well vote either way.

The sixth and last of these important suggested amendments has reference to the nationalisation of monopolies. It enables Parliament to declare an "industry or business of producing, manufacturing, or supplying any specified services" to be the subject of a monopoly, and to make laws "for carrying on the industry or business by or under the control of the Commonwealth, and acquiring for that purpose on just terms, any property used in connection with the industry or business." The objection to this is that it rests with Parliament to declare what is a monopoly, and here we come to what is, we think, the chief objection to every one of these proposed amendments, especially to the first, the third, the fourth, and the sixth; and that is they are specially framed to suit the Labour Party. We are told that some of the powers, if granted, will never be used. Is anyone going to be fool enough to believe that if the Government did not mean to use the powers it would go to so much trouble to obtain them? It should be remembered, too, that, even if the present Government be not inclined to go to the lengths indicated, it is quite likely that in the course of a very few years it will be supplanted by a coterie of socialistic extremists who will be glad to use to the utmost every one of the powers now asked for, and to demand more.

To sum up, then, it seems to us that the only proposed amendment of the Constitution to which an answer in the affirmative can be returned by thoughtful non-party men is the 5th, and that the 3rd and 4th, especially the 4th, are so far-reaching and so pregnant of ill for the people of the Commonwealth that it behoves everyone to go to the poll to cast a vote in the negative against them. Next to No. 5 the 6th is perhaps the least harmful, because there might always be a good deal of difficulty in the way of nationalising an industry, even if the Constitution admitted of it. Between these two extremes of utterly inadmissible and comparatively harmless proposals, lie Nos. 1 and 2, to both of which, especially No. 1, great objection is to be taken. Each of them means a divided control, and the first amendment would mean, indeed, more than that, for it would be capable of being stretched, to embrace almost anything, and would be so stretched, with the result that the High Court would be kept sufficiently busy doing nothing but deciding whether or no matters were brought within the Federal jurisdiction by this constitutional change. Everyone would be directly affected, and yet no one would know definitely to what extent he would have to be guided by State law, and to what extent the Federal law would hold sway over him. The existing law provides for the Commonwealth having control over all trade and commerce "with other countries and among the States," and it seems to us that that power is precisely what it ought to have, and that to demand anything further is to attempt to encroach upon the rights and duties of the States. For the reasons we have adduced, we hope that everyone of these suggested amendments, with the exception perhaps of No. 5, will be rejected by the public at the forthcoming election.

E. H. C. Oliphant, 376 Flinders-lane, Melb.

---

The Trades Unions in the Old Country will not have gained so much as they expected by the setting aside of the Osborne judgment, for the rules of the Chief Registrar for the working of the Trade Union Act now prescribe that before a union can devote its funds to any political object there must be a ballot ensuring absolute secrecy, and there will also be strong rules for keeping the political levies separate from the general funds. It would be well if such rules obtained also in Australia, and it would also be well if, as we have urged before, no strike could be entered upon until it had been agreed to by a majority of the men concerned, voting in a manner that ensured absolute secrecy. The formidable list, given in one of the Melbourne papers, of 349 strikes that have occurred within the past three years (the number is almost certainly very much larger) would probably not have totalled one-third of that number had such a rule been in existence.

* * *

It is indeed a sad thing when the patriots of Australia have to choose between two great national interests. Most wickedly and unwarrantably the Labour Government of the Commonwealth has fixed Saturday as the day on which polling is to take place. Did they forget that Saturday was the holiest day of the week, a day consecrated throughout the winter months to the worship of the great national ball game? What are the righteous to do? They must record their votes in the interests of the peculiarly tyrannical brand of freedom which is advocated by the Trades Hall, but at the same time they must not neglect their devotions at the national shrine. The difficulty has been recognised, and at the meeting of the Melbourne Trades' Hall Council held last week, it was actually proposed that the Victorian Football League and the Victorian Football Association should be asked to abandon all matches on polling day. The member of the Eight Hours' Committee who proposed this drastic resolution was bold enough to express the opinion "that the welfare of the country was more important than football." This surely constitutes a very near approach to blasphemy. Another motion, proposed by, perhaps not unnaturally, a representative of the Hotel and Caterers' Union, was to the effect that members of the Labour Party should refrain from attending football matches on polling day; but, after all, this and various other motions to deal with the matter were eventually withdrawn, on the ground that it would be wise "to leave it to the good sense of the supporters of the game to see that they recorded their votes." It was apparently not necessary to leave it to the good sense of the supporters of the party to see that after recording their votes, they also attended the football matches.

E. H. C. Oliphant, 376 Flinders-lane, Melb.

* * *

The Dredging Board, which the Victorian Government appointed after an organised demonstration had been made by the penny morning press, as to the alleged awful desolation which the industry was perpetrating in the State, is not meeting with the success which the agitators anticipated. A public meeting of residents of Bright, where the evil was supposed to be most rampant, has protested that "unfair, biassed, and, to a large extent misleading, statements" have appeared in the metropolitan press regarding the industry, and declaring that "no serious injury has been done," and that to "close down the industry would mean serious embarrassment to the whole residents of the valley." Following this comes the announcement that the private members of the Board, representing the Chamber of Mines, the Water Works Trusts, and the Chamber of Agriculture, threaten to resign because the Cabinet has decided to provide only travelling and living expenses while they are engaged on the inquiry. It is declared by the daily press that if the private members withdraw, the inquiry will be discredited. This amounts to an assertion that the remaining members, composed of departmental officers, cannot be trusted to make an impartial survey of the situation. There is no ground for this charge. The Department of Mines has only the best interests of the industry to serve, and, hitherto, it has not failed to justify the confidence which has been placed in it. If the officers proceed to the end with the duty which has been committed to them those who know best their capabilities and absolute single-mindedness will accept their verdict as one given without fear or favour.

* * *

The favourite complaint of the "Yarra Bank" Sunday afternoon orator to the more or less horny-handed son of toil is that the labourer does not gain a fair share of the harvest which capital has, with the aid of the worker, planted and reaped. This may be so in some cases, but it cannot be applied to the mining industry, the mainstay of Australia and its original source of prosperity. This was forcibly illustrated this week by Mr. A. Campbell, at the half-yearly meeting of the Broken Hill Block 14 Co., in Melbourne. Mr. Campbell said it had been urged by agitators that the miner did not get a fair share of the wealth taken out of the mines, and in this connection it was an interesting fact that since the inception of the company 1,233,520 tons of ore had been raised, which realised £3,327,404. Out of that sum the shareholders had received £538,161 in dividends, while the miners, and other workmen, had been paid £1,385,600 in wages. This seems to be a very fair share of the spoils. In other mines which might readily be named, the proportion of wages to dividends has been strikingly in favour of the worker. A remarkable instance of the enterprise of speculators is shewn this week where, after 24 years prospecting, and after over 200 calls had been more or less cheerfully met by the shareholders, a Bright exploring association has applied for help to the Victorian Government. There are many other instances in which fortunes have been sunk in the earth in keeping miners employed searching for what, after all, proved to be vain expectations.

* * *

The answer of the Bendigo (V.) mine-owners that they will continue to hoist in the breeze of freedom the flag of justice to all, and favour to none, has brought the non-union question to a crisis, and grave responsibility will rest upon those who seek to haul the banner down. The action of the officials of the Mining Employees' Federation, in seeking to obtain the assistance of the shareholders in coercing men to join the ranks of the unionists, is a lamentable confession of weakness. It is stated that not much more than half of the men employed on the Bendigo field have considered it to be to their advantage to resign freedom of contract in favour of the iron-bound rule of the unions. If moral suasion has failed to shew these men that they are acting against their own interests in remaining outside the ranks of the Federation—and self-interest is perhaps, after all, the most powerful lever which could be utilised—then the attractions of the union cannot be very strong. The forces within the union must be of a repellent nature. No one can complain, and no fair-minded person does complain, of the working miner combining to obtain for himself fair remuneration for his labour, and the most favourable conditions of employment, and towards these ends the employer has, as far as reasonably can be expected, met his wishes. But, when aid is asked to force men into an association, governed to a great extent by reckless agitators, the request is out of all reason. The officials declare that they "mean business," which, of course, means a strike. Should a strike ensue at the present juncture there is no doubt that several mines will be closed down, and that much privation and suffering will be prevalent among the mining fraternity, and the women and children. The onus will be with those who, for an unjust cause, bring such a state of things to pass.

* * *

Anyone who has had to do with patents will appreciate the aims and objects of the London Institute of Inventors. This organisation was formed in the early part of 1912, with the Earl of Minto as the first president, and most of the High Commissioners for the colonies as vice-presidents. The objects of the institute are the protection of the rights of inventors, the furtherance of their interests by Acts of Parliament, financial assistance for members, and the provision of a fund for legal aid and advice. An important scheme which the society has at heart is an Empire patent. At present inventors have to pay for patent rights in the United Kingdom, Canada, South Africa, India, Australia, New Zealand, and even Malta, separately, paying individual charges and fees in each case, as if they were foreign countries. Standardisation of drawings is a kindred reform aimed at, which would mean the saving of thousands of pounds to inventors as a class. Mr. E. H. W. Crossley, secretary of the London Institute, is at present in Sydney, and is taking steps to form a similar association there. "At present," he states, "inventors are an ill-used class, although they are the mainstay of the engineer, the architect, and the builder. Without the inventor the engineer would have no implements, and the architect could not work out his ideas. The institute was formed to weed out the 'crank' inventor, whose inventions were only imaginary, and also the 'cribbers.' These two types are too numerous, and cause the capitalist and manufacturer to fight shy of the genuine inventor."

* * *

Very little is being done, or has been done, except by private enterprise, to educate the general public regarding the uses to which electricity may be put, for power, lighting, and cooking, to say nothing of its advantages over gas in the interests of health in a warm climate like that of Australia. Earlier efforts to utilise the mystic current, there is no doubt, created a certain amount of prejudice in the mind of the man in the street, and time is but slowly effacing it. A hint might be taken by Australasian metropolitan authorities from the Corporation of Glasgow, an example to the world at large, in the matter of municipal administration. Arrangements have been made by the second city in the United Kingdom to hold an Electricity Exhibition, which will be open for two months, from October 23rd of the present year, at which excellent arrangements will be provided for exhibitors. There is to be a special cinematograph display daily, demonstrating the latest applications of electricity, and manufacturers have been invited to forward particulars of any suitable films which they would care to have shown. The exhibits are to exemplify electric heating, cooking, and laundry work, generating plant, transmission and utilisation of electric power, lifts, fans, smoke prevention, and shop-window-lighting. Lectures and demonstrations will also be given. An exhibition on somewhat similar lines would do much to awaken interest in Australasia in a medium, in regard to which, as far as the general public is concerned, there is a great deal of ignorance to enlighten.

---

Mr. W. E. Hills, secretary of the Austral Malay Tin Mining Co., reports that the formation of a London company, to take over the Kamunting property, has been completed.

## NEWS AND NOTES.

The Federal External Affairs Department has received a report stating that since boring operations were stopped by Mr. F. C. Grebin at Vailala River, Papua, to allow a reservoir for the petroleum to be constructed, oil has been gradually filtering into the bore. Two gallons of oil is on its way to the Department for testing. The work being undertaken by the other expert, Mr. C. H. Locke, is said to be also yielding encouraging results.

Representatives of the Bright District Prospecting Association (V.) waited upon the Minister of Mines while he was on a visit to the district, and applied for a grant to assist them in extending their tunnel at Wandiligong. The work has been in progress for 26 years, and 256 calls have been met by the shareholders. The tunnel is in 5021 feet, and a report, it was stated, by Mr. Kenny, surveyor, gave favourable indications. Mr. Billson promised to give the application consideration, and said he would send Mr. Herman, the Government Geologist, to inspect the property and report.

A company, with a capital of £10,000, is being formed to take over the Hope and Morning Star leases, Wood's Point (V.), and it is expected that operations will be begun within the next six months.

Smelting has been stopped at the S.A. Government mine at Yelta, but ore is still being raised, and will probably be sold to the Wallaroo and Moonta Mining Co.

The estimate of the population of New South Wales on March 31 was 1,799,442, the gain during the quarter being 20,530, of which three-fifths was due to excess of arrivals over departures.

Good progress is being made with the construction of the tramway line to link up the McGregor group of mines (Q.) with the Cloncurry-Hampden-Mount Elliot railway, and the Hampden Co.'s smelting plant. The earthworks have been completed to the ten mile point, and the rails laid for three miles.

The Western Star Ltd. has been floated with a capital of £2000 to carry on the business of explorers, prospectors, miners and smelters, etc., the principal place of business being Cloncurry (Q.). The registered office is at Friezeland (Q.).

Giving evidence before the Empire Trade Commission in Adelaide, Mr. G. D. Delprat, manager of the Broken Hill Propy. Co. (N.S.W.), said the company got more out of lead than zinc, and more out of zinc than silver. It was difficult to say what was beyond the ore reserves in sight, but they had enough plotted out to keep them going for the next eight or nine years. The business was enormous; the biggest of its kind in the world. Referring to the Newcastle works, he said it was their intention to make all the steel rails required in the Commonwealth, and they would also make galvanised corrugated steel sheets and steel wire.

The Oxide Creek mine (Q.) is timed to commence production and shipping ore in seven weeks' time.

Gold received at the Melbourne branch of the Royal Mint during the week ended 24th May amounted to 2898.96 oz. The gold and bullion issued was valued at £43,504 13s. 5d.

Colours of gold, it is reported, have been found in a line of reef about four miles from Frankston (V.), where indications were prospected several years ago. A prospector who then put down a shaft was beaten by the water. A parcel of ore has been sent to Melbourne for treatment.

## YERRANDERIE FIELD (N.S.W.).

Our Lithgow correspondent, who has recently paid a visit to the Yerranderie silver mines, writes thus of the field generally:—

The working of the Yerranderie silver field dates back to the early nineties, long before the passage of the Mining on Private Lands Act. Some men who were engaged fencing for Mr. H. Manning, a local selector, accidentally discovered galena on that gentleman's land. Some time later, a Mr. Oram put on the first few men to mine for mineral; then, in 1898, Mr. J. B. V. Bartlett, a well-known prospector, who had previously worked the Ruby Creek country, as well as many other areas, accompanied by his sons, was attracted to the field. They opened up the principal mine—the Colon Peaks, which is still the property of the senior Mr. Bartlett. Mr. A. C. Bartlett, the present manager of the Colon Peaks, is just now working only one of the two shafts down on the property. He has about 108 hands employed on the mine. The shaft now being worked is down 540 feet. The average percentage right through has been 115 oz. of silver, 25 per cent. of lead, and 4 dwt. of gold to the ton. An advantageous feature of this mine—and of the field in general—is that it is beyond the zinc zone, which is signally encountered in country further to the westward and which gives so high a degree of refractoriness to the ore out in that area. Mr. Bartlett claims that the Colon Peaks was the first of the field on the lode, and the first on private property. The output of this mine exceeds somewhat 3000 tons per year, the whole of which is sent direct to the shipping agents in Sydney.

At the Silver Peak, in the same locality, where Mr. A. Barlow is manager, an up-to-date concentrating plant has recently been erected for the use of the mine. This is of the oil-flotation type, and on the Bavay principle. The purpose of the plant is to work low-grade ores, of which the mine has 5000 or 6000 tons at grass at the present moment. The plant is costly, but its work will be watched with vivid interest, since its success will mean the indefinite extensions of the life of the field.

Briefly outlined, the mode of the plant's working is:—Breakers treat the ore, which then passes into a revolving screen, through which drop the "fines" into jigs, but the "over-sizes" go on to the rolls to be further crushed. The screened ore is then elevated to the trommel (revolving screen) again; and again the over-size goes out, and further crushing ensues, till all has been treated and reduced equally. In the second process the jigs pass the fine stuff to the pans, which treat the ore as did the rolls—in short, the second is the former process repeated on a more minute scale—the "fines" are made finer. In the third process, the stuff is carried to the flotation. It is seldom, indeed, in mining that so much work is done before flotation is reached. By this the stuff is treated by oil precipitation, namely, the metal is taken up by oil. Thence it passes to the drying floor, is then bagged as concentrates, and despatched to the smelter. The mill superintendent is Mr. H. H. Smith. Inspection was made of the whole of the stages of concentration, and exceedingly curious and interesting they were. The mine has a large water condenser, whereby the heavily mineralised water from the mine is purified, while 60 or 70 per cent. of the water is saved to return to the boilers at over 100 degrees of temperature. Thus, that amount of potential caloric is saved in the shape of fuel.

Messrs. Woodhill and Company's show, on the same field, is working along smoothly. At the Yerranderie Silver-Mining Company's mine, where Mr. G. C. Grosse is manager, the deepest shaft on the field—1400 feet—was encountered, and over 100 men are employed. The New Burragorang property is only in its prospecting stages, consequently only a limited number of men have been employed there up to the present. Here Mr. T. Hooper is manager, and a very capable one, too. The new shaft was started 12 months ago, and its prospects are said to be very encouraging. In fact, a very sanguine idea is held that they are right on the lode. In sinking the first 300 feet, 15 or 16 tons of stuff were raised that yielded over £12 per ton. From there, patches were found right through. This shaft is now at the 600ft. level, and is only about a stone's throw from the Yerranderie mine, which is right on the line of lode.

Mr. G. Featherstone, manager of the Tonalli mine, is busy with a gang of men installing new machinery for development purposes. The installations comprise a new and larger winding engine, compressors, rock-drills, etc. When in full swing, which it is hoped will be the case in a few weeks, the property will carry between 60 and 70 men. Then, there are on the field the Great Peak and Lead Prospecting Company, managed by Mr. W. Gander; and the Diamond Drill party, owned and worked by a Braidwood syndicate, with Mr. H. Wilson as manager. The latter is named after the diamond-drill, near by, and in charge of Mr. R. Dent.

There is a probability that industrial trouble is looming over the field, which is an unfortunate circumstance. The recent award gave the men:—Miners, 9s. 6d. to 9s. 10d.; engine-drivers, 11s.; miners in wet ground, 1s. extra; in each case a shift of 8 hours, of course. Then, surface hands get 8s.; and tool-sharpeners, 9s. 6d. It is stated that the miners intend to demand an extra 1s. per day. It would, indeed, be unfortunate if this fine field, now moving upwards so encouragingly, were to be further hampered by industrial troubles.

---

Mr. Frederick Wilde died at Bathurst last week, aged 83. He participated in the rush to the Blue Mountains in '51, and later became managing director of the Big Oakey Sluicing Company, and also of a claim at Erskine Flat, which were subsequently sold for £8000 and £3000 respectively.

Mr. Daniel Hogarth, of Bathurst, has been elected a fellow of the Royal Astronomical Society, and a fellow of the British Royal Meteorological Society.

# THE INVESTOR'S COLUMN.

## Some Companies Attracting Attention To-day.

(By Our Exchange Reporter.)

### Junction North Broken Hill (N.S.W.).

It has very often been noticed in the mining world that the publication of an unfavourable report has been immediately followed by a strong demand for shares, and such has just been the case with this company.

The trading in this stock has for a long while been on an extensive scale, and the fluctuations have generally been between 12s. and 15s.; towards the end of the week, however, a strong demand for the shares set in, with the result that prices rose to [illegible] 8d., this being about the closing quotation.

Such a marked improvement in the case of a stock whose position of affairs is regarded as unfavourable may be accounted for by the fact that there is usually a bear account outstanding, and the publication of the official report is regarded as about the best opportunity for settling it up, as it may be taken for granted that the worst has been made known. It is only just in this particular instance to say that, although the results of the working operations for the last half year, and the financial position also, are very different from what was expected about twelve months ago, still there are some crumbs of comfort for the shareholders. The most important of these is the statement of the general manager, that the development at the No. 12 level in the northern end of the property has given a very considerable addition to the ore reserves in this level, and points to a greater enrichment in the ore bodies at lower levels. Mr. Palmer also says that, if the heel of the ore body does not pitch north much, there are prospects of the No. 13 being equal to any level ever worked in the mine, and also of a still further improvement in the No. 14 level.

As the value and size of an ore body are the essential things in mining, these statements are decidedly welcome. There is also a satisfactory announcement that the experiments in connection with selective flotation, which have been carried on at the mine, for the purpose of producing zinc and lead separately from the slimes, have been a distinct advance in the treatment of the latter material, these products being readily saleable. Among the unfavourable items in the report is the result of the law case with the Broken Hill Junction Company. This action had been brought by the Junction North against its neighbour on the question of mine ventilation, and the decision was given against the plaintiff.

Against this verdict, the company has appealed, and as the case has already cost the shareholders over £5000, they will await the final result with some anxiety.

Owing to shortage of labour the mill only worked to 59 per cent. of its capacity, yet the production of concentrates compared favourably with that of the previous year, the figures being—Lead concentrates, 12,910 tons, zinc concentrates, 9055, as against 10,640 and 7762 respectively for the former period—the second grade lead concentrates (included in the statement) being 2418, as against 1616 tons. The working account is, however, a very disappointing record of operations—the value of the concentrates produced being £115,997; while the mining, development and treatment costs amount to £97,439, purchased ore £13,337, and Minerals Separation royalty £2089—so that the net profit transferred to profit and loss account comes to £3130 only.

As the cost of administration, including office expenses, directors' fees, discount on redeemable bonds, etc., came to £4154, the writing off for depreciation £2928, and the cost of Equity suit (as already stated) £5124, it will be seen that the company lost ground seriously during the term, the difference between the balance carried forward (£5092), and that for the previous period (£[illegible]) being £8672. When it is remembered that the market expectations of the results were, not long ago, a net profit of £2000 per week, it will be understood how great a disappointment this stock has been, and why the criticism of its management is somewhat bitter. The calls have also been much heavier than it was thought would be necessary, so that the paid-up capital now stands at £142,810, an increase of over £40,000 since the shares were being bought at 24s.

It is not surprising that the Melbourne shareholders are making an effort to get some new blood into the directorate, and it is to be hoped that their efforts will be successful. Some of the interesting items in the balance sheet are as follows:—Liabilities, redeemable bonds, £39,645; sundry creditors, including provision for income tax, £18,848; E. S. and A. Bank Ltd., Sydney, £4069; the total liabilities, other than that to capital, and including profit and loss balance being £[illegible]; The assets, mine, mine plant, mill plant, flotation and de-leading plant, together with sundry debtors (£24,125), come to £107,403—a deduction of £20,000 from this amount having to be made for reserve against depreciation of assets taken over from old company, so that it totals £87,403. The other assets, which may be described as liquid, total a little under £124,000, being made up of concentrates on floors, £20,263. Slimes purchased account, being amounts paid for material not yet treated, £68,465; stores on hand, £16,582; discount in suspense, redeemable bonds, £14,977; cash balances, £3068.

It should have been mentioned that there is also a contingent liability on account of the law suit, but allowing for this, there is a good balance on the right side, and it would look as if the shares were worth buying, especially as the liability on them is now reduced to 3s. 6d.

The working operations have certainly been disappointing recently, but against this fact must be taken into consideration the satisfactory developments in the mine, and the probability of others of a similar nature before long—there are also the improved results now being obtained from the treatment plants, which are equal to 12 per cent. more than their previously estimated capacity.

These shares will continue to fluctuate in sympathy with the tone of the London market in the other Broken Hill stocks, but the fluctuations will probably now be on a higher range of prices.

### Amalgamated Pictures Ltd.

The ordinary shares in this company, although very much below their par value, have recently been steady, with sales at 12s., but the quotation is now seller at that price. This is an improvement on the low prices which were touched about a month ago, and there is no doubt that the stock has some consistent supporters. The cumulative preference shares, which carry a dividend at the rate of 10 per cent., are quoted at seller 22s., the last transactions having been somewhere in this vicinity.

It is difficult to estimate the position of the company—that is, with regard to its earnings—as a material change in the nature of its operations has taken place. The biograph interests of Messrs. West Ltd., Spencer Ltd., and the Amalgamated Pictures, together with the film businesses of Messrs. Pathe Freres, Harrington Ltd., and Gaumonts Ltd., throughout Australia, have been formed into the General Film Company of Australasia Ltd., with a capital of £250,000. It was in order to provide the company's proportion of the necessary funds that the issue of the 12,000 cum. pref. shares was made. The Amalgamated Pictures Co. is to receive shares in the new company in payment for the goodwill of its film hiring and exhibiting businesses; also six per cent. debentures in payment for its stock-in-trade, plant, etc. The freehold and leasehold assets it will retain. In January, this year, the General Film Company, with the consent of the constituent companies, entered into an agreement with the Greater J. D. Williams' Amusement Company, whereby the latter was included in the amalgamation. Since then, two new companies domiciled in Sydney, and each with a capital of £300,000, have been formed. One, the Union Theatres Ltd., will control the exhibiting businesses of the four companies in the amalgamation, and the other, the Australian Films Ltd., will control their film hiring businesses. In the exhibition company the General Film Company receives 180,000 shares, and the Greater J. D. Williams, 120,000—while in the film hiring company the proportion is 225,000 and 75,000 respectively. The holdings of the different companies other than the Greater J. D. Williams in the General Film Company are now being assessed. The net earnings per annum of the exhibiting and film hiring companies are expected to be well over £100,000 per annum, and as in the 600,000 shares in them, the General Film Co. will hold 405,000; the three constituent companies—West's, Spencer's and Amalgamated Pictures—should divide on such a basis about £67,500 between them.

### Edna May (W.A.).

The course of prices in the shares of this company has been marked by considerable fluctuations, and the operations of the last few weeks have not been an exception. As the official reports came to hand showing that good progress was being made with the sinking of the new shaft, the quotations for the shares steadily hardened, and when the crosscut, which was put in at a depth of 71ft., had connected with the drive on the reef from the underlie shaft, the prices had improved from about 33s. to 36s., the reef at this point being proved to be 23ft. wide. Then the news came to hand, that in continuing the sinking difficult ground had been encountered, and later on the intimation that it would be necessary to put down another shaft. It was not surprising, under the circumstances, that a serious set-back in prices ensued, sales being recorded in the vicinity of 28s.; it was certainly more remarkable that some substantial buying then set in, and after fairly heavy exchanges the shares steadily fought their way back to their previous level of 36s. The probable reasons for this manifestation of market support are, first, the new manager's estimate of the ore reserves, which is 20,000 tons, worth £4 2s. 6d. per ton—this estimate being for ore above the 71ft. level. No allowance is made for any tonnage below this level, but as a winze has been put down 55ft. deeper, and the reef at the bottom is 10ft. wide, and a crushing of 114 tons from it gave the return of 285 oz. of gold, it is evident that the statement of Mr. Williams, that the work in this direction gives a splendid potential value, is well justified. Another reason for the market recovery is the fact that the main shaft which was being put down is quite sound to 71ft—that is, to the point where the connection was made with the workings; it will be available for haulage, so that ore production will begin at once. As the mill will be completed in a few weeks, the company should soon be making profits, thus providing for the expense of sinking the new shaft, which will be carried on at the same time. It is evident that those persons who sold the shares on account of the misfortune to the shaft, either did so hastily or without realising that it was not to be abandoned. It was fortunate, indeed, for the company that it remains sound to the depth from which connection with the drive could be made.

One cannot help being impressed with the possibilities of this company, and although the shares seem fairly high at present prices, yet the chances are that those who hold on will probably get more money for them.

---

## PERSONAL.

Mr. J. M. Smail, M.I.C.E., president of the Institute of Local Government Engineers of Australasia, was entertained at dinner in the Cafe Francais, Melbourne, by the Victorian section of the Institute, on the 21st. Representatives from other civil engineering institutes were present.

Captain Hallet, who has resigned the secretaryship of the Melbourne Chamber of Commerce, after 24 years' service, has been entertained by the members, and presented with a handsome cheque.

Mr. A. W. Moore, of Beaufort (V.), has been appointed manager of the Beaufort Deep Leads.

Mr. J. H. Blow, Under-Secretary for Public Works (N.Z.), is representing the Dominion's Department of Mines at the Australasian Mining Congress at Broken Hill.

Mr. H. Herman, Director of Geological Survey (V.), has been appointed by the State Executive as examiner for mining surveyors in place of Mr. E. J. Dunn, who has retired.

Mr. H. C. Bellinger arrived from London on Monday, via America, by "Ventura." He has been away from Australia five months, the period anticipated by him when leaving. Mr. Bellinger is renewing his engagement with the Great Cobar Company. He speaks enthusiastically about the progress mining methods have made in America during his absence in Australia.

---

## METAL QUOTATIONS.

### By Cable.

(From Our Correspondent.)

**London, Tuesday.**

The metal markets were fairly steady during the week, and showed an inclination to firm for spot quotations towards the close. Standard copper, on the spot, opened at £68 17s. 6d. for the middle position, and went half-a-crown higher, but steadied again the the original figure. Forward supplies were steady around £68 10s. Electrolytic had a good market at the opening of the week at £72 17s. 6d., an increase of 12s. 6d., and closed to-day at £72 10s., an increase of 5s. on last week's figure. Tin moved from £221 5s. to £220 5s., and spurted £2 10s. at the close for spot, while three months closed strong at £217 15s. Lead made up to £19 10s. Aluminium was quoted at from £88 to £92, and spelter at £24 5s. Silver closed the week at 27 13-16d. per oz. for standard. Quotations were:—

COPPER.—Spot, £68 17s. 6d., £68 12s. 6d., £69, and £68 17s. 6d.; three months, £68 15s., £68 10s., £68 15s., and £68 10s.

Electrolytic.—£72 17s. 6d., £72 15s., and £72 10s.

TIN.—Spot, £221 5s., £218 15s., £220 5s., £221 15s., and £223 15s.; three months, £214 5s., £214, £215 10s., £216 5s., and £217 15s.

LEAD.—£19, £19 8s. 3d., and £19 10s.

SILVER.—27 3-16d., 27 11-16d., and 27 13-16d.

ANTIMONY.—"Star" brand, £31; 50 per cent., £9 10s.

WOLFRAM (70 per cent. ore).—Unchanged at 34s. 6d. per unit, or £120 15s. per ton.

MOLYBDENITE.—2s. 6d. per lb, or £280 per ton, a reduction of £28.

MANGANESE (50 per cent. ore).—10d. per unit, or 41s. 8d. per ton; no change.

# OUR BIG MINES.

## Examinations of their Yearly and Half-Yearly Reports.

(By a Mining Accountant.)

### The Mount Lyell Mining and Railway Co. Ltd.

The nineteenth half-yearly report, dealing with the period ending March 31, 1913, is mostly concerned with the fire in the North Mt. Lyell mine. It affords eloquent testimony to the value of this mine to the company. The report is interesting throughout, but its usefulness is limited. The results, both technical and financial, are not to be taken as a guide to the future. The whole period was saturated with abnormality.

There is little need to recall the events of those unhappy days immediately following the outbreak of the fire. All sympathy must be extended to the relatives of the dead miners and to the executive officers in charge. It is indeed satisfactory that no blame for the disaster has been attached to any human being. The Royal Commission gave a finding which, though largely negative, was a complete exoneration of the Department and the company from the charges of criminal neglect levelled against them. The report of the Commission may be found on pages 47 to 54 of the company's report.

Turning to the actual operations during the year, they may be summarised thus: The North Mt. Lyell mine was, so far as ore production is concerned, a negligible factor. On October 21 the mine was flooded, and the fire was finally extinguished on or about November 23, the water level at that time reaching to within a few feet of the 700ft. level. To the end of the period baling operations and repair work only were undertaken. With the richest mine idle the company was faced with the option of ceasing productive work for the time being, or of continuing operations with the almost dead certainty of sustaining a loss. The latter course was chosen. In the end it will undoubtedly prove to have been the wiser one. In these days labour is an altogether too scarce a commodity to lose. Furthermore, there was the consideration due to the men themselves. Considerable outside surface work was undertaken for the purpose of keeping the employees together, and every effort was made to keep the smelters going, recourse being had to smelting the Lyell Tharsis opencut metal-bearing flux, supplemented by supplies of Lyell Comstock ore. Both these materials, being siliceous, could be used to furnace the pyrites from the Mt. Lyell mine, from which the largest supplies of ore are normally derived. But the loss of the more siliceous and far richer ore from the North Mt. Lyell could not altogether be replaced, and for the first time in the history of the company a half-yearly financial loss has to be recorded. That it was possible to carry on operations without a severe loss, in such low grade ore, and under such trying conditions, reflects great credit on the company's officers. The reward of the policy is that, now that a resumption of the former conditions is approaching, the number of mining employees stands at 796 men, as compared with 783 at the date of the disaster.

The total output of ore mined was 75,191 tons, being about half the quantity usually raised, and the copper contents of the ore smelted were much below average, being 1.11 per cent., as compared with 2.45 per cent. for the preceding period. The abnormal state of affairs is revealed in Tables A, C, and D. Table A deals with the underground history. For the sake of contrast, and to indicate what are the more normal lines, the results for the previous period are also shown.

Table A.—Underground History.

| | Half-year ended Sept., 1912. Tons. | Half-year ended March, 1913. Tons. |
|---|---|---|
| Ore Mined and Raised:— | | |
| From Mt. Lyell mine— | | |
| Opencut .. .. .. .. | 21,523 | 7,364 |
| Underground .. .. .. | 74,724 | 48,953 |
| | 96,247 | 56,317 |
| From North Mt. Lyell mine— | | |
| Underground .. .. .. | 58,768 | 5,368 |
| Precipitates .. .. .. | 145 | 116 |
| From Mt. Lyell Comstock mine— | | |
| Underground .. .. .. | — | 3,757 |
| | 155,160 | 65,558 |
| Metal-bearing Flux— | | |
| Lyell Tharsis mine .. | 83 | 21,242 |
| Total .. .. .. .. | 155,243 | 86,800 |

Further reference to Tables C and D will explain the full meaning of the above. Regarding the ore reserves, an independent re-estimation was not deemed necessary, owing to the small tonnages won since the reserves were estimated on the occasion of the last report on September 30, 1912. No definite calculation of positive ore reserves can as yet be made in either of the South Lyell or the Lyell Comstock mines, for development work is not in a sufficiently forward state to give decisive information about the tonnages actually in sight. The figures in Table B were obtained by deducting from the previous estimate the ore extracted during the period just ended. They are as follows:—

Table B.—Ore Reserves.

| | Tons Dry | Copper % | Silver oz. | Gold oz. |
|---|---|---|---|---|
| Mt. Lyell Mine— | | | | |
| Available for Opencut extraction .. .. | 319,845 | 0.60 | 1.93 | 0.043 |
| Available for Underground extraction .. .. | 1,975,387 | 0.52 | 1.97 | 0.025 |
| Total .. .. | 2,295,232 | 0.53 | 1.96 | 0.028 |
| North Mt. Lyell Mine .. .. .. | 1,078,384 | 6.0 | 1.33 | 0.005 |

Thus there is a good healthy supply yet available. The ores in the two mines are approximately in the required proportions evidenced by past furnace records. Nevertheless it may be worth mentioning that the grade of the reserves has not materially changed for some years, while on the other hand, the ores smelted during recent periods have been considerably below those of earlier periods.

A comparison of the grade of the reserves with the average grade of ore smelted since 1903, and with that the ore smelted during the half-year ended September, 1912, might be instructive. For obvious reasons the smelting results for the half-year just ended will not be taken into consideration.

Table C.—Assay Value of Ore.

| | Copper % | Silver oz. | Gold oz. |
|---|---|---|---|
| Mt. Lyell Mine:— | | | |
| (a) Average of smelting results since August, 1903 .. .. .. .. .. .. | 0.83 | 1.95 | 0.061 |
| (b) Average of smelting results during half-year ended September, 1912 | 0.51 | 1.86 | 0.040 |
| (c) Average grade of ore reserves .. .. .. .. .. | 0.53 | 1.96 | 0.027 |
| North Mt. Lyell Mine:— | | | |
| (a) (As above) .. .. .. | 6.07 | 1.54 | 0.0046 |
| (b) „ „ .. .. .. | 5.45 | 1.14 | 0.0028 |
| (c) „ „ .. .. .. | 6.0 | 1.33 | 0.005 |

The North Mt. Lyell figures do not show such variation as those of the Mt. Lyell. From the latter mine the ore extracted during the half-year ended September, 1909, averaged 0.98 per cent. copper, 2.25 oz. silver, and 0.046 oz. gold. Since then there has been an almost unbroken decline in the grade of ore treated, until it has reached that shown in Table C. During that period the ore reserves at the Mt. Lyell mine have declined by 872,929 tons (to September, 1912). As there has been no alteration whatever in the grade of the reserves, the only logical conclusion is that the ore developed each period, being less in tonnage than that extracted, must have been higher in grade. The contrary is the case with the North Lyell, as the reserves have grown by 369,816 tons in the same period, the average grade being unaltered. It is worth noting that the grade of the ore treated the previous half-year was less than that credited to the reserves. Of course, so far nothing is proved, but the figures do not inspire great confidence in the grade of reserves. The case of the Golden Horseshoe somehow presents itself for consideration.

Coming to the detailed work in progress at the various mines, the most notable features are the exploration and development of the Lyell Comstock mine. The portion of the mine immediately adjoining the North Mt. Lyell was dealt with in detail in the previous report. This portion did not receive attention during the intervening period. But in addition to these ore deposits, which are considered the most important, as they are thought to be extensions of the North Lyell reserves, there is, to the north, an important mineralised area on Lease No. 4764/M. The opening up of this deposit was undertaken immediately after the cessation of operations at the North Lyell, and the necessary surface connections were made by means of tram, etc., with the general transportation system. At the mine itself a self-acting incline was prepared, accessible from the various tunnels, and from its foot a short tram line was laid to a storage bin, from which again the extension of one of the former firewood tramlines up the middle branch of the Queen River connect the property with the reduction works, the entire length of route being about five miles. The report states that underground developments so far have yielded satisfactory results, and the means of transport permitted of the despatch of 100 tons of ore per day to the smelters. Up to the end of the period 3757 tons were broken and delivered to the reduction works. Of this quantity 3292 tons were smelted, and assayed 3.28 per cent. copper, 0.27 oz. silver, and 0.03 oz. gold.

Other important work proceeding was the drift from the No. 8 level of the Mt. Lyell mine, to connect with the South Lyell pyritic ore body. The drift was in 299ft., within 60ft. of the ore body. When this is complete the company will have the benefit of the additional reserves from the South Lyell mine.

Regarding the Mt. Lyell mine itself, there is not much to add to the report of the previous period. Most of the work was underground; the opencut was worked chiefly for filling material. At the North Lyell mine baling and repair work occupied most of the time. The unwatering of the mine should shortly be completed. A fair amount of damage was found to have been done to the timber and filling supports from the 500ft. to the 700ft. levels, and some of the main shaft timbers were also damaged. But the chief working levels, i.e., the 850ft. and 1000ft. levels, upon their re-entrance, were found to be in as excellent a condition as they were before the catastrophe.

When operations are fully resumed, as they may be about the end of June, the company should be in position to maintain a large output. The examining expert, engaged by the Tasmanian Government to report on the safety and general conditions of the mines, gave a highly satisfactory statement. This was since the close of the half-year. Already the advance towards the establishment of normal conditions has been considerable.

The following table, showing the tonnages and assay values of the ore, etc., treated, is given for the purposes of record, though the fact must be kept in mind that the output was far from normal:—

Table D.—Half-Yearly Output.

| Source. | Dry Weight. Tons. | Dry Weight. Tons. | Average Assay. Copper. Per Cent. | Average Assay. Silver. Oz. | Average Assay. Gold. Oz. |
|---|---|---|---|---|---|
| Mt. Lyell Mine— | | | | | |
| Opencut and Underground .. .. .. .. | | 54,789 | 0.46 | 1.86 | 0.037 |
| North Mt. Lyell Mine— | | | | | |
| Opencut and Underground .. .. .. .. | 6,262 | — | 4.71 | 1.07 | 0.003 |
| Precipitates .. .. .. .. .. .. | 111 | — | 47.98 | 0.20 | Tr. |
| | | 6,373 | 5.47 | 1.06 | 0.003 |
| Mt. Lyell Comstock Mine .. .. .. .. | | 3,292 | 3.28 | 0.27 | 0.03 |
| Total Ore Treated .. .. .. .. | | 64,454 | 1.11 | 1.70 | 0.03 |
| Metal-bearing Flux (Lyell Tharsis) .. .. | | 20,379 | 1.45 | 0.25 | 0.007 |
| | | 84,833 | 1.19 | 1.35 | 0.027 |

From the above furnace charge the following products were obtained:—

| | | |
|---|---|---|
| Matte treated .. .. .. .. | 2,191 | tons |
| Blister copper produced .. | 825 | „ |
| Estimated to contain— | | |
| Copper .. .. .. .. .. .. .. | 813 | „ |
| Silver .. .. .. .. .. .. .. | 95,283 | oz. |
| Gold .. .. .. .. .. .. .. .. | 2,260 | „ |

Compare this output with the previous 157,296 tons of metal-bearing material treated, for a yield of 3124 tons of copper, 213,285 oz. of silver, and 4316 oz. of gold. From such comparison the disastrous effects of the fire can be realised, to say nothing of the cost of repair and rescue work.

The removal of the converters and the proposed alterations to the smelting plant have been deferred until the hydro-electric power scheme is further advanced. Good progress has been made in connection with this scheme. Up to date £23,517 has been expended on the works. When they are completed, it is confidently expected that the reduction in power costs will be a substantial one.

Before proceeding to a discussion of the accounts, there is the usual difficulty to encounter with the manufacture of superphosphates. The undoubted intention of the directors is to give as little information as possible regarding this important branch of the company's operations. For all practical purposes the report might just as well omit all reference to superphosphates. All that is given can be boiled down to the fact that the works at Yarraville, Port Adelaide, and Fremantle were taxed to their utmost capacity to keep up with the largely increased demand for superphosphates. And yet the profit transferred from the superphosphate accounts was less than formerly if the information regarding the copper transaction is to be explicitly believed. Here is the working account as published in the report.

Working Account, Half Year ending 31st March, 1913.

| Dr. | | Cr. | |
|---|---|---|---|
| To Mining Charges | £34,707 | By Blister Copper and Chemical Works Accounts | 114,313 |
| „ Mine Preparatory Works, Overburden Account | 736 | „ Railway Traffic Revenue | 20,834 |
| „ Mt. Lyell Mine, Underground Development Account | 816 | | |
| „ Smelting Expenses | 51,552 | | |
| „ Converter Expenses (Bessemerising) | 4,518 | | |
| „ Railway Traffic Expenses, Maintenance, Management, and Repairs | 18,098 | | |
| „ Freight and Charges on Copper | 8,166 | | |
| „ Balance to P. and L. Account | 16,544 | | |
| | £135,147 | | £135,147 |

The method of dealing with this account, to obtain the cost of copper production, was illustrated at length in the criticism of the previous report ["Mining Standard," December 12th, 1912]. The present half-year is too abnormal to justify a lengthy investigation. The Profit and Loss Account is debited with the following:—

| | |
|---|---|
| Administration and Head Office Charges | £8,608 |
| Written off Mine Prospecting | 4,818 |
| Income Taxes | 24 |
| Depreciation | 11,455 |
| North Lyell Mine Fire Expenses | 21,283 |
| | £46,188 |

The account was credited with interest £1,662, and with £16,554, the balance from working account, thus showing a net loss of £27,972. Whether to debit the copper production with the whole of the expenses shown, or to make the railways and chemical works share a portion of the standing charges, is a matter that can not be definitely settled, on the information to hand.

The superphosphate profit can only be derived in an indirect way, and then it represents only a portion of the full profits from this source. Where the rest goes to is a matter for surmise. The report steadfastly refuses to overburden itself with such information. Such as it is, here it is: "At 30th September last, 996 tons of copper remained unsold, and were taken into account at £60 per ton. This copper was sold at an average price of £81 7s. 3d. per ton. Of the 813 tons of refined copper since produced, 254 tons were sold at an average price of £70 5s. 7d. per ton, leaving 559 tons unsold at the 31st March, which have been taken into the Profit and Loss Account at £60 per ton." In its way this is a good example for other companies to follow. Analysing the information, and making necessary additions to cover omissions, the following results:—

| | | |
|---|---|---|
| 996 tons copper at £21 7s. 3d. | = | £21,276 |
| 254 tons copper at £70 5s. 3d. | = | 17,751 |
| 559 tons copper at £60 | = | 33,540 |
| Total from copper | = | £72,567 |
| Add 95,283 oz. silver at 2s. 3d.* | = | 10,719 |
| Add 2,260 oz. gold at 84s. 11½d.† | = | 9,600 |
| Grand Total | = | £92,886 |

*Estimated. †Fine gold.

In the Working Account the Blister Copper and Chemical Works Account, are credited with £114,313. The above analysis shows that £92,886 was contributed by the blister copper. Hence Chemical Works Account—i.e., the superphosphate production—contributed £21,429. There is no debit anywhere in the Working Account to show the cost of production of superphosphates. Hence this £21,429 must be a credit balance from the Chemical Works Account. Whether this balance represents gross or net profit is indeterminable. It probably is about half of what was actually earned. The full output of the chemical works is about 90,000 tons of superphosphate per year. If the net profit be taken at £1 per ton the result probably will not be far wrong. No tonnage is given in the report itself; the accounts are given in detail above, so that readers of this paper may form their own conclusions.

The copper brought forward, taken into the accounts at £60, and sold at £81 7s. 3d., played an important part in making the results look fairly respectable. The extra amount that accrued to the company this half-year was £21,276. At the end of the period only 559 tons of copper were on hand, as against 996 tons brought forward. The following table shows the principal features of the financial side:—

Table E.—Financial Results.

Half-Year Ended.

| | Mar., 1911. | Sept., 1911. | Mar., 1912.* | Sept., 1912. | Mar., 1913. |
|---|---|---|---|---|---|
| Revenue | £326,887 | £306,331 | £163,694 | £326,689 | £136,809 |
| Expenditure | 216,849 | 217,437 | 128,106 | 204,442 | 148,508† |
| Written-off | 24,262 | 19,860 | 15,055 | 15,518 | 16,273 |
| Net Profit | 85,776 | 69,034 | 20,523 | 106,749 | Loss |
| Dividend | 75,000 | 75,000 | — | — | — |
| To Reserves†† | 512,643 | 505,977 | 523,254 | 627,783 | 522,591 |
| Paid Capital | 1,200,000 | 1,200,000 | 1,200,000 | 1,286,739‡ | 1,286,786 |
| Liquid Assets | 725,499 | 510,281 | 540,623 | 661,812‡ | 641,800 |
| Liabilities | 324,513 | 121,389 | 126,042 | 117,154 | 147,281 |
| Surplus of Liquid Assets | 400,986 | 388,892 | 420,581 | 544,658 | 494,519 |

*Strike during period.
††Including transfers.
Loss = £27,972.
†Includes 21,283 North Lyell fire expenses.
‡Premiums = £21,685.

## MINING IN NEW SOUTH WALES.

### Broken Hill.

### Junction North Broken Hill Mine No Liability.

(From Our Correspondent.)

Broken Hill, 23rd May.

Mr. Alfred Rigby, chairman of directors of the Junction North mine, made the following statement to-day:—

My co-directors, Messrs. G. A. Grant and T. H. Smith, and I have investigated the company's affairs at the mine during the past 4 days, and have satisfied ourselves that the general standard of efficiency has been quite recently increased materially throughout all departments. The various treatment plants now amply demonstrate that they can, and are, profitably treating considerably greater tonnages than they are rated for. The recent heavy weekly increase of saleable products is the result of steady improvements in capacity and metal recoveries. Economies are manifest in most of the operations, and further progress in this direction is having keen attention. The extension of No. 12 level so far northwards is gradually permitting additional sill stopes to be opened out, whereby the output of the mine is being increased; such ore is mined more cheaply than ore now broken in the upper levels. There is good reason to expect a useful body of ore at No. 13 level, towards which the drive has now been started.

We have witnessed demonstrations, on a working scale, of the selective process that has been developed by the company's staff. The process deals effectively and cheaply with the separation of lead, silver, and zinc in the best saleable form, and is likely to be of great value to the company.

### Bathurst District.

(From Our Correspondent.)

Lithgow, May 23rd.

It is pleasing to note that mining operations in the south-western side of this district are continuing to advance in a most satisfactory manner. In point of importance, the Burraga Lloyd copper industry, of course, takes the premier position. Here the conditions of activity are gradually assuming the standard enjoyed some five years ago. There is plenty of work for labour of various classes, and the one-time empty houses have entirely disappeared. Then, about 12 miles distant, at Mount David, both mines owned by that company are being pushed forward at a brisk rate. At the No. 2 shaft the installation of a new and powerful winding plant has been completed. The workings are now practically empty of the accumulated water, and in a few days the work of sinking the shaft an additional 80 feet, which will bring the total depth up to 535ft., will be entered upon. The encouraging indications met with at the 420 feet level have warranted the additional sinking, as the lense of ore encountered was of good value, and, as the trend of the stone was downward, but could not be followed safely for want of air. This work is of twofold character: that of giving natural ventilation by connecting certain levels, and of accurately testing the continuity of the lode. The Little Marvel mine was formerly owned by a syndicate, which worked it to a depth of 165ft. with good results, the ore averaging from 10dwt. to 23dwt. per ton, under expensive and somewhat primitive working conditions. A new main shift is now in progress, the destined depth being 200ft.; it is a three-compartment shaft, and closely timbered throughout. The country passed through consists of decomposed felsite, which forms one of the walls. The rate of sinking has been rapid, and when finished a short crosscut of about 50 feet will be proceeded with, in order to cut the fissure, where one of excellent quality is known to exist.

### Lithgow District.

(From Our Correspondent.)

Bathurst, May 22nd.

Amalgamated Hill End Ltd. have at length had a bit of luck in their low level tunnel. A dreary drive of 1000ft. disclosed nothing payable, and as working capital was frittering away things looked very multy. The drive was slewed some 80ft. out of the straight, and the horseshoe bend turning northward cut a reef channel carrying coarse gold. The tunnel drive is a contract job, and some 6ft. a day is being cut out with machine drills, and it was not until 40ft. had been driven on this channel that gold specimens were "discovered" on the tip.

An arrangement has been come to between the Amalgamated and Rowley's Reef Co. by which the latter is allowed to enter the former's mine and drive along the Star of Peace reef into Rowleys. Rowleys will pay a royalty, on a sliding scale basis, on all gold crushed at the Amalgamated battery. The drive is to be continued until opposite the Patriarch shaft, 550ft. vertical, when a short crosscut will tap this near the bottom, and give some 250ft. of backs to work on. The intention is to put the old Patriarch in order and to instal the necessary hauling plant and make this the main working shaft, as suggested by Mr. Cundy, who in his report drew attention to the fine asset the company possessed in this shaft, its position being an ideal one for testing the reefs at a great depth.

A number of authorities to enter have been applied for by Bathurst speculators, on the Brucedale Estate, Peel, for hydraulic sluicing purposes. Until the ground is marked out, and rent and compensation assessed, no prospecting can be done, but a cursory examination shows an immense body of wash extending down the Clear Creek and the Wimborne Dale Creeks, on the left-hand banks and points. A number of dishes washed from different parts showed both fine and coarse gold in payable quantities if handled in a large way. It is also said stream tin has been discovered, but its locality is kept secret until the ground is secured. Taken altogether, there are possibilities of profitably working a large area with the installation of up-to-date machinery. Mr. H. C. Glade, in conjunction with a Sydney capitalist, is forming a small company to thoroughly test the areas he and his party will hold, and has secured a small plant to carry out this work preparatory to the large scheme contemplated, if the preliminary canter is successful.

Great Lucknow Consols, Napoleon, are passing through troublous times. The company was granted suspension of labour conditions, and wages being in arrears, the men sued the manager and obtained a verdict. Money not coming to hand, the Warden's bailiff proceeded to sell the plant by auction to satisfy the judgment. The whole of the compact battery plant, 10-head, with engine, boiler, Wilfley table, etc., were offered in one lot, and not content with that (to satisfy a claim of £115) a first class winding engine was thrown in in addition. The lot realised £140, Mr. Brooks, a shareholder in the company, being the purchaser. Other creditors are now clamouring for payment, but there is little plant left to levy upon, after such a "slaughter sale."

Mr. Dewar, in the same district, is sinking a shaft to cut a reef that was rich at surface, and is down 40ft. A small vein or two met with indicated its close proximity.

Amalgamated Green Swamp copper mine is still closed down, and additional capital must be forthcoming before deepening the new main shaft can be resumed.

D. Bennett recently purchased a 5-head battery, and is now erecting it on his mine on the other side of Trunkey. His party have a 20-acre lease, and the show is regarded as a promising one.

Hawkins Hill Reward's first crushing from the new reef returned 92 ounces from 20 tons. This was taken from the whole length of the chute, 200ft. Had it been confined to the richest part of chute, 50ft., it would easily have gone over 10 oz. The result is most encouraging. Three shafts are being sunk, and are down 90ft., and connected, and another crushing will be going through in a few days. The reef is increasing in size, and is better defined, as the country becomes more settled, at depth.

The equipment of plant for the Exhibition shaft is proceeding. The winding engine is on the ground, and a Cornish boiler on the way. This shaft is a fine asset for the company, 410ft. vertical, and three compartments, whilst its position is an ideal one for testing the reefs at a depth. When all is ready to keep their 20-head mill constantly running—and there is abundance of ore in sight—one may reasonably expect dividends to follow.

Mr. J. Collins has purchased a Huntington mill plant and is erecting it on a large, low grade deposit at Pine Ridge, near Trunkey. The place was worked years ago, and was then known as Hell's Hole, on account of its inaccessibility, local residents unanimously declaring it to be a h—l of a place to get in or out of. Pine Ridge certainly sounds a lot better.

Only ten men are employed at the Harden mine. Five of these have secured a tribute for cyaniding the slimes.

The Great Cobar mines started continuous operations on Tuesday last. The furnaces are expected to have a sufficient supply of coke in a day or two.

The directors of the Araluen Redbank G.D. Co., N.L., have declared a dividend, the 24th, of 6d. per share, payable to-day.

A find of kerosene shale is reported from Diamond Head, on the coast between the Manning River and Camden Haven. Eight or nine leases have been pegged, and it is stated that tests gave a return of 97 per cent. crude oil.

## TASMANIAN MINING.

### Mount Lyell District.

(From Our Correspondent.)

Queenstown, May 23.

Mining operations at the North Lyell mine continue to proceed very satisfactorily. The output of ore is steadily increasing, and is now about 1000 tons a week. A small proportion of this is being won from the 400ft. and 500ft. levels, but the ore bodies here are pretty well depleted. The bulk of the tonnage is coming from the 850ft. level, where the three big stopes, Nos. 19, 20, and 22, are in full productive order. At the 1000ft. level ore breaking is being gradually extended, and very shortly they will be drawing a big tonnage from Nos. 24, 26 and 34 stopes, all of which are of large area. Among other work which is going on at this level is the extension of the east crosscut which is required to make the connection with the Lyell Blocks main shaft, and about which there has been so much controversy, and also much correspondence. And when the connection is made it would, in addition to providing a second means of exit from both mines in case of accident, materially improve their ventilation. At the same time, there is nothing wrong with the ventilation in the North Lyell mine at present; in fact, in that respect, it is one of the best in the Commonwealth.

Unwatering operations have been in regular progress since last writing, but, owing to various unforeseen circumstances, the water has been lowered very slowly, and it will take somewhat longer than anticipated to get the 1100ft. level drained. It is, however, practically certain that all the water will be out by the time these notes are in print.

The Mount Lyell mine is now in first-class producing order, and an output of about 600 tons a day is being maintained. Most of this is coming from the three underground levels, with a small tonnage from the three benches of the open cut. Production from here is always limited at this time of year, the climatic conditions making it very difficult for men to work full time. In addition to the ore sent to the reduction works, regular shipments of low-grade material continue to be made to the company's fertiliser works on the mainland. With the increasing supplies of 6 per cent. ore available from the North Lyell mine, the output from the Mount Lyell mine will also show a corresponding increase, and it is quite ready for any requirements in this direction to an extent, if needed, of 1000 tons daily.

Regarding the Lyell Comstock mine, which is providing about 600 tons a week for the smelters, it is interesting to note that in gold contents the ore is nearly equal to the Mount Lyell ore, the average assay value of the former being .03 oz., as against .037 oz. for the latter. This no doubt accounts in a great measure for the way in which the proportionate gold production kept up during the last half-yearly period, while the copper contents were less than half the ordinary value. Apart from the gold the copper value of the Comstock ore treated during the period was very satisfactory. A bulk value of 3¼ per cent. copper and over half a dwt. of gold in ore, which can be mined to a depth of nearly 400ft. by tunnelling, is a fairly good proposition. Assuming that the portion of the Comstock property under review, which is comprised in the northern lease, and has no connection with the important ore deposits on the southern lease, which have been proved to be extensions of the North Lyell ore bodies, contains only 150,000 tons of ore of the above value and it is pretty certain this is a conservative estimate—what a splendid bargain the Mount Lyell Company made when it purchased the Comstock property for £18,000.

The labour supply generally in the various departments of the company, although not up to requirements, is fairly adequate. At the three mines there are now about 900 men now regularly employed, while at the reduction works, Lake Margaret Scheme, railways, etc., the total number employed approximates 700, so that altogether the Mount Lyell Company is at present giving direct employment in the Lyell district to some 1600 men. And they still have room for suitable men, either miners or labourers; in fact, any man who is willing to do a fair day's work can get constant employment here at good wages.

Regarding union matters on the Lyell field, it may be mentioned that the Maltese employees of the Mount Lyell Company have, since the result of the ballot taken by the Miners' Association, which was in favour of their admission, practically all joined that body. As there are between 100 and 130 of the men employed by the company, their joining means an appreciable addition to the strength of the Association, and, what is of more importance, these Maltese promise to make staunch members of the Association in every respect, and thereby set an example to many of the Australian workers. The Lyell branch of the Federated Miners' Association is now, and gives every indication of continuing, an important factor in industrial operations on this part of the West Coast. There are about 1600 men in the employ of the Mount Lyell Company, and of these it is pretty safe to say 1150 are members of the Miners' Association. Then there is the local branch of the Federated Enginedrivers and Firemen's Association, which numbers at least another 150, so that out of the 1600 men working for the Mount Lyell Company, 1300 may be reckoned as belonging to the Unions. And, as a large number of the 300 outside the Association are debarred by their positions from joining, it may fairly be said that, as far as the Mount Lyell Company is concerned, quite 80 per cent. of the men in its employ are unionists. And unless the writer is very much mistaken, every worker for the Mount Lyell Company—or for any other company in the district—who may be eligible will, before another year is over, have become a member of one or other of the unions mentioned. And he also ventures to predict that when the present agreement between the company and its employees has expired and a fresh one is being discussed, the question of preference to unionists will be found to constitute a very important item in the negotiations.

The Minister of Mines has decided to limit the areas to be granted at Bald Hills, on the West Coast, where the recent osmiridium discoveries were made, to 10 acres. There have been many applications, but objections have been made to the granting of large areas, in view of the high price of the metal. The Government Geologist is preparing to make an examination of the field.

## MINING IN WESTERN AUSTRALIA

(From Our Correspondent.)

Kalgoorlie, May 19.

The No. 7 level of the Fenian at Meekathara is proving one of the richest in the mine. The south drive has been extended a distance of 52ft. in ore assaying 292s. per ton over a width of 92in. The face is in country, but the lode has been picked up 6ft. to the west. The north drive is in 35ft. in ore assaying 357s. per ton over a width of 86in. The face is in ore assaying 361s. per ton for a width of 120in. This mine has produced 92,302 tons for a return of £383,324, and paid £161,165 in dividends. The mine is now producing 2700 tons monthly for a yield of £9800. The shares are privately held.

Mr. M. T. Williams, manager of the Edna May, seems to have made a mistake in sinking a vertical instead of continuing the incline shaft, as advised by Mr. A. E. Morgans. At a depth of 100ft. "spewy" ground was met with, and, although alluvial miners were employed, they apparently did not know their work, and the shaft collapsed at the bottom. A crosscut to connect with the old No. 1 drive at 75ft. is being extended, and should be completed by the time the treatment plant is erected in the middle of June. The ore in sight is estimated by Mr. A. W. MacIntyre at 23,500 tons, worth £9 6s. per ton, and by A. E. Morgans at 12,000 tons, worth 87s. 8d. per ton. The ore actually treated has been 1421 tons for £11,420, or £8 per ton, with 26s. per ton in the residues. This is what Mr. MacIntyre based his values on, and how Mr. Morgans arrived at his estimate it is hard to say. Probably the real value will be found to be somewhere between the two estimates, as there is no outcrop of the lode, and no one knows definitely how high above the 75ft. level the good values extend, but the underlie shaft proved that they continue below it, and show improvement.

Chief Detective Inspector Dempsey returned from Southern Cross yesterday, apparently as wise as when he went to investigate the Bullfinch robbery. It looks as if the robbery will remain a mystery in spite of the reward of £500 offered by the company for the recovery of the gold stolen. So far as known, no attempt has been made to estimate the ore reserves in the mine, but they must be considerable. At the 100ft. level one of the northern series of lodes—and there are five lodes on the property—is being stoped for a width of 15 to 60ft., and the ore-shoot is proved for a length of 400ft. These lodes have also been tested at the 200 and 300ft. levels. Out of 160 men on the pay sheet, only 4 are working in the rich stope of the boom time of 1910-11, when 1776 tons were treated for £86,000, or £49 per ton. The mill is crushing 10 tons per stamp daily, and is expected to treat 6000 tons monthly when the extra 5 stamps and the tube mill make a start. Mr. Morgan says that he could easily keep a mill of double the capacity fully employed.

The Corinthian North mill is only running at intervals, as the 5in. main installed by the Government, which replaced the original 3in. to Bullfinch, cannot fully supply both mines. This will only be a temporary setback, as salt water has been cut in the shaft, and when the reef is opened up at the 200ft. level an ample supply is anticipated, and fresh water will only be used for the boilers. The mill, when in full swing, has a capacity of 600 tons a month, and is expected to earn a profit of £2500 monthly, sufficient to pay dividends of 1s. 6d. a share yearly, after covering depreciation, etc. On this prospect the present price of the shares is hardly warranted.

The Sons of Gwalia, during last year, treated 155,603 tons for a yield of £262,094, or 33s. 8d. per ton. Costs are given as £180,794, or 24s. 3d. per ton, and a gross profit of £81,300 is shown. After writing off London charges, depreciation, etc., a net profit of £59,494 is left. The peculiar thing is that, according to the monthly returns published in the Chamber of Mines Journal, the gold recovered only totalled £248,093, and the costs came to £184,882, leaving a gross profit of £63,211, or £18,000 less than the annual report shows. This is most misleading, and proves that the monthly reports are quite unreliable. The ore reserves on December 31st, 1912, were estimated at 560,000 tons, worth 32s., against 581,000 tons of similar value a year previously.

The Great Boulder Perseverance is gradually improving its position. A year ago ore reserves were estimated at 807,660 tons, worth 23s. 11d. per ton, and they are now given as 856,740 tons, worth 23s. 3d. per ton. No sinking was done during the year, the extra tonnage being gained by further exploiting the old levels, where it was found that some of the drives were entirely off the lodes. The plant is now treating 250,000 tons yearly, so there are 41 months' reserves, besides big possibilities of opening out more on the levels now being operated on.

# THE COAL MINING INDUSTRY

## New South Wales.

### Northern District.

(From Our Newcastle Correspondent.)

The Delegate Board of the Colliery Employees' Federation met at Maitland last month, and the chief business before it was consideration of the decision of the federation, by ballot, to have a conciliation board under the Industrial Arbitration Act to deal with the two important questions of the abolition of the afternoon shift, and payment for the winning of small coal. Several of the speakers at the meeting said they regarded the conciliation board as but another form of the wages board, to which the members of the federation are strongly opposed. They felt that the federation would soon get tired of it, as it would not give the same results as did the Joint Committee. At the same time, they expressed their regret that the members had ever been so foolish as to give the proprietors the opportunity to withdraw from the Joint Committee. Other speakers contended that it was all very well to criticise the present proposal, but the fact was that the federation was in such a position that it could do nothing else but accept the conciliation board under the Act. They could only hope that the board would deal with matters submitted to it in an expeditious manner, and that the results would be satisfactory in the main to the members of the federation. The federation is calling for nominations for representatives on the board, and also for an advocate to plead their cause before it.

The Minmi Lodge has dealt with the resolution of the delegates which imposed a fine upon the lodge, and also expelled it from the federation, for entering into the agreement with the proprietors of Minmi Colliery. The lodge contends that the action of the federation is due largely to the fact that the lodge has stood up for its rights during the last four years or so, and it is now insisting upon the question being submitted to a ballot of the members of the federation. The resolution expelling Minmi Lodge was carried by lodge vote, and that means that 20 or 30 men may decide for a lodge of 300 or 400 men.

Many of the collieries in the district have been in serious trouble during the past week owing to the heavy floods that have swept down the Hunter Valley. The whole of the pits in the South Maitland district were shut off from communication by rail with Newcastle, and no coal trains have run from Maitland to the port for over a week. In places the river, having broken through its banks, rushed across the main railway lines, and the lines running out to the collieries, to a depth of several feet, and at a rate of ten or twelve miles an hour, doing great damage to the Government lines and to the companies' lines. Traffic on the Government railways was restored yesterday through to the north, and it is expected that the lines out to the collieries will be free of water early next week. The result has been that the coal trade has been seriously interfered with, particularly that to other States, and the mine-owners and the shipping companies have lost some thousands of pounds. The loss of the men in wages probably runs into £10,000 or £15,000. It is matter for congratulation, however, that the mines were not damaged in any way by the flood waters.

The result of the flood has directed attention to the position of the mines on the South Maitland field, in that they have to send all their coal through Maitland, where the land is always liable to flood, or, as in the case of Messrs. J. and A. Brown's mines, down to Hexham, which is just as badly off. A suggestion has been made that the flood gates which now protect the lower part of Maitland, but which prevent the outflow of the water at a rapid rate, from the swamps near the colliery lines, should be removed. But those who know Maitland know that that would aggravate the trouble, for the colliery lines would then be overflowed once or more every year, whereas now years may pass without them being flooded. The solution of the difficulty will probably come by the construction of a railway line through from Cessnock to Cockle Creek, on Lake Macquarie. That line would not be subject to flood, although heavy rains might cause washaways occasionally, and it would have the further recommendation that it would reduce the distance between Cessnock (the centre of the South Maitland field), and Newcastle by about 11 miles. The saving in cost of haulage alone would soon pay for the line, and it is understood that the Caledonian Collieries, Limited, will undertake the work at once if certain guarantees can be obtained from other companies to send their coal over the line. The construction of the line will be a fairly heavy undertaking, owing to the fact that a mountain will have to be pierced with a long tunnel.

The district continues to be affected with troubles, more or less serious. Stockton Borehole and Lambton B Collieries have been idle for some weeks owing to disputes between the management and the men, and on the 24th Burwood Colliery, which belongs to the same company as does Lambton B Pit (Scottish Australian Mining Company), did not work, because the men decided to take the morning off to hold a meeting to ventilate their views over the screening and weighing of the coal, and the proposal to strike a consolidated rate for working in pillars. This action on the part of the Burwood men shows the unreasonableness of some of the mine workers in the district. The day was back Saturday, and the rule of the district is that work should be done as usual, pay Saturday being the fortnightly holiday. However, the secretary of Burwood Lodge posted a notice at the pit top to the effect that a meeting of the men would be held at 10 a.m. The manager had the notice removed, and one substituted intimating that there would be work as usual. He also got into communication with the officers of the Colliery Employees' Federation, and asked the lodge secretary to come to the telephone and speak to them on the matter. The secretary refused to do so, as he said he took his instructions from the lodge, and not from the federation, in such matters. The men held a hurried meeting when they knocked off on Friday, and they decided to meet again in the morning to transact their business. The result was that the mine was idle all day, although coal was urgently needed to fill orders in hand. The opinion of those connected with the company is that some of the men in the mine wanted to attend the races (it being Newcastle Cup day), and that the meeting was partly an excuse to keep away from the mine, so as to be early at the racecourse. Whether that opinion is correct or not, the action of the men is most unfair to the company, for they could have met at night, after working hours, and have transacted their business without loss to themselves or to the company. The company has all it can do to make ends meet each year, and much of the expenditure which falls upon it is due to the action of the men in stopping work without any thought for their employers, and throwing the mine idle, and keeping ships waiting.

The Minister for Mines in this State (Mr. A. Edden) has made arrangements for a test of the new electric safety lamp received from England, to be made at the Dudley Colliery, Newcastle, on Thursday next. The Minister and the officers of the Department will be present, and also the agents of the firm which manufactures the lamp. Information has been received by the Minister from the Agent-General, in London, to the effect that exhaustive tests are being made in England of different types of safety lamps for use in collieries. The Minister has also received a quantity of literature and copies of orders issued by the Home Office on the subject. Mr. Edden has asked the Premier to communicate with the British Government, and ask that any further information on the subject may be forwarded as soon as it is available.

The coal trade of Newcastle is brisk, and it is expected to be very heavy during next week, owing to the temporary set-back caused by the floods around Maitland. The outlook for the winter months is good, and there are those in the trade who believe that, with industrial peace, trade will continue good for the rest of the year. The most satisfactory feature in connection with the trade is the increase from month to month in the quantity consumed in Australia and New Zealand. At the present rate of increase in Australasian consumption, the day is not far distant when Australian colliery owners will be independent of foreign markets, and the oil bogie will have no fears for them.

### Southern District.

(From Our Wollongong Correspondent.)

A Wages Board is being constituted to make an award to take the place of the present southern collieries award, which expires in August. Trade continues sufficient to keep the mines practically fully at work.

All the collieries at the northern end of the seam, which rely upon Government railway transport of their coal, have lost time this fortnight for lack of trucks. The trouble has become chronic, and appears to be irremediable. Industries throughout the country which use the railways will have to adapt themselves to the situation of a monopolistic railway service acting in restraint of trade.

The Balgownie mine, on the four-feet seam, was inspected by a Sydney party a couple of weeks ago. Over on the highlands, behind this narrow strip of a district, there is coal also. The Progress Association of the district of Robertson has long been endeavouring to get the Mines Department to put down a coal prospecting bore there, the argument being that the Railway Department could do with a colliery for the supply of the southern railway. It is announced that the Minister has approved of a visit of inspection by Mr. Pitman.

---

A traveller who has just returned to Sydney after a five months' tour of the East, Mr. Walter Armstrong, of Messrs. Lane and Dawson, Sydney, gives a more encouraging view as to the future of the Newcastle coal trade in that direction, than we have been wont to hear of late. Commenting on Java and the export of coal from Newcastle, he said: "I am satisfied that the future is bright. They have been using Japanese and native coal there, but are prepared to pay more for the Newcastle product. Native coal is about 6s. per ton cheaper than ours, and the Japanese article is from 1s. 3d. to 2s. per ton less. They are, however, doing a fair business with New South Wales, with prospects of an increase. In Singapore the Japanese hold the coal market. There is ample evidence of it. This is really the central bunkering port of the East, and stocks averaging 300,000 tons are on hand. Newcastle's share of this is but a drop in the ocean—Japanese coal predominates. And the same may be said of Penang. No Newcastle coal has gone to Hongkong for years. Japanese and Chinese coal dominates the situation. Speaking of Japanese coal, let me say that the new colliery at Fushun is very much talked about, as it has a seam 200ft. thick. I have good reason to believe that some of the coal contracts lost to us during last year or so may come back. Japan has had a big share of this business, you know, but I think Newcastle will get one contract for 80,000 tons.

## Victoria.

### Powlett River District.

(From Our Wonthaggi Correspondent.)

The past week has been a quiet one at the State mine, but how long this state of affairs is to continue it is hard to say. The acceptance of the filling rate of 1s. 7½d. per ton for machine-cut coal in the No. 9 pit was only agreed to by the miners because they had either to do so or stop work. As there is practically no money available in the funds of the V.C.M.A., a fight could not be put up by the men, and they accepted the rates offered by Mr. Broome, the general manager, but not willingly. The men received the assurance that if it was proved that they could not earn the shift rate of 10s. 2d. at the filling price of 1s. 7½d., their earnings would be made up to that amount. This agreement is only to continue in force until the end of June, when it will expire with the agreements for other parts of the mine. The manager gave the promise to make up any deficiency in the miners' earnings, because he was satisfied in his own mind that the rate offered was such that any competent man could earn more than the shift rate of pay. It is understood that if any earnings have to be made up some good reason will have to be given, otherwise those affected will be classed as "deficients" or "slow workers," and their services no longer required.

During the strike at the No. 9 pit, the roads were put in order and everything made ready to cut all the coal in this part of the mine, for the future, with the coal-cutting machines. When the men resumed work in No. 9 it was found that there was not room enough for those who had previously been engaged there on pick work to fill coal. It was then arranged that some should be placed in other parts of the mine, and it was also agreed that in order to get the development work pushed ahead that three shifts should be employed, driving the headings in No. 9 at an increased rate of pay. The machines do a lot more work than the miners can, so that in order to make room for the men they have displaced development work must be kept going continuously. The first week on the new rate has passed without any complaints being made, and by the end of June the rate will have had a fair trial, provided that the men do not quietly agree amongst themselves to put on what is termed a "dag," which means that they will not fill more than a certain quantity of coal per shift.

A contract has been let for the first two sections of the "McBride Tunnel," and work on it will be started as soon as the necessary preparations are completed. The portion let will extend for a length of about a third of a mile, and the price to be paid for labour only is between £3500 and £4000. The intention is to extend this tunnel for nearly a mile in length, and to a depth of 600ft., so that both seams of coal in what is known as the Dudley area can be worked from it.

At the Co-operative Colliery, Kilcunda, the output is being materially increased, as there is now a railway siding to the pits' mouth. The seam, which gives an average width of 3ft., is of excellent quality, and the whole of the output finds a ready sale at good prices.

## Queensland.

The Bowen River Coal Co. Ltd. has been formed at Townsville to purchase, lease, or otherwise acquire any area or areas of land of any tenure whatsoever within the Bowen mining district, and particularly at or within the vicinity of Pelican Creek, which may be deemed necessary or suitable for the purposes of prospecting for and obtaining gold. The capital of the company is £2000, divided into 2000 shares of £1 each. The first directors are: Charles John Marshall, John Dinsdale, William Herbert Flamstead, Patrick Walsh, and John Hall-Scott. The registered office of the company is situate at Bowen.

# VICTORIAN MINING ACTIVITIES.

## Bendigo and District.

(From Our Correspondent.)

The gold production for the week ending May 24, 1913, amounted to 2938 oz. 18 dwt. The principal producers were:—Koch's Pioneer, 221 oz. 17 dwt.; Virginia, 190 oz. 9 dwt.; Nell Gwynne, 170 oz.; Golden Pyke, 150 oz. 10 dwt.; South New Moon, 142 oz. 4 dwt.; New Prince of Wales, 130 oz. 14 dwt.; United Hustler's and Redan, 122 oz. 10 dwt.; Catherine Reef, 96 oz. 7 dwt.; Williams' United, 96 oz. 3 dwt. Dividends totalling £2072 10s. were announced, viz., Golden Pyke, 1s., £1372 10s., total to date, £71,195 7s.; Nell Gwynne, 6d., £700, total to date £4200.

Koch's Pioneer tributers provided one of the most interesting items of the week in the exceptionally fine return of 169 oz. from 20 tons. This milling came from the 1900ft. north level, the main eastern reef formerly worked extensively by the company. Good as the average is, it has been exceeded on one or two occasions by the same party, who, last year, sent in a yield of 14 oz. per ton. Like most rich shoots, for which these eastern reefs are noted, the gold is confined to a very small area. The tributers are working on the "halves" system, so that the company benefit substantially by their success. Up to the present, about £4500 worth of gold has been extracted from this small block of ground, of which the company have received half. The greater part of the recent milling was broken previous to the breaking down of the winding plant last November, and, as operations have only been resumed during the past few weeks, the tributers were greatly concerned for their welfare during the suspension. The existence of about £500 worth of broken stone was looked upon as a tempting bait, even at a depth of 1900ft., and it was feared that access to the lower levels would be attempted from some of the adjoining shallow workings. The tenure of the tribute block not expiring for some months yet, the company will endeavour to pick up the shoot by extending one of the lower levels, but some time will elapse before the position of the tribs' winze is reached. These eastern reefs form downward from the east backs, well below the turnover, and are usually found where the pitch of the beds is continuous in one direction for a considerable distance. The quartz is frequently very regularly bedded, with spurs traversing the footwall rocks. Where the backs are faulted the stone thickens occasionally, but the same features are also observed where the beds have not been so disturbed. At present the company are operating on similar formations at 2250ft. and 2650ft., but both are of very low grade.

Carlisle average from the spurry deposit allied to the Victory east back, at 1140ft. and 1200ft., dropped back to below 3 dwt. per ton last week, only 67 oz. 2 dwt. resulting from 476 tons. Though of very low grade, the return still covers expenses. This falling off is due to the inclusion of more inferior grade quartz from 1200ft., and the limited overhead stoping yet in progress above 1140ft. The official report states that a width of 25ft. of payable material is being extracted along the course of the top fault in the latter stopes, and, with the extension of these workings south above the timber southward, the gold production should increase. The north level has been stopped at 210ft. in, owing to the spurs thinning and losing their quality. In this direction good stone has pitched underfoot, and the 1200ft. intermediate is expected to pick it up again during next month. The reef in the 3430ft. north intermediate has been abandoned for the present.

New Prince of Wales closed the fortnight with a debit of £130 on the current account, but have a reserve fund of £400. The return from the 800ft. intermediate stopes, though not as remunerative as the previous milling, was again very profitable. This is the more satisfactory, as the stopes have not reached the richer shoot passed through in rising to connect the Nos. 1 and 2 winzes. During the next few weeks these operations are, therefore, expected to produce even better results, and if anticipations are realised, it should not be long before there is a further division of profits. There is 8ft. to 10ft. of crushing material exposed in these winzes, and further south the company are about to commence stoping toward the South Prince of Wales boundary, on the continuation of the payable stone first seen in the latter company's level. At the north shaft it is intended to rise through the quartz along the faulting in the 870ft. north level, where an improvement is hoped for. This shaft went through quartz, showing a colour or two of gold, for a depth of 60ft., and a portion of the same formation should be prospected by the rise at 118ft. further north.

Princess Dagmar rather unexpectedly entered a substantial enrichment of the middle reef at 853ft. during the week, several very fine specimens being dislodged by a couple of firings. The company are here driving south from the Golden Age boundary, and have advanced the level to 166ft. A few feet back from the face there is a rise coming up through the same stone from the main 867ft. north level off the company's shaft. As there is less than 12ft. of ground to spend before holing through, and no gold has been visible in rising, the important development came as a surprise. In the rise, however, the stone has not been dislodged for the last 6ft., and when this is taken down during the next few days some indication of the gold shoot may be disclosed. The improvement in the level came in with a new make of stone from underfoot, and the gold is of a coarse sample. For the last 50ft. the conditions have been more favourable, since passing through an irregularity in the bedding. A good quantity of stone has yet to be taken down along the bottom of the level and more than likely this work will reveal higher-grade stone than traversed in driving early in the month, as the shoot is rising south. Three stopes are following the level, the two upper stopes showing fair prospects occasionally, but the reef is of very irregular dimensions. At 1845ft. the crosscut has been stopped after disclosing a small west back. A level has since been started on the corresponding east back, before rising to the cap.

Derby Reef, having continued to open up gold-bearing stone in driving north along the eastern turnover of 300ft. cap, are putting through a trial crushing this week. This intermediate is gaining north from the rise over the 365ft. south level. The quartz is very highly mineralised, but the gold, up to the present, has been of a fine character. The best prospects are along the east leg, where it merges into the cap. Should the return reflect a payable average, it will give this portion of the Derby Reef channel a much needed fillip.

Golden Pyke have better prospects above the 543ft. north level, the improvement occurring at the close of the term. The company recently started a rise at 200ft. north of the main crosscut, and midway between the shaft and the Constellation boundary. In attaining a height of 23ft., the reef enlarged to 2ft. and carries good gold. This rise will be put through to 447ft. and the latter level continued to the boundary. At 543ft. a connection has been effected with the adjoining mine, which will permit of more working faces, as stopes may now be brought along from this end. It is here that the Constellation rose to 75ft. above their own level, and probably 90ft. higher than the 543ft. level, opening up stone of good quality for the greater part. These indications suggest that the block of ground, now being traversed by the rise at 200ft. further south, will prove very productive. At 643ft. the south level is without any material change at 75ft. from the Golden Age boundary, where profitable stone has been anticipated for some time.

Great Extended Hustler's "Little" reef in the 937ft. level deteriorated in value in overhead stoping, and this work was suspended. The level is still being pushed ahead, but the reef is smaller and of inferior grade. Having revealed good prospects underfoot at the outset, this stone is now being followed by understoping. So far fair gold is showing, and the management is hopeful of maintaining fair averages in this way till the 1037ft. crosscut is in far enough to reach the north pitch of the reef. The pay shoot is associated with faulting and a roll in the bedding planes, and may not extend to the deeper level. At 1326ft. the main north level is entering the portion of the east leg of a massive formation, which, it is anticipated, will shortly prove auriferous at this depth, as the under stopes from the intermediate have followed a fair sample of gold at 70ft. above.

Garden Gully are endeavouring to locate the continuation of the Carlisle payable spurs by sinking a winze from the 745ft. crosscut. At a depth of 10ft. there is 2ft. of well mineralised quartz allied to the Victory east back. Another 40ft. of sinking should reach a fault, when the outlook is expected to improve. This break may be the slide with which the auriferous spurs are found further north. In any case, the geological conditions are favourable, and if anything of value is located, this portion of the back is intact throughout the lease. At 494ft. the back stopes are showing a few colours of gold in the east leg of the 400ft. reef, but nothing of interest has transpired in opening up the channel in which the "South Garden" formations are contained.

South New Moon shaft passed through a fair width of quartz dipping east, some years ago, below the 1300ft. plat. The main reef channel is about 40ft. west at this depth, and to ascertain whether the stone extends across to it, a centre winze is being started from the 1300ft. west crosscut. For a mine that has proved wonderfully productive in the shallow ground, the deeper levels have been generally disappointing. The prospecting level at 400ft. is without alteration. Fair gold is still seen in the 980ft. main spurs; a few colours also showing in the 900ft. eastern spurs. The outlook in the rise over the 980ft. south stopes is less favourable, the auriferous quartz having been left behind and a fault uncovered in the top in "clean" country. On the Paddy's Gully line, the east crosscut should reach the reef channel early next month.

Johnson's Reef have been reluctantly compelled to reduce the number of employees by about 50, owing to the returns from the Derby Reef channel falling off. Since finding the 1150ft. reef at the No. 3 shaft, which yielded excellent returns for several months, an extensive programme of developmental work has been carried out. This additional outlay has made it impossible for shareholders to receive any dividends of late, and the work is being greatly curtailed. On the Paddy's Gully line of reef, the Collmann saddle formation is smaller than where last seen at 300ft. further south. The cap is not yet of value in the 1735ft. rise at the No. 2 shaft, though payable gold, of a fine character, is occasionally seen in driving the intermediate north. This back carries 9in. to 12in. of laminated quartz, which, however, cannot be satisfactorily mined till further connections are made with the No. 1 shaft.

## Castlemaine and District.

(From Our Correspondent.)

Spring Gully did not have such a profitable crushing as was expected. From 205 tons 49 oz. 17 dwt. was received. It is payable. The stone was of a uniform lower grade than the previous fortnight. Towards the end of the week the stone became richer, and better results are promised next week. Driving has been started north off the rise over 200ft. to connect with the 170ft. level, and up 13ft. cut a gold-bearing spur, which will be prospected. At 170ft. the east back has been cut, and spurry country should soon be entered, the same as was worked at 200ft. At 240ft. the eastern crosscut is in 45ft.

The directors of the Francis Ormond have decided to permanently close down the mine. It is many years since the late Mr. G. Lansell pinned his faith to the mine, and he never wavered in his belief that rich stone would be discovered in time. After his death the trustees continued to pay the call until quite recently, when they decided to throw in their shares, which approximated to three-fourths of the total. An effort was made to raise enough money to clean up the stopes that collapsed during last week, but apparently it failed. Mr. Stanfield, of Bendigo, arrived on Saturday and gave orders for the absolute stoppage of operations. Rails, cages, etc., will be raised next week. This has happened before, but with the virile Lansell Estate out, it is a much harder matter to raise enough money to give it another chance. This puts another good chance away of proving the vexed theory as to whether there is gold in payable quantities at the deeper levels on the Castlemaine field.

The two bucket dredges of the Campbell's Creek had a full run for 60 oz. for the week. This is payable.

South Wattle Gully during the week struck a rich leader on the surface of their lease. It is nearly 6in. wide, and some fine specimens have been knocked off. The rich stone that has been driven for since the floating of the present company is estimated to be within a dozen feet or so. As about £5000 has been expended, shareholders will be glad to hear of gold stone being discovered.

The Quartz Hill tunnel is now in 70ft. A leader traversing the bottom is carrying colours of gold.

McCann's Co., at Yapeen, reports good progress. The shaft is now down 120ft. Country is chiefly sandstone bars and quartz leaders. The water is heavy, but an appreciable difference is being made by it, and Scotson's shaft has been drained by several feet since pumping became regular.

The Little Nuggety, at Campbell's Creek, has had a wait while the shareholders who agreed to take shares paid up. They have now done so, and word came from Melbourne last week that work would commence in about a week.

The locally-owned Burnt Creek Reefing Co., at Dunolly, reports having made another start under Mr. P. Hendrickson. The shaft has been unwatered, and driving south has commenced on an indicator, with good prospects.

## Maldon.

(From Our Correspondent.)

Oswald's Estate mine has been increasing in value lately, and last month was the best for a long time past. The figures are:—Battery, 660 tons, 428 oz.; cyanide plant, 990 tons, 150 oz. 3 dwt.; slime plant, 375 tons, 81 oz. 9 dwt.; chlorination plant, 22 tons, 227 oz. 15 dwt.; total, 887 oz. 7 dwt. A new company of 30,000 shares has been registered to take over the property, with Messrs. S. Warnock, W. Rewell, and R. A. Moon as directors. The mine has been stopped for a couple of weeks to allow of repairs to the poppet legs and battery. At 1100ft. they have driven along the payable run of stone for a distance of 45ft., and it is still payable in the end. Whilst driving an intermediate level at 440ft., some very rich stone was met with in the reef, which is 4ft. wide.

South German are making preparations to drive north off the winze between the 1750ft. and 2000ft. levels, right under the place where Baxter and party are getting good [illegible] the plant treated [illegible] from 1 to 35 oz. 2 dwt. From the battery only, Gauss and party cleaned up 113 tons for 7½ oz. 10 dwt. The other crushers' returns are:—Hope Old Jones, 110 tons 14 oz. 19 dwt.; Moore and Stone, 88 tons, 15 oz. 5 dwt.; Hosie and Tullie, 45 tons, 4 oz. 4 dwt.; Hansen and party, 60 tons, 12 oz. 18 dwt.; Best and party, 141 tons, 23 oz. 17 dwt.

The Nonsuch district is continuing its development policy. Ellen Reef has come to the conclusion that the south drive is not on the right track. It is in 100ft., and the country is getting harder. Ten tons of stone were sent up and it averaged 3 dwt. per ton. The new eastern crosscut is now in 24ft., included in which was 10ft. of sandstone and quartz intermixed, hard and bad for shooting. However, the country is improving, showing leaders carrying gold. There are indications of the reef channel being at hand, but it is thought that the gold has gone north on the eastern side of the hard country. Sinking is still prevented owing to the non-arrival of timber.

Pyke and Company, on the Otago Reef at Sandy Creek, crushed a further parcel of 10 tons, and it showed the improved average of 7 dwt. per ton.

## Daylesford.

(From Our Correspondent.)

Mining prospects about this part are looking brighter. The last returns from the Ajax, Central Ajax, and North Nuggety Ajax, each showed a substantial increase on those compared to the previous month's milling, while the New Specimen Hill had a much improved yield and a larger output than has been its record of late, while on present appearances there is considered to be every probability that after the next milling term the mine will again show on the dividend list. New Specimen Hill and Central Ajax are going to run their shafts down an additional lift. The faces below, in the Central Ajax, still continue on the favourable side, and are expected to be able to keep producing a sufficiency of dirt to the enlarged milling capacity determined upon, for some time to come. At the North Nuggety Ajax the prospects are on the improving side and are better than a few weeks ago. A fair amount of payable stone is being broken at the levels worked, the bulk of which is coming from No. 6; and the face driven upon south from the Central Ajax shows improvement. The North Ajax continues to promise a future. As the drives are run out north and south on the bottom (700ft. level) 4ft. of stone shows in the end of the former, and 5ft. carries good pood payable gold in the latter face. 8ft. in. The erection of the larger plant is progressing. Frenchman's Reef is also on the up grade. The Olive Branch has been testing the old Abundance, lying about a mile away east from their main operations. This reef has returned as high as 20 oz. to the ton, but has always proved patchy, and it is hoped that in the present testing it may prove of a more permanent nature. A crushing taken out from 30ft., which was followed some 60ft. in an open cut, returned 22 oz. from 48 tons, nothing being rejected, and is considered so satisfactory that a shaft is being forced down to half a hundred feet, and it is expected at that depth to open out on similar quality of formation.

## A.I.M.E.

### Broken Hill Conference.

**The following is the official list of those visiting Broken Hill (N.S.W.) in connection with the** conference of the Australasian Institute of Mining Engineers, now being held in that city:—

From Victoria:—Prof. E. W. Skeats, Wm. Poole, T. J. Greenway, J. R. V. Anderson, G. Twentyman Brown, Henry Buckley, E. J. Rigby, D. Avery, D. L. Stirling, C. S. Wallace, P. Tait, C. W. Rose, T. J. Dyason, S. Barnes, R. S. Anderson, O. Lockyer, Malcolm S. Moore, S. R. Mitchell, Francis Bray, G. H. Broome, Gerard W. Young, G. C. Delmar, Kirk O'Brien, C. W. A. Adamson, Victor G. Crawford, W. Hart, A. Andersen, N. R. Junner, A. D. Mackay, Frank Stillwell, C. O. Ramsay, E. Smith, Clark Fraser.

From New South Wales:—J. R. Peberdy, A. J. King, J. H. Charlesworth, A. H. P. Moline, Jas. McBryde, H. S. Stephenson, L. V. Waterhouse, W. J. Mulligan, Wm. Zietsch, Peter Kritsch, J. Atkinson, D. N. Morrison, J. W. Tilley, A. Noel Ist.

From South Australia:—J. L. Pearson, H. Pomeroy, F. W. Reed, J. P. Wood, A. V. Gurer, H. W. Gartrell, G. Chettleborough, G. C. Dempster, E. W. Hughes, A. Kelly, E. C. Walker, J. J. Pengelly, K. Hodgson, J. E. P. Murray, R. T. Gepp, R. Hylton.

From Tasmania:—Lindsay Clark, W. A. Beamish, W. Guy Boydell, Eric L. Jones.

From Queensland:—J. Malcolm Newman, Mrs. Malcolm Newman.

From New Zealand:—H. J. H. Blow, I.S.O.

## VICTORIA CONSOLS CO., BENDIGO (V.).

### Prospects of Sheepshead Reef Channel.

(From Our Correspondent.)

The rise of about 100 per cent. in this company's scrip values during the past few weeks has been occasioned through a steady improvement in prospects on the Sheepshead line of reefs, a reef channel that bounded into favour with the initial success of the Central Red, White and Blue Co. some 24 years since, at about three-quarters of a mile further south. As far as location is concerned, the site of the Victoria Consols' holding compares more than favourably with most of the leases along this important parallel line, while the area also exceeds in length the holdings of all the more prominent mines to date. On the western side, which is the shortest, the lease takes in a length of 620 yards of the reef channel, which will ultimately be increased to about 800 yards with the easting of the anticlinal fold at greater depths. A comparison with the North Nuggety and Central Ajax leases, two prominent Daylesford ventures, conveys a better idea of the company's extensive property, for even along the western portion the lease is nearly four times as long as either of the ventures mentioned. It occupies a position between the Lansell Proprietary's Little No. 180, which adjoins the Central Red, White and Blue southward, and the Ironbark Co. on the north end. The three mines referred to have been very productive on this line down to present shallow levels, and, as the same reefs show continuity through the Victoria Consols' ground, on paper it is apparently merely a matter of extended exploration to achieve similar excellent results. There are important geological features also which favour the chance of success, in the fact of a reversal of pitch of the reef channel occurring within the lease. Two other similar reversals to the southward assist in maintaining the reefs found to date at comparatively shallow levels, throughout this lengthy central section of the line. As the Central Red, White and Blue and Lansell's Little No. 180 are both deeper in the strata, the data from these mines give an excellent line to the possibilities of the reef channel further north. In this way the formations already opened up by the Victoria Consols may be identified. The shaft has been sunk to 820ft., with plats at 180ft., 300ft., 400ft., 512ft., 600ft., 700ft., and 800ft. Though a small reef should exist somewhere about the 100ft. level, according to the exposures in the old surface workings, a short distance north, the first formation reported to have been met, was intersected at a depth of 180ft., in shaft sinking. Though extensively worked with very profitable returns in the Ironbark ground as far back as the late "fifties," the Victoria Consols have not yet tested the quartz beyond driving a short level south. No gold was seen. Sinking to 512ft., one or two small bedded veins were passed through before reaching the formation that is now attracting so much attention. The extreme upper limits of this stone were met at about 50ft. above the 512ft., and a little gold disclosed. From the 512ft. plat, a level was started north in the eastern portion of the irregular cap stone, traversing 7ft. to 9ft. of spurry crushing stuff for about 100ft. This portion, which was associated with a fault, gradually pitching underfoot, the level continued along eastside of the lengthy neck of quartz, which has been such a conspicuous feature in the mines adjoining. This stone is more consolidated, but failed to show much gold, trial millings averaging 2½ dwt. per ton. At 150ft. in, the level was carried across to the western wall, with which the lavas are more closely allied. These operations have resulted in better prospects, gold showing more freely in the stone adhering to the lava at 200ft. from the shaft. From here to the north boundary there is still 400ft. of ground untouched. The improvement in the quality of the reef has been disclosed, coincident with the extension of operations along the lavas, and no doubt exists that the intrusive dykes have had a direct bearing on the auriferous character of this particular reef. The same conditions may be observed in the adjoining mines north and south, and as the lavas are continuous through the property, the chances of permanency in the pay shoots are enhanced. Up to the present no stoping has been done north of the shaft, and before doing so, a rise will be extended into the neck stone at 40ft. north. This work is likely to lead to interesting developments, for the stopes following will eventually command the portion of the reef from which the best prospects have been forthcoming at other points. To the east of the regular neck stone, there is an outer vein of bedded quartz, probably originating from the fault referred to. It showed gold near the plat, but has not since been tapped. To follow the north pitch of the formation, a crosscut is being put out to the downward continuation of the east back, from the 600ft. plat. From here, it will be possible to extract the whole of the stone to the Ironbark boundary. Southward, the main level is advanced to 210ft.; driven on the east leg through. A small dyke is associated with this back, and the stone is not more than 4in. to 6in. thick, but shows a little gold. It is in the stopes overhead that the reef is of higher grade. At 40ft. south is a rise to 35ft. above the rails, with 3ft. of quartz in the top. Another 10ft. of rising will get through the reef. Stoping is in progress for a length of 80ft., the leading stope being 100ft. behind the level. The width of crushing material varies from 3ft. to 14ft. in these workings, the lower portion consisting chiefly of spurs. In the back stopes there is 4ft. to 5ft. of solid quartz, of a well mineralised character, sandwiched between the lavas, a few colours of fine gold showing. Where the western dyke intruded along the hanging wall, there has been a deposition of calcite and very small veins of silica. As this portion has been found to contain fine gold, the dykes are being sent to the mill with the rest of the material. A considerable quantity of country rock has also been included lately, and averages of 6½ to 8 dwt. per ton may therefore be regarded as very satisfactory. A profit can be shown on 4½ dwt. per ton, with an increased tonnage, which will be brought about shortly on the introduction of rock drills. The reef, after undulating slightly along the south level, is now rising more rapidly, but should be easily worked from the present base for a long time to come. Now that it has been demonstrated that the western side of the formation has been enriched by the intrusion of the dykes, more attention will be given to this portion, the eastern back having been favoured in the initial stages of prospecting. From the end of the south level to Lansell's Little No. 180 lease, where the reef was not followed right to the boundary, the Victoria Consols have about 1000ft. of ground. The extensive holding in this direction was acquired from the defunct Victoria Reef Quartz Co., on the understanding that the latter receive the first £1000 worth of gold extracted from that portion of the lease, from a point 330ft. south of the shaft. The level has 120ft. to go to reach this ground. When the Victoria Reef Quartz Co.'s assets were realised some time ago, this right was secured by an investor for £220. The investment now looks particularly sound, and it seems extraordinary that the Victoria Consols' management did not purchase this interest when the opportunity was presented. From 512ft. to 600ft. the shaft continued in the reef channel, but failed to reveal anything of more importance than spurs. Between 600ft. and 700ft., however, these quartz veins were more numerous, and continued till the regular portion of the "Central Red, White and Blue" 318ft. formation was passed through. This reef was small and did not reveal any gold, but a couple of colours were seen in the spurs. From the indications observed in shaft sinking, there is a possibility of this channel furnishing a good quantity of spurry crushing material, and if payable results continue at 512ft., the "Central Red, White and Blue" stone will be opened up expeditiously. Beyond passing through an easterly dipping fault below 700ft., the work to 800ft. was resultless. At the bottom level there is a crosscut east through the reef channel, tapping it at the intersection of the faulting. The shaft is again getting into a very interesting stage, as in the next 300ft. of sinking two or three bedded reefs and a couple of important faults are due to come through. On the New Chum line, where operations were continuously profitable over a period of more than 30 years, work is restricted to the 344ft. south level, where a rise will be extended shortly, to determine the value of a large formation allied to a fault.

## MORE TIN COMPANIES.

The following companies were registered in Sydney last week:—Drumlish Hill Tin Mining Company, No Liability, registered May 19, with a capital of £60,000 in 120,000 shares of 10s. each (of which 60,000 are to be issued as fully paid up), to operate at Ardlethan, N.S.W. The signatures to the registration are those of William John Young, Wilton Carlisle Archibald, Thomas Nelson Robertson, Charles Burton Bradley, Charles Mashell, Thomas Thompson Butement, and James Carnegie Alexander. Manager, Leslie V. Puckle.

The Bygoo Extended Option Syndicate (Ardlethan), No Liability, registered April 18, with a capital of £1000 in £10 shares, to operate at Ardlethan, N.S.W. The signatures to the registration are those of Robert Wright Bonnar, Joseph Tilson Lang, Joseph Edward Cocker, George Arthur Down, Alexander Grant, Evelyn Lloyd, Thos. R. Ray, Harry Ormiston Ormiston, and Alfred Rolph Gregory. Manager, Joseph Edward Cocker. Registered office, Australasia Chambers, Martin Place, Sydney.

Watson's Creek Tin Sluicing Company, No Liability, registered May 13, with a capital of £20,000 in £1 shares (17,000 of which are to be issued as fully paid up, and the remaining 3000 shares as contributing), to operate at Watson's Creek, N.S.W. The signatures to the registration are those of A. G. Friend, George Dickson, W. C. Goulding, A. T. Hockings, W. T. Flannery, James Welman, K. Baxter. Manager, E. R. Babb. Registered office, Somerset House, Moore street, Sydney.

## BENDIGO MINERS.

### Owners Resolved on the Open Mine.

The mine owners have now given a decided answer to the Bendigo (V.) Branch of the Mining Employees who asked for preference of employment for unionists.

At the adjourned conference between the employers and the men's officials, Mr. S. H. McGowan, President of the Bendigo Mineowners' Association, said the proposals to allow stewards in the mines to allow the miners' officials to go on the mines in the case of a dispute with non-unionists, and the formation of a disputes committee, composed of employers and employed, could hardly be carried to their logical conclusion, because it would simply mean the taking of the mines from the control of the shareholders, who paid the calls to keep the mines going. The mineowners could not possibly accept that position. He thought that if the miners looked at the question from a business point of view they would agree that the contention of the mineowners was correct. The call payers were the owners of the mines. They were in a British country, under the British flag. They had just been celebrating Empire Day in Bendigo, and they looked upon that flag as an emblem of freedom and liberty. Every man who was born under the flag had a perfect right to earn a livelihood for himself and his family in the best possible way and where he could. For the mineowners to attempt to force men to join either the Miners' Association, or any other organisation, was a thing they could not possibly agree to. Therefore, having that phase of the question in view, and having in view the fact that the directors of the mining companies were merely the trustees for the shareholders, they could not give the property of the shareholders to the control of any outside association. The mineowners had decided in reference to proposal No. 1 that it could not possibly be allowed, with the exception that the stewards of the Miners' Union would be permitted in the mines as hitherto for the purpose of collecting dues only. The mineowners had never hesitated to allow stewards in the mines as long as they did not interfere with the working of the mines. No. 2 proposal could not be entertained. If it were accepted, the mineowners would have no control over the mines at all. The only control the shareholders would have would be to find the money to keep the mines going. Numbers of people were going out of mining because they found it did not pay. Mining was like any other business. As soon as a drapery store or a bakery did not pay it was shut up. It was the same with the mines. Many shareholders had been staunch supporters of mining for 30 or 35 years. Some of them had not been getting ½ per cent. on their money, and in thousands of cases their money had gone down the shafts, and had remained there. Therefore it was of grave moment not to oppress the remaining shareholders with any further burdens.

Continuing, Mr. McGowan said the mineowners would always be willing to meet the representatives of the men, but they would not do so under the style of "a grievance committee." He knew from the many communications he had received during the week that the shareholders were determined that they and the directors would manage the business of the companies, or they would go out of business. They had worked harmoniously with the men for 25 years, and why should the question be raised when everything was working so smoothly. The owners had met all reasonable demands made by the men, and by acts of Parliament, and they did not object to the wages board, which had made a very fair award. The men must remember that the Mineowners' Association were in the unique position of not being able to pass on increased working costs, as did tradesmen. The mineowners wanted to keep the open door. Everybody had a right under the British flag to be employed in a British country under freedom, and as far as the mineowners were concerned they saw no reason to depart from that line of conduct.

After some discussion, the conference concluded.

At a subsequent meeting of the men, it was decided to hold a mass meeting on Sunday, the 1st June. During the week the Victorian Executive will meet and decide what action should be taken in the event of the non-unionists declining to join the Association.

At the men's meeting, Mr. J. W. Wearne, a member of the Branch, attempted to move the following motion, but was refused a hearing:—"In view of the failure of the recent conference with the Mineowners' Association re the non-union question, the depressed state of the labour market, the absence of that enterprise of capital which is so necessary for the development of our resources, we, the members of the Bendigo Branch of the Federated Mining Employees' Association, consider the present time to be inopportune to force the question of non-unionism in the mines of Bendigo to extremes, and we consider the steps that have been taken to be precipitate, premature, and suicidal to the best interests of members generally, who have all to lose and nothing to gain if extreme measures are resorted to at this juncture."

## LOW GRADE ORES.

### "Astounding" Results in West Australia.

Speaking at a banquet in Perth (W.A.), Mr. Loring, the well-known mining expert, said he had just finished a 1000 miles trip through the "out back" country, and he was astounded by what he had seen being done in the working of low-grade ores at the mines. Sir Edward Wittenoom had said that low-grade ores could not be worked because of certain difficulties. That might be true in some cases, but he had had the pleasure of seeing mines working on low-grade ore and showing a considerable profit, some with the plant erected for higher grade ore, while others, having more up-to-date machinery, were making handsome profits on ore of only 25s. gross value per ton. He thought that that was a very fair example of what might be achieved in this State.

Continuing, Mr. Loring said the advances in metallurgy made during the last three or four years had made it possible for ore of the gross value of only 20s. a ton to be worked at a profit. He was perfectly certain that this was the case. The Victorious mine at Ora Banda had shown that 15s. a ton covered all expenses, and any value above 15s. was profit. Great strides had been made in mining machinery and treatment of ores in the last few years, and everybody was working to the same end--to lower costs and get better results. Something had been said about State batteries. He did not want to enter into politics, but in his opinion the State battery system had been detrimental to the State. In the case of a prospector, as soon as he got out a crushing he sent it to the State battery, and the money he received from the product he did not expend on the development of further ore reserves on his show, but in other directions that he need not mention. When he came to the water level, he had no money to develop his show and cope with water difficulties, and so he shut down and nobody knew much about it. Even the State battery people knew exactly how much gold had come from the man's crushing, but they did not know where it came from. He believed that these prospecting shows should be reported on by competent engineers and the reports filed, so that investors might have an opportunity of investigating these concerns with a view of carrying on their development to a greater depth. He thought that companies, after taking out the higher grade crushings, should certainly sink to a greater depth, and alluded to a find at the 18th level of the Great Fingall as an example of what could be done by deep sinking in the country. There was no need for people to look dismal in West Australia. When he came back here everybody was going around as though he had a safe on his back—with nothing in it—and complaining about the mining industry going to the dogs. It was going to the dogs only by comparison, but was really now on a sounder footing than it had ever been before, because it was self-supporting. It had not been so before, but had been kept alive by British capital.

## THE DREDGING BOARD.

### Public Meeting of Protest.

A public meeting at Bright (V.) on the 21st May, at which there was a large attendance, protested against the methods of the daily press in connection with the inquiry into the dredging industry in the Ovens Valley and elsewhere. Objection was taken to the publication of statements regarding the industry while the matter was still under consideration by the Commission, which owes its existence largely to persistent lay newspaper agitation. Councillor G. R. Abraham presided, and the following resolutions were adopted:—

Moved by Mr. Latch and Councillor J. Brogan—"That this meeting emphatically protests against the unfair, biassed, and to a large extent misleading statements that have appeared in the metropolitan press during the past week regarding the dredging industry in the Bright district."

Moved by Messrs. Goldsworthy and Chapman—"That strong exception be taken at the attitude of the president of the Wangaratta Anti-dredging League (Mr. Thomas Graham) in approaching the board, and urging immediate action, while the whole question is under consideration."

Moved by Councillors Abraham and A. H. Wallace—"That this meeting of representative townspeople, while they deprecate the destruction of good land, affirm that to date no serious injury has been done, and that, this being an entirely mining district, to close down the industry would mean serious embarrassment to the whole of the residents of the valley."

Moved by Messrs. Manning and J. P. Murphy—"That a committee be appointed to convey the foregoing resolutions to the Acting Premier (Mr. Murray), and also to safeguard the people's interests in any way deemed advisable."

Mr. H. P. Richards, J.P., thought it would be advisable that a copy of the resolutions should be forwarded to the "Australian Mining Standard," and also that it should be asked to take the matter up on behalf of the dredging industry. A motion to this effect was carried.

## REPORTS OF COMPANIES AND CORPORATIONS.

### A1 Gold Mines.

Mr. J. T. Greenway presided, on 21st May, at the general meeting of the A1 Gold Mines, Gaffney's Creek (V.), in Melbourne.

In moving the adoption of the reports and balance sheet, Mr. Greenway said that the company's operations during the past nine months had consisted chiefly of opening up the 850ft. level, which to date has been driven to a total of 283ft. At 165ft. from the main shaft plat good gold was struck, and gold still showed in the face. Stoping had been commenced, and up to the present 620 tons of ore had been obtained from this level, of which 430 tons had been crushed for an average yield of about 14 dwt. Later operations at the mine had been much interfered with by want of sufficient ventilation. It was proposed to remedy this by sinking a winze from the 750ft. level, and to expedite this the rock-drilling plant had started work. An early cessation of calls was expected.

The report and balance sheet were adopted.

### Mount Lyell M. and R. Co.

The amended comparative table shows the smelting and the converter returns of the Mount Lyell M. and R. Company for the last two four-weekly periods:—

| | †April 16. | May 14. |
|---|---|---|
| Mt. Lyell ore treated, tons .. | 10,335 | 12,284 |
| N. Mt. Lyell ore treated, tons | 1,025 | 2,308 |
| Lyell Comstock ore .. .. .. .. | 1,641 | 2,308 |
| Total ore treated, tons .. | 13,001 | 16,900 |
| Fluxes and purchased ores .. .. | 1,616 | 940 |
| Blister copper produced, tons | 162 | 308 |
| Contents— | | |
| Copper, tons .. .. .. .. .. .. | 160 | 304 |
| Silver, oz. .. .. .. .. .. .. .. | 17,770 | 23,745 |
| Gold, oz. .. .. .. .. .. .. .. | 414 | 498 |

†Ore furnaces running continuously, except one for 16 days only.

### Edna May G.M. Co.

In his report, to be submitted to the half-yearly meeting of the Edna May G.M. Co. (W.A.), at 31 Queen-street, Melbourne, on the 30th, the manager says the values of the ore, at and above the 71ft. level, vary considerably, but the whole of the stone carries more or less gold. He averages the value of 20,000 tons in sight, or reasonably supposed to be in sight, at £4 2s. 6d. per ton. The stone opened up by the winze proves that there is a fine body of ore below the level, but this cannot, at present, be taken into consideration in estimating the ore reserves, though giving a splendid potential value to the property. The cost of mining, haulage, and milling should not exceed 20s. per ton. At present a 10-head mill is in course of construction, and it is intended to crush with a fine screen, recovering the gold by amalgamation, and leaving the treatment of sand and slimes in abeyance. Subsequently the treatment of the latter will be proceeded with, after the best method has been ascertained by test. The mine is ready to produce ore for the mill, and "substantial and profitable" returns may be expected.

# ENGINEERING and ELECTRICAL RECORD

Vol. XXVII. MELBOURNE AND SYDNEY, MAY 29, 1913. No. 757.

THE ENGINEERING AND ELECTRICAL RECORD is *published every Thursday morning. Price Sixpence.*

*All communications should be sent to the Editor; those having reference to business matters should be addressed* CRITCHLEY PARKER.

CASUAL ADVERTISEMENTS *on this page* 15s. *per inch per insertion.*

Australian
General Electric Co.
217 Clarence Street, Sydney.
Tel.—Central, 3495, 4397; City, 2381.
Equitable Building, Melbourne.
Tel.—Central, 2647.
Representing—
GENERAL ELECTRIC CO., U.S.A.
The
BRITISH THOMSON-HOUSTON
CO. LTD., of Rugby, England.
The GUARANTEE of EXCELLENCE on GOODS ELECTRICAL

## BRITISH AND EUROPEAN DEVELOPMENTS.

(From Our Correspondent.)

London, April 25th.

In view of recent developments on the Continent, more interest attaches to the subject of tidal waters as a source of power than was the case, at any rate from the practical engineering standpoint, a few years ago. The matter comes before a meeting of the Society of Engineers in London on May 5th. The author, Mr. C. A. Battiscombe, will discuss the commercial possibilities of hydro-electric installations in the British Isles, with special reference to the use of the tides, head of water available, form of installation for continuous output, maintenance of working head, sequence of flow between tidal way and reservoir, choice of site, design of structural details, rough estimate for installation, cost of B.O.T. unit, and he will show how utilisation of tides would be a gain to commercial and industrial interests.

Reference was made here at the time of the issue of the public prospectus, to the French, American and British combination which had secured from the Turkish Government the concession for establishing and operating telephone facilities in Constantinople. That the concession was to be carried out on such lines gave it a peculiar interest, as it was the first large electrical undertaking embodying the principle of international co-operation in which British manufacturers formed one of the parties. The Turkish market has never been a very easy one for British electrical firms to handle for a variety of reasons, first and foremost being the very backward state of the country in relation to modern electrical facilities, and the indisposition of those in high quarters to catch up to other nations in this respect. Within the past year or two Turkey has been passing through serious times, as all the world knows—first by reason of its war with Italy respecting Tripoli, and latterly its disastrous conflict with the Balkan States. But the telephone concession at Constantinople of course holds good, though it would have been surprising if the company had not been handicapped in its efforts to get the system established. The first report has just been issued, from which some idea may be gained of the position of affairs. The annual meeting is announced to be held in Constantinople on May 5th. Considering the difficulties mentioned, it is said that satisfactory progress has been made, but the date of opening the service will, of course, now be later than was originally intended. The leading officials are men of experience, who were formerly in our own National Telephone Company. One of the first problems that had to be dealt with was that of securing sites for the three large exchange buildings at Stamboul, Pera and Kadikeuy, and the company has now purchased sites eminently suitable to the general design of the system. Good progress has been made with the buildings, and it is hoped that shortly the installation of the exchange equipments will be begun by the Western Electric Co. and the French Thomson-Houston Co., who are jointly responsible for this work. In the early part of 1912 the company made a contract with the British Insulated and Helsby Cables Ltd., for building underground conduits and pole routes, and supplying and laying the necessary cables, and notwithstanding the various delays which have occurred from time to time, chiefly owing to the war, a large portion of this work has been completed. On 31st December, 1912, there were constructed 84 kilometres of underground duct and 17 kilometres of pole route; 18 kilometres of cable had also been installed, containing 3600 kilometres of circuit. Early in 1912 the general manager organised a contract department for the purpose of securing subscribers, and in spite of the disturbed conditions at Constantinople orders had been obtained on 31st December, 1912, for 2999 stations. The number of orders secured exceeds the original expectations of the directors as to the development to that date, and as the work of securing new orders still proceeds at a satisfactory rate, having regard to the existing conditions, it is confidently anticipated that the business of the company will be substantially in advance of preconceived ideas.

The desire of the Hastings Tramways Company to change over from the Dolter surface contact system along the sea-front, which has been like a "millstone round its neck" for years, to overhead trolley, making its system uniform throughout, is again refused. The proposal has been before a Parliamentary Committee this week. Engineering evidence was called to show that the conduit system having been a failure at Blackpool many years ago along the sea-front there, owing to sea-water, sand and shingle getting into the conduit and causing unsatisfactory running, it was not reasonable to suppose that that method would be a permanent efficient substitute for surface contact working. The two factors which influenced the Parliamentary Committee in throwing out the Hastings Company's Bill were the very strong opposition from frontagers and other local people who hate the idea of having overhead wires, and the evidence of Sir Maurice Fitz-Maurice, the late chief engineer to the London County Council, who declared, after inspection of the Hastings front, that he saw no reason why the conduit system should not work satisfactorily there. Sir Maurice, of course, had had experience of the London conduit tramways, and on that ground his opinion would carry weight, but naturally enough the company does not want to be saddled with the very heavy cost of conduit construction—only a public authority such as the London County Council can stand against that. Bournemouth and Blackpool municipalities both found it good policy to abandon conduit and make their lines uniform with trolley, and Torquay Company was authorised to clear out its surface contacts and substitute trolley, but Hastings—well, it has got to do something else. The position at Oxford, also, is equally unsatisfactory, and it is a matter for wonder as to how long horses will be allowed to serve citizens at their orthodox jog trot pace.

In the course of his paper on London electric supply, already mentioned here, Mr. F. Bailey gave the following table, showing a number of individual typical examples of the use of electric motors for many different purposes in London:—

Printing (newspaper), 1036kw. connected, cost of supply per annum £1812; printing (general), 56kw., £119; box-makers, 9 kw., £80; chemists, 92kw., £222; brewers, 39kw., £153; paint factory, 108kw., £253; soap-makers, 110kw., £69; glass-makers, 18kw., £119; blouse-makers, 13kw., £89; wood wool-makers, 166kw., £623; packing case, 52kw., £215; tailors, 63 kw., £160; biscuit factory, 265kw., £419; confectioners, 174kw., £569; rubber factory, 222kw., £220; sawmill, 79kw., £302; spice factory, 69 kw., £371; cabinet-maker, 87kw., £303; ironfounders, 150kw., £878; vinegar brewery, 15kw., £202; marble masons, 101kw., £294; tobacco manufacturers, 22kw., £138; cold store, 164kw., £922; flour mills, 51kw., £159; ink mills, 48kw., £235.

He said that the average cost for each kilowatt connected in the representative cases given in this table works out at £2 15s. 8d. per annum, or per horse power, say, £2 1s. 6d. per annum. Had this horse power been obtained from the old-fashioned engine, with the losses in shafting, belting, and steam pipes, starting up the plant and keeping the boilers warm all night, and the additional labour required, the cost would have been from £6 to £8 per annum, with further costs for continual repairs, and all the annoyance of running steam plant taking up more room than it was worth.

Electrical publicity men who are on the look-out for "powder and shot" to assist them in storming the positions taken up by the conservative consumer who still clings to gas, might find the following figures just published respecting comparative costs of the two illuminants at a church at Lewisham, in south-east London, of some service.

| | Gas. | Electricity. |
|---|---|---|
| Quarter ended Xmas, 1911 | £9 10 1 | — |
| „ „ Ladyday, 1912 | £9 19 1 | — |
| Quarter ended Xmas, 1912 . | — | £4 12 9 |
| „ „ Ladyday, 1913 | — | £2 14 0 |
| | £19 9 2 | £7 6 9 |

The price of electricity was 4½d. per unit; gas somewhere between 2s. and 2s. 6d. per 1000.

There has been published this week a preliminary report of the London County Council's Special Committee on London Electricity Supply. This Committee, it will be remembered, was appointed to consider the whole question of London supply in regard to the future, and in the present statement, issued after more than twelve months' deliberations, it says that the preliminary steps in its investigations may now be regarded as complete. The questions discussed between the municipal and company authorities fell mainly under three heads:—(1) The present position of the respective undertakings; (2) Proposals in hand for the development of these undertakings; (3) The question of bulk supply. It is considered that it is time to enter upon the next step. A large amount of information has been collected, and it is now proposed to take advantage of the offers which have been made by certain well-known experts to place their views before the committee. Similar offers will be welcomed from other experts on either the technical or business side of the question. "When we have obtained this expert evidence, we shall be in a better position to survey the whole position from the point of view of policy, and to advise the Council as to the action to be taken."

While wireless telegraph matters continue to occupy both parliamentary and public attention, and the question of a possible rival to the Marconi system is still undismissed, it is interesting to read in the report issued this week by the Indo-European Telegraph Company, that it has taken in hand a system of its own—the Galletti. The directors say:—"In view of the ever-increasing importance of radio-telegraphy, they have acquired a controlling interest in the Galletti wireless system, a new and independent system of much promise. Important experiments to establish its vlaue are now in progress, and the necessary funds for this and for the acquisition of the controlling interest have been provided by the company. . . . The sum is represented by a holding of £32,200 of the capital of the Galletti's Wireless Telegraph and Telephone Company Ltd., a company formed and controlled by this company." It is added that in view of the risks which must attend the development of an entirely new system the whole of the above amount is taken from the profits of the past year.

Members of the Institution of Electrical Engineers who are anxious for more papers to be read on commercial and industrial matters relating to electrical engineering have had one or two **opportunities of the kind at local sections during the past session, but few of the subjects that have** been advanced have been of so great importance as that which occupied the Yorkshire Local Section on Wednesday evening last. Modestly announced as an informal paper, Mr. Sidney Simpson's brief treatment of the question, "Prices charged for Electric Power—Are the present supply prices justified?" opened out the matter of financial soundness of municipal electric supply undertakings in such a manner as to promote discussion of some of those questions which were very much under notice a year or two ago. Mr. Simpson had selected from published records the returns of a number of electric supply systems throughout the country, and from these he showed **that in comparison with most industries an adequate and true profit on capital invested is not being made. The success of the electrical manufacturing industry is ultimately bound up with the success of electricity supply, therefore the com**mercial basis of the latter should be stable. If, however, the commercial position is gauged by the balance available after meeting all debts and liabilities in respect of capital expenditure, working expenses and depreciation, the result is unsatisfactory. The working results selected by the author were considered on a basis of loan repayment in 15 years at 4½ per cent. interest, and a few authorities on this basis showed a working profit, but the majority showed a loss. The following were the five factors mentioned as entering into the determination of any rule for arriving at the deterioration which has taken place in an undertaking:—

(1) The estimated tenure of life, regard being had to the functions and the conditions under which they are performed, including also the personal equation of care and attention bestowed.

(2) The extent and value of the renovation or restoration made from time to time.

(3) The present earning power relatively and comparatively to other plant, etc., used for a similar purpose, i.e., obsolescence or the competition of improved production methods.

(4) The change in market values of the several items constituting the property.

(5) The residual value either as scrap or an implement which, though possibly applicable to other uses, is no longer fit for its original purpose.

Mr. Simpson said that the chief of these considerations was obsolescence. There was the certainty of deterioration, and always the risk of obsolescence, even though kept in good repair. He worked out a tariff for an average case, which suggested that the lighting consumer was a remunerative customer, and that in many cases he was paying for the losses made on power supply. He also referred to the questions of periodically revising the accounts from considerations of resultant [illegible] factor on the plant, an equitable maximum demand charge, and working power factor (in the case of A.C. supply). Mr. Simpson said that the tariff he **had worked out would** appear to indicate that charges in excess of present prices were necessary for commercial efficiency, and considerations of the capital saved on consumers' power plant, when supply was purchased and put into the manufacturing **side of** the business, would appear to indicate **that if a** determined move were made in this direction better prices could be justified and obtained.

## SYDNEY CITY COUNCIL.

At the meeting of the Sydney City Council on Tuesday, the following recommendations of the Electric Light Committee were adopted:—

That with regard to the tenders for the supply of 1500 high-tension insulators, conditionally accepted by Council of 6th May, 1913, if the British General Electric Company will **not give the under**taking to supply within twelve weeks from receipt of the acceptance of their tender, **the resolution of** 6th May, 1913, be rescinded, and an offer by Messrs. Noyes Bros. to supply the insulators within seventeen weeks for the sum of £217 14s. 2d. be accepted.

That authority be given for the purchase of arc lamp carbons for special arc lamps for the year 1913 from Messrs. Dick, Kerr and Co., under a contract entered into in the year 1910, which provides that they would supply a special form of **arc lamp carbons required for these lamps for a** period of five years without any increase in price on their tender.

That extensions of electricity mains be authorised as follows:—Alexandria.—From power house to Alexandria, as provided for under agreement, high tension underground feeder. Estimated cost, £1600, of which cable amounting to £1175 is already in stock and paid for, leaving a sum of £425 to be provided for; Alexandria.—Overhead high tension cable from Huntley-street, along Euston-road, to supply city brickworks. Estimated cost, £115; also that necessary connections be made at Substation No. 31, Huntley-street, and a 200 K.V.A. transformer erected at the brickworks at an estimated cost of £90, provided the proprietors of the brickworks supply a satisfactory housing for the transformer, and give the usual guarantee for the full estimated cost of the extension, including the cost of switchgear and **transformer. Elizabeth-street, city, from Liverpool-street to Bathurst-street.—Underground** distributor; estimated cost, £360, of which cable **troughing, bridges, etc., amounting to £95 are in** stock, **leaving £265 to be provided for.**

**That the agreement submitted to the City Solicitor in connection with the supply of electricity to the Municipality of Strathfield be ap**proved, and authority given to the town clerk for **the execution of same.**

**That excess expenditure over the estimates, including £243 16s. 8d. for underground extension from Pyrmont-street, along Taylor and Quarry streets, and amounting in all to £660 16s. 1d., be authorised.**

**That the following works required at the Power** House be carried out:—Six impellors for the circulating pumps of Nos. 6 and 7 sets—To be ob**tained from the suppliers of the plant, Messrs. Willans and Robinson, provided they are prepared to supply at a sum reasonably close to the estimate of £61 each; rearrangement of auxiliary motor and lighting circuits, consequent on building extensions and the sale of Nos. 1, 3 and 5 sets and the altered running conditions generally, and to provide additional control boards to minimise as far as practicable the risk of interruption of supply to the public; estimated cost, £3500; switchboard and circuit-breaker—Supplied by the Australian General Electric Co.; removal of type which has proved insufficiently reliable, and the substitution of another board with a more expensive and reliable type of circuit-breaker, by the Australian General Electric Co., at a cost of** £150.

**That work at sundry substations be approved as** follows:—Waterloo Substation No. 18, Young-**street—Connecting substation to distributor network to give a general supply. Estimated cost, £43; Drummoyne—Substation, Lyons-road. Excess cost of erection, £68, over amount of £300, already authorised.**

**That approval be given for the purchase of the following under existing contracts:—Lamp fittings—300 additional public lighting fittings, required in connection with the public lighting systems now being carried out. From Messrs. Lawrence and Hanson, at a cost of £91 13s. 4d.; bare copper cable—Additional quantities required for general extension purposes—100,000 yards** 7/18 bare copper cable, and 50,000 yards 7/14 **bare copper cable. From the British Insulated and Helsby Cables Ltd., at a cost of £1574 14s., subject to the fluctuation of the copper market, provided for in the specification.**

**That tenders be invited for the following in accordance with specifications submitted by the** City Electrical Engineer:—

(a) **Lead caps for wood poles (4500).**

(b) **Rubber insulated cable, 30 miles of 3/20, required in connection with public lighting systems now being installed.**

**And that in each case authority be given for the City Electrical Engineer to interview tenderers between the dates of the opening of tenders and the acceptance of any tender.**

**That the quotation of Messrs. Siemens Bros. for the supply of a spare armature for 1000 kw. motor generator, delivered at the Town Hall substation,** for the sum of £[illegible] be accepted.

**That in view of the circumstances not allowing the loading of the parts of the 600kw. Willans and Robinson—Dick Kerr sets sold to the Public Works Department during working hours, an al**lowance of payment of £12 be made to Willans and Robinson for loading same at night.

---

**Our Lithgow correspondent writes under date May 23:—Mr. C. H. Hoskins stated that the heavy rain during the week had completely hung up the extension work at the blast furnace, coke ovens, as well as in all other directions. The heavy fall of rain had also caused a washaway** on the railway siding leading to the coke oven **at Oakey Park, and in consequence the blast furnace had to be damped down for want of** coke. It was expected, however, that the stop**page would not be of long duration. The coke difficulty has been rendered more acute by the fact that for many weeks no coke could be obtained from the South Coast districts, owing to the strike. Mr. Hoskins further stated that the** firm was now busily loading steel rails and fish-plates for Port Augusta, to be acquisitioned in **the Trans-Australian Railway. If trucks were available, they hoped to get away within the** next few days from 1600 to 1800 tons of steel **rails and other accessories.**

## AN ELECTRICAL ENGINEER'S TOUR IN AUSTRALASIA.

By Justus Eck, M.A. (Cantab.), M.I.E.E.

(Continued from issue of May 22.)

The State of Victoria has distinguished itself by deciding, none too soon, on the electrification of the Melbourne suburban railway lines, under the splendid guidance of Mr. Charles Merz, and it is to be hoped that before the scheme goes too far Melbourne will decide to electrify all its tramways. In this connection, it should be noted that a more ridiculous waste of time than that which takes place at the termini when the hauling and trailing cars are hand-operated for reversal of direction can hardly be imagined. Flinders street, so poorly placed for a central passenger station, will be the starting point of the eletcrically-driven service, and it must be properly led by an electric tramway **service. It is not unreasonable** to hope for the running of the Elizabeth-street cars into the station, thus collecting and delivering their passengers at the right point and under cover. With a suitable loop and elec**trification of the street lines this direct service** could gather from all parts to feed Flinders street station, as the right angle divergencies, now impossible with wire rope, could, as in Adelaide, be safely overcome, and without delay in service. Mr. Merz is a man of pioneer views, but he needs a man of equally strong personality to back him up on the spot and to guide the undertaking to the absolute success that is before it if in capable, experienced and tried hands used to dealing with electric traction. It is to be hoped that an electrical engineer of Australian experience will be ap**pointed to this important post, for, looking** round amongst the successful electric traction work in the sub-continent, many suitable men are to be found.

Branch and even main-line electrification in **New Zealand seems likely to become at an early** date an accomplished fact. The Lake Coleridge hydro-electric power scheme, under the **enthusiastic Mr. Parry, electrical engineer of** the Public Works, and his assistant, Mr. L. Birks, is at last making progress, and provided **the New Zealand administration does not with**hold the funds earmarked annually for this **noteworthy enterprise, Christchurch will soon** have all the electric energy it can utilise. Thus the discomforts of the notorious Lyttelton tunnel will be abolished, and set the example to the railway authorities of what can be done in main line railway working. The certainty of the water power in New Zealand is a feature that **indicates that country as one of unlimited extension of electric utilisation for agricul**tural, industrial, and domestic use.

Before leaving electric traction, mention must be made of Mr. H. R. Harper's pioneer work **in Melbourne with storage battery traction for commercial and private use. The electric** brougham, with Edison batteries, I had the pleasure of travelling in certainly worked well, and showed points in economy and hill climb**ing ability worthy of note. Mr. Harper has** also an electric-driven lorry, hauling stone, **bricks, etc., for the town at money-saving costs.** For town work, with daylight charging rates, this class of traction has a future, the sim**plicity of driving and control and the effici**ency of the electric motor gearing, as compared with that used in petrol-driven cars, and the lower tyre maintenance charges are all in favour of this class of drive.

The electric lighting of public streets is **steadily being taken over by the electricity works, and in this respect Sydney stands fore**most for streets which are lit uniformly and well. In the heart of Sydney a number of arc lamps of a type now obsolete in Europe still **remain, and spoil the well-laid plan. Street** arc lamps in Queen street, Auckland, are placed on columns which are of a very useful form, projecting the lamps well into the street, enabling them to light both the street surface as well as under the verandahs. Suspension gears, **placing the arc lamps centrally over the streets** and lowering them to the ground on or near the side walk, are coming into use. **In some places where the buildings are of sufficiently strong construction to carry the attachments, the light distribution and economy of lamps** thus hung at street intersections is fully ap**preciated, and the necessity of keeping down the** number of poles in the streets is also now realised.

One of the most surprising features of the street lighting of some towns is the entire absence of it in important areas. Queen street, Brisbane, the leading thoroughfare, depends, except for a few widely-placed gas lamps, for **its lighting on the light the shopkeepers have to spare, after illuminating their premises.** After 10 at night, and on Sundays, practical darkness prevails unless the moon shines. Bris**bane does not stand alone in this respect, other** towns well provided with electric supply neglect their streets after dark. The straight, wide [illegible] of most Australasian towns adopts them expressly for arc lighting, a fact appreciated in many towns and particularly well used in the small town of Devonport, Tasmania. The agreeable after-dark temperatures call for the state of affairs noted above to be remedied, so that citizens may find their streets agreeable and safe to use at night.

Evening sports are in many towns well provided for, bowling greens, ovals and sports grounds are lit with flame arc lamps with dioptric globes giving even and satisfactory illumination over extensive areas. The success of this work is greatly appreciated, and such places will prove a valuable counter attraction to the bar and the billiard-room. Lawn tennis by arc light I had no opportunity of seeing, but as such fast ball games as racquets and tennis are played in England by artificial light, there is no reason why the same should not be done in Australasia.

The lighting, after closing hours of the leading shops by means of arc lamps hung under the verandahs is a noticeable feature of most towns, the only regrettable thing being the absence of uniformity in the verandahs, which bring many of the lamps unnecessarily low. The lighting of shop windows has been taken actively in hand, but with indifferent results; the striving after concealed lights is obvious, but the effects produced, in spite of the really excellent windows are inadequate. The ideal window lighting, which, while producing a powerful illumination of the displayed goods, conceals effectively the light source, was conspicuous by its absence, and instead were seen windows lit to a medium degree with many reflections of the supposed concealed lights, producing almost as much glare and distraction of the eye as if the lamp had been entirely visible and hung on the eye-level. The phenomenal growth of large stores with high ceilings during the last years has accentuated the question of illumination. The British movements of the Illuminating Engineering Society, and its official organ, the "Illuminating Engineer," are now filtering through to the colonial electrical engineers, and schemes are being devised to meet the existing conditions.

The splendid sunlight of Australia and the north island of New Zealand demand good interior daytime illumination, which the extensive necessary use of the verandah renders difficult of achievement from daylight. Good electric lighting is therefore necessary, and to about twice the intensities adopted as standards in the Old Country, where the artificial illumination is in contrast with the street lighting, and not with brilliant day light. With such intensities, the question of maintenance costs as well as absence from glare, have to be carefully studied. The best shops are adopting indirect lighting, in most cases by arc lamps burning pure carbons, and giving colour true rendering of the fabrics and materials displayed. In small establishments where colour truth is not of so great importance, and where the restricted size of the room prohibits arc lamp lighting, indirect lighting by metal filament lamps is being adopted, and there is no doubt that before long the American indirect and diffused lighting systems will appear and be adopted.

Whilst the shop owners and their consulting engineers are endeavouring to solve the problem of absence of glare, colour, true light and practical economy combined, the public buildings are remaining in the back-ground of progress. The eminent engineer, Mr. William Corin, who looks after the public works interests in New South Wales, has, however, taken time by the forelock, and improved the lighting of many public buildings, whilst Mr. Chas. Demaine, the consulting engineer of Melbourne, is carrying out a noteworthy scheme of lighting for the magnificent new Public Library that city is now completing.

The private house, the club, the hotel have not yet benefited largely from the correct study of illumination; the glare of the directly-exposed metal filament greets one's eyes in a painful manner from every direction, prismatic shades of the Holophane, or similar makes, are used with a surprising disregard of the scientific principles embodied. Alba glass from America being less capable of abuse provides a satisfactory relief when encountered.

The cardinal feeling of the Australasian market of purchasing a low-priced, instead of a cheap, article seems most prevalent in the lighting section of the industry, with the usual result of inferior workmanship, poor economy and improper or insufficient switching arrangements.

The prevalence of the Cinematograph Theatre in all towns provides a good demand for current with practically no peak load. The exterior attractive arc or incandescent lighting of such premises calls for no comment, but the operating arcs for the lanterns and their motor generators are of interest for we find heavy currents forced through large arcs, indifferently placed as regards the optical system which are producing poorly illuminated pictures often further spoilt by tinting screens of too deep a colour. More skill exhibited by the operator and properly constructed arc lamps correctly placed so as to secure even illumination, would secure economies of the order of 30 to 40 per cent., and enables the operator to work in a more reasonable temperature. Harmony between the cinematograph supply houses and first class electrical firms would secure better results. The purely electrical man seems unable to influence the operator or the proprietor, and good films fail to produce the proper results. It is interesting to note that the Kinema colour pictures, which excited so much admiration in England, have practically failed out here, a result one is inclined to attribute to want of skill and care in the operator.

Electric signs and advertisements are commencing their career, limited as to size and first cost by commercial considerations, and up to now have not offended the canons of good taste, it is to be hoped the public spirit of the citizens will prevent the night signs disfiguring their towns in the same way, and to the same degree, as the day signs often do. The most beautiful sites and entrances to harbours of unparalleled grandeur are spoilt by aggressive commonplace signs, that most of all by their blatant vulgarity defeat the aims of their owners. A tax on advertisements in public places the world over might relieve State finances and in some measure compensate the public for the constant offence such advertisements usually are. One of the most effective night signs noted was that used by Mr. J. C. Scott, of the Christchurch tramway, to illuminate time tables at various points on the route, shallow cases framing the time-tables and concealing linolite lamps produced a very neat and useful effect.

A field that offers much scope to the electrical contractor, ventilation by electrically-driven fans, needs exploiting. A few picture theatres have ventilating systems admitting tempered (i.e., cooled or heated) air, and thus provide good working examples of what needs to be done in the public halls, assembly, rooms, churches, libraries, etc., to say nothing of the legitimate theatres. The sliding roof theatre is apparently not suited to the climate, with its sudden squalls and downpours, and somewhat noisy traffic in the main streets, where the theatres are situated; scientific ventilation is therefore all the more necessary. The table and ceiling fans in endless varieties present little of novelty, except the high temperatures of the motor bodies, either motors of too small a size are used or the blades are twisted for greater thrust after delivery. The ceiling fan still goes round, driving the warm air from the upper to the lower level, a method of cooling now abandoned in the United States and Canada. The importance of fans for preventing the attacks of flies on edibles was noted with wonder. It is surprising that fly-proof screens and doors are not more used and appreciated.

The moderate price of current, the high price of domestic service, and the trying summer temperatures have created a demand for current for cooking and ironing that whenever sufficient supply has been available, has been encouraged, and often pioneered by the central station engineer. It goes without saying that, in a land so closely related in climate as Australia is to a great part of the United States, and also so conveniently situated as it is to North America, the excellent, well-designed American pattern of apparatus prevail. European apparatus is also available in most towns, and Melbourne possesses an original worker in the electric heating line, whose abilities have been recognised by a firm of British manufacturers, so that again in this respect Australasia is looking after its own needs with its own talent.

A suitable system of tariff in connection with a time switch should enable still cheaper rates to be given for heating current, so that the consumer is encouraged and enabled to afford the somewhat big outlay involved in adopting electric cooking apparatus. The simple and expensive heat conserver, with the 100 per cent. load factor, has still to be evolved in a form suitable for cooking.

The electric elevator for passenger service has a good vogue, and is constructed on standard European and American lines. Many of these exhibit the peculiar feature of being operated by an attendant during certain hours, but often at dinner time or evening, left for automatic use by the passengers. Surely if the latter is safe, and safety can easily be secured, the attendant is entirely superfluous. The real danger of public automatic lifts is the overcrowding, which no individual passenger can control. Friction hoists, electrically-driven, both fixed in warehouses or portable for use on docks, harbour, or in connection with building, are coming into use, and should have a large future where unskilled labour is so highly paid.

Passing from the heavy current to the low current side, we find Australia ahead of England in adopting automatic telephone exchanges, for although the Australians believe they are badly treated by the operators, their hand-operated exchanges present no features to call for more grumbling than the British ones. The automatic apparatus being installed is good in design, of ample strength, and of suitable materials. It should, therefore, give success, and show the Motherland the way to improvement. The subscribers' apparatus is, as in most countries, very diverse in type, make, and method of operation. The hand combination instrument is still in use, and long may it flourish, for no more retrograde steps were ever taken in telephony in the United Kingdom than when it fell under the sway of American influence, and adopted the pedestal heavy-weight transmitter, with no speaking key, and an independent receiver. Under the veil of necessity of such apparatus for the central battery system, the time saving, convenient, and efficient hand combination was cajoled out of the possession of hundreds of thousands of subscribers. The hand combinations are in many towns fitted with hygienic nickel-plated caps over the transmitter, which, whatever its antiseptic virtues may or may not be, provides a smart finish, and trends to cleanliness. In no place was the high efficiency "Stalloid" receiver diaphragm in use, a simple improvement of no expense, that would greatly improve hearing in the towns, where the motors and gears of the tram cars are noisy.

Wireless telegraphy has been taken in hand by the Federal Government for long distance transmission, for strategic as well as commercial purposes. It is also compulsory on ships of certain classes and sizes, to the great comfort of the Australasian, who is compelled to make frequent and long ship journeys, if he wishes to avoid the inconvenience and discomfort of the main line services, with their antiquated sleeping cars, unnecessary change of gauge, and profusion of dirty smoke and fine dust. Why are the tracks in the arid districts oil sprayed?

In the direction of wireless telegraphy Australia shows itself in the forefront by adopting its own system under the guidance of the expert, Mr. Balsillie, and defying the European Marconi and Telefunken patent owners, and, further than this, in manufacturing large quantities of wireless plant, notably in Sydney, under Father Shaw's patents.

Electric bells and fire alarm services are good in quality, the latter especially a most important matter in a land of very combustible buildings. It is to be hoped the sound commonsense which makes the Australasian careful of naked lights and exposed flames will, when combined with well installed and regularly maintained fire alarm systems, enable the existing high fire insurance premiums to be reduced and life rendered safer in hotels and other tall buildings.

Rules, regulations, and specifications for electrical plant, apparatus, and installations have been codified by the electrical engineers of the Fire Underwriters' Boards, in the different States, but the administration of them differs considerably, and what is passed in one State as good and safe is taboo in the other. Apparatus permitted for use here is prohibited there with insufficient time notice to importers to enable them to utilise stocks already ordered from home, and in some cases on the water. This is a real hardship to traders, who would like to suggest that the capable men, Mr. Noel Murray, of Melbourne, Mr. Burgess, of New South Wales, Mr. Weston, of Brisbane, and Mr. Osborne, of South Australia, should meet at more frequent intervals, and work on identical lines.

Standard rating for machines are not fixed, and probably never will be, for, although the British Engineering Committee standards for machines will answer in the southern part of the continent, they are not suitable for Queensland and the northern parts. Until something is settled, the motor trade is carried on on somewhat haphazard lines.

In conclusion, it is pleasant to note the generally superior education and intellectual equipment of members of the electrical fraternity, for one feels sure the electrical future of Australasia is in good hands, and will not degenerate to an industry carried on in different lines without self-respect and esprit de corps, and one therefore feels confident in predicting a permanently successful future for electrical engineers in Australasia.

## MISCELLANEOUS.

The Bulli Shire Council has, writes our Wollongong (N.S.W.) correspondent, drawn up conditions for the supply of electric light to private houses at 12s. 6d. per lamp of 16 c.p. per annum, the cost of external switch to building, and of installing each lamp, from 20s. to 25s.; alternately, a flat rate of 12s. 6d., the consumer to have the option of installing a meter, to cost 30s., and to be charged 6d. per unit. Large consumers may instal at their own expense a transformer of a capacity equal to the number of lights required, cost from £4 to £5 per 800 c.p., charge to be at the rate of 5d. per unit. All appliances have either to be purchased from the Council, or as the Council shall direct.

* * *

The Governor of Queensland in Council has approved of a loan of £250,000 to the Mackay Harbour Board to finance the new harbour scheme. Work is to be commenced by constructing a viaduct to connect with Flat Top Island, where the harbour is to be established.

* * *

Arrangements are being made for erecting a permanent power-house at Canberra. The foundations are in position, and portions of the plant are on the ground ready to be installed. Eventually there will be two generation units each of 500 kilowatts, and one spare generator for emergency purposes. Only one unit is to be fitted up at present, however.

* * *

The New South Wales Railway Department is short of locomotives. It is understood that within the next week or two the Chief Commissioner will ask the Treasurer for funds to purchase more engines. The Eveleigh workshops, it is stated, have not been able to cope with the demand for locomotives, and it is not unlikely that a large order will be placed in England.

* * *

The Lord Mayor of Melbourne, the Victorian Railways Commissioners, Messrs. Norman and McClelland, Sir John Taverner, formerly Agent-General for the State, Mr. McKenzie (Minister for Lands), the Commissioners of the Melbourne Harbour Trust, Members of the Railways Standing Committee, the Chief Engineer of the Public Works Department, the Chief Engineer of the Commonwealth Railway Construction Branch, and representatives of the Melbourne Tramway Company, the Prahran—Malvern Tramway Trust, and various municipal bodies, were present on the afternoon of the 21st inst. at the Star Picture Theatre, Bourke-street, Melbourne, to witness a series of biographic views of the railless traction system as it is operating in Rotherham, England. The system illustrated was that of the Railless Electric Traction Construction Co. Ltd. The advantages and operations of the railless tram were fully described in the "Standard" of 1st February, 1912, so that there is no need to say more about the films shown than that they gave a very good idea of the system in operation. Those present were specially impressed with the ease with which the R. E. T. cars threaded their way past heavy traffic. It may be mentioned, too, that it is claimed that the initial cost of installation is only one-fifth of that of the ordinary tramway system.

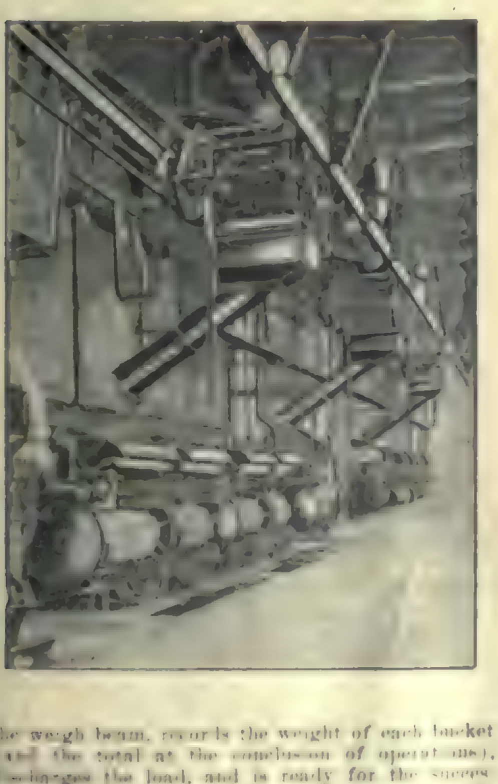
---

## INDUSTRIAL.

### Ingrey Weighing and Recording Machine.

Economy and time-saving, combined with simplicity of working, are the principal claims put forward by the "Ingrey" patent automatic and recording machines, where minerals or other heavy materials are being handled. The value of the machines have been fully demonstrated at the British Admiralty dockyards, and by leading corporations and power stations in the United Kingdom.

The machine operates mechanically, and with the utmost simplicity. The weight, or impact, of the material falling into the weigh bucket puts the machine into action, lowers to bucket on to the weigh beam, records the weight of each bucket (and the total at the conclusion of operations), discharges the load, and is ready for the successive operation in from 15 to 30 seconds. No attendant is required, except for cleaning and oiling. No matter how the load may vary it is accurately weighed, the weight indicated on the dial, and added to the aggregate, thus showing at a glance the total weight that has passed through the machine. The machines are standardised, and all parts are kept in stock. Mr. Lascelles Parrington is the Australasian representative. The "Ingrey" machine shown in the illustration is a travelling type for boiler feeding.



* * *

An order has been placed with Messrs. Chas. Ruwolt and Co., Richmond (V.), for a dredger by the Deebrook Dredging Co., F.M.S.

* * *

N. Guthridge Ltd. wish us to state that the concentrators supplied to the Central tin mine are not, as stated in an "Industrial" par. in our last issue, of a similar type to those in use at Mt. Bischoff and other Tasmanian tin mines, the decks in use on their tables being patented.

---

## FINANCIAL

### MEETING OF CREDITORS.

### Extraordinary Allegations.

A meeting of the creditors in the estate of Perks, Dane and Co. Pty. Ltd. was held in Colonial Mutual Chambers, Melbourne, on Friday afternoon, and the proceedings afforded an excellent example of the disadvantages under which creditors are placed in a voluntary liquidation. The meeting was convened by Mr. A. S. Abraham, the liquidator appointed by the shareholders in accordance with the instructions of the Court, and was called "to obtain an expression of opinion by the creditors as to:—(a) Whether the alleged claims made by Hubert William Perks, Charles Edgar Perks, and John Edward Dane for unpaid salaries, loan, etc., shall be allowed. (b) Whether legal proceedings should be taken against the said Hubert William Perks, Charles Edgar Perks, and John Edward Dane, or any of them in respect of monies alleged to have been overdrawn by them for salaries, etc. (c) Whether the liquidator be authorised to compromise the said alleged claims."

There was a large attendance of creditors, and trouble commenced almost immediately on the chairman rising to make a statement, a proposal being put forward that Mr. Henry Stirling, who represented the Royal Bank and 26 other creditors, should be appointed to the chair. The liquidator's brother, Mr. D. S. Abraham, who was present as his solicitor, declared that the motion was ultra vires, and that the liquidator was by law entitled to preside. This view was strongly objected to by Mr. Derham, solicitor, who appeared on behalf of the Acme Motor Engineering Co. This gentleman read rule 110 of the Companies Act, which runs as follows:—

110. "Where a meeting is summoned by the Official Liquidator or the Liquidator, he, or some one nominated by him, shall be chairman of the meeting. At every other meeting of creditors and contributories the chairman shall be such person as the meeting by resolution shall appoint."

Mr. Derham maintained that this meeting came under the heading of "other meetings" referred to in the rule, while Mr. D. S. Abraham held that it did not, Mr. Abraham's contention being that the notice of meeting was issued by the liquidator, and Mr. Derham's, that this action was taken only by order of the Court. Mr. Abraham thought to clinch matters by the assertion that he had obtained counsel's opinion on the question, but Mr. Derham refused to attach any importance to this without knowing who counsel was, and how the question was put to him. This information Mr. Abraham did not give. The motion that Mr. Stirling should take the chair was put and carried by an overwhelming majority, but was ignored by the liquidator; and, as a deadlock seemed to have been reached, Mr. Arthur Woolcott, solicitor, who was appearing on behalf of Sydney creditors, urged as a compromise that the liquidator should make his statement, and then should vacate the chair and allow the meeting to appoint whom it chose. This course was apparently acceptable to the majority, but not to the liquidator's solicitor, who suggested as a counter-compromise that, after the liquidator's statement had been made, the representative of the largest creditor should be appointed to the chair. The meeting, however, did not intend to have its choice thus dictated to it, and this proposal was not accepted. The liquidator then proceeded with his statement, and was, though not definitely recognised as chairman of the meeting, allowed to act in that capacity.

The next trouble arose over the question of the admission of the Press, which was proposed by Mr. Stirling, and objected to by the liquidator. A vote on the question was taken, and again there was an overwhelming majority against the liquidator, who, however, refused to recognise the vote, with the result that the pressmen waiting outside were not admitted. This proceeding was characterised by Mr. Stirling, as showing that the liquidator had something he wished to conceal.

After the liquidator had hurried through a statement and a fresh wrangle had occurred as to whether Mr. Stirling or the liquidator was in the chair, the former rose to propose a resolution; but the liquidator refused to allow him to do so until the business for which the meeting had been called had been disposed of. A motion, however, that Mr. Stirling should be heard was carried, and that gentleman proceeded to make a very bitter attack on the liquidator's proceedings in connection with the winding up of the estate. This had now been going on, he said, for nearly 18 months. The delay was attributed by the liquidator to certain claims made by Messrs. Perks against the estate; but those claims should have been settled long ago. He considered it might be quite sufficient explanation of the delay that had taken place in winding up that on the 7th of June, 1912, an order was made by the Court for the payment to the liquidator of a sum of £584 for his services to the end of May. This was at the rate of 10s. an hour for all time spent on the estate. The total receipts amounted to £2884, and the cost of getting them in to over £700, and there was £90 still to come. The liquidator had kept a diary, and the entries were very interesting. One of them showed that on one day he worked on the business of the estate from 9 a.m. to 6 p.m., the work he did being summed up in his own words "Dismissed all unnecessary employees."

"It took him 9 hours to do it," said Mr. Stirling ironically, to the accompaniment of loud laughter.

The Liquidator: You are putting quite a wrong construction upon it.

Mr. Stirling went on to deal with other items from this diary. One day's entry stated that the liquidator had worked 10½ hours on that day and had called at the Bank four times to see Mr. Stirling, who was out every time. "He could," said Mr. Stirling, "have easily got me on the 'phone and made an appointment with me. It was all a waste of time in order to get fees out of the estate." For a space of about six weeks, to the 10th of January, Mr. Stirling went on to say, the diary contained particulars of his work; from that date to the end of May there was not an entry giving any particulars of the work done, the entries merely giving the hours of work. On 77 days, the liquidator, in his great kindness of heart and desire to benefit the creditors to the utmost, went without any lunch. On three occasions he charged for no less than thirteen hours a day, and on those days went without either lunch or dinner. He apparently had no other work to do than the business of the estate. In six months he spent no less than 11,067¾ hours on the work of the estate, excluding Sundays and public holidays, but including Saturdays. This panned out at an average of eight hours 25 minutes work on the estate per day. In the face of those facts it would be well to instruct the liquidator to wind up the estate at once. Moreover, the creditors must remember that the large sum drawn was only up to the end of May, 1912; his fees to date were still to come. It was quite obvious that the liquidator had no business of his own to attend to. He claimed to have given the estate the whole of his attention. The charges made were altogether opposed to the interests of business morality in Melbourne; and there was yet another phase of this matter to which attention should be directed. The order for 10s. an hour had been obtained from the Court in a legal way, but had it been obtained in a fair way? The application was made on an ex-parte statement, and none of the creditors were given any notice of it. If a creditor had been in the Court and had opposed the application, it would not have been granted; and it was certain that the Chief Justice would have acted as Mr. Justice Hodges had now acted, and referred the matter to the creditors. Moreover, he would point out that the liquidator had not complied with the law, by lodging accounts with the Registrar-General. He asked whether the liquidator was prepared to present them with the figures to date.

The Liquidator: Not just now.

Mr. Stirling, after remarking that the assets were only being frittered away, and were mostly going into the pockets of the liquidator, put forward a motion which was subsequently withdrawn in favour of a somewhat similar motion by Mr. Derham, to the effect that a claim made by Mr. Hubert Perks for £412 against the estate should be admitted, and that, on the claims for wages overdue being dropped, the liquidator should be forbidden to take any action for overdrawn salary. This motion was agreed to, and the meeting was adjourned for 14 days, it being understood that the liquidator would then put a statement before the creditors. He was asked for an assurance that before making any further application for remuneration, the creditors would receive notice; and this assurance was given.

**P. & O. COMPANY'S ROYAL MAIL STEAMERS**
FOR MARSEILLES, PLYMOUTH, AND LONDON

Leave Sydney on the subjoined dates, calling at usual ports.

FIRST AND SECOND SALOON ONLY.

| Steamer | Tons. | Commander. | Noon. | Melb., 3 p.m. |
|---|---|---|---|---|
| MOREA | 11,000 | Andrews | May 31 | June 3 |
| MARMORA | 10,500 | Lockyer | June 14 | June 17 |
| MEDINA | 12,500 | Notley | June 28 | July 1 |

PASSAGE MONEY TO LONDON—
Single, £41 16s. to £82 10s.
Return, £69 6s. and £123 4s.

Return Tickets between Inter-State Ports are available for return by Orient, Messageries Maritimes, and N.D.L. steamers having room.

SPECIAL HOLIDAY RETURN TICKETS to COLOMBO are now issued, available for two months. Fares from Sydney, £45 2s. first saloon, and £31 18s. second saloon.

A. GORDON WESCHE, Superintendent IN AUSTRALIA, 63 Pitt-street, Sydney.

**The COLONIAL MUTUAL FIRE Insurance Company Limited.**

Principal Office 60 MARKET-ST., MELBOURNE.

Branches in all the States
Transacts Fire, Guarantee, Employers' Liability, Marine, Burglary, and Plate Glass, Accident, Workers' Compensation and Live Stock Insurances.
Send for Prospectus
W. TUCKER, General Manager.

**Harringtons Ltd.**

ANALYTICAL & METALLURGICAL DEPT.

Lowest fees for all kinds of Assay, Analytical, and Metallurgical work.

Expert Advice on Ore Treatment, Bullion Refining, Smelting, etc., etc. Directed by a qualified Analyst from Messrs. Johnson and Sons, London; Assayers to Bank of England; H.M. Mint, The Council of India, etc.

HARRINGTONS LTD.
386 George Street, Sydney.

## PUBLICATIONS RECEIVED.

We have received from Messrs. William Laidley and Co., 7 O'Connell street, Sydney, direct agents for Messrs. Richard Klinger and Co., manufacturers of the well known "Klingerit" jointing and packing, a handy 28-page booklet entitled, "Engineers' Jointing Book," dealing with jointing materials, which they will be pleased to supply to engineers on application.

* * *

Bulletin No. 6 of the Commonwealth Bureau of Census and Statistics—"Transport and Communication." The number is a summary of the Commonwealth statistics, of transport and communication for the years 1902-1912. It contains particulars relative to Government and private railways, tramways, shipping, posts, telegraphs, and telephones.

* * *

"Contributions to the Study of the Geology and Ore Deposits of Kalgoorlie, East Coolgardie Goldfield," by E. S. Simpson and C. G. Gibson, is a bulky bulletin issued by the Western Australian Geological Survey Office. The work Mr. A. Gibb Maitland, the Government Geologist, "thinks of sufficient public interest to warrant its issue in advance of the completion of the more or less detailed work underground, which is at present in progress. The latter work has been delayed, partly owing to staff re-arrangements. As the underground survey proceeds, the issue of another bulletin, containing an account of the structural relations of the ore deposits, and the general tectonics of the field, as well as its petrography (aspects which it has been found impossible to touch upon in the present publication) is contemplated. The bulletin of 198 pages includes 49 photographs and microphotographs, and two maps. Appended are translations by E. S. Simpson of "The Telluride Ores of Western Australia," by P. Krusch, and "The Tellurides of Gold and Silver of the Kalgoorlie District," by Ad. Carnot. In a prefatory note Mr Maitland says: "The results of such scientific researches as have at present been carried out at Kalgoorlie seem to indicate that there is little or no fear that, on the whole, the ore deposits will not persist to the greatest depth to which mining becomes possible, and that the grade of ore below a depth of 2000 feet may be expected to be just as variable below that level as it has been above it."

# *Tenders Invited and Accepted*

**It is particularly requested that the information regarding contracts open, and the successful tenderers, be forwarded to The Editor not later than Monday of each week.**

The following contractions are used throughout:—S—supply; D—delivery; M—manufacture; C—construction; E—erection; P—purchase; I—installation; R—removal. Where no contractions appear, supply and delivery is understood. The date at the beginning of each paragraph refers to the closing of tenders.

## INVITED.

### Commonwealth.

**Specifications, tender-forms, etc., for tenders invited for the Postmaster-General's Department of the various States under this heading may be had as follows:—Victoria—Various State G.P.O.'s. New South Wales—Departmental Stores, Sydney, and various G.P.O.'s in other States. South Australia—Adelaide, Melbourne, Sydney and Brisbane G.P.O.'s. Western Australia—Departmental Stores, Perth, and various G.P.O.'s in other States. Queensland—Various State G.P.O.'s. All States—Various G.P.O.'s. . If the Specifications, etc., may be had elsewhere in addition the places will be given in parentheses.**

POSTMASTER-GENERAL'S DEPARTMENT. Melbourne.—3rd June.—S. and D. of electric lamps, schedule No. 863.

3rd June.—Conduit fittings, as per schedule No. 903.

10th June.—S. and D. of incandescent electric lamps, as per schedule No. 862.

10th June.—Ironwork, as per schedule No. 890.

10th June.—100 fire alarm boxes, as per schedule No. 909.

10th June.—Iron letter-boxes and pillars, as per schedule No. 914.

10th June.—Sand, and the removal of spoil, from the 1st July, 1913, to the 30th June, 1914, as per schedule No. 949.

17th June.—Metal toppings and screenings, as per schedule No. 888.

17th June.—S. and D. of wire, iron, etc., as per schedule No. 853.

24th June.—Telephone parts, as per schedule No. 867.

24th June.—Telephones, as per schedule No. 864.

24th June. — Hard-drawn copper wire, etc., as per schedule No. 855.

24th June.—Hard-drawn copper wire, as per schedule No. 854.

24th June.—15,000gal. of benzine, from the 1st July, 1913, to the 30th June, 1914, as per schedule No. 933.

1st July.—S. and D. of 30 nautical miles of submarine cable, as per schedule No. 858.

1st July.—S. and D. of telephone instruments, as per schedule No. 865.

1st July.—S. and D. of insulators, as per schedule Nos. 874 and 875.

1st July.—Switchboard parts, as per schedule No. 879.

1st July.—175 cable boxes, as per schedule No. 876.

8th July.—Instruments, telephone parts, as per schedule No. 866.

8th July.—India-rubber covered wire, as per schedule No. 873.

8th July.—Cast-iron pipes, as per schedule No. 885.

8th July. — Measuring instruments, as per schedule No. 871.

8th July.—Wire, I.R. covered, as per schedule No. 872.

8th July.—Batteries and battery material, as per schedule No. 880.

8th July.—Galvanised-iron piping, as per schedule No. 887.

8th July.—Switchboards, telephone, various, as per schedule No. 895.

8th July.—Measuring instruments, various, as per schedule No. 870.

8th July.—S., D., and E. of a common battery switchboard at Windsor, as per schedule No. 805.

15th July.—Telegraph and telephone material (switchboard parts), as per schedule No. 878.

15th July.—Galvanised-iron piping and fittings, as per schedule No. 886.

22nd July.—Batteries and battery material, as per schedule No. 881.

22nd July.—Wire (silk covered), schedule No. 884.

22nd July.—45 lb. wire (silk covered), as per schedule No. 883.

22nd July.—10,000 porous pots, as per schedule No. 882.

22nd July.—Ironwork, as per schedule No. 891.

22nd July.—Telephone switchboards, as per schedule No. 899.

22nd July.—Telephone switchboard cable, as per schedule No. 856.

22nd July.—Telephone switchboard cable, as per schedule No. 857.

22nd July.—Sundries, as per schedule No. 892.

29th July.—Detectors, keys, staples, tongs and rosettes for table telephones, as per schedule No. 901.

29th July.—Sundries, as per schedule No. 893.

29th July.—Coach screws and spikes, as per schedule No. 904.

19th August.—105 miles of paper-insulated, lead-covered cable, as per schedule No. 906. (See advertising columns.)

26th August.—300 coin-collecting devices, electrically controlled, as per schedule No. 916.

16th September.—S., D., E., and I., at the Telephone Exchange, Collingwood, Victoria, of a common battery switchboard, as per schedule No. 860, or an automatic, or semi-automatic, switchboard, as per schedule No. 859.

POSTMASTER-GENERAL'S DEPARTMENT. Sydney.—25th June (extended from 11th June). —Switchboard cable, to stores schedule N.S.W., 290; copper wire, etc., to stores schedule N.S.W., No. 291; wire, india-rubber covered, to stores schedule N.S.W., No. 292; wire, cotton, silk, or wool covered, etc., to schedule N.S.W., No. 293.

25th June. — (1) Battery material, as per stores schedule N.S.W. No. 298; (2) instrument ink, etc., as per stores schedule N.S.W. No. 299; (3) coal tar composition, etc., as per stores schedule N.S.W. No. 300.

9th July.—Eight multiple magneto incoming junction line switchboards, with associated equipment, as per schedule No. 205.

9th July.—Wire, galvanised iron, etc., stores schedule, N.S.W., No. 295; bridle rings, etc., stores schedule, N.S.W., No. 297.

27th August.—(1) Telephones to stores schedule N.S.W. No. 301; (2) switchboards to stores schedule N.S.W. No. 302; (3) lamps, electric, incandescent, to stores schedule N.S.W., No. 304.

POSTMASTER-GENERAL'S DEPARTMENT Perth. — 4th June.—Pole steps and steel spindles to W.A. schedule No. 280.

4th June.—3 miles of 39 pairs, 3 miles of 156 pairs, 1 mile of 208 pairs, 1 mile of 260 pairs, and 1 mile of 312 pairs lead-covered cables, 12½ lb. conductors, unserved, to specification 459 and schedule W.A. 282.

11th June.—S. and D. of metal filament lamps to W.A. schedule No. 274.

11th June.—Mild steel plates, cast-iron covers and frames, steel beams, etc., to W.A. schedule No. 288.

11th June.—Expansion bolts and shields, to W.A. schedule No. 285.

11th June.—Bricks, cement, and blue metal, to W.A. schedule No. 286.

11th June.—2700 conduits, 4 duct, to W.A. schedule No. 287.

18th June. — 20 tons of hard-drawn copper wire, to W.A. schedule No. 291.

25th June.—20 miles of wire (cotton, silk, or wool-covered), to W.A. schedule No. 292.

**Osborn's Truck Wheels & Axles**

Osborn's Mushet High Speed Steel, Twist Drills, Mining Steels, Crusher Jaws and all classes of Castings.

Samuel Osborn & Co. Ltd., Sheffield, are Standard Makers.

**Gibson, Battle & Co. Ltd.**

535 Kent St., Sydney.
486 Collins St., Melbourne.
S.A. Agent: C. C. Deland, Victoria Square, Adelaide.

25th June.—Conduits, to W.A. schedule No. 290.

9th July.—S. and D. of wire, india rubber covered, and cotton, silk, or wool covered, to W.A. schedules Nos. 265 and 266.

16th July.—S. and D. of wire, bronze and copper, to W.A. schedule Nos. 260, 267, and 273.

23rd July.—S. and D. of switchboards and parts, telegraph and telephone instruments, to W.A. schedules Nos. 254, 255, and 256.

30th July.—S. and D. of switchboard cable, to W.A. schedule No. 275.

30th July.—S. and D. of steel towers, battery material, wire and iron work generally, to W.A. schedules, Nos. 259, 262, 263, 268, and 269.

6th August.—S. and D. of insulators, telegraph and telephone material, and iron poles, to W.A. schedules, Nos. 258, 261, and 264.

POSTMASTER-GENERAL'S DEPARTMENT, Brisbane. — 4th June.—Waterproofs, as per stores schedule No. 251.

25th June.—S. and D. of letter-box fronts, as per stores schedule No. 249.

27th August.—S., D., and E. at the Telephone Exchange, Brisbane, of five sections of switchboard, common battery, multiple, and other equipment to schedule No. 243, specification No. 458.

10th September.—Telephone Exchange, Brisbane, nine sections of a trunk line switchboard, to schedule No. 244, specification No. 461, and the general conditions, drawings, etc., attached thereto.

POSTMASTER-GENERAL'S DEPARTMENT, Hobart.—9th June, 1913.—S. and D. of telegraph and telephobe material to schedules 56 to 63.

16th June.—One motor car (petrol), complete, to schedule No. T.67.

POSTMASTER-GENERAL'S DEPARTMENT, Adelaide.—25th June.—1000 letter box fronts, as per schedule No. 288.

16th July.—Telegraph and telephone material, schedules Nos. 277 to 286.

13th August.—Telephone parts, as per schedule No. 292, and switchboards, as per schedule No. 293.

DEPARTMENT OF HOME AFFAIRS (Works Director Victoria).—7th July.—Cold storage installation at Naval College, Jervis Bay.

DEPARTMENT OF HOME AFFAIRS (Kalgoorlie-Port Augusta Railways).—2nd June.—Putting down bores along portions of the route of the Transcontinental Railway lying between approximately 170 miles and 430 miles from Kalgoorlie.

3rd June.—Electric lighting and power plant for Kalgoorlie and Port Augusta depots.

DEPARTMENT OF EXTERNAL AFFAIRS. —Port Augusta to Oodnadatta Railway.—3rd June.—M. in Australia, S. and D. of 15 sheep waggons, 3ft. 6in. gauge.

3rd June.—M. in Australia, S. and D. of 30 bogie cattle waggons, 3ft. 6in. gauge.

3rd June.—M. in Australia, S. and D. of 80 12-ton waggons (4-wheel), 3ft. 6in. gauge.

17th June.—M., S. and D. of 550 pairs of wheels and axles, 3ft. 6in. gauge.

24th June.—M., S. and D. of bogie goods waggons, 3ft. 6in. gauge; and water tank waggons, 3ft. 6in. gauge. (See advertising columns.)

DEPARTMENT OF TRADE AND CUSTOMS. —1st July.—M., S., and D. (at Melbourne) of an automatic flashing light for Emery Point, Port Darwin, and also of an automatic flashing post light for Fort Point, Port Darwin.

## Victoria.

VICTORIAN RAILWAYS.—4th June.—Linseed oil.

4th June.—Cement.

4th June.—White lead in oil.

4th June.—No. 8, 400 lb. galvanised telegraph wire.

4th June.—M., S., and D. of 5000 wrought-iron side brackets.

11th June.—Brass locomotive boiler tubes.

11th June.—M., S., and D. of 400,000 spring washers for 1in. dia. fishbolts.

18th June.—(a) One hoisting engine and boiler for pile driving, new or secondhand; (b) portable steam engine and boiler, 20 h.p., new or secondhand; (c) one air-compressor and receiver, new or secondhand; (d) one steam pump, new or secondhand; (e) one portable petrol-driven concrete (Batch) mixer and Batch hopper. (See advertising columns.)

2nd July.—Copper plates.

23rd July.—M., S., and D. of one hydraulic flanging press.

30th July.—Balls and ball races for 70ft. turntables.

6th August.—Steel channel bars.

13th August.—Best steel boiler plates for steel cranes, boilers, etc.

13th August.—30,000 lineal feet of wrought-iron steam pipe, 1in. diameter.

20th August.—M., S. and D. of (a) lathe, (b) sawing machine, (c) chisel mortiser, (d) cut-off machine, (e) moulding machine.

27th August.—Hollow chisels and bits.

3rd September.—S. of three petrol engines and pumps for use at Newport Workshops. (Fresh tenders.)

VICTORIAN RAILWAYS COMMISSIONERS. —State Coal Mines.—25th June.—S. of 2 10h.p. portable oil engines, and boring plants and equipment.

13th August (extended from 25th June). — S. of electrical equipment. (See advertising columns.)

PUBLIC WORKS DEPARTMENT. — 2nd June.—S. and D. of pumping plant.

2nd June.—S. and D. propelling machinery, surface conductors, etc.

## New South Wales.

PUBLIC WORKS DEPARTMENT. — 2nd June. — Pumping machinery for Wagga Wagga sewerage. (Fresh tenders.)

16th June.—Monier plates and walings for Carrington Wharf, Newcastle.

11th August. — Steel bridge for Macleay River, Wauchope, to Kempsey section, North Coast railway.

11th August. — Steel bridges for Hastings River and flood channel, Wauchope to Kempsey section, North Coast railway.

3rd September.—Efficient steam tugs for use at Bellinger River and Cape Hawke, from 1st November, 1913.

RAILWAY DEPARTMENT.—11th June.—S. of one steam-driven boiler feed pump. (See advertising columns.)

11th June.—S. of one 20b.h.p. crude oil engine, to specification No. 419. (See advertising columns.)

18th June.—S. of 8 automatic coal weighing machines for White Bay Power House. (See advertising columns.)

6th August.—S. of one live steam feed water heater for Ultimo power-house. (See advertising columns.)

20th August.—S. of a pneumatic ash handling plant for White Bay power-house. (See advertising columns.)

SYDNEY HARBOUR TRUST.—(H. F. Norrie, Secretary).—2nd June.—S. and D., at Dobroyd Point, Port Jackson, of a wrought-iron mark buoy.

METROPOLITAN WATER AND SEWERAGE BOARD.—2nd June.—Cast-iron pipes and special castings for a period of four years. (Fresh tenders.)

10th June.—C. of 17,074 lineal feet of cast-iron and stoneware pipe sewers, in the Municipality of Drummoyne. (Fresh tenders.)

16th June.—C. and E. of 1 mild steel elevated service tank at Wahroonga.

HUNTER DISTRICT WATER SUPPLY AND SEWERAGE BOARD, Newcastle (Alfred E. Fry, Secretary).—30th May.—Coal for Walka pumping station; oils, lubricants, and stores, for pumping stations; stoneware pipes and fittings, for year ending 30th June, 1914.

## South Australia.

SUPPLY AND TENDER BOARD. — 15th July.—S. and D. of best mild steel.

15th July.—S. and D. of 500 bars bright drawn hexagon steel.

15th July.—S. and D. of cold-reeled mild steel bars.

15th July.—S. and D. of solid drawn copper tubes.

22nd July.—S. and D. of chain iron.

PUBLIC WORKS.—17th June.—C. and D. of spare parts for dredges.

RAILWAYS. — 17th June.—C. of 132 waggons, 3ft. 6in. gauge.

15th July.—C. of 8 bogie passenger brakevans, 5ft. 3in. gauge.

15th July.—C. of 17 bogie goods brakevans, 5ft. 3in. gauge.

22nd July.—C. of 30 or 50 bogie waggons, 5ft. 3in. gauge.

NORD DEUTSCHER LLOYD
REGULAR SERVICE TO EUROPE.
REDUCED FARES TO LONDON.
TO MANILA, CHINA AND JAPAN.
Via New Guinea and Yap.
Fares to Hong Kong, £40; II., £26.
Full particulars will be sent on application to—
LOHMANN AND CO., General Agents,
7-9 Bridge-street, Sydney.
Ostermeyer, Van Rompaey and Co., Melbourne; H. Muecke and Co., Adelaide; L. Ratazzi and Co., Fremantle; Thos. Brown and Sons Ltd., Brisbane.

The Mount Lyell Mining & Railway
CO. LIMITED.
Purchasers of Ores containing Copper, Gold and Silver. Rates obtainable on application to the Secretary
Manufacturers of Coke for Smelting and Foundry Purposes, Acids, Etc.
HEAD OFFICE—
39 QUEEN-STREET, MELBOURNE.
D. G. LUMSDEN,
Secretary.

THE
-PACIFIC CABLE BOARD-
Cablegrams should be Marked
"VIA PACIFIC."
(Not Charged for.)

The quickest and most accurate route for Cablegrams from Australasia to United Kingdom, Canada, United States, Germany, New Zealand, and Pacific Islands.
This route is owned by Great Britain, Australia, New Zealand, and Canada. Australia being the largest part owner (having one-third interest), the public are urged to support the National Cable.

RATES—

| | Ordinary | Deferred. |
|---|---|---|
| UNITED KINGDOM | 3/- | 1/6 |
| GERMANY | 3/- | 1/6 |
| CANADA | 2/4 | 1/2 |
| UNITED STATES | 2/4<br>to 2/8 | 1/2<br>to 2/4 |
| NEW ZEALAND | 4½d. | Nil |
| FIJI | 8d. | Nil |

DEFERRED RATES (IN PLAIN LANGUAGE ONLY) have now been arranged to most Countries where ordinary rate exceeds 10d. per word.
Enquiries for further information, pads of cablegram forms, maps and tariff cards, address to—
The Superintendent, SOUTHPORT, QUEENSLAND;
The Officer in Charge, 408 Collins-street, MELBOURNE, telephone 2588;
The Officer in Charge, 42 Hunter-street, SYDNEY; telephones, City 1346, City 3684;
J. Milward, Manager in the Pacific, 64 Pitt-street SYDNEY; telephones City 1346, City 3684.

## Western Australia.

GOVERNMENT TENDER BOARD. — 29th May.—58 tons arsenic for Public Works Department, as per schedule No. 107A, 1913.

29th May.—Steam hammers for Railway Department, as per schedule No. 78a, 1913.

19th June.—Four overhead electric travelling cranes, as per schedule No. 101a, 1913.

19th June.—Engine tyres for Railway Department, as per schedule No. 98a, 1913.

3rd July.—Tubular iron poles, for Railway Department, as per schedule No. 118A, 1913.

## Queensland.

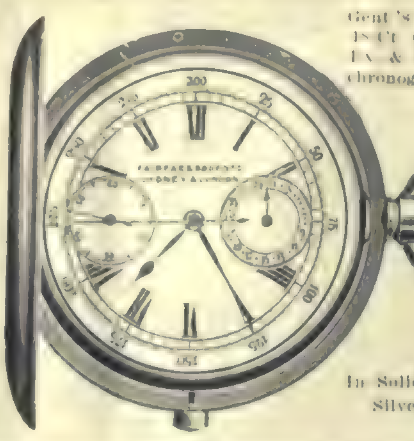
RAILWAYS DEPARTMENT.—15th July.—M. and S. of steel super-structure bridge over Pioneer River.

15th July.—S. of one 120ft. steel super-structure (one span), Caboolture River bridge.

PUBLIC WORKS DEPARTMENT. — 20th June.—Assay laboratory, Technical College, Mt. Morgan.

Dunlop Mining Goods
Are now used with satisfaction in most of the leading mines of Australasia — Their QUALITY & wear are UNSURPASSED.
Tenders & Samples submitted
Correspondence invited
Send for Illustrated Catalogue
The Dunlop [illegible]
[illegible] Flinders St. MELBOURNE.
& ALL STATES
Dunlop Rubber Belting
Is more efficient than Leather belting for Outdoor & Wet Work.
Sample & Price on application

TRADE MARK
DICK'S ORIGINAL BALATA GUTTA PERCHA & CANVAS BELTING
Note this on every belt.
Be sure you get
"DICK'S"
We know there are numerous imitations. Dick's maintains its high reputation for strength and efficiency. Every belt guaranteed. Sole agents:
JAMES HARDIE & CO.
Melbourne and Sydney.



**Absolutely Reliable!**

**Is the Reputation of These Chronographs.**

[illegible] special strength and accuracy [illegible]

We have never had a complaint about the celebrated "F. & R." Chronos

The movements are on the Lever principle

They have Breguet overcoil balance springs

They are fully jewelled

They have compensated and adjusted balances

They have jewel ruby rollers

They are self-registering to 1-5 part of a second

They are guaranteed for 15 years, and kept in order (breakages excepted) for 2 years

**FAIRFAX & ROBERTS, LTD.,**

The Oldest Jewellery House in Sydney.

23 & 25 Hunter Street.

PLAIN FIGURES CASH

Gent's heavy 18 Ct Gold Hunting F. & R. chronograph £22 10/-.

In Solid Silver Case, £10 10/-.

## General.

CITY OF MELBOURNE.—30th May.—High-tension switchboard, with remote control.

11th June.—Switchgear and instruments.

17th June.—Laying of 2 lines of steel tram track (principally labour).

MUNICIPAL COUNCIL OF SYDNEY.—7th July.—Arc lamp carbons.

CITY OF TOWNSVILLE (Q.) (H. C. Johnson, Town Clerk).—30th May.—Power plant for pumping water.

CITY OF TOOWOOMBA (Q.) (extended indefinitely from 1st March).—Following plant:—(1) **S. and E. of pumping plant of 25,000** gallons per hour capacity; (2) 10in. cast iron water pipes; (3) valves, special castings, etc. Tenders must be in accordance **with specifications and conditions of tenders,** copies of which may be seen, and tender forms **obtained, at the offices of the town clerk, Sydney, Melbourne, Brisbane, and Toowoomba.**

TOWN OF CAULFIELD (V.) (F. Jowett, Town Clerk).—4th June.—P. of old tramway rails and fishplates.

**SHIRE OF MANSFIELD (V.) (E. W. Finlason, Secretary) (G. B. Lincolne and J. K. MacDougall).—16th June.—(a) and (b), S., D.,** and E. of one suction gas engine and plant, **complete; (c) S. and D. of electrical plant and equipment; (d) E. of electrical plant and equipment; (e) S. and D. of wires and cables; (f) S. and D. of wood poles.**

**SHIRE OF SWAN HILL (V.) (A. W. D. Brown, Engineer). — 17th June.—P. of Fish Point punt.**

SHIRE OF COLAC (D. M. Dunoon, Secretary).—**14th June.—I. of electric light and** power plant in township of Colac.

**MELBOURNE AND METROPOLITAN BOARD OF WORKS (Geo. A. Gibbs, Secretary). — 3rd June.—M., S., and D., at the pumping station, Spotswood, of mild steel tie** rods, bolts, etc.

**17th June.—S. and D., at the Metropolitan** Farm, Werribee, of two steel wire plough **ropes.**

**METROPOLITAN WATER AND SEWERAGE BOARD, Brisbane (Q.) (Geo. Johnston,** Secretary).—26th June.—S. and D. of 5000 **water meters.**

**31st July.—41,000 casks Portland cement, un**der contract No. 10, 1913; and 41,000 casks **Portland cement, under contract No. 11, 1913.**

**MUNICIPAL TRAMWAYS TRUST, Adelaide (W. G. T. Goodman, Chief Engineer and Gene**ral Manager).—3rd June.—S. and D. of sleepers.

**15th July.—M., S. and D. of steel rails.**

29th July.—S. and D. of bonding material.

METROPOLITAN FIRE BRIGADES **BOARD, Melbourne (V.) (F. J. Gomm, Secre**tary).—29th May.—S. of 100 fire alarms and telephones, in boxes, complete. (See advertising columns.)

**BOROUGH ECHUCA WATER TRUST (A. E. Castles, Tongala (V.), Trust Engineer). —** 5th June.—132 chains of 12in., 57½ chains of **10in., and 12 chains of 8in. diameter pipes,** with valves, fittings, and materials, etc.

W. J. Southerwood, Launceston, Tasmania.—9th June.—S. of 4 motor cars, passenger and **luggage, with or without bodies.**

**Peak** Downs Freehold Copper Mine, Clermont (Q.) (A. Raymond Jones, 276-8 Edward-street, **Brisbane).—31st** May.—P. of property, buildings, machinery, plant and stores.

**Deep Leads Electric Transmission Co. Ltd.,** Charlotte Plains (V.) (Royal Insurance Build**ings, Collins-street, Melbourne). — For sale,** electric power plant. (See advertising columns.)

Berry Co-op. Dairy Co., Berry (J. E. Wiley, secretary).—June 7.—S. and E. 20-ton refrigerator, boiler, tanks, coolers, etc.

## ACCEPTED.

### Commonwealth.

POSTMASTER-GENERAL'S DEPARTMENT. Perth.—75 steel date stamps, £1 12s. each; 25 steel date and time stamps, £1 17s. each — C. G. Roeszler and Son, Melbourne.

500 letter-box fronts, small size, with lock and four keys, 5s. 4d. each; 100 letter-box fronts, medium size, with lock and four keys, 5s. 11d. each—Briscoe and Co. Ltd., Melbourne.

**11,000 cleats, galvanised steel, 2 11-12d. each;** 6000 clamps, cable, 3d. each; 5500 clamps, cable, 3¼d. each—Archibald Harper, Fremantle.

40 waterproofs, with capes (sizes 58, 56, 54, and 52in.), £2 17s. 9d. each; 30 capes, 37in., £1 13s. 7d. each; 20 capes, 31in., £1 10s. 6d. each—Dunlop Rubber Co. of Australasia Ltd., Perth.

DEPARTMENT OF HOME AFFAIRS.—Steel stanchions and principals for gymnasium, Royal Military College, Duntroon, £444—Hay and Co., Sydney.

### Victoria.

VICTORIAN RAILWAYS.—Steel superstructure for the duplication and renewal of portion of the Flinders-street viaduct, £27,402 6s. 2d.—Mephan Ferguson Pty. Ltd.

**Footbridge girders, etc., and clips for foot**bridges at Malvern new station (Caulfield line **duplication), £381 6s.—A. Challingsworth.**

Copper plates for "DD" and "A2" engines—**Copper plates for 20 "DD" engines—Item No. 1, to figure 1 of drawing No. 1371, at £87 4s.** per ton, delivered at Spencer-street railway station; item No. 2, to figure 2 of drawing No. 1371, at £87 4s. per ton, delivered at Spencer-**street railway station; item No. 3, to figure 3 of drawing No. 1371, at £87 4s. per ton, delivered at Spencer-street railway station; copper** plates for 25 "DD" engines—Item No. 4, to figure 1 of drawing No. 1371, at £87 4s. per **ton, delivered at Spencer-street railway station; item No. 5, to figure 2 of drawing No. 1371, at £87 4s. per ton, delivered at Spencer-street** railway station; item No. 6, to figure 3 of draw**ing No. 1371, at £87 4s. per ton, delivered at Spencer-street railway station; copper plates for 5 "A2" engines—Item No. 7, to figure 1 of** drawing No. 1407, at £88 5s. per ton, delivered **at Spencer-street railway station; item No. 8, to figure 2 of drawing No. 1407, at £88 5s. per ton, delivered at Spencer-street railway station; item No. 9, to figure 3 of drawing No. 1407, at £88 5s. per ton, delivered at Spencer-street railway station; plates to be inspected at the manufacturer's works, England — Edward Duckett and Sons.**

**Sulphate of copper, at £25 3s. per ton—C. S. Green and Son.**

**Purchase of a quantity of copper bar, £94—Thomas Warburton.**

STATE RIVERS AND WATER SUPPLY COMMISSION. — Pre-heater casing and steel **tubes, £144 18s., including 5 per cent. provision —James O'Grady, South Melbourne.**

### New South Wales.

**PUBLIC WORKS DEPARTMENT.—S., D., E., and maintenance of a sawdust and shavings** removal plant at the State Building Workshops, Uhr's Point—Austral Ventilating Co., Sydney.

Hinges, gudgeons and ironwork for gates and new abattoir stockyard, £3 5s. 4d. per cwt.—McKenzie Bros. Ltd., Ultimo.

HARBOUR WORKS.—Steel and ironwork for bins, flight conveyor, pit, and chequer plates, ladder and platforms for Port Kembla coal and loading plant, £32 per ton—Brown and Brown, **Pyrmont.**

**RAILWAY AND TRAMWAY CONSTRUCTION WORKS.—M., S., and D. of steel overbridge for road and steel bridge for Jerrabom**berra Creek, on Queanbeyan to Federal Capital railway—Sydney Steel Co. Ltd., Marrickville.

WATER AND SEWERAGE BOARD.—Con**struction of 7826 lineal feet of concrete pipe sewers in the municipality of Willoughby; office** estimate, schedule rates, £4300—R. Gendle, 4.44 **per cent. above schedule.**

**Construction of 7785 lineal feet of concrete aqueduct, monier and concrete pipe sewers, in the municipalities of Kogarah and Rockdale;** office estimate, schedule rates, £19,000 — R. **Gough and Son, 8.2 per cent. above schedule.**

STORES SUPPLY COMMITTEE.—**Supplies and services for public service for three years, commencing 1st July, 1913.**

Disinfectants and deodorants—**Items 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, and 13—Elliott Bros. Ltd.**

Item 11 (New South Wales manufacture) — Samuel Bowen, Regent-street, City.

**Item 11 (Izal)—T. K. Steanes, 37-43 Pitt-street, Sydney.**

Item 12 (Lavozone) — Biturine Lavers Ltd., **Flora-street, Erskineville.**

**Items 14 and 15—Australian Drug Co. Ltd., Sydney; as required during period terminating 28th February, 1914.**

**Cast-iron desk standards — Approximately** 10,000 right-hand stands, 10,000 left-hand stan**dards, and 8700 centre legs — Meadowbank** Manufacturing Co.

### Queensland

RAILWAYS DEPARTMENT.—20 H. waggons, £2683—Brown and Broad

### Western Australia.

GOVERNMENT TENDER BOARD.—Water Supply Department.—Tuppers packing, £21 19s. a ton—McLean Bros. and Rigg.

**RAILWAYS DEPARTMENT.—Steel angles, flats, etc., rates obtainable on application — Neilson and Maxwell Ltd.; H. J. Skelton and Co. Ltd. (per Agent-General); G. Wills and Co.**

### General.

PRAHRAN AND MALVERN TRAMWAYS TRUST (V.). — 10 summer car bodies and 6 bogie car bodies, £9470—Duncan and Fraser.

Town of Petersburg (S.A.).—Contract A. — Two Robson gas engines, with Cambridge pro**ducers and sundries, £2031 10s. — Australian** Metal Co. Ltd.

**Contract B.—Two 40kw. 3-wire 230-460-volt D.C. generators and 1 motor-driven, booster** complete with spares, £582 18s. 6d.—**Australian General Electric Co. Ltd.**

**One 350 amp. Hart accumulator battery, £834 15s. 2d.; portable testing instruments, £30 7s. 6d.—Edison and Swan United Electric Light Co. Ltd.**

Switchboard, supply and erection, complete, **£218 6s.; lightning arresters, insulators, and steel brackets, £78 3s. 4d.—Australian Metal Co. Ltd.**

**House service fuses and links, £17 5s. 3d.—W. T. Henley's Telegraph Works Co. Ltd.**

Contract C.—Electric equipment, other than **switchboard, £397 3s. 6d.—Turner, Robertson, and Co.**

**Contract D.—Aluminium cables, £318 8s. 4d.** —Todd and Samuel, Adelaide.

Poles being obtained from Conservator of **Forests. Consumers' meters not settled.**

MELBOURNE AND METROPOLITAN BOARD OF WORKS (V.).—1000 tons of engine coal for pumping station, Spotswood, £1025—**Outtrim, Howitt and British Consolidated Coal Co. N.L.**

Wrought-iron vent tubes, 9in. and 12in. dia**meters (steel spiral riveted tubes), £74 14s. 11d.** —Mephan Ferguson Pty. Ltd.

**COMMERCIAL TRAVELLERS' ASSOCIA**TION OF VICTORIA.—One Linde refrigerat**ing plant, £377—Wildridge and Sinclair Ltd.**

**MORWELL WATER WORKS TRUST (V.). —16¾ tons lead, at £18 15s. a ton—John McIlwraith and Co. Pty. Ltd.**

**Valves, fire-plugs, and special castings, etc., £263—John Danks and Sons Pty. Ltd.**

**SYDNEY CITY COUNCIL. — Transformers** (pole), **£981—The Australian General Electric Co.**

**Wood troughing, £773—H. D. McKenzie.**

Stoneware bridges, £262 17s. 3d. — Bakewell Bros.

**Direct-current feeders, £9793 19s. 4d.—The** Wetern Electric Co.

**Time switches, £395 6s.—Crompton and Co.**

**Fibre conduit, £437 10s.—Haes and Eggers.**

High-tension D.C. feeder panels, £1780 — **The Australian General Electric Co.**

**Pole finials, £223 12s. 6d.—A. Thomson and Son.**

Supply of motors for hiring out — Gardner, **Waern and Co., for motors only for schedules** A, B, and C, conditional on their undertaking to **supply pulleys of certain dimensions as regards** diameter and width of face, these dimensions to **be supplied later; the Australian General Electric Co., for starters in schedules A, B, and C.;** The British Westinghouse Co., for schedule E.; **The Australian Metal Co., for motors and** starters in schedules D and F, on condition that **the company undertakes to reduce the diameter of the shaft on that part carrying the pulley, to** increase the size of the oil inspection hole in the motors in schedule D, and to provide pulleys of sizes which will be supplied to them so far as diameter and width of face is concerned.

## DIVIDENDS OF MINING COMPANIES.

The following dividends and bonuses of mining companies in Australia have been declared and are payable on the dates mentioned:—

May.

29th.—Mararoa, 1s., £5000.
29th.—Golden Pyke, 1s., £1400.
29th.—Nell Gwynne, 6d., £700.
Cathcart, 1½d. (final), £583.
**31st.—Vict. Araluen, 6d., £750.**
**National Bank of Aust., 7 per cent. (ord. and pref.), £41,735.**
**Papuan Brilliant and Victoria, 3d., £1600.**

June.

**2nd.—Silverton Tramway, 1s., and 1s. bonus, £25,000.**
**4th.—Ajax Central, 1s., £1500.**
**4th.—Talisman Consol, 1s. 9d., £30,180.**
**13th.—British Broken Hill, 1s., £48,000.**
14th.—Y Water, 1s., £1500.
**17th.—Tongah Compound, 1s. and 2s. bonus, £7500.**
20th.—Broken Hill Water, 1s. 6d., £15,000.
24th.—Sons of Gwalia, 1s. (less I.T.), £17,500.
25th. — Broken Hill Block 10, 1s. and 1s. bonus, £10,000.
26th.—Zinc Corporation, 1s. 6d. (ord. and pref.), £89,882.
**27th.—Broken Hill South, 6s., £60,000.**

## BANK CLEARINGS.

The Melbourne Clearing House returns for the week ended 26th May, were:—

| | | |
|---|---|---|
| Total clearance .. .. .. | | £4,591,247 |
| Settled by certificates | £342,500 | |
| Settled in coin . .. | 137,502 | |
| | | £480,002 |
| Total for the corresponding week of 1912 . . . . .. | | £4,927,601 |

## Government Notice (N.S.W.).

New South Wales Government Railways.
Office of the Chief Commissioner,
Sydney, 14th May, 1913.

TENDERS will be received at this Office until 12 o'clock noon on the dates specified for the undermentioned Works, etc., viz.:—

Wednesday, 11th June, 1913.

The Supply of One Steam-driven Boiler Feed Pump to Specification No. 421, price 2s. 6d. each.

The Supply of one 20 B.H.P. Crude Oil Engine, to Specification No. 419, price, 2s. 6d.

Wednesday, 18th June, 1913.

The Supply of Eight Automatic Coal-weighing Machines for the White Bay Power House. Specification No. 414; price, 2s. 6d. each.

Wednesday, 6th August, 1913.

The Supply of One Live Steam Feed Water Heater for Ultimo Power House. Specification No. 397, price, 2s. 6d. each.

Wednesday, 20th August, 1913

The Supply of Pneumatic Ash-handling Plant for the White Bay Power-house, to Specification No. 415; copies, 5s. each.

All specifications can be obtained at the Electrical Engineer's Office, 64 Hunter-street, Sydney.

Tenders are to be endorsed, "Tender for Feed Pump," or as the case may be.

The Chief Commissioner does not bind himself to accept the lowest or any tender.

By order,
J. S. SPURWAY,
**Secretary.**

---

## BROKEN HILL SOUTH SILVER MINING COMPANY, No Liability.

Notice is hereby given that a DIVIDEND (56th) of six shillings per share has been declared, due and PAYABLE on Friday, 27th June, 1913.

Transfer books will close at the offices of the company, Collins House, Collins-street, Melbourne; Brookman's Building, Grenfell-street, Adelaide; and 16 O'Connell-street, Sydney, on Friday, 13th June, 1913, at 4 o'clock p.m.

By order of the Board,
FRANK G. HICKEY, Secretary.

Shareholders are notified that their dividends will be posted direct.

360 Collins-street, Melbourne, 24th May, 1913.

---

**METROPOLITAN FIRE BRIGADES BOARD.**

TENDERS are invited for the SUPPLY of—
One Hundred Open Fire Alarms and Telephones in boxes complete.

Conditions and specifications obtainable upon application at the headquarters' station.

Deposit of 5 per cent. must accompany tenders, which are returnable not later than 3 o'clock p.m. on Thursday, 29th May, 1913.

F. J. GOMM, Secretary.
**Headquarters Station, Eastern Hill.**

---

## Commonwealth of Australia.

Postmaster-General's Department,
Melbourne, 23rd May, 1913.

TENDERS will be received at the office of the Deputy Postmaster-General, MELBOURNE, until 3 p.m., on the 19th August, 1913, for the supply and delivery of 105 Miles of Paper Insulated Lead Covered Cable (Sch. 906). See Commonwealth Gazette, 24th May.

C. E. FRAZER,
(1202). Postmaster-General.

### PORT AUGUSTA TO OODNADATTA RAILWAY.

Separate Tenders, addressed to the Secretary, Department of External Affairs, Melbourne, will be received up to 11 a.m. on 24th June, 1913, as under:—

Manufacture, Supply and Delivery of Bogie Goods Waggons, 3ft. 6in. gauge.

Manufacture, Supply and Delivery of Water Tank Waggons, 3ft. 6in. gauge.

Specifications, plans, etc., will be on view at the following offices on and after 3rd June, 1913:—

Commonwealth Railways, 84 William-street, Melbourne.
Commonwealth Works Director, Customs House, Sydney, and
Commonwealth Works Registrars, Brisbane, Adelaide, Perth, and Hobart.

The charge for each copy of specification will be £1 1s., and for each plan 5s., which must be paid before the documents can be issued.

Tenders are to be endorsed "Tender for ——," (as the case may be), and accompanied by the deposit mentioned in the Form of Tender.

JOSIAH THOMAS,
Minister of State for External Affairs.

### PINE CREEK TO KATHERINE RIVER RAILWAY.

SEPARATE TENDERS, addressed to the Secretary, Department of External Affairs, Melbourne, will be received up to 11 a.m. on 19th AUGUST, 1913, as under:—

SUPPLY and DELIVERY of 80 lb. STEEL RAILS and FISHPLATES.

SUPPLY and DELIVERY of SLEEPERS—(a) STEEL; (b) TIMBER (Powellised).

SUPPLY and DELIVERY of IRON DOG SPIKES and STEEL FISHBOLTS and NUTS, for 80 lb. Rails.

Specifications, etc., will be on view at the following Offices on and after 26th May, 1913:—

Commonwealth Railways, 84 William-street, Melbourne.
Commonwealth Works Director, Customs House, Sydney; and
Commonwealth Works Registrars, Brisbane, Adelaide, Perth, and Hobart; and on and after 26th June, at the Office of the High Commissioner, London.

The charge for each copy of Specification will be £1 1s., and for each Plan 5s., which must be paid before the documents can be issued.

Tenders should be endorsed "Tender for ——" (as the case may be), and be accompanied by the deposit mentioned in the Form of Tender.

JOSIAH THOMAS,
Minister of State for External Affairs.

---

## THE UNIVERSITY OF QUEENSLAND.

LECTURES IN ELECTRICAL ENGINEERING.

Applications are invited from gentlemen qualified to fill the above position. Applicants must have had a sound technical training, with practical experience in Electrical Engineering. The successful applicant may be required to give courses of lectures in Applied Mechanics and Hydraulics, and undertake general laboratory instruction.

Applications must be forwarded so as to reach this office not later than the 20th June, and the successful applicant must be prepared to enter on duty as from the 1st August proximo.

Further information may be obtained on application to the undersigned.

F. W. S. CUMBRAE STEWART,
Brisbane, Registrar.
22nd May, 1913.

---

## THE MELBOURNE ELECTRIC SUPPLY COMPANY LIMITED.

Notice is hereby given that an Interim DIVIDEND of 4 per cent. (at the rate of 8 per cent. per annum) for the six months ending the 28th February, 1913, on the consolidated ordinary stock of the company, will be PAYABLE on Monday, the 2nd June, 1913.

W. J. MOUNTAIN,
19 Queen-street, Melbourne. Secretary.

---

## Government Notice (V.).

VICTORIAN RAILWAYS COMMISSIONERS.

STATE COAL MINES.

OIL ENGINES AND BORING PLANTS, ETC.

Separate Tenders (endorsed "Tender for ——") to be addressed to the General Manager, State Coal Mines, Wonthaggi, and delivered at his office at Wonthaggi, not later than 12 noon of 25th June, are invited for the supply of two 10 h.p. Portable Oil Engines, and Boring Plants and Equipment. P.D. in each case £5. Particulars and forms of tender at the Melbourne office of the State Coal Mines, Robb's Buildings, Collins-street, and at the office of the General Manager, Wonthaggi.

ELECTRICAL EQUIPMENT.

Tenders (endorsed "Tender for Electrical Equipment"), to be addressed to the General Manager, State Coal Mines, Wonthaggi, and delivered at his office at Wonthaggi, not later than 12 noon of 13th August, are invited for the supply of Electrical Equipment for McBride Tunnel. P.D. £50. Particulars and forms of tender at the Melbourne Office of the State Coal Mines, Wonthaggi, and at the office of the General Manager, Wonthaggi.

No tender will necessarily be accepted.

G. H. BROOM,
General Manager.

---

## THE RENISON BELL PROSPECTING & MINING CO., No Liability.

NOTICE OF DIVIDEND.

Notice is hereby given that a DIVIDEND (the fifth) of SIXPENCE per Share has this day been DECLARED on all Shares in the above-named Company, and will be PAYABLE at Hobart on THURSDAY, June 12th, 1913. The Transfer Books of the said company will be closed from the 2nd to the 12th prox., both days inclusive. By order of the Board, J. SMITHIES,
Hobart, May 20th, 1913. Manager.

---

## WILLIAM TELL GOLD MINING CO., NO LIABILITY, Daylesford.

The Half-yearly General MEETING of Shareholders in above company will be held at Phair's Hotel, Collins-street, Melbourne, on Friday, 30th May, 1913, at 3 p.m. Business:—To receive and adopt reports and balance-sheet. To elect directors, to elect auditors. General.—S. J. PLAIN, Manager, Equitable Building, Collins-street, Melbourne.

---

NOTICE is hereby given that the patentee of the undermentioned Australian Patents, each dated 15th December, 1910, is prepared to satisfy any demands and all requirements of the public with respect thereto:—No. 20198/10, No. 20199/10, No. 20201/10, "Improvements in Centrifugal Ore Separators." No. 20200/10, "Improvements in Centrifugal Ore Separating Apparatus." Further information and particulars obtainable from EDWARD WATERS and SONS, Patent Attorneys, of Nos. 414-418 Collins-street, Melbourne, and 7 Moor-street, Sydney.

---

## CHIEF METALLURGIST.

THE MOUNT LYELL MINING AND RAILWAY COMPANY LIMITED require a Chief Metallurgist to take charge of blast furnace, smelting plant, and converting plant, at their works, Queenstown, Tasmania.

Apply, stating salary required and date when services available, also enclosing copies of testimonials, to

THE SECRETARY,
THE MOUNT LYELL MINING AND RAILWAY CO. LTD.,
39 Queen-street, Melbourne,
from whom all information can be obtained.

---

## FOR SALE.—ELECTRIC POWER PLANT

The Alternating Current Plant of The Deep Leads Electric Transmission Co. Ltd., Charlotte Plains, Victoria, specially manufactured for the Company by the General Electric Co., Schenectady, N.Y., U.S.A., comprising 3-400kw. generators, 150 r.p.m. 60 cycles, 6600 volts; 3-18¾in. x 36in. x 27in. Cross Compound Buckeye Aut. Engines, 735, 1h.p.; 2-30kw. exciters, 6 Babcock and Wilcox Patent Boilers, 300h.p.; 3-1400 sq. ft. Wheeler Admiralty Surface Condensers; 1-1200h.p. Coubert Feed Water Heater; 3-7in. Combined Stratton Separators and Steam Receivers; 2 Caird and Rayner's Patent Evaporators, 4250 lb. per hour; 2 Worthington Duplex Pumps, each to suit the 6 coolers at work; all necessary piping, a number of Motors, 10 to 250 h.p.; Switchboard, etc., etc., all in good order. Liberal terms. Full particulars, The Directors, Royal Insurance Buildings, Collins-street, Melbourne.

## APPROVED SAFETY LAMPS FOR MINES.

The Home Secretary issued an order dated January 14th 1913 under Section 33 of the Coal Mines Act, 1911, approving two types of safety lamps and safety lamp glass, for use in mines to which the Act applies. The lamps mentioned are the Hailwood lamp No 1, made by Messrs. Ackroyd and Best Ltd., and the Oldham "Emergency" electric lamp, made by Messrs. Oldham and Sons of Denton, near Manchester.

The Schedule in which the approval is issued gives the following details:—

The Hailwood Lamp No. 1, the general design of which is shown in Fig. 1, is a single gauze,* flame oil lamp with air feed through vertical holes in the middle ring. It consists of the following essential parts:—

(1) Bonnet or shield of seamless steel with a separate securely fastened crown or cap.

Height from bottom of middle ring to top of crown . . . 5in. ± 5-8in.
Internal diameter at top . . . 2¼in. ± 1-8in.
Internal diameter at bottom . . . 2 7-8in. ± 1-8in.

Furnished with outlet holes immediately below the crown, provided that the bottom of the holes shall not be less than 3-16in above the top of the gauze.

Fitted or not with a deflector (with or without a baffle ring).

(2.) Middle Ring of brass, steel or iron rivetted to bonnet and provided with 5 vertical air inlet holes of total area not greater than 1-1 sq. in. The inner flange prolonged or not to form a baffle ring.

Pillars of brass, steel or iron, 5, so arranged that a straight line touching the exterior part of consecutive pillars does not touch the glass.

Base or Bottom Ring of brass, steel or iron.

(3.) Gauze of not less than 28 S.W.G. steel wire, 784 meshes to the square inch, with double-folded lap seams, formed to fit flanges of the inner and outer base rings, and so secured to the same by punch indentations as to make a strong and flame-tight joint.

Internal Dimensions—

Height from the shoulder of the base ring . . . . . . . . . 3 5-16in. ± 1-8in.
Diameter at top . . . . . . 1 5-8in. ± 1-16in.
Diameter at bottom . . . . . . 1 3-4in ± 1-16in.

Provided that the gauze may be fitted or not with a gauze cap or a Mueseler tube.

(4.) Glass.—Cylindrical.

Height . . . . . . . . 67. m.m. ± ½ m.m.
External diameter . . . . . . 56½ m.m. ± 1 m.m.

Furnished with top and bottom asbestos washers to ensure flame-tight joints with the gause and retaining ring.

(5) Glass retaining ring of brass provided with a left-hand screw thread; provided also with ratchet teeth to engage the bolt of the magnetic lock.

(6) Oil Vessel.—A casting of brass of capacity sufficient to provide the required light for the required time as specified in paragraph 9 below; fitted with a flat ⅜in. burner, and provided or not with a porcelain body and with an electric spark igniter of the type shown in the drawing so fitted as not to cause the lamp to be dangerous in an explosive atmosphere.

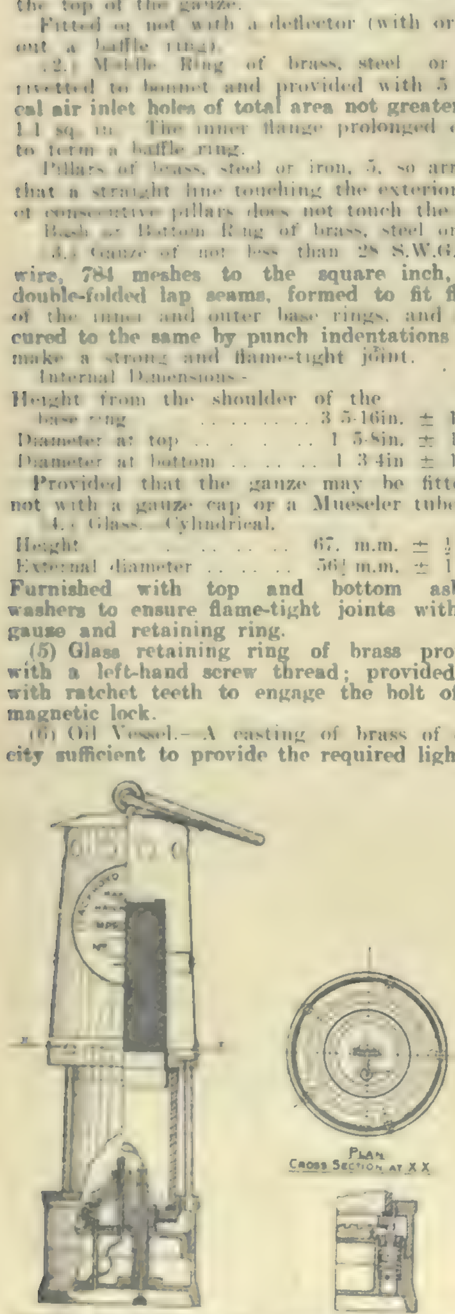


Fig. 1.—Hailwood Lamp, No. 1.

(7) Locking Device.—A vertical iron bolt and plug kept in position by a spiral spring, and so arranged that the bolt can only be withdrawn by applying the pole of an electro-magnet through the hole in the base of the oil vessel.

(8) Reflector.—The lamp may be fitted with a reflector.

(9) Provided—

(i.) That the strength of material and attachments throughout the lamp is not less than in the sample submitted to the mechanical tests on the 24th and 25th October, 1912.

(ii.) That the oil and wick used in the lamp shall be such that the lamp shall be capable of maintaining a light of candle-power not less than 0.30 as determined by a pentane standard all round in a horizontal plane throughout a period of not less than 10 hours.

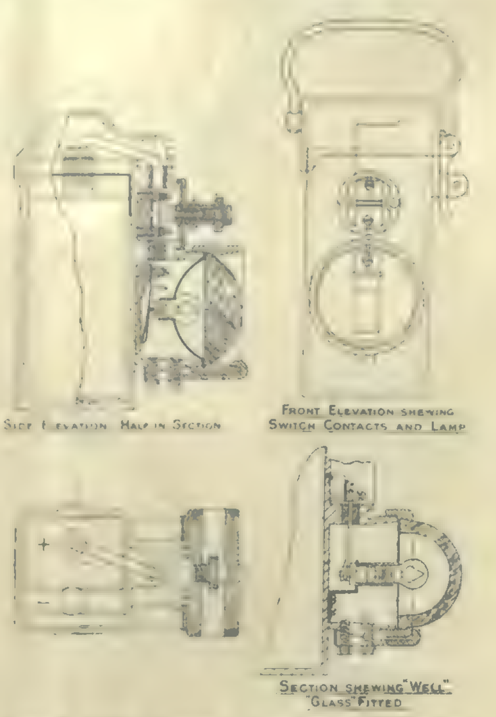

Side Elevation Half in Section
Front Elevation shewing Switch Contacts and Lamp
Section shewing "Well" Glass Fitted

Fig. 2.—The Oldham "Emergency" Electric Lamp.

(iii.) That the lamp has been made at the works of Messrs. Ackroyd and Best Ltd., at Morley, near Leeds.

(iv.) That the glass shall be of an approved type, and that its dimensions shall not be outside the limits laid down in paragraph 4.

(v.) That the lamp shall have marked upon it its name and the name of the maker.

The Oldham "Emergency" electric lamp, the general design of which is shown in Fig. II., is of the bull's-eye type. It possesses the following essential features:—

(1) A cast aluminium case, with a cover secured by a lead rivet lock.

(2) An electrical accumulator, so constructed as to prevent escape of the liquid, whatever the position of the lamp, whilst allowing the escape of gas generated by chemical action in the accumulator.

(3) A flame-tight screwed plug of vulcanite, or other suitable material, enclosing the contact made between the insulated lead and the positive terminal of the cell.

(4) A switch contained in a flame-tight enclosure, the cover of which, with its washer, is secured by screws. The screw heads are pierced so that a wire may be threaded through, and the ends sealed with lead seals.

(5) A bulb and reflector contained in a second enclosure, which communicates with the switch enclosure. It is made flame-tight by means of a screwed ring containing the lens, and a washer. The ring is prevented from unscrewing by means of a clip secured by screws, the heads of which are pierced as in the case of the switch cover screws. The lens may be of either of the types shown in the drawing or of other types if not inferior in strength.

Provided—

(1) That the total weight of the lamp is not more than 4 lb. 8 oz.

(2) That the strength of material and attachments throughout the lamp is not less than in the sample submitted to test on the 30th October, 1912.

(3) That the lamp is capable of maintaining a light of not less than 1.5c.p. throughout a period of not less than 10 hours.

(4) That the lamp shall be used only for work of rescue or exploration in the case of an accident or other emergency or by officials.

(5) That the lamp has been made at the works of Messrs. Oldham and Son at Denton, near Manchester.

(6) That the lamp shall have marked upon it its name and the name of the maker.

---

*This specification, so far as regards the use of a single gauze, is provisional, and will remain in force only until 1st January, 1914, or for lamps now in use, until 1st January, 1916.

---

Activity is being shown in carrying out the deviation from Waterfall to Otford, on the South Coast line, and it is expected to be ready for use in twelve months' time. The line will be lengthened about 2¾ miles, but the grades are considerably reduced, and the tunnels avoided. When completed, it will considerably expedite the carriage of coal from the Southern mines.

## WORLD'S COPPER OUTPUT.

(In English Tons of Fine Copper.)
Compiled by Henry R. Merton and Co. Ltd.

| | 1911. | 1912. |
|---|---|---|
| Africa— | | |
| Cape Colony | 4,480 | 3,870 |
| Namaqua | 2,500 | 2,500 |
| Sundries | 10,000 | 10,000 |
| Argentina | 1,020 | 330 |
| Australasia | 41,840 | 47,020 |
| Austria | 2,440 | 3,860 |
| Bolivia—Coro/coro | 1,800 | 1,850 |
| Canada | 24,930 | 34,710 |
| Chile | 29,595 | 37,305 |
| Cuba | 3,695 | 3,935 |
| England | 400 | *400 |
| Germany— | | |
| Mansfeld | 20,520 | 20,180 |
| Other German | 1,490 | 3,740 |
| Hungary | 85 | 100 |
| Italy | 2,600 | 2,300 |
| Japan | 55,000 | 65,500 |
| Mexico—Boleo | 12,165 | 12,450 |
| Other Mexican | 48,740 | 58,395 |
| Newfoundland | 1,155 | 540 |
| Norway—Sulitelma | 3,590 | 4,755 |
| Other Norwegian | 5,835 | 6,225 |
| Peru | 28,050 | 27,165 |
| Russia | 25,310 | 33,010 |
| Servia | 6,885 | 7,240 |
| Sweden | 2,000 | 1,500 |
| Spain and Portugal | 50,930 | 58,930 |
| United States of America | 483,865 | 554,835 |
| Turkey | 1,000 | 500 |
| Venezuela | — | 1,340 |
| | 871,920 | 1,004,485 |
| Average of Prices of Standard on 1st of each month | £55 16/2 | £73 1/3 |

*Those marked with an asterisk are estimated.

## NEW ORE DISCOVERY IN COLORADO.

It has been so many years since a promising discovery of ore was made in a new district in Colorado, that the recent announcement of such a find in Eagle county has attracted more than usual attention. The scene is on Brush Creek, in the vicinity of the Mount of the Holy Cross, where an earlier find of gold and silver ore a number of years ago gave prominence to the camp of Fulford. On account of the difficulties encountered in prospecting and transportation, nothing of importance developed, but conditions are now more favourable, and it is probable that the coming spring and summer will find this district thoroughly prospected.

The ore is unlike anything thus far known in Colorado. In appearance it is a grey sandstone, containing minerals of silver which are variously reported to be chloride, bromide and sulphide. Assays indicate the presence of silver in large quantities—several hundred ounces per ton. The richest ore shows bluish spots, which, when heated under the blow-pipe or in a muffle, yield metallic silver. A peculiarity of the ore is that some of it contains vanadium in small quantities, say, about 1½ to 2 per cent. $V_2O_5$. Should later development show that there is a considerable deposit of this kind of ore, a nice metallurgical problem will be presented to those who ultimately mine and treat it. Such a content of vanadium is not appreciably lower than that of some ores which are treated for this metal alone, and it should not be neglected in this high-grade silver ore. This is a condition which should be recognised before too much of the ore is smelted for the recovery of silver alone, in which event the vanadium would be lost in the slag.

---

What one man can do in the way of mining and milling is well exemplified by a resourceful miner in Colorado, who installed a small but complete mill in connection with his gold mine. He did all the work of mining, milling, and marketing his product. The "Mining and Engineering World" thus describes his work:—He installed a 30ft. overshot water-wheel—a power plant sufficient to do the work of raising the ore from the nearby shaft, and to operate his mill a steam engine was used as an auxiliary plant, serving in cold weather, when the stream was frozen, and the exhaust so arranged as to keep ice from the wheel in freezing weather. The steam also ran a piston drill in his mine. He drilled his round of holes, charged them with dynamite, and hastily climbed out. When the smoke cleared away, he descended into the shaft, filled his ore bucket, and climbed out again to operate his hoist. This device was connected by a friction clutch to the main shaft of the water-wheel, and controlled by a lever. As the bucket reached the surface, the ore was dumped by means of a hook and chain, falling into the hoppers of the mill, whence it was fed automatically under the stamps. An amalgam plate caught the gold as it passed from the stamp. As this process required no constant supervision, the owner could do enough mining to keep his hoppers full, and at the end of the day retire with the knowledge that his mill would work for him while he slept.

## PROFESSIONAL CARDS.

**G. H. BLAKEMORE,**

CONSULTING METALLURGIST
For Copper and Lead.
MINING ENGINEER,
CASTLEREAGH CHAMBERS, 16 CASTLEREAGH ST.
Telegraph Codes: Bedford McNeill 1908 Edition
Moreing & Neal
A B C. 5th Edition.
Cable Address: Radgarn. Telephone 7124 City

**MATTHEW C. COATES, A.M.I.E.E.**

CONSULTING MECHANICAL and ELECTRICAL ENGINEER. Expert Reports given for Power Generating Plants, Factory Installations, Steam, Gas and Electric.
99 QUEEN STREET, MELBOURNE.

**HARTWELL CONDER,**

M.A. Cambs., A.R.S.M., London.

AUSTRALIAN PROPERTIES EXAMINED AND REPORTED ON.

SPECIAL KNOWLEDGE OF TASMANIA

Cables: STRAHAN, Tasmania
Code: BEDFORD McNEILL

**GOYDER & HALLETT,**

ASSAYERS AND ANALYSTS
110 Gawler Place, Adelaide.
Telephone 169
Metallurgical and Chemical Processes Investigated
Ores Sampled and Assayed

**T. J. GREENWAY, M.I.M.M., F.I.C.**

MINING AND METALLURGICAL ENGINEER
60 QUEEN STREET, MELBOURNE

**KAY, MACNICOL & CO.,**

Mechanical, Mining &
Electrical Engineers.

BROKEN HILL CHAMBERS.
31 QUEEN STREET, MELBOURNE.
Cable Address: "Engineer," Melbourne.
Telephone, No. 4883.

**McCARTY, UNDERWOOD & CO.,**

CONSULTING ELECTRICAL AND MECHANICAL ENGINEERS.

31 QUEEN STREET, MELBOURNE

Telephone, 7096

**J. D. AUDLEY SMITH,**

MINING ENGINEER,
9 Bridge-street, Sydney
Telegraphic Address-
Audley Smith,
Mining Engineer,
Sydney.
Telephone No.—
City 2677.

**WALTER F. SMITH,**

MANAGER FLOATER G.M.
Ravensthorpe, W.A.
Mines Sampled, Valued, and Reported on.
ASSAYS MADE.
Code: Bedford McNeil
Reliable Information Furnished on the Phillips River Gold and Copper Field.

**E. A. WEINBERG,**

MINING AND METALLURGICAL ENGINEER,
19 QUEEN STREET, MELBOURNE.

THE

## University of Sydney.

### DEPARTMENT OF ENGINEERING.

The course for the degree of Bachelor of Engineering in Mining and Metallurgy extends over a period of four years, during which lectures and practical instruction are given in the following subjects:—

Chemistry, Physics, Mathematics, Descriptive Geometry, Geology, and Economic Geology, Mineralogy, Engineering Construction, Mechanical Engineering Materials and Structures, Electrical Engineering, Surveying, Building Construction, Mining, Metallurgy, Assaying, Engineering Design and Drawing.

The Chemical, Metallurgical, Physical, Geological, Mechanical and Electrical laboratories are thoroughly well equipped with modern plant and machinery.

The Academic year commences in March. The fees are nine guineas per term, or a total cost for graduation of £125 8s., including Matriculation and Degree Fees. Students who do not wish to take up the full course may select individual subjects.

Full particulars will be found in the University Calendar, which may be obtained upon application.

H. E. BARFF,
Registrar.

According to a recently published official return there are at present in Bavaria 10,000 establishments using electric motive power. The electric motors number 24,000 of, together, 107,000 kilowatts. The private consumption of electricity in Bavaria amounts to 821,000,000 kilowatt-hours a year.

## The Australasian Joint Stock Companies' Year Book,

1913.

*By* ROBERT LUCAS NASH,

*Financial Editor of Sydney "Daily Telegraph," Author of "Interest, Sinking Fund and Redemption Tables," "Profitable Nature of Our Investments," Eight Editions of "Penn on the Funds" (London), etc.*

**A COMPLETE OFFICIAL RECORD** of Government Finance, The Government Debts, Corporation Loans, Banks, Insurance Companies, Gas and Water Companies, Shipping Companies, Trading and other Companies, Dredging Companies, Coal and Shale Mining Companies, Gold Mining Companies in New South Wales, New Zealand, Queensland, South Australian and Northern Territory, Tasmanian, Victorian, Western Australian Silver, Copper and other Mines, also a

**DIRECTORY OF MINING SECRETARIES AND LEGAL MANAGERS**

Each of the previous seven editions has grown substantially, and the last edition gave a record of £568,146,000 of capital invested and of £26,120,000 interest and dividend payments in the year.

But on this occasion, the **EIGHTH EDITION** will record an expansion in joint stock enterprise quite unprecedented. The Australian capital dealt with, excluding the London contributions thereto, will be between £600,000,000 and £700,000,000 (six hundred millions and seven hundred millions), and the dividends and interest payments for 1912 exceed £30,000,000 (thirty millions), while no less than 2500 (two thousand five hundred) new companies are added to the enumeration, and the new issues by the older companies have been enormous. The dimensions of the volume are of course greatly extended.

**THE AUSTRALASIAN JOINT STOCK COMPANIES' YEAR-BOOK** is the only work giving such a record, and the vast growth of joint stock enterprise throughout these States and colonies renders it an indispensable book of reference.

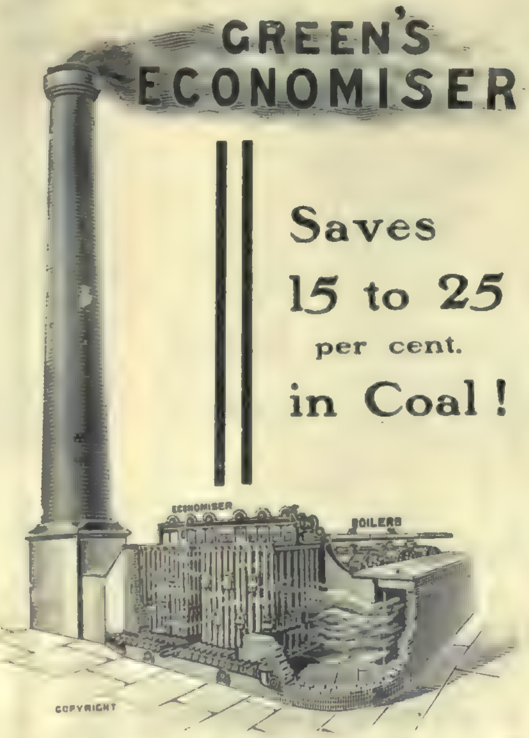
As regards **PUBLIC COMPANIES**, the work addresses directors and leading officials, capitals, dividend paid, and much historical and current detail, such as date of registration, reserve funds, the latest accounts, bankers, and numbers of shareholders.

The **DIRECTORY OF SECRETARIES AND LEGAL MANAGERS OF MINING COMPANIES** at the end of the book is a special feature which has proved of material service to a large body of subscribers.

*Price, 10/-, by post, throughout the Commonwealth, 10/8. Contains approximately 600 pages Demy Octavo (9 x 6). Obtainable from your bookseller or direct from the publisher—*

*Critchley Parker,*
*Mining Standard,*
*12 O'Connell St., Sydney* *376 Flinders-lane, Melbourne.*

***A Valuable Asset to any Steam User!***



WRITE TO-DAY FOR PAMPHLET PY TO:—

PATENTEES AND SOLE MAKERS—

***E. Green & Son Limited,***

**WAKEFIELD - - - ENGLAND.**

**Commonwealth Bank of Australia**

**Branches** are open for the transaction of **General Banking Business** throughout Australia as under:—

**New South Wales**—Sydney and Canberra. **Victoria**—Melbourne. **Queensland**—Brisbane and Townsville. **South Australia**—Adelaide. **Western Australia**—Perth. **Tasmania**—Hobart. And at 36-38 New Broad Street, **London**.

Cable remittances made to, and drafts drawn on foreign places direct. Foreign Bills negotiated and collected. Letters of Credit and Circular Notes issued to any part of the world. Bills negotiated or forwarded for collection. Banking and Exchange Business of every description transacted within the Commonwealth, United Kingdom, and foreign countries.

SAVINGS BANK DEPARTMENT.

**Agencies** are open in practically all **Post Offices** which issue Money Orders **in the Australian Commonwealth and Papua.**

**Withdrawals on demand** may be effected for sums up to £10 at any office within the Commonwealth.

**1/-** Minimum Deposit **3%** Rate of Interest on all Deposits up to **£300**

20th January, 1913. DENISON MILLER, Governor.

**Coalfields and Collieries of Australia.**

**440 Pages—25s. nett. All Booksellers or Australian Mining Standard.**

Established 1860.

**Bondholders' Register**

Publishes the Actual Numbers of all Drawn Bonds Throughout the World.

PUBLISHED FORTNIGHTLY.
10s. PER ANNUM

73 Farrington St., LONDON, E.C.
**Australian Offices**
376 Flinders Lane, MELBOURNE.

All Australians visiting London should read the **"British Australasian," 6d. weekly**—an illustrated paper containing mail and cable news from Australia, and news of Australians in Europe and at home.

Australians are cordially invited to visit the **"British Australasian" Reading Room at the offices, 115 High Holborn, London, W.C.**, where they can see the home papers, meet their friends, use the telephone, and obtain information without charge.

***The IMPERIAL***

***OIL TRACTOR***

for

ROAD HAULAGE, etc.,

also

***OIL DRIVEN LOCOS., WINCHES, ETC.***

built to any specification.

***A. H. McDONALD & CO.,* Imperial Engine Works,**
***Stawell Street, Burnley, Melbourne.***

No. U 354.

**The Farmers' Phone.**

No. U 354.

**The Farmers' Phone.**

Long-distance Magneto Ringing Bridging Phone,
For Farmers, Railways, Etc.
5 Magnet Generator.
HIGHEST GRADE.

AGENTS (with Stock).

**NEW SOUTH WALES:—**
The Lawrence & Hanson Electrical Co. Ltd., 33 York Street, Wynyard Square, Sydney.

**VICTORIA & TASMANIA:—**
Warburton, Franki (Melb.) Ltd., 380 Bourke Street, Melbourne.

**QUEENSLAND:—**
Trackson Bros., Ltd., 157-159 Elizabeth Street, Brisbane.

**SOUTH AUSTRALIA:—**
Newton, McLaren Ltd., Leigh Street, Adelaide.

**WESTERN AUSTRALIA:—**
Chas. Atkins & Co. (W.A.) Ltd., Queen Street, Perth.

**NEW ZEALAND:—**
Turnbull & Jones Ltd., Wellington, Auckland, Christchurch, Dunedin.

**STERLING TELEPHONES**
**BRITISH MADE**

## CONTENTS.

### JUNE 5.

**Editorial—**
Railway Construction in N.S.W. .. 461
Lessons in Geography .. .. .. .. 461
Leaderettes .. .. .. .. .. .. .. .. .. .. 462
News and Notes .. .. .. .. .. .. .. 462
The Coal Mining Industry .. .. .. 463
North Sydney Bridge .. .. .. .. .. .. 463
Our Big Mines .. .. .. .. .. .. .. .. 464
Publications Received .. .. .. .. .. 464
Investor's Column—
Great Langi Logan (V.) .. .. .. 465
Mount Carrington (N.S.W.) .. .. 465
Marvel Loch (W.A.) .. .. .. .. .. 465
Mining in New South Wales .. .. .. 465
Victorian Mining Activities .. .. .. 466
Mining in Western Australia .. .. 466
Metal Quotations .. .. .. .. .. .. .. 466
Aust. Inst. of Mining Engineers .. .. 467
Miners' Plaint .. .. .. .. .. .. .. .. 476
Mt. Lyell M. and R. Co. (T.) .. .. 477
New Tasmanian Coalfield .. .. .. 477
Industrial .. .. .. .. .. .. .. .. .. .. 477
Bank of New South Wales .. .. .. 477
N.S.W. Miners' Amendment Bill .. .. 477
Tenders Invited and Accepted .. .. 480

### Engineering and Electrical Record.

The Territory .. .. .. .. .. .. .. .. 478
Sydney City Council .. .. .. .. .. .. 478
An Inventors' Institute .. .. .. .. .. 478
British and European Developments . 479
Miscellaneous .. .. .. .. .. .. .. .. 479

HENLEY'S
Electric Wires and Cables
AND INSULATING TAPES
ARE THE BEST.
W. T. HENLEY'S Telegraph Works Co. Ltd.
546 COLLINS ST., MELBOURNE.
61 YORK ST., SYDNEY.

BELTING!
Largest stock of all kinds of Machine Belting in the Commonwealth.
Conveyor and Elevator Belting for all purposes.
HOPKINS BROS. & ODLUM PY. LTD
LEICESTER ST., CARLTON, MELBOURNE.
'Phone, Central 754 and 5202. Box 377 G.P.O.

COKE!
NORTH BULLI COLLIERY
Limited
Supplies best quality hard
SOUTHERN
SMELTING COKE.
(Weekly output 1250 tons.)
H. G. Hyde, Secretary
Royal Insurance Building, 16 Spring-street,
SYDNEY.

AUSTRALIAN MINING STANDARD.
Forwarded Post Free to any Address.
Australasia .. .. .. .. .. .. .. .. .. .. .. .. 26/- per
Abroad .. .. .. .. .. .. .. .. .. .. .. .. .. 30/- Annum.
Payable half-yearly or yearly, in advance.
All amounts should be made payable to order of "CRITCHLEY PARKER, Bank of Australasia."
12 O'Connell-street, Sydney.
376 Flinders-lane, Mebourne.

**BACK NUMBERS OF THE "MINING STANDARD."**

The following is the rate for back copies more than a month old. Applications by post must be accompanied with cash and postage added. In no case can we guarantee to supply copies, as our storage accommodation is limited.

A postcard will be sent if the number required is out of print.

For copies three months old, ninepence; six month, one shilling; and beyond that period, one penny per month per copy.

As there is a regular demand for back copies of the "Mining Standard," newsagents are requested to send back all returns uncut and in good condition, otherwise they will not be accepted.

All Returns from Newsagents must reach us by the end of each month (the whole paper must be sent). No credit will be allowed beyond this term.

Postage — British, 1d.; Foreign, 1½d.; Australasia, ½d. per copy.

Stamps will be accepted as pre-payment.

Address communications: Publishing Department, "Mining Standard."

**ALTERATION TO ADVERTISEMENTS.**

As our publishing arrangements necessitate the "Mining Standard" being issued simultaneously in Sydney, Melbourne and Adelaide on the same day each week, advertisers wishing to change their advertising matter must supply same ten days in advance of publication.

**CASUAL ADVERTISEMENTS.**

The rate for this class of advertisement is governed by the position it occupies.

If it appears on leader page or amongst or next to reading matter, the rate is 15s per inch (nonpariel) per insertion.

Towards end of reading section, set in brevier, 16 ems width, 6s per inch per insertion.

If set in nonpariel the rate is 4s. per half inch.

**ADVERTISEMENT PROOFS.**

Proofs are submitted to advertisers in order to give them an opportunity of going over the advertisements before printing. Any alterations from the original copy will be charged for. Advertisers are specially requested to instruct their publicity departments, advertisement writers, etc., to give clear and definite instructions respecting changes of matter or new copy, to avoid incurring extra charges.

Advertising Copy must be typed and so arranged as to clearly indicate the display required for the more important features of the advertisement.

THE AUSTRALIAN MINING STANDARD.
ESTABLISHED 1888.
It is requested that all business communications be Addressed to Critchley Parker.
THURSDAY, JUNE 5, 1913.

## RAILWAY CONSTRUCTION IN NEW SOUTH WALES.

The division of responsibility which is entailed by the peculiar constitution of the railway system of the senior State is responsible for a curious anomaly. Residents in country districts, when it is proposed to connect them with the seaboard by rail, complain that the estimated cost of the line to be made is unduly swelled by the addition of unnecessary makeweight, such as elaborate station buildings, weighbridges, turntables, and the like, and that the addition of this sum may make all the difference between the endorsement or rejection of the line when it comes before the Public Works Committee. Mr. Eddy, the able inaugurator of the methods which of late years have been pursued in the railways of New South Wales, was wont to say that all that the country settler needs is "two lines of steel" to enable him to get his produce to market. Those who are agitating for railway communication maintain, therefore, that the cost of these "two lines of steel" is all that should be taken into the account. The Chief Commissioner, however, insists that the line shall be equipped with all these other appliances before he will take it over from the Works Department, which is the constructing authority. It is here that the dual nature of the system affects the result. It is to the interest of the Department which is responsible for the working of the railways that they shall be as complete as possible before it takes them over. It desires, and not altogether without justification, that the cost of all necessary appliances shall be charged to capital in the first instance and not unduly complicated with working expenses. The Chief Commissioner knows full well that when the "two lines of steel" are provided, the residents will discover that other things are also necessary. There must be accommodation for passengers; females must be decently catered for; facilities must be given for transferring goods from the waggons and drays into the railway trucks; cranes must be erected for lifting heavy weights, and so on; or else there will be a terrible amount of heavy "bullocking" for the teamsters. As they agitated for the "two lines of steel" till they got them, so the residents will agitate for these until they get them also. But unless the Commissioner insists that they shall be provided by the constructing authority in the first instance, he may have to provide them himself, or, in the alternative, to enter into an interminable and possibly acrimonious controversy with the Works Department as to who shall or ought to provide them. In the matter of cost and elaborateness, again, it is always believed that the construction of a railway line will give a great impetus to the settlement of the districts affected. It will be more economical, in the long run, to make immediate provision for needs which can be foreseen than to start with those that are barely adequate to present requirements. If the Chief Commissioner were charged with the construction of the lines as well as with their working his viewpoint, and that of the residents who complain of the swelling of the estimates, might not be so widely dissimilar as they are. But his present course of action seems to be in a manner forced upon him by the conditions under which he has to work. After all, it is hardly conceivable that the cost of properly equipping a railway line would be a matter of sufficient magnitude to cause the rejection of the project if the line were in other respects eligible and desirable.

## LESSONS IN GEOGRAPHY.

The ignorance of Australia shown in many portions of the Home land is a constant subject of ridicule to Australians, though, as a matter of fact, it is not very much more marked, and is far more pardonable, than the ignorance of the United Kingdom shown by the untravelled Australian. The writer thought it very amusing when the remark was made to him in a London drawing-room, "If you come from Melbourne, I suppose you know a relation of mine who lives in Cooktown"; but is it any more absurd than the remark made to him in a club in one of the largest of Victorian towns, "If you have been to London, I suppose you know Mr. ———." The fact is that we all know mighty little of the places we have seen, and have next to no conception of those we have not seen, and so the ignorance that is so often displayed, however amusing it may be, is not altogether inexcusable; but there is one class of man at least who ought not to fall into absurd errors—the man who writes for the instruction of others. Unfortunately, even this type of man is not free from error, and it is particularly deplorable when one finds such blunders in books used in the education of the young. We have before us a book published by Macmillan and Co. Pty. Ltd., entitled "An Elementary Class-Book of General Geography," by Hugh Robert Mill, D.Sc., LL.D., and it is sad to find in this work, which is doubtless used in many British schools, statements of fact that are quite contrary to the truth. It may be worth while to mention a few of these. Victoria is set down as the most populous of the Australian States, though New South Wales has about four hundred thousand more people within its borders than are to be found within the limits of the more southerly State. In other words, New South Wales' population is about 25 per cent. above that of Victoria. Victoria is said to grow "much more" wheat than her great rival, though the production of the two States is about equal. The statement that the Victorian Legislative Council is "elected by the well-to-do people" of the State is scarcely correct, and the reference to the State's "small but serviceable army and navy" is entirely out of date. The date of Victoria's separation from New South Wales is not 1850 but 1851, and it might surely have been possible to mention the fact of Tasmania's separation from the parent State. Though perhaps the statement made that the coal seams (which, by the way, are spoken of quite incorrectly as cropping out for hundreds of miles along the Eastern slope of the Dividing Range) "are far more valuable in the long run than the gold which abounds in quartz veins in many parts of the Continent," may be correct, it is likely to lead children to a false impression, so that they will suppose the output of coal in Australia to date to have been of greater value than that of gold, whereas it runs to little more than one-tenth of the amount. These are a few blunders noticed in a cursory examination of the portion of the book referring to Australia; presumably there are just as bad blunders made in the other parts. One, for instance, met our glance in the chapter on the "distribution of living creatures," wherein the number of men of the black type is stated to be "small and diminishing." Not only in the United States, but also in every part of South Africa (in Basutoland, the Bechuanaland Protectorate, Rhodesia, and the Union of South Africa), the black races have been multiplying much more rapidly than the white, so that the statement made in this book, which is given out for the instruction of children, is hopelessly misleading. It is a pity that books of this sort are not carefully scanned by capable educationalists before their use is sanctioned for educational purposes.

— — —

The pitch to which unionism has attained is well exemplified by some recent happenings. The workers at the N.S.W. Government Dock at Cockatoo Island refused to pay the increased fares charged by the Sydney Ferries Co., and after the men had unsuccessfully tried to run a steamer themselves at the old rates, and the Government had also failed to run a steamer at the old rates, 1s. 6d. a week, a compromise was effected whereby the Ferry Co. receives 1s. 9d. (instead of the 2s. 6d. proposed to be charged), the Federal Government paying the excess of 3d. per man per week over the old rate. The increase of fares was necessitated by the increased wages paid to the ferry hands as a result of the recent strike. From New Zealand comes word of a proposed arrangement between the Federation of Labour (the Waihi type) and the Shipping Companies, guaranteeing the companies immunity from strikes in return for preference to the members of the Waterside Workers' Union, and, it is further stated, the Union is prepared to enter into a substantial bond for the observance of the compact, whereby free labour and rival unions are to be excluded from the wharves. The Wellington Farmers' Union, in conference, decided that the proposal was an unwarranted interference with the liberty of the subject, and a menace to the farming community. Yet again in Sydney we have a Labour Minister, Mr. Carmichael, complaining that Union secretaries are so reckless in making complaints re non-observance of awards that a very considerable waste is caused in the expenditure of his department by investigations which prove to be wild-goose chasers.

* * *

It is hard to knock some people out, and therefore it is not surprising that a deputation of miners should have waited upon the New South Wales Minister for Mines a few days ago to urge, inter alia, that provision should be made in the Mining Act Amendment Bill, now under consideration, for an export duty on ores. "Vast quantities of ore," it was stated on behalf of the deputation, "were being shipped to Germany and other places, and it was felt by the members of the deputation that the imposition of the proposed duty would lead to great mining development in the States, and encourage the smelting industry. They would like to see State smelters established." It is not two years ago since the whole matter was exhaustively gone into at the instance of the Commonwealth Government by the smelting companies themselves, the mining industry, and the Mines Department of New South Wales, when the Under-Secretary for Mines reported that whilst the establishment of additional smelters would lead to a greater consumption of coal and coke, this would be off-set by the disadvantages and restrictions which an export duty would impose on the output and disposal of the products of the metalliferous mines, and that in the interests of the mining community the department opposed the scheme. The smelting companies and the mine-owners themselves emphatically endorsed the views of the department. In fact, as Mr. Edden informed the deputation, the information gathered in New South Wales was that no one was in favour of the proposed export duty. Dealing with the request for a State smelting works, he pointed out that if a plant were erected in Australia, and equipped with modern appliances for the treatment of such ores as are now exported for treatment, it would cost about £4,000,000. He added that "there was some talk of a Royal Commission being appointed to inquire into the matter, and if it would do any good, he would welcome such a commission." The reservation was well made, for it is difficult to see how a Royal Commission could do aught else but traverse the same ground as has been so thoroughly gone over by the Mines Department, and discover the same unanimity of condemnation of the proposal.

* * *

The non-union trouble is still simmering at Bendigo (V.), although the officials of the local branch of the Federated Mine Employees' Association say that all the men on the field, with the exception of seventeen, have joined their ranks. A mass meeting on Sunday, however, disclosed the fact that within the association all is not well, the proceedings at times being rather noisy, a section of those present apparently being dissatisfied with the explanations offered them. It is obvious that the Bendigo movement is only the beginning of the trouble, and unless preference is scotched at the place of its inception the disease will spread throughout Australasia. Delegates who were present from neighbouring States declared that if the men won the day at Bendigo the question would be immediately taken up elsewhere. These declarations justify the strong stand which the employers have taken against any attempt to introduce the boycott. It is not likely, however, that the chastening effect of recent doings at the poll may have the desirable effect of inducing the agitators to see the unreason of the attitude which they have adopted.

* * *

As we anticipated last week, the Victorian Dredging Board will proceed with the inquiry which it has been appointed to carry out, whether the private representatives resign or not. These gentlemen were nominated to seats on the board (which owes its existence largely to a systematic newspaper agitation) along with the officials of the Mining Department. After accepting office, and starting on the inquiry, these representatives threatened to resign unless they received a monetary consideration in addition to their expenses. It is rather late in the day to make the application now.

* * *

Australia, in view of the continued spread of burglary and crimes of violence in the chief cities of the Commonwealth, might take a lesson from Glasgow, where electricity is cleverly utilised to help the man on the beat to perform his duties with credit and comfort. There has just been installed in the streets of Scotland's commercial metropolis a number of ingeniously contrived signalling stations or boxes. Each box is provided with a telephone connected with the nearest office, to which is attached an apparatus that automatically lights a signal lamp when the office wishes to speak to the man on the beat. This signal is on the top of the box, or, if the latter is off the thoroughfare, on the street corner. The box is also provided with an electric heater, at which food or tea may be heated. The policeman, when answering a call, plugs into a jack, which, besides putting the telephone into circuit, disconnects the signal lamp, and the relay resets itself ready for the next call. By plugging through, it is also possible to put the signal boxes in telephonic communication with the post-office telephone system. No meters are fitted; the energy used for the lamp and heater is charged at a fixed rate per annum. A specially designed cut-off switch is operated by the door-sneck, connected so that the electric heater can only be in circuit when the box is occupied and the door is closed by the sneck. In this way the hot-plate cannot be left in circuit even if the policeman omits to turn off the switch when he leaves the box. Another luxury for the Glasgow policemen is an electric lantern of moderate weight to replace the hot and uncomfortable bulls-eye lantern. It weighs 1 lb. 13 oz. complete with accumulator, and gives light from a 0.6 amp. bulb lamp for about six hours' continuous burning. A good bi-convex lens is used, and the circle illuminated is even throughout.

## NEWS AND NOTES.

Owing to pressure on our space, reports of various company meetings are held over till next issue.

The Mount Oxide (Q.) Mines Ltd. has been registered in London with a capital of £475,000. It is understood that full power of attorney has been sent to the Melbourne solicitors for the purchase of the mine.

The Transvaal gold output in March amounted to 790,552 fine oz., valued at £3,358,050, compared with 830,723 oz., valued at £3,528,688 in March of 1912.

For the ten months, ended 30th April, the net Federal Customs and excise revenue amounted to £13,212,038, compared with £12,306,314 for the corresponding period of the previous financial year.

The Victorian Employers' Federation has passed a resolution to support the Bendigo Mine-Owners' Association, in the policy which they have adopted towards unionism. The trouble at Bendigo seems to be fizzling out, it having been reported at a meeting of the men's association last week that there were only seventeen workmen outside the union on the field.

During the month of March 6503 tons of nickel were exported from New Caledonia, bringing the total amount exported for 1913 up to 16,749 tons.

Mr. Mitchell, representing the claimant union, has withdrawn the plaint of the engine-drivers and firemen in the Arbitration Court, as far as the Mount Bischoff Tin Mining Co. (T.) is concerned. He was satisfied, he said, that the company was paying good wages, and providing good conditions of employment.

The Victorian Cabinet, at its next meeting, will consider the claim of the non-official members of the Dredging Board, to be paid for their services.

It is probable, however, that no grant will be made, and that the inquiry will be continued by the officials.

The International Petroleum and Mineral Development Co. has been registered at Christchurch (N.Z.), exclusive rights on several properties having been acquired. The capital is £400,000.

The Wages Board appointed to deal with the claims of the Silverton Tramways employes is sitting this week at Broken Hill (N.S.W.). Mr. G. D. Delprat represents the employers, and Mr. C. Kynaust the employes.

Mr. Groves, a diamond-mine owner of Inverell, has obtained plant and proposes to establish the diamond-cutting industry in New South Wales. He intends to apprentice lads to the industry. At present it is said there is a profit of 600 to 700 per cent. made in Amsterdam and Antwerp on the cutting of Australian diamonds, and Mr. Groves is attempting to show that the operation can be carried out here. The new machinery may also be fitted with appliances for the cutting of rubies, sapphires, and other stones when required.

The Golden Crest G.M. Co. (T.) has decided to increase its capital to £4000, in 40,000 2s. shares, of which 30,000 will be issued to the shareholders paid up to 1s., and 10,000 shares held in reserve.

Sir Edgar Vincent, chairman of the Dominions Royal Commission; Mr. Edgar R. Bowring, the Newfoundland representative; Mr. E. J. Harding, secretary, and Mr. Bridgman, assistant secretary, left by "Ventura" on Saturday last for San Francisco. Mr. Foster (Canadian Minister for Commerce), who is remaining in Melbourne in connection with the reciprocity negotiations, will probably arrive in Sydney on the 10th prox., and leave the next day for the East, en route to Vancouver.

## THE COAL MINING INDUSTRY

### New South Wales.

### Northern District.

(From Our Newcastle Correspondent.)

The matter of chief interest to people engaged in the coal trade during the week has been the judgment of the Privy Council in the matter of the appeal of the Federal Government against the decision of the High Court of Australia in what is known as the Vend case. The Attorney-General of the Commonwealth was the appellant, and the Adelaide Steamship Co. and other shipowners were the respondents, they having successfully appealed to the High Court against the decision of Mr. Justice Isaacs. The colliery owners, who were made co-defendants in the original hearing, had paid the fines imposed. The Lord Chancellor, in delivering the judgment of the Privy Council, said it was difficult to prove operations detrimental to the public, and in this particular matter they had to consider the miners' strike, which may have affected prices; and also the cost of screening coal. He found that there was nothing to show that the control exercised over the coal trade by the respondents was detrimental to the public. He thought that the reasons which led them to the conclusion that the vend agreement was not illegal must apply also to the shipping agreement. The appeal was therefore dismissed, with costs against the Commonwealth Government.

The judgment will give a good deal of satisfaction in Newcastle, for there are many who hold that the vend did a good thing in raising the price of coal to a fair level. At the same time they are not disposed to defend all the charges that are made between the pit mouth and the consumers' coal bin. It certainly seems a strange thing that coal which sells at Newcastle at 11s. per ton f.o.b. should cost the user in Sydney, only 60 miles away by water, 25s. per ton. Be that part of the business as it may, it cannot be laid to the charge of the colliery companies as a body that they did anything detrimental to the interests of the public.

The problem of producing a safety lamp that will give miners a better light than those now in use is one to which the Mines Department of this State is devoting a good deal of attention. On Thursday, the 29th inst., a test was made at Dudley colliery of a new electric safety lamp. Mr. A. Edden, Minister of Mines, was present, Mr. E. F. Pittman (Under-Secretary of Mines), Mr. A. A. Atkinson (Chief Inspector of Collieries), Mr. E. Peters (acting president of the Colliery Employees' Federation), Mr. H. S. Forsyth (general superintendent of the Dudley Coal Co.), and several miners. The lamp, which is of one and a half candle power, was tried under varying conditions and such as were most likely to give the severest test of its powers. The result was stated by those present to be generally satisfactory. The Miners' Federation will make further tests of the lamp, in order to satisfy the men that it will do what has been claimed for it.

Trouble has arisen over the screening and weighing of coal at Burwood colliery, and the Government is taking certain steps in the matter to test the position before the courts. On Thursday, when the Minister of Mines, the president of the Miners' Federation, and party, were returning from Dudley colliery a message was sent to the manager of Burwood colliery (Mr. F. Croudace), stating that the Minister and those with him would like to inspect the screens at his pit. The reply on the telephone was taken to be favourable to the whole of the party going to the screens, but when they arrived, Mr. Croudace said he must object to Mr. Peters making an inspection, as he had no Government authority. Mr. Edden said if that were the attitude taken up, he would not go to the screens. The party then left the mine without making the inspection.

The coal-owners of the Maitland field are still put to much inconvenience and loss as a result of the floods which held up the traffic recently. Trains have been running for the past week, but naturally the traffic has become congested. It was bad enough before the floods occurred, but during the week trains have been running up to 30 hours late, and shipping people do not know what to do to complete orders, and there is also general inconvenience and loss of time at the pits because empty waggons do not reach the collieries quickly enough to keep them going.

### Southern District.

(From Our Wollongong Correspondent.)

The demand for southern coal continued good during the week. The extremely wet weather, however, is giving some of the collieries trouble, as not a few of the employees will not face the elements when the tracks up the hills are sloppy and heavy rain is falling. The sea to-day (Friday) has been too high for the use of the jetties. So far, the winter is turning out very like that of 1899, when for four months there were very few days on which ships could be loaded, and the collieries had much idle time. The position is little, if any, advanced to-day on what it was then, and there is actually less facility for getting the coal to the ship by rail, as the truck supply is as unreliable as winter weather. The Works Department have just accepted a tender for the supply of appliances for the new coal shipping jetty, Port Kembla, such as bins, conveyor, platforms, and chequer plates. It was supposed that a contract had been made for all of the loading appliances for this jetty, and that it would be but a short time before the fitting up was very fairly advanced. But there is still little coal coming to Port Kembla. If the new jetty, when ready, does not get very much more custom, it will be a bad investment for the department.

## NORTH SYDNEY BRIDGE.

### Adoption of Mr. Bradfield's Scheme.

On Friday last the New South Wales Public Works Committee came to a decision on the subject of the means of communication between Sydney and North Sydney, a resolution being carried, "That, in the opinion of the committee, it is expedient to connect Sydney and North Sydney by means of a bridge, and they recommend the adoption of the scheme submitted by Mr. J. J. C. Bradfield, engineer-in-charge, Sydney Harbour Bridge and City Transit, for the construction of a cantilever bridge from Dawes Point to Milson's Point, carrying four lines of railway, one 35ft. roadway, one 17ft. 6in. roadway, and one 15ft. roadway, at an estimated cost of £2,750,000."

This means the definite abandonment of the subway scheme, for the reason that the grades would have been heavier and the length of railway-line greater.

Following is a description of the bridge as designed by Mr. Bradfield:—

"The main bridge consists of nickel steel cantilevers supporting central girders, also constructed of nickel steel. The anchor or shore arms of the cantilevers and the harbour or cantilever arms are each 550ft. long, whilst the centre girder is 500ft. long. The main piers supporting the cantilevers are placed 1600ft. apart, centre to centre. The total length of the steelwork is 2700ft. Provision is made between the girders for four lines of electric railway and a roadway 35ft. wide. Outside the main girders on the eastern side is a motor roadway 17ft. 6in. wide, and on the western side a footway 15ft. wide. A headway of 170ft. above high-water is provided for shipping under the bridge. The P. and O. and Orient boats require 135ft. to clear the top of the masts. The ends of the cantilever arms adjacent to the centre span are arranged to slide in or out according to the variation of stress and temperature; the maximum movement will be about 12 inches. To admit of these movements the end posts supporting the centre girders are provided with cast steel cylindrical bearings at top and bottom. At normal temperature the end posts would be vertical, and as the bridge expands or contracts the end posts will be slightly inclined from the vertical in either direction. The spans are so proportioned that under all possible conditions of loading there must always be a pull upon the ties which secure the shore ends of the cantilevers to anchor girders embedded in the concrete of the anchor piers. To allow for the movements of the cantilevers due to deflections and changes of temperature, the anchor ties are provided at their upper ends with pin-connected links, which can traverse the necessary distance on either side of their normal vertical positions without appreciable change of level at the ends of the cantilevers. The main piers and anchor piers are constructed of masonry and bluestone concrete."

The approaches will consist of reinforced concrete or steel arch spans. On the southern side the roadway and footway will reach the surface of the ground at the intersection of Princes-street and Argyle-street, whilst on the northern side the roadway and footway will reach the ground about the intersection of Burton-street and Alfred-street, opposite the Town Hall, North Sydney. The railway will branch off from the Milson's Point-Hornsby railway near Cary-street, and join with the proposed underground city railway at Wynyard-square station. On the North Sydney side two stations will be provided: "North Sydney," between Miller-street and Walker-street, parallel to Blue-street, and "Kirribilli," to the east of Alfred-street, opposite the Town Hall, North Sydney.

Parliament will be asked to approve the Public Works Committee's recommendations early next session.

## DIVIDENDS OF MINING COMPANIES.

The following dividends and bonuses of mining companies in Australia have been declared and are payable on the dates mentioned:—

June.

4th.—Ajax Central, 1s., £1500.

5th.—United Hustler's and Redan, 6d., £1200.

5th.—Virginia, 1s., £1350.

5th.—North Bendigo, 6d., £600.

13th.—British Broken Hill, 1s., £48,000.

13th.—Llanberris No. 1, 6d., £600.

14th.—Y Water, 1s., £3000.

17th.—Tongah Compound, 1s. and 2s. bonus, £7500.

24th.—Sons of Gwalia, 1s. (less I.T.), £17,500.

24th.—Great Boulder, 9d., £56,250.

25th. — Broken Hill Block 10, 1s. and 1s. bonus, £10,000.

26th.—Zinc Corporation, 1s. 6d. (ord. and pref.), £89,882.

26th.—North Broken Hill, 2s., £60,000.

27th.—Broken Hill South, 6s., £60,000.

July.

4th.—Broken Hill Water, 1s. 6d., £15,000.

(On production of scrip.)

New Canico, first and final, 5d., £625.

Maude and Homeward Bound, first and final, 3½d., £516.

More attention is being given to the market for selenium, which is a by-product in increasing quantity from copper refineries, and if experiments of industrial chemists are successful there should be a substantial expansion in consumption. At present several thousand pounds of selenium are consumed annually in the United States, and during 1912 producers of the metal quoted 2.75 to 3.50 dollars per pound, according to size of order, at New York. These quotations were for wholesale lots, smaller purchases being reported at a premium of 2 to 3 dollars per pound. These prices are somewhat less than those quoted two or three years ago, the reduction indicating that producers are anxious to find a market for their surplus supplies. The greatest use for selenium continues to be in the manufacture of glass to give it a red colour.

Verdigris can be prevented by neutralising any acids contained in the ore with lime, or similar compounds; and should spots of verdigris appear on the plates, they should be scrubbed off with sal-ammoniac or a little cyanide, and the spots rubbed with mercury, preferably containing a small amount of amalgam. It is best never to use cyanide of potassium on silver plates, as it simply dissolves some of the silver and carries it away with the wash water. Permanganate of potassium does not neutralise the effect of cyanide of potassium.

# OUR BIG MINES.

## Examinations of their Yearly and Half-Yearly Reports.

(By a Mining Accountant.)

### Ivanhoe Gold Corporation Ltd.

The report for the year ended December 31, 1912, discloses a continuation of the unsatisfactory trend made manifest in recent years. The company is contending against a serious decline in the assay value of the ore, while at the same time working costs are rising. Mine developments are lacking in promise, though of course the prospects are not hopeless. But the position is sufficiently uncomfortable to make shareholders sit up and look around to see what is best to be done. The dividend distribution again has suffered from the paring-down process, being reduced to 19s. per share. Even so, the total of £190,000 almost absorbed the net profit, which amounted to £196,168.

The most important exploratory work was in the deep levels of the mine. The results obtained were far short of expectations. The main shaft was sunk 154ft., to a total depth of 2754ft. At the 2720ft. level a start was made to open out, and east and west crosscuts were extended for distances of 42ft. and 8ft. respectively. This work was not far enough advanced to intersect any of the known ore-bodies. At the level above, that is the 2570ft. level, the main east crosscut was advanced 322ft., to a total of 360ft. from the shaft. The east lode was intersected at 305ft., but although the ore-body maintained its usual width, it was found to be of an unprofitable grade. Work has not yet been advanced sufficiently far to allow of any definite conclusions being formed, but, with one slight exception, the results obtained to date have proved disappointing. The consulting engineers, Messrs. Bewick, Moreing and Co., consider that there is no geological reason why the ore-body should not live and carry values at a depth, and that it is quite probable that a poor zone only has been entered. For this reason the work of cross-cutting at the 2720ft. level is of special interest. At the 2420ft. level a short run of ore, at approximately the pay-margin, was exposed in the main north drift (section 4) on the east lode, but with this isolated exception the whole of the 900ft. of exploratory driving and cross-cutting failed to discover payore. So far as can at present be seen the payshoot at this level has contracted to about 200ft. in length, and the grade of the ore is low.

The tonnage of ore opened up by new development during the year was comparatively small, and were it not for the fact that when the drifts in other portions of the mine were stripped, ore was exposed in greater widths than previously estimated, there would have been a considerably greater drop in the tonnage of the reserves. Once again a further small decrease in the average grade has to be recorded. The underground history of the last three years may be traced in the following table:—

Table A.—Underground History.

| | Year ended Dec., 1910. | 1911. | 1912. |
|---|---|---|---|
| Ore extracted, tons | 232,842 | 238,965 | 237,266 |
| Average assay value | 47/8.02 | 45/7.18 | 44/3.82 |
| Footage of development work— | | | |
| Shaft sinking | 178 | 170 | 154 |
| Crosscuts & drifts | 3,927 | 3,201 | 2,528 |
| Winzes and rises | 1,473 | 1,093 | 920 |
| Total footage | 5,578 | 4,464 | 3,602 |
| Ore reserves, tons | 985,036 | 1,088,421 | 1,080,850 |
| Average assay value | 44/10 | 43/7 | 40/7 |

The east lode is by far the most important in the mine; the tonnage of ore in reserve is estimated to be 809,174 tons, of an average assay value of 39s. 4d. The other lodes are the middle, new, and Boulder. The consulting engineers in their usual check estimate confirm, in the main, the estimate of the mine manager. When the underground results are traced back for a longer period than three years, the present position becomes still more unsatisfactory.

At the mill there was crushed a total of 237,266 tons of ore, the average duty per stamp per 24 hours being 6.88 tons. Gold to the value of £117,273 was recovered by amalgamation at a total average working cost of 2s. 9.97d. per ton, including rock breaking, ore transport, milling, and concentrating. The grinding plant was fully engaged in treating 161,[illegible] tons of sand, at an average cost of 1s. 2.[illegible]d. per ton. By means of the Wilfley concentrating tables and canvas strakes 27,089 tons of concentrate was saved and then treated in the Edwards's furnaces on the mine, slimed in grinding pans, cyanided, and filter-pressed for a yield of £104,153. The average assay value of the residue was 4s. 11.4d. per ton, showing an extraction of 94.81 per cent. The working cost was 12s. 2.3[illegible]d. per ton. Gold to the value of £66,646 was recovered from 105,892 tons of sand by percolation with cyanide solution, leaving 5s. 8.55d. per ton in the residue, the extraction being 68.78 per cent., obtained at a cost of 1s. 9.53d. per ton. In the filter-press plant 108,285 tons of slime was treated, yielding £180,743 in gold. Total working cost 4s. 7.9d. per ton, percentage of extraction 89.73d., and residue 3s. 9.86d. per ton.

The total treatment cost averaged 8s. 7.45d. per ton. This is higher than the cost for the previous year, but the report explains that, owing to the cleaner residue obtained, the net result was 0.88d. per ton in favour of 1912. Thus:

Table B.

| | 1911. s. | d. | 1912. s. | d. |
|---|---|---|---|---|
| Treatment cost .. .. .. | 8 | 3.32 | 8 | 7.45 |
| Loss in residue .. .. .. | 5 | 2.31 | 4 | 9.30 |
| Total .. .. .. .. .. .. | 13 | 5.63 | 13 | 4.75 |

This may be so, but the slight gain of 0.88d. per ton is insignificant when compared with the reduction in the assay value of the ore treated. This reduction was 3s. per ton. The following will illustrate to better advantage the net result of the three factors, assay value, extractions, and cost:—

Table C.

| | 1911. s. | d. | 1912. s. | d. |
|---|---|---|---|---|
| Assay value of ore .. .. .. | 43 | 7 | 40 | 7 |
| Cost, including loss in residue | 13 | 6 | 13 | 5 |
| Gross profit .. .. .. .. .. | 30 | 1 | 27 | 2 |

It is poor comfort to know that a saving of so many hundreds of pounds was effected by obtaining a cleaner residue, when compared with the actual fact that the profit per ton declined by 10 per cent. Nevertheless, from the technical standpoint it is interesting to record a recovery of 89.23 per cent. Also the details of the working cost are full of interest to technical men. But excessive attention to these is apt to cloud the main issue to shareholders, and that is the net profit per ton. It must further be remembered that a working cost is far from being the total cost; in some cases it is only 60 per cent. of the latter. In Ivanhoe's case it is 82½ per cent. Thus (from profit and loss account):—

Table D.—Costs.

| | | |
|---|---|---|
| Ore extraction .. .. .. .. .. .. .. .. | | £110,245 |
| Ore reduction .. .. .. .. .. .. .. .. | | 102,274 |
| General expenses .. .. .. .. .. .. .. | | 17,758 |
| Realisation of bullion .. .. .. .. .. .. | | 4,437 |
| Total W.A. working cost .. .. .. .. | | £234,714 |
| Add | | |
| Written off mine development | £26,591 | |
| Written off buildings, plant, and equipment .. .. .. .. .. .. | 1,458 | |
| London office expenses .. .. .. | 3,167 | |
| Colonial register, bonus to staff, ore purchase, exploration .. | 8,308 | |
| Dividend duty .. .. .. .. .. .. | 9,500 | |
| | | £49,024 |
| Total cost .. .. .. .. .. .. .. .. | | £283,738 |

This total cost is equivalent to 23s. 11d. per ton. Compare this with the treatment cost of 8s. 7d. in Table B. The comparison can be made more unfavourable still if the directors' remuneration in respect of dividends be regarded as a cost, as indeed it certainly is. This little item, totalling £2375, is comfortably tucked away in the appropriation account in company with the dividend payments. Profit and loss account is debited with only £900 for directors' remuneration: add £2375, and £3275 is what the shareholders pay for directoral administration.

However, no quarrel is desired to be picked with the framers of the report for presenting the bare operating costs in dealing with the technical work. The manager also has an undoubted right to present those costs over which he can exercise complete control, as apart from those costs that are beyond his responsibility. The object of this diversion is to draw attention to those other matters too often overlooked.

In point of actual fact the cost of 8s. 7d. per ton is no more to be considered (as in Table B) than is the cost of ore extraction. This latter is carefully kept in the background, though it has jumped from 7s. 10d. to 9s. 3d. in three years. Then again there are other working costs, such as the Realisation Expenses and the hazy "General Expenses." (See Table D.) The bonus of £1561 to the staff, if not a working expense, is certainly the next thing to it. For the sake of the interesting technical information and for greater clarity in explanation of the foregoing, the following schedule of working costs is copied from the report:—

Table E.
Schedule of Working Cost for Year 1912.

| Particulars. | Total Cost. £ | Cost per ton. s. | d. | Cost per ton. s. | d. |
|---|---|---|---|---|---|
| Ore extraction— | | | | | |
| Breaking ore .. | 68,189 | 5 | 8.98 | | |
| Filling stopes .. | 13,635 | 1 | 1.79 | | |
| Trucking & raising ore .. .. | 28,421 | 2 | 4.75 | | |
| | 110.245 | | | 9 | 3.52 |
| Ore treatment— | | | | | |
| Rock breaking.. | 4,481 | 0 | 4.53 | | |
| Ore transport .. | 1,731 | 0 | 1.75 | | |
| Milling .. .. .. | 21,154 | 1 | 9.40 | | |
| Concentrating .. | 6,224 | 0 | 6.29 | | |
| Roasting .. .. | 6,992 | 0 | 7.07 | | |
| Fine - grinding concentrates . | 1,843 | 0 | 1.87 | | |
| Cyaniding concentrates .. | 5,241 | 0 | 5.30 | | |
| Fine - grinding sands .. .. .. | 9,768 | 0 | 9.88 | | |
| Cyaniding by percolation .. | 9,409 | 0 | 9.52 | | |
| Cyaniding by agitation .. | 18,218 | 1 | 6.43 | | |
| Filter-pressing.. | 7,002 | 0 | 7.08 | | |
| Precipitation and smelting .. | 4,368 | 0 | 4.42 | | |
| Disposal of residue .. .. .. | 5,843 | 0 | 5.91 | | |
| | £102,274 | | | 8 | 7.45 |
| General expenses | 17,758 | | | 1 | 5.96 |
| Mint and bank charges on bullion .. .. .. | 4,437 | | | 0 | 4.49 |
| Total working cost .. .. .. | £234,714 | | | 19 | 9.42 |
| Mine development .. .. .. | 26,591 | | | 2 | 2.90 |
| Buildings, plant, and equipment | 1,458 | | | 0 | 1.47 |
| | £262,763 | | | 22 | 1.79 |

Shareholders' interest does not cease here, for there are the additional expenses shown in Table D. The chief points of interest for the average shareholder would be contained in a table of comparisons drawn up on the following principle:—

Table F.

| | Per ton of Ore Treated. s. | d. |
|---|---|---|
| Extraction grade .. .. .. .. .. | 39 | 6 |
| Total cost to shareholders .. .. | 23 | 11 |
| Net profit .. .. .. .. .. .. .. | 15 | 7 |

In few, if any, reports is this convenient summary to be found. Comparison on such lines gives the readiest key to the secret, often hidden in a mass of less important details. These latter, of course, need careful examination to ascertain if there has been any marked departure from the normal. The Ivanhoe profit and loss account is credited with sundry receipts totalling over £8000, mostly from interest on the numerous investments. Table G summarises the financial points of interest:—

Table G.—Financial Results.

| | |
|---|---|
| Revenue .. .. .. .. .. .. .. .. | £479.906 |
| Expenditure .. .. .. .. .. .. .. | 255,689 |
| Written off .. .. .. .. .. .. .. | 28.049 |
| Net profit .. .. .. .. .. .. .. | 196,168 |
| Dividend .. .. .. .. .. .. .. | 192 375 |
| To reserves .. .. .. .. .. .. | 8,577 |
| Capital (£5 shares) .. .. .. | 1.000,000 |
| Liquid assets* .. .. .. .. .. | 285,706 |
| Liabilities† .. .. .. .. .. .. | 20,581 |
| Surplus of liquid assets .. .. | 265,125 |

* Includes £2375 directors' remuneration.

† Exclusive of contingent liability for calls (£17,175) on certain shares invested.

## PUBLICATIONS RECEIVED.

"Petroleum in Southern California."—A bulletin covering this subject has been issued by the State Mining Bureau and is available for distribution. The book covers the oil fields of Ventura, Los Angeles, Orange, San Bernardino, and Santa Barbara counties; gives various methods of analysis of typical oils in the several fields; gives a history of the development of the fields, and describes wells and operations in the different localities. The book contains 430 pages, cloth bound, is well illustrated, and is accompanied by six maps of the different fields. The price of this publication has been fixed at $1.50, with an additional 22 cents for postage, and may be obtained by applying to the State Mining Bureau, Ferry Building, San Francisco.

* * *

We have received from the Australian General Electric Co. an artistic and clear almanac for 1913, which also gives interesting information concerning the company's well-known circuit-breakers.

# THE INVESTOR'S COLUMN.

## Some Companies Attracting Attention To-day.

(By Our Exchange Reporter.)

### Great Langi Logan (V.).

Despite the more favourable outlook at the leading Ararat mines—that is, at the Cathcart Central and the New Langi Logan—the shares in the lower priced and less advanced companies have for a long while been very dull. Among others the Great Langi Logan may be noticed. At the beginning of the year there were numerous transactions daily, and as the water pressure above the drives at the New Langi Logan became steadily reduced, while at the same time it was being lowered in the old shafts of the same company, it might reasonably have been expected that the public interest in the adjoining stocks would have been maintained. Such, however, has not been the case, and the prices of the shares are quoted at a little below 2s., as against a high water mark of about 4s. It should be borne in mind, however, that since the latter price was reached a fresh issue of 10,000 shares has been made, that is, one for every two previously issued by the company, making the number altogether 44,200. One probable explanation of limited enquiry for the stock is that the operations up to the present have been confined to boring with the object of proving the value and course of the gutter. This work has now been completed with what may be described as thoroughly satisfactory results. It may now be regarded as established that the main lead of the district, that is, the New Langi Logan, traverses the property from one end, giving approximately 18,000ft. in length, which is certainly sufficient ground to justify the formation of one, if not two, other companies to work the lease. Some negotiations for the purchase of a portion of the lease with this object have been attempted, but have not been entertained, as it is believed that better results will be obtained when the New Langi Logan washdirt is entered, the company evidently being very confident as to the results of the opening up of that mine. It may be mentioned that, in addition to the washdirt areas on the main lead, it has further resources in the tributary systems coming in both from the east and the west. The nature of the gravel and washdirt material is regarded as most promising for successful mining, being composed of well water worn quartz resting on a soft slate bed rock intersected with quartz veins, the thickness of the gravel being generally about 8ft. Although absolute reliance cannot be placed upon the prospects of gold obtained by boring, yet they are always a good indication of the payable character of a gutter, and the shareholders in this company will no doubt have been well pleased to know that the prospects obtained compare favourably with the best on the field. This result might not unreasonably have been expected, as the property is on the deep ground immediately contiguous to the point where the rich tributaries of the old Ararat field join the main channel.

Vigorous development work is now to be undertaken in order to bring about the speedy opening up and draining of the lead, and a convenient site for the shaft has been selected, and as the necessary plant of a first-class character has been procured (on very reasonable terms) sinking will be started immediately. It is anticipated that the water will not be heavy, as the pumping operations at the other mines on the field, which have been carried on, in the case of the New Langi Logan, for a considerable period, have materially reduced the volume, and as the mine of this company is higher up on the lead it need not be expected that the quantity will be so great. In their report to the shareholders, the directors express their belief that the mine will probably become one of the chief gold producers of the State. This may seem a bold prediction, but it is not unjustified as far as the existing knowledge of the field is concerned, for if the New Langi Logan proves to be as good a property as is expected by leading alluvial mining men, then there cannot be much doubt that the Great Langi Logan mine should also have a great future. At present prices, the shares are worth buying and locking up.

### Mount Carrington (N.S.W.).

There has recently been an improved enquiry for the shares in this company, all those offered between 3s. 6d. and 4s. 6d. having been readily accepted, so that the quotation is now buyer at the latter price, seller 5s. The flotation took place last year mainly on the strength of a favourable report given by Mr. George Young, a Victorian mining manager. The property, which is situated near the township of Drake in the New England district of New South Wales, was formerly known as the Pioneer Copper Mine, and a considerable amount of prospecting and developing work had been done upon it. The total holding amounting to 65 acres, made up of a prospecting area of 40 acres, a lease of 20 acres, and another of 5 acres. The exact situation of the mine is on the slopes of Mount Carrington in the Dividing Range and about a mile from the township, with which it is expected there will soon be railway communication, as line has been surveyed from Casino to Tenterfield, and this will pass close to the township of Drake. In the meantime, transport is by means of a traction engine over a good coach road. The main work has so far been done on the 20-acre lease, where a tunnel has been driven over 1100ft. into the hill, proving the existence of several promising lodes. At 492ft. one of these was intersected, showing a width of 12in. assaying 10 per cent. of copper. At 600ft. another formation was met; this had a width of from 3ft. to 5ft., and assaying about the same figures per cent. At 850ft. another formation, varying from 18in. to 4ft., was met, assaying up to 5 dwt. of gold, 5 per cent. copper, and 5 oz. of silver; and still another at 1050ft., the last assaying 5 dwt. gold, 11 per cent. copper. Although these formations are rather on the small side, they establish the metal bearing qualities of the ore and justify a belief that the main ore body will be a payable one. This latter lode, which was found to exist just below the tunnel level, is of a much more substantial character than the others, the winze which has been sunk upon it from a point of 60ft. in from the tunnel entrance has reached a depth of 100ft., and drives have been extended at this depth for a distance of 100ft. A cross-cut has been put in 25ft. across the lode, the value varying from 8 to 15 per cent. The capital of the company is £10,000 in 40,000 shares of 5s. each, of which 15,000 fully paid went to the vendors in payment for the property, 15,000 paid up to 1s. were sold to the public at 1s. per share, and another 10d. per share has since been called up; 10,000 shares are held in reserve. It was not anticipated that the original working capital would be sufficient to open up and equip a big mine such as it is hoped this will prove to be, but it will give the owners some idea of what their property is like, and when further funds are required they may be raised by means of the reserve shares. It should be mentioned that an option over 5000 of these at 5s. per share has been given to a small syndicate which is getting a report made on the mine by Mr. Powell, the well-known expert. The company itself has an option over a neighbouring property known as McCrossins, the terms being 1000 of the reserved shares. Assays from this property have given payable results, and a bulk trial of 10 tons of the ore is now being made; and should the return be satisfactory the property will be acquired. This stock is a promising one, with some consistent supporters "On Change."

### Marvel Loch (W.A.).

Although the mining market seems to have been somewhat influenced by the elections, a few of the smaller priced stocks have been dealt in freely —among others, Marvel Loch. This company certainly has had a checkered career, for after a very brief success, during which a dividend or so was paid and the shares rose to 10s., it was found that the best of the ore had been extracted and the mine had got into such an unworkable condition that it would be necessary to sink the shaft deeper and provide new machinery. This meant reconstruction, and at first it appeared rather doubtful whether the necessary working capital would be put up. The prospects, however, were considered sufficiently promising to warrant giving the property an exhaustive trial under up-to-date methods of working. It cannot be said that the results since obtained have justified the expenditure incurred, for although there are large bodies of ore opened up, they are unfortunately of just too low a value to make the operations payable. The margin between profit and loss is not large, but it is on the wrong side, and for a little while it seemed that for the second occasion in its career the company would have to cease work—a decline in the price of the shares set in until they were not worth much more than 6d., and even at this low quotation it is probable that part of the support came from the oversold division of the market. Soon afterwards, a rallying tendency became evident, and a fairly heavy turnover was maintained, until 2s. 10d. was reached. The reason for this improvement was the acquisition by the company of another property known as the Comet, the reports from which have been of an encouraging character, the latest being that the ore in the drive, which is being put in north, is 12½ft. wide. These values are quite good enough to justify an expectation of payable returns, and further developments will be waited with interest. As the company's Marvel Loch mine is well equipped, the ten-head battery being a first-class milling plant, and the ore bodies there are now a little more than paying the working costs, there appears to be a reasonable hope of the shareholders getting some return for the money they have invested. The Comet mine is situated about half-a-mile from the Marvel Loch, and the present workings are at the 150ft. level—the drive north being about 123ft. in the lode. The size varies from under a foot to 12½ft., and the values from perhaps 15 to 30 dwt, the narrower portion being the richer.

The prospects of the company are probably better to-day than at any period in its history.

---

# MINING IN NEW SOUTH WALES.

## Cobar District.

(From Our Correspondent.)

Cobar, May 29.

The miners started work in the Great Cobar mine on Monday, and it is expected that the smelters will be started next week.

The Queen Bee Company is applying for partial suspension of the labour conditions. There is trouble in regard to the treatment of the ore.

A line is being surveyed to the C.S.A. mines. The distance is about 7 miles from Cobar in a northerly direction.

## Emmaville.

(From Our Correspondent.)

Emmaville, May 29.

The recent rains have had a beneficial effect to the sluicing and dredging industry, replenishing the water supply all around. Wood-carting, etc., was hung up for about a week, owing to the heavy state of the wet ground. There should be no lack of water now for some considerable time to come. The sluicing ventures are all maintaining fairly well their positions as consistent tin producers.

The Vegetable Creek Co. (deep lead) has an improved outlook since the opening up of a body of wash, carrying high tin values, from the new shaft (Allen's). This company has had a particularly difficult proposition in the past, and it is to be hoped that, with this latest development, the future will be decidedly brighter.

---

An alleged valuable discovery of tin has been made on Mr. W. F. Duane's property at Malebo, near Wagga. As the title to the property is an old one, the metal deposits were not reserved to the State. The discovery can consequently only be worked with the permission of the owner and the mining officers. A rush is expected if the ground be made available.

The New South Wales Cement, Lime, and Coal Company Limited was registered in Sydney last week, with a capital of £200,000, in £1 shares, to acquire coal mines, etc., and to carry on the business of manufacturers of cement, lime, bricks, etc. The first directors are:—James Angus, E. H. Buchanan, L. J. Davies, C. A. Jaques, and George R. W. McDonald. Registered office, Sydney.

The Arramagong tin mines, ten miles from Grenfell, are being prospected. Twenty distinct parties have taken up 700 acres of ground. The area carries tin lodes and alluvial tin. The main reef has not yet been discovered. Prospects have realised up to 2 dwt. gold and 3 lb. of tin to the dish.

Mr. Arthur Griffith, N.S.W. Minister for Works, speaking at Kiama upon the work the Government had done in establishing State quarries at Kiama and Port Kembla, remarked that it was intended to make several important improvements at both centres to facilitate the handling of metal at Kiama particularly. A large sum of money was to be spent in constructing a tramline from the quarry to the harbour and on the erection of new crushers, on completion of which works he hoped to be able to land metal in Sydney at 5s. per ton.

At Forest Reefs the Austral mine has been unwatered, and an inspection made of the sulphides for the purpose of ascertaining if they were suitable for blending with those from the Cadia mine, so as to overcome the smelting difficulty. For some reason, however, negotiations have been broken off, and attention is being turned to the Little Cadia mine, from which ore containing a sufficient quantity of sulphur is said to be available. The lode at the Cadia still carries a high percentage of copper, but is deficient in sulphur, hence the smelting difficulty. The last run of eight days' smelting is reported to have equalled 46 tons of smelted copper.

The Lloyd copper mine treated 1800 tons of ore during the fortnight for 66 tons matte averaging 02 per cent. copper, 11 dwt. of gold, and 12.6 oz. silver. The machinery for the oil flotation plant is arriving at the mine.

## VICTORIAN MINING ACTIVITIES.

### Bendigo and District.

(From Our Correspondent.)

The gold production for the week ending May 31st, 1913, amounted to 3170 oz. 6 dwt. The principal producers were Central Red, White and Blue, 259 oz.; Golden Pyke, 245 oz. 6 dwt.; Johnson's Reef, 202 oz. 14 dwt.; Virginia, 168 oz. 10 dwt.; Carlisle, 128 oz.; Catherine's Reef, 94 oz. 17 dwt.; Bendigo Dredge, 91 oz. 5dwt. Three dividends, totalling £3025 6s., were announced, viz.:—Virginia, 1s., £1350, total to date, £163,386; United Hustlers and Redan, 6d., £1075 3s., total to date £175,225 14s.; North Bendigo, 6d., £600, total to date, £5400.

Princess Dagmar average of 2 oz. 7½ dwt. per ton was a bit above expectations, though it was generally known that the rich specimens obtained from the 853ft. level were to be included in the output of 77 tons. These specimens were from the new splice of quartz recently entered in driving from the Golden Age end, and it is officially stated that good prospects were still visible in the face last Saturday, the reef being about 12in. thick. There is a rise coming through from 867ft. at the company's shaft to connect the level. Although the conditions in rising are similar and the quartz is of a well mineralised character, no gold has been disclosed. As there is only two or three feet of solid ground remaining according to the surface, the rich shoot does not extend far below the 853ft. level, providing operations are on the same back.

Carlisle sprang a surprise with an increase of 40 oz. for the week, compared with the preceding term. The return of 128 oz. included 12 oz. 12 dwt. from cleanings, and leaves a substantial profit, though the output ran into 460 tons. This improved result was due to a small proportion of the lower grade stone at 1200ft. being included, and the profitable portion of the formation along the top fault at 1140ft. furnishing the bulk of the tonnage. Interesting results are expected in the 1200 ft. north intermediate after the expiration of a few weeks, in picking up the pitch of the faulting.

Johnson's Reef appear to have a fair chance of being rewarded for their pertinacity in following the Collmann reef on the Paddy's Gully line, from the No. 2 shaft. Several very fair specimens were extracted from the western limits of the formation during the term. The west leg is the best quality, but unfortunately small and short. The cap is also of limited dimensions and of comparatively low grade, while the east leg has not yet proved of value at this point. In order to work the reef over the length of 1000ft. remaining intact at this end of the property, it will first be necessary to connect with the old south stopes, a matter of 300ft. of driving. On the Derby line the results were also more satisfactory, and with the shortening of hands just previously, the field should leave a good profit.

Central Red, White and Blue had a further drop in average, it taking 850 tons to produce 259 oz. The falling off is in consequence of the depreciation in the value of the reef in the old stopes below 318ft., both along the main hanging wall and the western turnover. What is regarded by the management as a very encouraging development, occurred in driving and side stoping on the 14ft. of quartz associated with the lavas at 400ft. This stone was first exposed in a crosscut west off the main level, at over 500ft. north of the shaft. From here a level has been advanced to within 130ft. from Lansell's Little No. 180 boundary. These operations are showing more fine gold, and the stone is estimated to be payable. Southward toward the shaft, the same channel has yet to be tapped for a length of 250ft. As yet the richer shoot seen in the No. 5 winze from 318ft. has not been drawn upon to any extent in stoping, and is expected to prove a valuable reserve. At 720ft. the level started on the east back of the gold bearing saddle reef is not revealing much stone, the formation having risen very rapidly overhead. This exceptionally steep pitch is confined to a short distance in the vicinity of the shaft. A rise is to be extended to keep in touch with the auriferous portion of the reef, which was reported to have shown fair prospects in shaft sinking. From 643ft. a winze is going down to meet a rise from 720ft., preparatory to driving on the smaller formation traversed in the shaft. The winze shows a few spurs, and the rise 2ft. of good looking quartz, of low value, along the west back. Something like £1300 remained after financing the customary fortnightly accounts.

South Garden United have suspended work at the main shaft for about 6 weeks, while the new machinery is being installed. A fairly profitable time has been experienced in working two formations from this shaft, at the respective depths of 2030ft. and 2080ft. It is proposed to test the same channels from the south or Londonderry shaft, while the erection of the machinery is in progress. Neither formation has been exploited to any great extent in this ground, which formerly belonged to the Londonderry Company. After providing for all liabilities, there is £1300 to credit at present.

### Maldon.

(From Our Correspondent.)

At a special meeting of shareholders, held at the end of last week, at Maldon, it was decided to give the directors of the South German Co. power to dispose of the 8687 shares in the hands of the company. They are to be offered to the present shareholders, and if they are over-applied for, they will be divided pro rata. This is what is likely to happen, judging by the rapidity with which they are being taken up. The prospects of the mine are much brighter than they have been for some time past. The company expect to drive under and cut the payable gold being mined by tributers below the 1750ft. level, by 50ft. of driving. The tributers are opening up north and south of the winze, and gold is reported to be showing in both ends. The other parties of tributers are working on stone of moderate value.

South British Co., Maldon, has extended the 210ft. level 50ft. to the north on well-mineralised stone. Good stone is being broken in the old shaft, and the battery house is nearly finished.

New Day Dawn has unwatered the main engine shaft to the No. 1 level. After repairing the ladder way and putting in plat set a start will be made to reach the continuation of the lode cut at the surface. This is estimated to take 60ft. The recently-uncovered lode on the surface is being sunk on with fair gold prospects. It is 2ft. wide.

Mr. E. Austin, of Maldon, has been granted the old Lock's lease at Sandy Creek, embracing 36 acres.

Derby United is breaking out stone in the stopes on a spur formation in the 700ft. level north. In the 680ft. level the intermediate south has been extended 53ft. from the rise on a reef channel 4ft. wide, but not payable. Rising has stopped, and the reef to the north will be opened up where there is 4ft. of dirt of fair quality. A crushing was put through at the battery for a yield of 36 oz. 18 dwt., and sand was cyanided for 14 oz.

A party of tributers, T. Cooper and J. Berryman, who have been for several months working on the north end of the Nuggety Extended lease, have sent a crushing of 43 tons to the Derby battery. It returned 374 oz. amalgam from the ripples, which should retort an average of about 4 oz. per ton. This is exclusive of sand and pyrites. This is the second crushing of great value put through by them.

## MINING IN WESTERN AUSTRALIA

(From Our Correspondent.)

Kalgoorlie, May 26.

Developments in the Victorious at Ora Banda continue fairly satisfactory, though the winzes have passed through the telluride ore, got between 30 and 40ft. No. 1 winze averages 41s. per ton for the 45ft. sunk; No. 2, 131s. for 55ft.; and No. 3, 135s. for 49ft. The average width is 5ft. No. 2 winze is now entirely in sulphide ore, and the other two in oxidised. The shaft is now 470ft. deep, and No. 5 level has been started at 460ft. As the ore-shoot is pitching east away from the shaft, this crosscut is going in diagonally in order to strike the middle of the shoot. At No. 4 level the lode was cut 95ft. south of the shaft, but, as the present crosscut is going south-east, it will probably have further to go. The suction gas plant was closed down most of last week owing to a breakdown, so that the May return will not be up to the average tonnage. The future of the mine depends on the result of the No. 5 level. At No. 4 the rich ore-shoot was 220ft. long by 9ft. wide by 140s. per ton, and three rises proved that the rich ore only continued for an average of 30ft. above the level. In the Gimlet, the shoot doubled in length in the sulphide zone, and this may prove to be the case with the Victorious.

The management of the Paringa, after driving 70ft. north at 100ft. level from the south shaft from Geach's ore-shoot, in practically barren rock, struck a new ore-shoot. This has been followed north for a distance of 88ft. in ore averaging 81s. 8d. per ton for a width of 4ft. The last 28ft. averaged 86s. per ton for a width of 5ft. The south shaft is over 1600ft. from the lease's northern boundary, and very little prospecting has been done on the west of these two shafts. In the early days all work was concentrated to the eastern half of the property in the vain hope of catching the Brown Hill ore-pipe, and at the 1300ft. level of the south shaft a crosscut was driven to the east boundary, and was subsequently, by arrangement, extended right across the Brown Hill mine. A vertical diamond drill bore hole was also sunk to 1100ft. in the south-east corner of the lease without result. The company is more than paying its way from profits, combined with royalties from tributers.

Mr. M. T. Williams, manager of the Edna May, has been in Kalgoorlie during the week, and seems bent on sinking a new vertical shaft 75ft. west and 36ft. north of the shaft, which has collapsed below 80ft. Mr. Williams' plea is that, by so doing, he can start the 10-head mill, and gain revenue while the new shaft is being sunk. The plea is ridiculous. Since November, 1911, the Golden Horseshoe main shaft has been sunk from 2240ft. to 2640ft., and, at the same time, 25,000 tons of ore, not to mention mullock, have been regularly hauled from this shaft every month. A party of Victorian alluvial miners could pick up and sink the collapsed shaft to solid country inside of two months, and sinking could thereafter be continued if Mr. Williams took a lesson from the Horseshoe and Ivanhoe, which have sunk steadily for years, and raised and crushed 20,000 to 25,000 tons monthly without a hitch. If a new shaft be sunk, it will probably collapse in the "spewy" ground like the other, and, even if not, it means the shifting of the head gear, and building a new aerial tramline to the mill ore-bin. The Bullfinch encountered similar "spewy" ground at 200ft., but with the aid of Victorian alluvial miners, who are very scarce here, the difficulty was overcome, and very little heard about it. Mr. Williams estimates the ore reserves at 20,000 tons assaying 85s. per ton, against Mr. A. E. Morgan's 12,000 tons assaying 87s. 8d., and Mr. A. W. MacIntyre's 23,500 tons assaying £9 6s. per ton. No wonder shareholders are at a loss when experts differ so widely.

Mr. Collier, Minister of Mines, has offered Mr. W. J. Loring a subsidy of £6000 if he can induce London capitalists to subscribe capital to sink a shaft to 1000ft. on Fraser's leases at Southern Cross. Mr. Collier is already paying £2 for £1 for testing the ground by boreholes. This work will continue until Mr. Loring reaches London and interviews his friends. No. 1 borehole is down to 1100ft., and Mr. A. Montgomery, State Mining Engineer, is to visit Southern Cross, and decide the site of the next bore. The present bore passed through 4ft. of ore at 538-542ft. assaying 84s. 6d. per ton, and again penetrated a lode from 958 to 976ft. The core at 968ft. carried visible gold, but official assays are not yet published. This should be the biggest mining proposition in the State if Mr. Loring can float it, as an option over an area of 180 acres is secured, and the ore-shoot has been stoped in the shallow levels for 4000ft. by 20ft., and has produced 325,000 tons of an average value of 44s. 6d. per ton. As both Mr. A. Montgomery and Mr. Harry P. Woodward's reports are enthusiastically favourable, there should be little difficulty in raising the capital when the market is favourable.

## METAL QUOTATIONS.

### By Cable.

(From Our Correspondent.)

London, Tuesday.

The metal markets were unsettled during the week, and towards the close showed a tendency to fall in value, tin losing £5 for spot, and copper declining 17s. 6d. for both positions. Electrolytic also lost 10s., and was quoted to-day at £71 10s. Lead, however, kept up to last week's figure, and on Tuesday touched £20. The quotations were:—

COPPER.—Spot, standard, £68 15s., £68 12s. 6d., £68 10s., and £67 17s. 6d.; three months, £68 2s. 6d., £68 5s., and £67 15s.

Electrolytic.—£72 10s., £72, and £71 10s.

TIN.—Spot, £221, £222 5s., £220 15s., £216 5s., and £215 15s.; three months, £216 15s., £218 5s., £216 15s., and £212 5s.

LEAD.—£19 15s., £20, £19 17s. 6d., and £19 15s.

SILVER.—27 11-16d., 27¾d., 27 11-16d., and 27 5-8d.

ALUMINIUM.—£92 to £95.

ANTIMONY.—"Star" brand, £31, and 50 per cent., £9 10s.

WOLFRAM (70 per cent. ore).—Unchanged at 34s. 6d. per unit, or £120 15s. per ton.

MOLYBDENITE.—2s. 9d. per lb., or £308 per ton, an increase of £28.

MANGANESE (50 per cent. ore).—9¾d. per unit, or 40s. 7½d. per ton.

Tenders are being invited in Great Britain and Australia, by Mr. Merz, for the supply of the switch gear for the Yarraville power house of the Victorian railway electrification scheme. It is expected that the erection of the power-house will be begun next month.

# Australasian Institute of Mining Engineers.

## THE BROKEN HILL CONGRESS.

By Our Special Commissioner, J. Malcolm Newman, B.E., Assoc. Inst. M.M., M. Aust. Inst. M.E.

Broken Hill, May 27.

On Monday, May 26, the Australasian Institute of Mining Engineers went into conference at Broken Hill. This fact is of twofold interest to the community, inasmuch as Broken Hill is the most important mining centre of Australasia, and the Institute represents the aspirations of the men immediately responsible for the direction of the mining industry to overcome the difficult problems which have to be faced in making Australia's mineral wealth available for the use of mankind.

Some idea of the value of the Broken Hill mining industry can be formed from the following statements:—The value of the output to date is over £75,000,000 sterling, and the amounts distributed by the mines in dividends is over £18,000,000, the Proprietary Company alone contributing over half the output, and two-thirds of the dividends. Probably very few people realise that Broken Hill has yielded almost as much in dividends as the whole of the mines of "Golden" West Australia, whose figure is about £23,000,000. The nominal capital of the Broken Hill companies which have contributed to the output is under £6,000,000.

It is eleven years since the Institute last met in conference at Broken Hill, and the writer proposes to briefly compare the outstanding features of the mining and treatment practice of to-day with that of eleven years ago.

The most distinctive feature in the comparison is the revolution in the recoveries of the metal contents particularly zinc—from the ores. A decade ago the recoveries were about:—50 per cent. Ag., 65 per cent. Pb., 7 per cent. Zn., while to-day the corresponding figures are about:—93 per cent. Ag., 94 per cent. Pb., 92 per cent. Zn. This result has been brought about primarily by the introduction of "the flotation process," and to quote Mr Hebbard's conclusion to his paper, "Evolution of the Flotation Process on the Central Mine":

> "It is, the writer believes, quite unique in the history of concentration that so far-reaching and extensive a development should have reached its present state of perfection in so short a space of time, and more wonderful still that it should prove applicable in an equally masterly manner to so many other classes of ore. There can be little doubt left in the minds of those who have, during this visit of the Institute to Broken Hill, seen this new system of concentration that it must of necessity spread to all parts of the world. There is, therefore, great pride in the knowledge that its initiation and development has taken place on this famous group of mines."

Of course there is still room for improvement, and within the last few months the so-called "Selective Flotation" process has given excellent results which should still further enhance recoveries and profits. Conspicuous evidence of the result of the introduction of the flotation process is seen on the modern landscape—Eleven years ago the South Co.'s mill was the southern outpost of activity. Now away beyond this is seen the huge buildings covering the Zinc Corporation's plant. On the formerly quiet eastern side of the line of lode there now stand the Central Mine and Mineral Separations Ltd. treatment plant, and on the north end, beyond the North Mine, the Amalgamated Zinc (De Bavay) Co. conducts its important operations. Further evidence is found in the partial disappearance or transportation of the enormous piles of tailings which 10 years ago constituted the leading feature of Broken Hill's backyard. Of striking significance also is the colour of the treated tailings dumps of to-day as compared with those of the old dumps. To-day's discarded tailings are almost pure white, and it is difficult to see any sulphides in them. The olden time tailings were dark in colour and full of sulphide particles.

A tour round the surface of the field reveals the second feature of modern Broken Hill, which is in marked contrast to the Broken Hill of eleven years ago, viz.: the power plants. These are second to none in Australia, and it is evident that Broken Hill managers have fully realised the importance of being up-to-date in the engineering branch of their operations. The net result is that the increased costs due to rises in wages and in the prices of supplies have been partly counterbalanced by the reduction in power costs and in the increased use of mechanical appliances. Electricity now plays a most important part in the scheme of things, its versatility and small transmission losses enabling large modern central power stations to be used, supplying current to motors driving separate sections of the treatment plants.

This centralization idea is perhaps capable of further extension on the lines of South African practice, where a central station supplies power to several mines. It is worthy of note also in passing that a similar idea has been put into operation in South Africa for the supply of compressed air, that indispensable form of power, the generation, transmission and use of which is fraught with such expense and possible inefficiencies.

Some idea of the power developed at the Broken Hill mines may be gained from the statement that at a rough estimate the dozen or more plants along the line of lode use from 1000 to 2000 horse power each, and the consumption of coal is probably 150,000 tons per annum. A striking feature of the power generation is the almost universal adoption of Babcock and Wilcox high-pressure boilers and Bellis and Morcom high-speed engines, The use of electric turbo-generators running on exhaust steam is another noticeable modern feature. Strict attention has also been paid to the condensing systems, which are very effective. But perhaps what strikes a visitor more than anything else is that in these times, when suction gas and gas engines are talked about on all sides, not one company in Broken Hill has installed one of these engines.

Passing now to the underground section—The disastrous "creeps" of 1902 taught Broken Hill its final lesson that timber alone will not hold ground, and ever since rigorous attention has been paid to the filling of depleted ground with mullock and waste product from the surface. The mullocking system is now of paramount importance, anl the huge open-cuts along the line of lode amply testify to this. The enormous width of the ore body and weight of filling, combined with the "bad" nature of the walls, has resulted in large areas being crushed so that in places it is a case of extracting ore from huge moving masses. Obviously great care and skill will be needed to recover all the available ore at reasonable cost and safety, but, by the various methods described in the papers being submitted to the conference, I have not the slightest doubt that such will be successfully accomplished.

The two main systems of mining are the same in principle as 10 years ago, viz.: open stoping with timber bulks on the filling, for good-standing ground, and square set stoping with continuous filling for friable or broken ground. The "Rill" system is still used where the ground is suitable. The "Crosscut" system, with modifications, is a comparatively modern feature of Broken Hill mining, while the introduction of "Underhand stoping with square sets" is a recent result of modern requirements, viz.: the necessity of beating out the final arches of ore under the levels (technically known as the "picking up of bottoms") and of mining "creep" ground and old crushed pillars.

The amount of oregon timber now used is far greater than 10 years ago, the cause being the increase in the number of square sets and "paddocking," and the renewal of drives and crosscuts in crushed ground. Other new features of Broken Hill mining to-day are described in the papers before congress, and include the use of steel ore-passes, conveyor belts for distributing filling underground, very high drive sets—up to 10ft.—the boom and king-post method of using driving laths, the "pulling" and re-using of old legs, and the cutting out or removal of old timber by air-driven augers.

Apart from the direct mining and treatment, considerable change has occurred in the general features of the field, namely:—

A decade ago Broken Hill was a shallow mining field. To-day the deep levels supply a big proportion of the ore milled. Fire-fighting has of late years been raised to a fine art here. Air and mechanical fans for ventilation and direction of air currents are common to-day. On all the mines one finds up-to-date ambulance and fire stations, and a proposal is on foot for all the companies to combine in the establishment and upkeep of a Central Rescue Training Station. This is an extremely gratifying fact. There are now no exceptions to the possession of up-to-date workmen's change houses properly fitted up with baths and hot-air clothes-drying systems.

From the foregoing it will be gathered that the visiting members of the institute will find a very up-to-date field in Broken Hill, so far as the engineering and technical side is concerned. Great changes have taken place also in other directions. Ten years ago the lowest wage was 7s. 6d. per shift; now-a-days the lowest rate is 9s. 6d. per shift. The average earnings of underground contractors is now probably 50 per cent. higher, a big proportion of them earning up to £1 per shift. The effect of the better wages is plainly visible in the town, as well-built cottages have taken the place largely of the miserable "shacks" which in former days were the homes of most of the workmen.

Many people will, of course, be familiar with the contrast between present market prices of Broken Hill mining companies' shares and the prices of 10 or 11 years ago. At that time Sulphide Corporation shares were sold as low as 4s. 2d. each. They are now 27s. South Mine shares, which were £3 or £4, are now £8, and so on. Of course, the price of metals is a big factor in the modern prosperity of Broken Hill, as a comparison will show. Ten or eleven years ago lead reached its lowest level, viz.: under £10 per ton. It is now worth nearly £20 per ton. When writing of market values one is reminded that in the last ten years there has been a change round in the order of value of properties; the South and North are now regarded by the man in the street as the premier mines for investors.

It is, perhaps, fitting to close the comparison by referring to the fact that in a few months' time Broken Hill will have its new water supply at Umberumberka, and, perhaps, in a few years, will have its new railway connecting it to the eastern New South Wales railway system.

Broken Hill, May 29.

The Session of the Institute at Broken Hill is in full swing, and owing to the perfect organisation of the visiting programme by the Local Committee of the Institute, the visitors have already been enabled to see the greater part of the field. During the next three days their education will be continued, and it will certainly not be the fault of the Broken Hill men if any visitor leaves the town on Sunday night without a good grasp of the wonderful methods and processes, the development of which has of late years brought Broken Hill so much to the fore. I propose later on to describe some of the most important of these methods as seen with a visitor's eye. Meanwhile, matters of vital concern to the mining industry have been dealt with at the evening gatherings, and we have been privileged to hear the views of the leading Broken Hill authorities on these matters.

Mr. Jas. Hebbard's Presidential address on "The Certification of Mine Managers" was a masterly expression of the views of a man who is justly regarded throughout Australasia as one fully competent by his achievements to deal with this important subject, and his views will, I am sure, receive the hearty endorsement of every mining man who has the interests of the profession and the industry at heart.

[Mr. Hebbard's paper is given in another column.]

As the subject chosen by the President for his address has recently had the consideration of the Council of the Institute, which submitted certain tentative suggestions for the consideration of the Branch Societies, and as the subject requires so much thrashing out, the President asked members to express their views on his address as if it had been submitted in the form of a paper for discussion. The result was most interesting, and the various speakers dealt with all phases of the question. The following opinions appeared to receive the unanimous support of the great gathering of 250 Austraalsian mining men present:—

1. That graduates of University and other reputable schools should not be asked to again submit themselves for examination after having obtained the practical experience necessary to qualify them for mine managers' certificates.

2. That the term "practical mining work" should be read in a broad sense, and not in the narrow sense of "work in the face," though it was generally thought that some actual manual work in the face was necessary and should be insisted on.

3. That mine surveying should constitute eligibility for certification, even without any practical experience "in the face."

4. That there should be two grades of examination for certificates—viz., one of a lower standard for the purely practical man of wide experience and knowledge of underground operations, who everyone recognises as the man best suited to determine matters of safety in the immediate operation of ore-breaking, and one of a higher standard for the man who everyone equally recognises should be an engineer capable of directing and organising mining operations generally with a view to efficiency, economy, and general safety.

It is obvious that this more strictly defines the respective spheres of the practical and the technical man in accordance with their relations to the ever-growing application of technical and scientific methods. It also means in substance that, instead of one individual called the "Mine Manager," there will be two—viz., the "Mining Foreman" and the "Mining Engineer or Superintendent."

5. That efforts should be made to obtain complete reciprocity in the matter of certificates issued by the different Australasian States and New Zealand.

Such certification already exists between the licensed surveyors of the different States, and it is obvious that, except in so far as the Mining Acts and Regulations of the various States vary from one another, there should be no difference in qualifications of the man whose duty it is to see to the safety of the workmen.

6. That the Institute should be brought into closer touch with the Universities and Schools of Mines, since the student is, or should be, the prospective mine manager and member of the Institute.

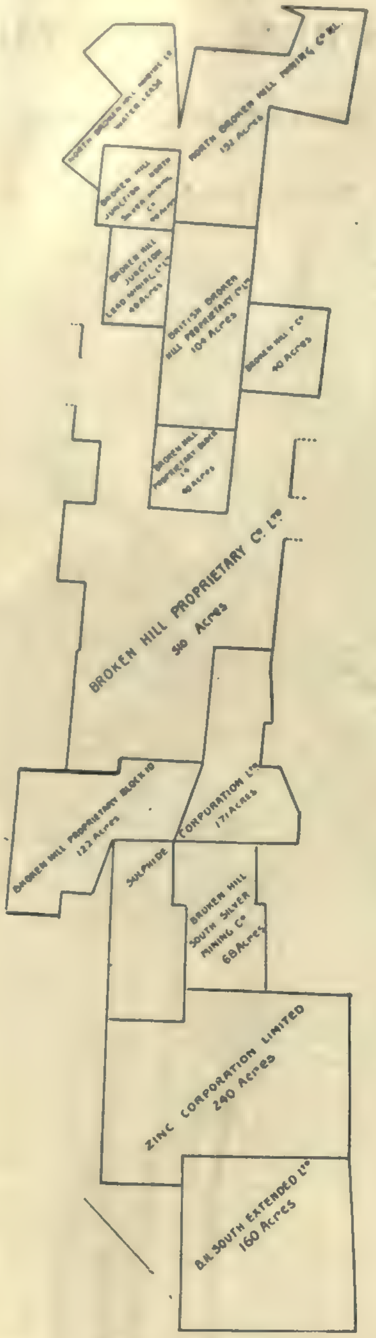
This would mean that the Council of the Institute should state its requirements in the training of mining engineers, that the schools should aim at fulfilling those requirements, and that the Institute should give students the facilities for obtaining those requirements in so far as they apply to practical work. It is gratifying to know that Broken Hill managers have in the past afforded such facilities to University and Schools of Mines graduates, while on Tuesday night prominent members of the Broken Hill Mining Managers' Association expressed their willingness to continue to do so. It is to be sincerely hoped that means will be provided whereby the Institute will have some representation in the direction of technical education throughout Australasia.

7. That as the status of the profession of mining engineering and the safeguarding of the investing public are dependent on the intellectual and moral standing of individual mining engineers, the Institute should have a direct voice in the statement of the qualifications for certification of mine managers.

It is felt that a great deal still remains to be done to free the profession from the odium resulting from the acts of charlatans and quacks, to protect the investing public and to encourage the development of the all-important mining industry.

### The Town and Trade.

Mr. H. W. Gepp, general manager of the Amalgamated Zinc (De Bavay) Co., at the annual dinner of the Institute held yesterday, in responding to the toast of "The Town and Trade," said.—"The toast emphasised the human side of mining in contrast to its financial and scientific aspects, and there was no doubt that to a greater and greater extent the sympathetic study of this side of the industry must be taken up by such associations as the Institute of Mining Engineers. Broken Hill was notably a town dependent on mining, and there was a peculiar fitness in that meeting honouring the toast of the town and trade of Broken Hill. There was one aspect of the subject very dear to him; one with which he knew they were all in full and active sympathy. The gathering represented, to a large and valuable degree, the social side of the Institute's work, and the social aim might, in the best interests of the profession, the industry, the city, and of Australasia, be extended to cover the welfare, not of the professions only, but of all who were dependent upon the industry directly or indirectly, for in that direction progress lay. It had been truly said that the chief importance of material wealth lay in the fact that when wisely used it increased the health and strength of the human race, and such thoughts surely led them to consider the great spectacle of local industry, and to ask: 'Whither is all this swarming activity struggling? Is it a great swarming of ants to build a mound of clay and disappear, or shall it leave this mass of people in a generation somewhat higher up the scale of human progress?'"


NORTH BROKEN HILL MINING CO. 132 ACRES
BROKEN HILL JUNCTION NORTH SILVER MINING CO. 40 ACRES
BROKEN HILL JUNCTION LEAD MINING CO. 40 ACRES
BRITISH BROKEN HILL PROPRIETARY CO. LTD. 100 ACRES
BROKEN HILL CO. 40 ACRES
BROKEN HILL PROPRIETARY BLOCK 14 40 ACRES
BROKEN HILL PROPRIETARY CO. LTD.
BROKEN HILL PROPRIETARY BLOCK 10 122 ACRES
SULPHIDE
CORPORATION LTD. 171 ACRES
BROKEN HILL SOUTH SILVER MINING CO. 68 ACRES
ZINC CORPORATION LIMITED 240 ACRES
B.H. SOUTH EXTENDED LTD. 160 ACRES

Plan of Leases.

Continuing, Mr. Gepp said he believed, with Aristotle, that good was the spring of all human action, and that therefore the enterprise, self-reliance, and forethought which had been so amply demonstrated in the development of this great local industry should also be used in the development of their local environments to the lasting benefit of the race. Economists agreed that the greatest and best use of wealth was to increase the health and strength of the human race. This truth was spreading throughout the civilised world in a wonderful way, and was bringing into more intimate contact the various human elements which went to make up this very intricate social economy as at present existing, and was tending to improve relationships generally, and remove that mistrust and suspicion which in so many cases caused more trouble than actual grievances. All should strive in every way possible to keep their minds clear from encrusting cobwebs of conservatism, and help all to appreciate that this world was not made up only of work, but also of the pleasures attached to the development of the higher side of their being. And thus we come to the question as to what the Institute could do in a practical way towards this end. As individuals they could give their hearty and practical sympathy to all movements which were inaugurated for the elevation of mankind, and particularly to those who were associated with them in this particular industry. By doing so they could elevate themselves, and, further, as an Institute, they could take up the subject in a thoroughly systematic and scientific manner, examining all the possibilities, assisting to keep the movement in the right lines, and, whilst recognising the limitations, doing their best individually and collectively towards the solution of these problems.

Broken Hill To-day.

In conclusion, Mr. Gepp said:—"The past history of the town, as evidenced to-day to anyone with eyes to see, is full of very dark shadows. It represents, to say the least of it, an unequal and inappropriate distribution of man's efforts. Broken Hill has always been the Cinderella of mining towns, but now the fairy godmother of mining and metallurgical science has come, and clearly demonstrated a long life and financial stability of this youngest sister amongst the large mining cities of the world, and we should assist to dress her in the best raiment of parks and lawns, and so improve her life that she may always be mentioned with interest and with pride. The creative energy which has been used to solve the problems of the mines should also be used to solve the problems of living conditions in the city, and we should strive to increase the numbers of those capable of that higher constructive imagination which enables appreciation of the finer uses of life. We have before us in this city an opportunity of showing that we are, above all, members of the State, and that we have interests larger and wider than those connected with our work. I know that I make this appeal to those who fully appreciate the importance of such work, and I have full confidence that the appeal will not fall unheeded."

In this speech Mr. Gepp has broken new grounds, and his thoughtful utterance should give mining men much food for reflection. Mr. Gepp's speech fittingly followed that of Mr. G. Weir, general manager of the North mine, and president of the Mining Managers' Association (Broken Hill), which dealt with the all-important necessity of the mining industry to the industrial progress of the world.

### Mr. Weir's Speech.

Mr. Weir, in the course of his speech, said:—"Mining and metallurgy were probably more important and far-reaching than any other single industry, for it was doubtful if any trade, calling, or profession could exist (under present-day conditions) without the use of minerals or metals, either directly or indirectly. Agriculture might produce foodstuffs, but they could not be reaped or converted into palatable food without the aid of minerals or metals. Sheep and other animals might provide material for clothing, but the raw material could not be made into suitable clothing without the aid of metals. In fact, without metals, the world would probably be still uncivilised and man would be living in caves or 'wurlies.' The estimated value of the total mineral production of the Commonwealth from the earliest records up to the present time might be taken as approximately £800,000,000, of which gold was responsible for 70 per cent., coal 9 per cent. silver and lead, 8½ per cent., copper, 7½ per cent., and tin 4 per cent. New South Wales still held its place as regards coal, silver, and lead, and was now adding zinc at the rate of over £1,000,000 per annum. For the year 1912 the zinc was valued at £1,766,000. The value of the total mineral production of the Commonwealth was estimated at £800,000,000. It was perhaps hard to realise just what this amount meant, but if the value was in sovereigns a man could place one at every inch along the coast line of the

Commonwealth (Australia and Tasmania), and have over £26,000,000 left for incidentals. The total output of coal amounted to over 206,000,000 tons. This was equal to a drive or tunnel 10ft. x 8ft. 6in. all round the coast of the Commonwealth, or from Melbourne to London by the ordinary steamship route, or a drive or tunnel 7ft. x 6ft. round the earth. The general public heard a great deal about the dividends paid by successful and prosperous mining companies, but very little of the struggling companies developing mines and evolving new processes for the treatment of their particular ores. It took a very large amount of money to develop a mine, and arrive at the producing stage. Out of the £25,000,000, which is the annual value to-day of the Commonwealth's mineral production, he thought he was safe in saying that about 70 per cent. of this amount was paid away in direct wages, to say nothing of the amounts spent on machinery and stores. Within the Commonwealth one man out of every fourteen (above the age of 16) was directly engaged in mining. Therefore, the mining industry was of national importance. Up to 125 years ago Australia was still in the Stone Age. Australia then commenced with the Golden Age, passed into the other metals, and was now about to blossom forth into the great Steel Age, which might mark another new and most important era in the history of the Commonwealth. No nation could be powerful without coal and iron and the knowledge how to work them. The defence of our country had now been seriously entered upon, and the nucleus of a navy already existed. Warships would be required for defence, and merchant ships to carry the nation's products to the ends of the earth. There was no reason why a great shipbuilding industry should not be built up in the Commonwealth when steel of suitable quality was produced, and he was sure all were pleased that it was a mining company, and a Broken Hill one at that, which was embarking on this great steel industry. The future of Australian mining was pregnant with possibilities. The extent of the mineral wealth must indeed be large. New mining methods, new appliances, new metallurgical processes, were continually being brought forward, and a great deal of the success of the future will, or should be dependent upon the Australasian Institute of Mining Engineers."

Argent street, showing Technical College, Town Hall and Post Office.

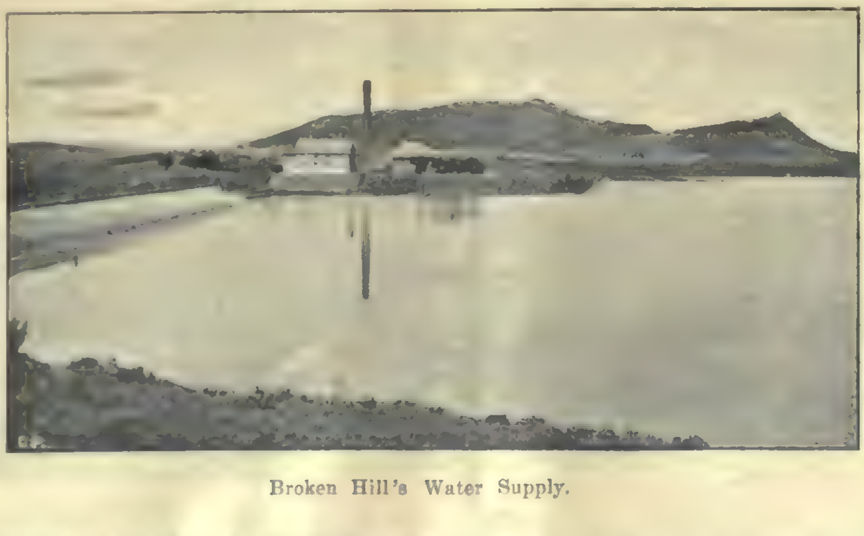
### Kindred Societies.

Mr. E. J. Horwood, manager of the Broken Hill Proprietary Co., appropriately dealt with the diffusion of scientific knowledge for the benefit of industry by societies kindred to the Australasian Institute of Mining Engineers. "It must," he said, "be freely admitted that, owing to the circulation of papers and discussions issued by the various societies, the interests of the mining industry as a whole were greatly benefited, and those engaged in the industry were enabled to keep themselves up to date in all technical matters, and opportunities were afforded by which valuable original ideas might be given out to the mining world with as little delay as possible, enabling any improved methods to be applied elsewhere to the advantage of the industry. The desire to co-operate which the publication of papers by members of the various societies indicated, was evidence of the friendly relations at all times existing between those engaged in mining and metallurgy. It was to be regretted that even more papers were not written, and this seemed to be the complaint with all scientific societies; but if members would only recognise that, though the paper might to the author appear to be of insufficient importance to merit publication, it was the indirect results that accrued to the issue of any series of contributions that were important, then more papers would be written. The human mind at the best had its limitations, but happily, where one may be deficient another might be able to fill the gap, and in the interchange of thought through the medium of the various soieeties, full advantage could be taken of the numerous points of view that could be brought to bear on every phase of mining and metallurgy. Each member in going through his work, took a different path to that taken by his brother engineer. Although there was much in the practices at Broken Hill which was original, and old methods had been improved, it was only fair to admit that much as Broken Hill had endeavoured to discard the old square set system of stoping owing to danger from fires, this system (introduced from abroad) was almost invariably resorted to wherever difficult ground had to be worked. Further, in the realm of ordinary wet concentration, sufficient recognition had not been given to the great improvement effected by the introduction of the machine invented by Mr. Wilfley. Likewise in the field covered by the various flotation processes, although a number of Broken Hill men had the honour of being associated with the development of the first commercial application of such a process to Broken Hill sulphide ore (he referred to the Delprat process, on the Proprietary mine) the germ of the idea was, it transpired, also in the possession of the late Mr. Potter, who was making his investigations independently. Again, later on, whilst local talent on the Central mine was responsible for the development of the frothing type of flotation process on a commercial scale, the initiation of this process was due to Mr. Cattermole, a London investigator."

## Presidential Address.

Mr. James Hebbard's presidential address was (slightly condensed) as follows:—

"At the annual dinner of the institute, held in Sydney last year, the president, in the course of his remarks, mentioned the question of the certification of mine managers as important, not only to the mineowner and the Mines Department, but in a much more acute degree to the mining student considered as an associate member of this institute. Almost every subsequent speaker touched upon the matter, and the divergence of the views expressed made quite evident the necessity of a thorough discussion of the question, particularly in the interests of mining students. One view very strongly held and very trenchantly expressed was that certificates should be granted to candidates on production of university degrees, diplomas of schools of mines, etc., without the necessity to sit for the examination prescribed by the Mines Department or the production of proof of practical experience. With the arguments adduced in support of this, I at the time disagreed, and this paper is intended as an elaboration of the views then expressed by myself. These remarks apply to the State of New South Wales particularly, though they have a general bearing on the attitude of the Mines Departments of other States also to this matter. I do not think that the necessity of issuing some form of certificate to mine managers admits of much argument, but it may be well to briefly enumerate the considerations that influence the State authorities, when they insist on mine managers possessing certain qualifications for the position. Speaking broadly, it may be said that the Mines Inspection Act contemplates nothing beyond the safety of the workmen engaged in the industry, and is entitled 'An Act to make better provision for the regulation and inspection of mines other than coal and shale mines, etc.' Every regulation, every rule, every provision of the Act, and every instruction or notice given under the Act by the inspectors appointed under the Act, whether in relation to the underground workings of a mine, or the engines and boilers and other mechanical appliances used in the extraction of the ore, or its subsequent treatment, has for its specific object either the prevention of accident to the employee or the preservation of his health. It must also be seen that these rules and regulations apply mainly to the underground operations. It may be taken for granted, therefore, that the chief concern of the State in framing this Act is to safeguard the interests of the persons employed in the industry and that the object sought by certification of managers after examination is to ensure that the persons thus certificated are possessed of the knowledge that will enable them to carry out operations incidental to the extraction and treatment of ore with the maximum amount of safety. From this point of view, therefore, the practical man with a wide range of experience should be eminently suited to receive certification, and his want of a high class education technically should be no bar to his certification, seeing that the Act is a provision for the safety of workmen, and that only. The examinations are of such a technical and academic character, however, that it is impossible for the practical man to pass, and if this class of examination continues to be demanded, the only hope for the practical man is that experience shall be balanced against academic attainment. There is another aspect of the question, however, which, though not mentioned, even incidentally, in the Act, may quite reasonably be a matter of anxious concern to the authorities who arrange the examination for mine managers' certificate, viz., the fact that the State owns the minerals, and that in reality the owners of the mines are merely lessees. If this aspect of the question is admitted in relation to the certification of managers, then the demand of the department, that the candidate shall furnish proof of a liberal, technical education, is a reasonable and justifiable one, because it is in the interests of the State that its available minerals shall be extracted in the most economical manner. Every increase in economy of extraction, and every improvement in the recovery of the metals and character of the product brings within the range of commercial operation a very large quantity of ore, and thereby increases the available mineral resources of the State. The reduction of cost and the more complete recovery of the metals is, therefore, a concern of the Mines Department, as it means a larger employment of labour and a larger aggregate expenditure on materials, thus increasing the volume of trade in the State, and consequent on these things automatically increasing the population and the revenue from Customs and other sources. On these grounds, therefore, it will be seen that the State has an interest in the ability of the man who is appointed to control a mine, and has a right to see that such a man shall be properly equipped by his education

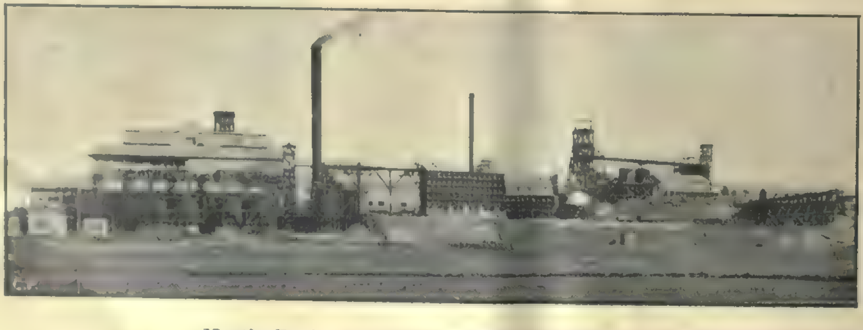


Broken Hill's Water Supply.

to so manage its concerns as to produce the maximum recovery of the metals with the minimum cost, even though this aspect of the question is not contemplated in the framing of the regulations under the Mines Inspection Act. Looking at the subject from the mine-owners' point of view, you will see that the same considerations apply. The State, as is shown, requires safety of working to be the first and most important consideration in the working of a mine, with economical operation as a desirable object in view of its relation to employment and revenue, and I think it will easily be conceded that from the mine-owners' point of view these two considerations, viz., safety and economy, stand in that order in the operation of any mine. Economy that spells unsafe conditions is a fallacy, for the reason that efficiency cannot be secured without normal safety, and that the prevalence of unsafe working conditions may be wide reaching in its effects and may so enhance the difficulties of mining as to put a portion of the available ore beyond the limits of profitable extraction, and may reduce the workings to such a condition as to lead to the abandonment of the mines as a remunerative proposition. There are cases that could be instanced where this condition of things has arisen in mines where unskilled and untrained management has been employed, and this condition of things can easily be brought about in other mines, which, under good management alive to the absolute indispensability of safety and economy combined, would continue profitable to the owner and remunerative to the employees and the State. The mine-owner, therefore, as well as the State, requires a high standard of ability in order that the interdependent results of safety and economy may reach the highest possible standard. The examination set by the Mines Department for managers' certificates in recent years aims at this. The debatable point in the consideration of this question is the amount of emphasis that should be laid on the practical training of the mining student as a qualification for the right to sit for examination as a mine manager. I will state definitely that I consider the Department of Mines were well advised when they placed so much importance on practical work as a qualification for certification, and I consider that any reduction in the term of practical mining work now insisted on would tend to lower the standard of efficiency of mine managers, and to a considerable extent negative the objects in view when certification of mine managers was introduced. In these days with current labour conditions and socialistic tendencies, with all the influence of labour in politics, not the least of the qualifications of a manager in mining or any other industry, involving the employment of a large number of workmen of various crafts, is the ability to manage, control, and negotiate with his workmen. Some men, of course, are naturally adapted to control, but it must aid and augment his natural ability if, before he assumes control in any business or undertaking that he intends to adopt as his profession or life work, he learns from the beginning the very rudiments of his business. If he continues sufficiently long on the practical side, he acquires an intimate knowledge of all its details and complexities, and incidentally an acquaintance with the mode of thought, the desires and aspirations, and even the fads and idiosyncrasies of the workmen with whom, during his practical experience, he has been associated. Bringing this line of argument from the general to its particular bearing on mining, you have a man trained in every way as to the best practical methods of carrying out work with safety, who knows the intimate details of the operations and can instruct others, and who by his ability to do the work himself and the knowledge that his employees have that the manager knows his job, inspires by their confidence in his opinion their willing eagerness to follow his advice and opinion. Any negotiation with the workmen is also rendered easier by the fact that having the practical experience the manager can see and admit their arguments if based on reasonable grounds or refute them effectually if unreasonable. There is a well-known axiom that 'He who seeks to command must first learn to obey,' and there is nothing that more readily commands prompt acquiescence to advice, or unquestioning obedience to orders, than the assurance in the minds of those advised or ordered that the man in command has, by hard won experience, acquired the right to that opinion. This knowledge in the minds of the men begets a confidence that must be very helpful. The faculty of inspiring confidence, whether acquired or Heaven born, is an important factor in the successful control of mining or any other operation. Every successful general has possessed this quality to a marked degree, and the possession of this influence over those under him, whether exercised through their fear, their love, their respect for his ability, their confidence in his judgment, or the integrity of his character, has, I believe, been the dominating factor that has made for his success. It will be seen how important a qualification this is for a mine manager, when he considers that all his technical ability fails of successful utilisation, when his men are on strike, or dissatisfied to a degree that destroys efficiency. On the grounds then, of economy, as well as safety, it seems to me highly necessary that the certificated manager should have received a thorough practical training and experience in order to equip him for his position, and it becomes a question, can a mine manager secure the knowledge, the influence, the esteem and respect for his opinion, or beget the confidence in his judgment necessary to his being faithfully followed by his subordinates unless he has been enabled by practical experience whilst learning the details of their daily work by daily contact with them to enter into their feelings, study their mode of thought, and put himself in possession of the baseless arguments on which workmen, on foolish and ignorant assumptions, found their opposition to innovations and improvements. In other words, is it possible to command with dignity, authority, and benefit to all, if one has never learned to serve and obey? It goes without saying that the examination test for certification must necessarily be on similar lines to those prescribed for degrees of engineering schools and diplomas of schools of mines. The State might, therefore, forego the right of examination in these cases, and grant the certificate on the production of diplomas and proof of practical service, but the latter should be firmly insisted upon. Even with great natural aptitude to command, the usefulness of the man is enormously enhanced by practical experience and intimate contact with workmen, and the wisdom of insistence on practical experience is evident. This course of practical training, if continued long enough to be thorough, is as much to the benefit of the prospective manager as to his employer, in improving his capabilities, or to the State as the guardian of the health and safety of the employee, as it gives him that confidence in his own judgment that accrues from acquired experience. Also it is to the prospective manager's personal benefit in that the time required in gaining the desirable practical experience prevents him from assuming a difficult and onerous responsibility whilst immature in experience and years. The future prospects of many have been blighted by mistakes or errors of judgment, which an older man with less knowledge but more experience would have avoided. I would, therefore, advise every mining student to see as much of the practical side of his profession as possible, and believe it would pay him in the long run, if, in attaining further practical experience whilst young, he somewhat delayed the object of his education, the possession of

Amalgamated Zinc Co.'s Flotation Plant.

Sill Floor Stope (70ft. wide), North Broken Hill Mine.


North Broken Hill Mine—General View.

Belt Conveyor Handling "Filling" from Mullock Pass in North Broken Hill Mine.

his degree or diploma. The nature of the examination is now so strictly technical, that it precludes the possibility of any but a highly educated man passing it. The ordinarily educated man, though of expert experience, with sound judgment, business instincts, and thoroughly competent to run a mine safely and economically, would be sure to fail for lack of special education. This is not as it should be, because it prevents the practical man from rising even though he may assiduously set himself to improve his technical education by attendance at the Schools of Mines, and eventually succeed in thoroughly fitting himself to control the ordinary mine. In fact, it seems probable that the student just through his course, with some knowledge of the principles gathered from text books, has the better chance of success. It seems reasonable, therefore, to suggest that the examination papers should be so arranged that the value of the practical experience should be enhanced in such a way that it cannot be counted out by the technical knowledge. The safety of the mine being the primary consideration of the State, the State's interests would be safeguarded by the certification of the practical experienced man even without the highest quality of technical education, and the mine-owner being thus assured that the interests of the mine are safeguarded, could, if the size and importance of the mine warranted it, select specialists to secure the efficient and economical control of the various departments. This is a reasonable proposition, as mining work is now so specialised in many mines, that even though the manager possesses all the knowledge required in all the departments of a big concern, the control must be delegated to an expert in each. The general knowledge of men acquired by personal contact is useful in the selection of these, as on this selection depends largely the success of the operations. If, however, as occurs in some cases, the certificate is held by the underground manager, and not by the manager, the State's interests are still sufficiently safeguarded, though an anomaly is created by the fact that the subordinate is the legally qualified and official manager of the mine, which is by no means satisfactory, even though the interests of the State are conserved. The safety of the mine is provided for and the opportunity can be availed of to provide the mine with a manager with the highest qualifications in metallurgy, which may in a particular case be of paramount importance. Moreover, if the interests of the State are protected in the appointment of a certificated man to the control of the actual extraction operations in the mine, it leaves a good deal of latitude in the appointment of the manager, who may, in some instances, need to be a man whose business abilities are the main desideratum in his appointment. Incidental to the suggestion regarding examinations it is desirable to make some provision for the certification of under managers and foremen. The experience in practical work, coupled with an ordinary education on the lines of their work, would entitle them to certification for these positions, and the conveniences of a School of Mines would enable them to qualify in the higher branches of their profession so as in time to pass the tests for the manager's certificates. In this way a means of rising from the ruck would be provided, and the best possible man, viz., the man with thorough practical training plus the technical knowledge would be available for the more responsible positions. Such a system would encourage the ambition of the workmen and would be an inducement to young men to take up mining simultaneously with the pursuit of study in the higher branches of their occupation. Incidentally, it would draw into mining operations young men still at an age when both the mind and the body can adapt themselves, and result in the production of skilled miners competent for any class of work, a class that is becoming increasingly scarce owing to the disinclination of the unions to permit anything in the way of apprentices or learners in the art of mining.

"Having stressed the point of indispensability of practical work and experience as being vital in the qualifications of a mine manager, I would make one exception to the rule requiring a certain length of time to be spent in the face, and one only. The mining surveyor, by the nature of his occupation, spends the major portion of his time in intimate association with the underground employee. It follows that, given the surveyor is ordinarily observant, he can acquire more knowledge of the actual details of the operation, the methods of work generally, and the risks involved in the extraction operations, in six months than by working in the face for three years. A man in putting in his practical work may have all his experience confined to one class of operation, but the surveyor has every class of operation brought under his notice and is intimately associated with it. I would therefore allow service as a surveyor for the term to constitute eligibility to sit for examination without the practical experience in the face. Experience applies to underground work only, as safe methods are easy on all surface workings.

"From the foregoing, it may appear that I suffer from a strong prejudice in favour of the practical man, and to those who know me well, it would be idle to 'deny the soft impeachment,' which I frankly admit, but my predilection in his favour does not blind me to the merits of the technical man, and the manner in which I have utilised him in any operations I have had the honour of controlling is equally well known, and must dispel any such supposition. But lest I may appear to have unduly stressed the indispensability of the practical training, I am glad to assert that among the very best men in this district may be numbered some whose education was almost solely academic up to the time they were given some sort of control, and I have every confidence in saying this as applying not only to fellow-managers controlling the gigantic operations of this field, but as regards their departmental officers and my own. At the same time I am certain that the special opportunities and facilities placed in the way of young men coming to this field who showed any marked adaptability has been a factor in their success and a pronounced factor in the enhancement of their usefulness. There is no doubt either that much of the success of the processes in vogue and the improvements

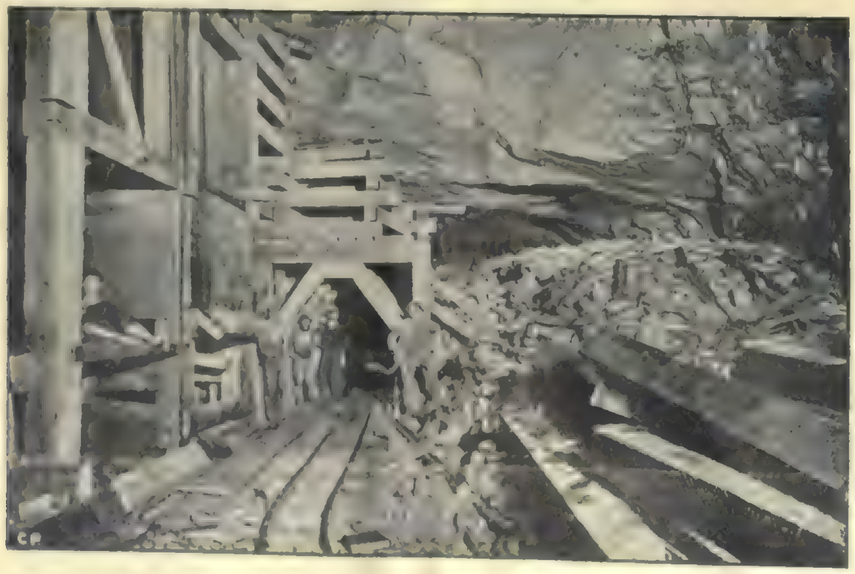
British Broken Hill.

Broken Hill Junction North.

Broken Hill Proprietary Block 14.

effected therein has accrued from the contact of bright minds and clear brains trained to correct habits of thought. The technical training induces logical thought and develops the critical faculty that tends to a well-balanced mind, so that with some knowledge of principles gained in study a correct judgment can be formed on matters of procedure and policy on general lines. This applies as strongly to purely mining work underground as it does to metallurgy and other arts incidental to it. Although it may appear, therefore, that the rough road of practical experience the more surely leads to the desired goal, there are many ways leading to the same end, and thorough training in the way indicated so fits some men that they will make some sort of success of any job that comes to their hand. If, therefore, as here argued, it is to the advantage of all parties concerned that practice and theory should go hand in hand, is it not advisable that universities and schools of mines should insist that some portion of the students' vacation should be spent in acquiring the practical part of the profession they are studying for? I am sure this would be of material advantage to the student in letting him see the practical application of the theories he is assimilating, and lead him to a quicker and clearer understanding. I feel sure this would facilitate the work of the lecturer, and I am certain that facilities in this direction would be freely placed in the way of students by those controlling mining operations generally. If these facilities were availed of there would be little fear of any man choosing the vocation of a mining engineer, while perhaps mentally and physically unsuited to it, and very decided influences would be at work from the start having the effect of raising the status and improving the position generally of the profession in the Commonwealth. The periods spent in practical work during study would render the succeeding term of practical experience much less irksome, and the insight gained during study would make students keener to continue the practical until thoroughly proficient in every department of mining and metallurgy. Whatever may be the views of members of this institute on the necessity for practical experience, and whatever policy may originate from the full discussion which I hope will follow, there can be no divergence of opinion on the urgent need—that of reciprocity between the different States of the Commonwealth in this matter of mine managers' certificates. We are an institute representative not of one State, but of the mining profession of the whole of Australasia, and it seems a duty peculiarly appropriate to our aims that we should endeavour to bring about some workable agreement between the different States. At present, there is no real reciprocity at all. The possession of the certificate of competency as a mine manager in one State conveys no legal rights in another State, and only in one or two cases is there what might be called a courtesy recognition of a neighbour's certificates. This is not as it should be. While many of the States' duties to and benefits from the mining industry may be different in, say, West Australia, to those in Victoria, nevertheless the man who can safely manage a mine in one part of Australia can certainly do so in another, and the State boundary lines should offer no impediments to his usefulness to the industry. No more valuable opinion could be formed than one resulting from the deliberations of such a representative body as this institute, and I will conclude with the hope that to-night's meeting will at least lay the foundation of a definite policy for placing the certification of mine managers on a sound and permanent footing.''

Broken Hill Proprietary Mine—General View.



Proprietary Mine, Underground Workings.

## The President.

Mr. James Hebbard, manager of the Central Mine, Broken Hill, President of the Australasian Institute of Mining Engineers, was born in Bendigo in 1862, and began his career in the Hustler's mine in that city. In '84 he migrated to Silverton, which was in those days a roaring mining camp. His first ''job'' was on the Hen and Chickens, then under the management of Mr. W. R. Wilson, who was general manager for the Barrier Ranges Silver Mining Association. It may be mentioned that at the Day Dream, which was one of the association's properties, the furnaces had water jackets, although it cost 10s. per 100 gallons to cart water to the mine. Young Hebbard worked at the face, hammer and drill boring. There were no drill boring machines in those days. A fortnight later his skill as a practical miner having attracted the attention of Mr. Wilson, he was recommended to the late Mr. Teddy Crisp, who appointed him manager of the Lubra mine at Purnamoota. This was the first rung in the ladder of success attained by him. He kept the position until the mine was floated into a company, and in 1885 accepted work as a miner under Mr. W. Jamieson, who had been appointed general manager of the Broken Hill Propty. Co., and very soon rose to the position of underground foreman. This he relinquished for the managership of the Britannia and Scotia S.M. Co., which was situated three miles from the old Gipps Head station. Six months later he resumed the foremanship at the Proprietary. At the end of the following year he was appointed manager of the newly formed Junction Co., and about a couple of years later resigned to take up a similar position in the Toms Lewis Ponds S. and G. mine at Orange, New South Wales.

Mr. Hebbard's fame as a mining expert was officially recognised by the Government, who in 1891 promoted him to the responsible position of Government Inspector of Mines at Broken Hill, a position he filled for ten years, when he resigned to accept the assistant general managership of the Central Mine (Sulphide Corporation), under Mr. C. F. Courtney, whom he succeeded in 1903. His early experience of the managership was carried on under somewhat adverse circumstances, a series of creeps interfering with the working, and wrecking mill and other plants, which were then on the town side of the mine. The disaster, however, was faced with courage, and order brought out of chaos.

C. Emery,
General Manager, British Broken Hill.

Mr. Hebbard has been President of the Mining Managers' Association, and is also a member of the American Institute of Mining Engineers.

Mr. Hebbard, in 1887, married Miss Olivia Pope, daughter of Mr. Richard Pope, manager of Johnson's Reef, Bendigo.

## BROKEN HILL.

(By Our Correspondent.)

The world at large has never understood Broken Hill. To millions it has ever been but a name. To thousands it has been just a Somewhere where mines exist. Many investors know that Broken Hill is, simply because they own scrip on which the name "Broken Hill" is printed in big letters. The mass of the people who have heard the name of the place believe Broken Hill to be the centre of dust, heat, discomfort, and ultra-unionism. It has always been, to the many, a Land Unknown.

O. B. Ward,
General Manager, Broken Hill Pty. Block 10.

And for many years, possibly, it deserved the reputation it unfortunately still holds. What is said about it as a red-hot centre of unionism is correct. It, through the unions, attempts to rule the policy of Australian Government. Of course, it doesn't succeed; but the unions still carry resolutions and think they are helping to turn the wheel that rolls definite action.

'Tis a rude thing to say, but it is unknown that the legislators of the country smile, if they do not laugh, at the decisions of the Broken Hill unions. The three members for the district are all Ministers—Messrs Cann, Griffith, and Thomas. The latter is a member of the Commonwealth Ministry. The American story, "From Log Cabin to White House," is applicable in Mr. Thomas' case. He was once a digger of "post holes" on the Barrier. He had a big hand in the famous '92 strike, got into Parliament, and stepped forward grade by grade. Mr. Thomas and Mr. Cann are examples of the history of Broken Hill. Mr. Griffith, so far as Broken Hill is concerned, is only a latter-day intrusion; but intrusions seriously affect a run of ore.

G. D. Delprat,
General Manager, Broken Hill Proprietary Co.

Broken Hill's beginning dates back to 1844, when Sturt discovered the Barrier Ranges. The memory of the early explorers is kept green by the names of municipal wards of the city—Burke, Wills, and Sturt. In 1876, Thackaringa became known through the discovery of silver-lead ore. Later on, in 1880, Silverton became a fact through the mineral discoveries at Umberumberka, Day Dream, the Apollyon Valley, and the surrounding district. Thousands of pounds were made and lost in what to-day are called "outside shows." They were No. 1 propositions in those days, but eased off when the carbonate zone was passed through. Some of the old "shows" may be worked again, when necessary. Sulphides should live below the carbonate area.

James Hebbard,
Manager B.H. Central Mine,
President A.I.M.E.

Before me I have figures showing some of the outputs of the early day mines. They, of course, are small compared with the doings of to-day. But in 1890, the Pioneer mine sent away over £30,000 worth of ore. The Gipsy Girl was credited with £13,500; the Apollyon with £10,000; and many others with more than enough to pay the owners and shareholders.

Nearly all the mines of the late "eighties" are dead. When Broken Hill came into existence, the miners from all over the district centred to the wonderful centre, and there since has been only dabbling at a few of the propositions.

G. Weir,
General Manager, North Broken Hill; President, Broken Hill Mining Managers' Association.

Broken Hill had its real being in 1883. "Paddy" Green had found mineral earlier, but in 1883 Chas. Rasp, then an employee on Mount Gipps station, found ore. He then had only a vague knowledge of what he had found, but he was able to induce the manager of the station, Mr. Geo. McCulloch, and a few others, to take up portion of the station as a mineral lease and prospect. Broken Hill city, as it is to-day, is portion of the old Mount Gipps station. Minerals proved better for Mr. McCulloch than sheep.

A "Broken Hill Mining Company" was formed. The name was based on the formation of the range of hills, at the foot of which Rasp found his ore. The original company, in these days called a syndicate, were:—George McCulloch (dead), Chas. Rasp (dead), Philip Charley (Sydney), David James (Kapunda, S.A.), James Poole (dead), Geo. Urquhart (dead), G. A. M. Lind (dead). Each man put in £70, or its equivalent. But the stock didn't long continue as "sevenths." The original holders split up their interests, and "fourteenths" were quoted. Many men to-day tell how they were offered a "fourteenth" for a trivial sum. Some of these men tell the truth. One man, known in the English racing world as "Mr. Fairie," won portion of a share at a game of cards. Lind sold his share at an early stage.

W. E. Wainwright,
General Manager, Broken Hill South.

This "Broken Hill Mining Company" was the basis of the present gigantic Broken Hill Proprietary Co., one of the great industrial concerns of the world.

Good ore was met with in the company's first experimental shaft, Rasp shaft, and when the news and the values of the ore became known men rushed in from all quarters to have a hand in the game. Silverton, Day Dream, the Valley—all were deserted. The Broken Hill Company, however, had secured many acres of rock and mulga, so explorers went north and south.

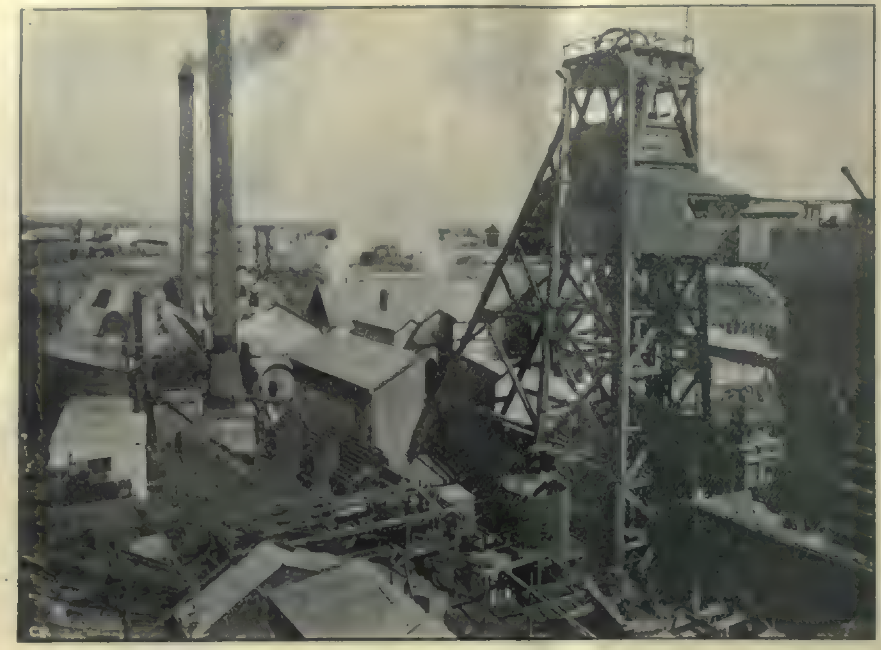
Mr. W. Maiden, of Menindie, took up what are now the South and South Blocks mines. He is not a millionaire, but he still holds a good interest in the South mine—taken up after he had passed his original possession.

E. J. Horwood,
Works Manager, Broken Hill Proprietary Co.

In the year 1891, locally, the following statement was printed (this is from a rare book, now out of issue):—"The almost phenomenal progress which the Barrier has made during the last few years is, it may be said, unparalleled even on this Continent, where towns have sprung up amid arid wastes and rugged gullies as grows the enchanter's magic tree. Cities of mushroom growth have too frequently but the short-lived existence of their prototype, but so ephemeral a future does not seem to be in store for the capital of the Barrier silver-field. So far as human prescience can vouch—a prescience founded on the researches of eminent mineralogists and practical miners of the highest experience—untold millions still lie hidden in the bowels of the mines awaiting the onslaught of gad and pick-axe. The stranger who parades the streets of Broken Hill and views the handsome buildings on either hand, and observes the clouds of dense smoke arising from the numerous stacks of reducing works and furnaces, can scarcely realise the fact that even the urchin who vends the daily papers has been the witness of these proofs of progress. It is but few years since the ground covered by these stores and dwelling-houses, which find work or provide rest for 30,000 fellow mortals, afforded a scanty sustenance to the squatters' herds and flocks; and the occasional crack of the stockwhip alone broke the silence which now resounds with the detonation of dynamite, the whirr of groaning machinery, and the tap of the artificer's busy hammer. To Broken Hill, however, belongs not the honour of being the pioneer town of the Barrier. At a time when the wallaby and kangaroo were only disturbed at their gambols by the occasional visits of prospectors, enamoured of the rugged outline of the peculiar-looking summit, Silverton had attained a not unimportant position, was hailed as the metropolis of the Back Blocks, and naturally considered destined to form the hub of the wheel from which the spokes would radiate to the congeries of mines to be developed in the near future. These anticipations, however, have not been realised, and the discovery of the marvellous wealth which lay hidden in the Broken Hill line of country soon emptied Silverton of more than half its residents, and diverted the stream of fortune-seekers who were hurrying to the Barrier. Lawless tales of the 'early days'—not yet a decade ago—tinged ofttimes with a halo of romance, show what life in the silver country then was. If men did not 'pull out their derringers for anything, maybe the price of whisky,' as Bret Harte tells us was the custom on Californian fields, yet these days had characteristics of their own—which will give ample scope for the pen of the future novelist, but would be altogether out of place in the matter-of-fact pages of the present publication. In May, 1885, J. P. Abbott, at that time Minister for Mines, arrived in Silverton, and, in making a thorough inspection of the various claims in the locality, visited the Broken Hill. Chlorides had recently been found in the shaft which was being sunk on Block 12, and care was taken to bring this and the other good 'shows' under his notice. The usual Ministerial promises were given, and, apparently, soon forgotten; but one important circumstance attending the visit was the presence of a ''Sydney Morning Herald'' reporter, and there is no doubt that the articles contributed to the 'great daily' of the colony did much to bring the Barrier silver-field into prominence. Before the month had passed away the Silverton Tramway Company's prospectus was published, and the shares were quickly taken up. In June 'The Broken Hill Mining Company' was formed, with a capital of 16,000 shares, of £20 each, two thousand of which were offered to the public at £9 each. These were also quickly applied for, and an ever-increasing interest was aroused in the adjoining claims.

''Broken Hill began to assert itself as soon as population flowed that way. On November 8th, 1885, the first meeting of the Progress Committee took place; Mr. W. Jamieson, then manager of the Broken Hill mine, was president, and the other members were Messrs. Vaughan, Renowden, Ramsden, Duff, and Clayton (secretary). Their first place of meeting was Ramsden's boardinghouse, and the first motion passed urged the appointment of a postmistress and the advisableness of Broken Hill being included in the mail-coach route between Silverton and Mount Gipps. It was also agreed that each member of the Committee should contribute 5s. per sitting towards cutting the mail track through what is now Argent-street! At the second sitting it was resolved that the Government should be petitioned to set apart five acres as a water reserve. Iodide and Oxide streets now run through the proposed site. On January 1st, 1886, Mrs. Renowden was appointed postmistress, at the munificent salary of £10 per annum, and to this lady belongs the honour of being the first Government official in Broken Hill. The letters then numbered twenty per week; in February the average increased to forty, and by the end of August to two hundred.

The high expectations of writers of more than 20 years ago have been more than realised. Mr. J. H. Curle, special mining commissioner of "The Economist," confirming the ideas of earlier experts, said in July, 1905: "The great silver-lead lode worked by the different mines at Broken Hill is, I believe, about to become the world's centre of interest so far as these metals are concerned." Yet neither the writers of the early "nineties" nor Mr. Curle hit upon one of the secrets which have assisted to place Broken Hill in the forefront of the world's mineral fields.



Central Mine, Power Plant, Shaft, Etc.

Broken Hill has had more than its share of trouble. It has suffered from serious strikes and industrial troubles—these have helped to retard progress. It has encountered grave metallurgical problems. But Brains have overcome everything. Brains have won.

In the early days of the field carbonate silver-lead ore only was sought for and worked. This was found near to the surface, close to the "grass-roots." Wonderfully rich ore was mined over a very wide area. But this gave out in time. The sulphide zone was met, and many of the outside mines were abandoned. It at one stage looked as if Broken Hill was up against a thick wall. Population decreased, property depreciated in the Brains of the mines saw the possibilities of value, and the end of the field was predicted. But the immense bodies of sulphides that were being exposed, and a period of serious thinking ensued. About 1895-6, a glimmer of light was visible, success followed success, and very soon the Sulphide Problem was solved. Broken Hill had a prosperous run for several years. Minor problems arose, and were mastered. Then came the great Zinc Question, early in the present decade. The sulphides generally began to carry more zinc, some of the lodes encountered showed a preponderance of zinc, and huge dumps of residues grew on the surface of all the mines, all rich but useless, and interfering with the economic working of the surface plants. Brains were again called for; the Zinc Problem was mastered, millions of tons of waste material became a valuable asset, and a new industry was introduced.

Central Mine—Wet Mill: Lead and Zinc Sections.

Dry magnetic concentration, wet magnetic concentration, flotation, granulation—various methods were experimented with. Stage by stage difficulties were surmounted. Ullrich, Odling, Warren, Potter, Delprat, De Bavay, Gillies, Cattermole, Carmichael, Elmore, Ballot—these and other men took a hand in the game. Rapid advance was made in knowledge, though ever at enormous expense. The Junction North moved. Other mines experimented. Then the Zinc Corporation came into being, and erected big works. These works, put up on the British lease, nearly ruined the Corporation, wealthy as it was. Expert after expert put his hand to the wheel. Some of the men moved the wheel forward, a few let it run backward. But perseverance won in the long run. The Delprat and De Bavay processes "made good" also, and to-day it seems difficult to recollect the time—so few years ago—when the only products of the Barrier were silver and lead.

To-day the mineral exports of the Barrier rank thus:—Lead 1, zinc 2, silver 3, gold 4. Copper and tin are several secondary products.

The population of Broken Hill at the present time is close on 40,000 souls, and about 9000 men are directly engaged on the mines and treatment works. Then Port Pirie (Propty.) and Cockle Creek (Sulphide Corporation) employ between them over 2000 more in the smelters, the refinery works, and the spelter plant. The Sulphide Corporation at one stage had a spelter producing plant at Cockle Creek, but this was transferred to England to the Central Zinc Co. Thus only the Proprietary produces spelter at the present stage, and this company, but on a moderate scale.

The Barrier is studded with mines, the majority dormant, a few keeping small parties of men in "tucker." Operations are really centred in a stretch of ground between two and three miles long, which separates Central and South Broken Hill. Starting from the northern end of the line of lode, the order is:—

De Bavay (Amal. Zinc) works, North mine, Junction North mine, Junction mine, British mine, Block 14 mine, Proprietary mine, Block 10 mine, Central mine, South mine, South Blocks mine, and Zinc Corporation works, South Extended mine.

Further southward, on the flat, are the Silver City Blocks, Horseshoe Blocks, Rising Sun, White Leads, and others, extending right to the Pinnacles. Recent developments in the South Blocks and South mines are favourable to the whole of this flat being payable at depth, so soon as a greater output from the field is necessary. No one who really knows is at all pessimistic about the Barrier. When more ore is wanted it will be found. It is only natural that the mines in work are not anxious to invest money in other properties while the supply is equal to the demand of the world's markets.

Unfortunately, all the mines named are not on the same plane of prosperity. The North, South, Central, and British have immense ore-wealth proved. They are safe for a decade or two just on what is now "in sight." The Proprietary still has a lot of ore to work out, but hitherto exploration at the lowest levels has not resulted in all expectations being fulfilled. But the Proprietary is highly conservative in some of its methods. It doesn't let everything be known; it always has something "up its sleeve." The writer doesn't anticipate seeing the day when the mine ends its career. The South Blocks is an improving proposition. Its orebodies are widening as they go down, and values improve. Block 10 has been rather a failure in its deepest workings, but the higher levels still offer a fairly lengthy life. Block 14 is seemingly near the end of its tether, though one can never tell. Greater depth may reveal a surprise. But the ore visible to-day is not extensive. The carbonates are naturally a decreasing factor and the sulphides are limited in quantity and of low grade. Block 14 is the only mine that isn't at present milling its ore; it sells direct to the Proprietary Co. and Junction North Co. The Junction remains in a "hopeful" stage. There is undoubtedly ore in the mine; it remains for the management to raise it and treat it profitably. If [illegible] the Junction North will be on a sounder footing in three months' time than it is to-day. Meantime the treatment plants are achieving all they were erected to do, and the outlook is brighter than it was. The South Extended is for the future. It has proved considerable ore, and is proving more; but production is still delayed.

Broken Hill Block 10 Mill.

The dividends paid by the mines and treatment plants to-day are as follows:—

Proprietary, £10,476,000 (exclusive of bonuses, "prop" shares, etc., valued at £2,408,000); Block 10, £1,405,000; South, £1,355,000; Sulphide Corporation, £1,239,438; British, £549,500; Block 14, £592,313; Junction, £81,750; Junction North, £88,166; North, £729,650; Zinc Corporation, £591,850; Amalgamated Zinc, £362,500. Total, £17,319,300.

A few of the old-time mines also paid dividends—but records of these payments are lost in the past.

The Proprietary is, of course, the parent of the present-day mines. It holds about 800 acres of mineral leases, has a capital of 960,000 shares of 8s. each; most of the shares are owned in Great Britain, and it has output nearly £35,000,000 worth of lead, silver, zinc, gold, and copper. The early day "pups" of the Big mine were Block 10, Block 14, and the British. The Proprietary erected smelters in 1886, but transplanted them to Port Pirie about 1899. At one time the Proprietary led in everything in the matters of testing new processes, experiments, etc., but, in more recent years, the other companies shed their swaddling clothes and there has been a friendly rivalry which has worked for the good of all. No mine now is above taking a hint from another. Interests are interwoven, and it has been by combination that success has attended the efforts of the companies.

At one stage of the field's history, the mining managers were mostly from Cornwall and America—practical miners all, but not college men, and not men versed in the geology and theory of mining. They were the pioneers and opened up. The Broken Hill mine manager of to-day is a different stamp of man. He is a geologist, a miner, an engineer, an electrician, a mill man, an experimentalist, a diplomat. He naturally has departmental officers under him, who carry responsibility, but he has to know for himself. His task is no light or easy one, and if he, as a rule, receives a large salary, he certainly earns it.

Estimates of the life of Broken Hill have frequently been made but not a one has ever been accurate. No estimate could be even nearly exact. No man can see through a wall of ore. Therefore, the wise manager endeavours to carry about 5 years' supply of ore "in sight." This is the position of most of the mines. An exception is Block 14. Also, the South, Central, and North, by reason of their extensive development work, can see even further ahead. Personally, I am content to predict 10 or 12 years' "life" on what is known. And more is yet to be known.

The mines have been opened up down to 1400 and 1500ft. Not so long ago, as modern time goes, a depth of 500 or 600ft. was thought to be great, and the finish of operations was looked for. But methods have advanced. What a few years since was regarded as a hopeless low-grade proposition is now accepted as a pleasant dividend-paying scheme. Perfection, it may be, is not yet. Several treatments are necessary to win all the metal contents of a ton of ore. But more than one company attains a recovery of 98 per cent. The residues being sent underground as filling contain in some cases only about 2 per cent. of mineral. It may be that these results will ere long be gained more expeditiously and economically. This is the metallurgist's dream. Mining and Progress go hand to hand, and the gigantic results that have been achieved in Broken Hill have placed the Hill in the rare position of being the chief training ground of Australian mineralogists, metallurgists, and mining engineers.

Broken Hill, 30 years ago a portion of a sheep-run, is now one of the world's important places.

## Broken Hill Proprietary Company Limited.

The Broken Hill ore deposit was discovered in 1883 by Mr. Charles Rasp, then a boundary rider on Mount Gipps Station, of which the Broken Hill District then formed a part.

In examining the bold manganic iron outcrop on what is now Block 13 of the Broken Hill Proprietary Company Limited, he found what proved to be argentiferous carbonate of lead ore. A syndicate, comprised principally of employees of the Mount Gipps Station and their friends, pegged out seven blocks, embracing a length of nearly two miles of the outcrop, and sank what is known as Rasp Shaft, with encouraging results.

The possibilities of the Broken Hill lode were later on greatly emphasised by the discovery of rich kaolin ore, containing chloride of silver on the outcrop on Block 12, by an aboriginal in the employ of Mr. William Jamieson, then Government Surveyor, as a result of which a considerable quantity of ore, assaying up to 7000 ounces of silver per ton, was despatched to Melbourne, and the Day Dream smelters, near Silverton, placing the company in a good financial position.

The erection of a number of 30-ton smelting furnaces early in 1886 enabled the company to treat its own ore, and to begin paying dividends in that year. Early in 1888 five new 80-ton furnaces were put into commission on Block 12, afterwards increased to 9, and these were followed by the substitution of six 80-ton smelters on the site of the old 30-tonners. The 15 smelters continued in operation until 1898, when, owing to the changed conditions, brought about by the increased proportion of sulphides, all smelting was conducted at Port Pirie, as being more advantageous.

In the late "eighties," Blocks 10, 14, 15, and 16 (the latter two now known as the British Broken Hill Co.) were floated into separate companies, and the shares distributed amongst the shareholders of the parent company, together with cash bonuses amounting to £576,000.

At about this time the annual dividends derived from profits on ore treated reached, and were maintained at this figure for several years, the sum of over a million pounds per annum.

The first concentrating mill was erected about 1888 to deal with silicious carbonate ores, an American steam stamp being used for crushing; in 1894 a new concentrating plant, having rolls for crushing and other improvements, was erected, and dealt with both carbonate and sulphide ores.

Other early plants, which operated on argentiferous silicious ores until these were depleted, were the chloridising and lixiviation plants, and the amalgamating plants.

In 1896 a new ore dressing mill of about 6000 tons weekly capacity was erected to deal exclusively with sulphide ore, and in 1899 an additional plant of like capacity was erected and brought into operation. These plants of a combined capacity of about 12,000 tons of sulphide ore weekly, ran without appreciable interruption until the end of 1908—the introduction of tube mills in 1907 marking a considerable advance in regrinding.

The successful treatment of the Broken Hill sulphides for the recovery of a zinc concentrate by flotation was first carried out on a commercial basis in a plant erected by this company in 1903—this plant having later on been improved and enlarged to a capacity if worked 3 shifts daily of over 12,000 tons weekly.

As a necessary adjunct to this plant, a sulphuric acid plant, capable of producing over 200 tons of acid per week, has been provided, part of which is derived from the roasting of zinc concentrates in Hasenclever muffle roasters prior to the distillation of the zinc contents at Port Pirie, and the balance from imported sulphur.

For over two years (1909 and 1910) no ore was mined; but the treatment plants were utilised to their full capacity in regrinding dump tailings and incidentally recovering substantial quantities of lead concentrates preparatory to subjecting the material to the flotation process for the recovery of the zinc in the form of zinc concentrates.

One of the mills was remodelled to adapt it to the work of regrinding dump material, whilst before the resumption of mining the other mill was improved in various ways to increase recoveries and cheapen the cost of treatment. Labor-saving appliances were at the same time introduced, including extensive systems of conveyor, involving the use of about one and three-quarter miles of belting, and the use of a steam shovel for handling the dump material.

Mining was resumed early in 1911, and was continued on the day shift only for about two years with an output approaching 5000 tons weekly, and, latterly, portion of the mine has been worked on two shifts.

The ore reserves, as given in the last half-yearly report, were about two million tons, whilst the tailings dump available for zinc flotation work, excluding slimes, was set down at 1,150,000 tons.

Zinc Corporation Works.

An important feature of recent date has been the development of a method of separating the valuable constituents of the sulphide slimes from the gangue by a modification of the acid process without the use of oil. A plant has been installed capable of dealing with 2500 tons of slimes weekly.

To the end of 1912, the amount distributed amongst shareholders, including the nominal value of the shares in Blocks 10, 14, and the British Broken Hill Companies, and bonuses, amounted to £12,000,000.

## British Broken Hill.

The British Broken Hill Proprietary Company Limited has for its mining property at Broken Hill, three mineral leases, Nos. 15, 16, and 57.

Nos. 15 and 16 were originally part of the parent company, the Broken Hill Proprietary Company Limited, and lie in a direct line between Block 14 and the North Company, with the Junction and Junction North mines adjoining the north-west boundary at the northern end. Mineral lease No. 57 lies on the south-east side, and is not, at the present time, used for mining purposes.

The principal portion of the mining work is now carried on in the vicinity of Thompson shaft, which is a little south of the boundary line between mineral leases 15 and 16. The mine has been producing for some time past approximately 4000 tons of ore per week, which has been milled on the property, and the resulting products, viz., lead concentrate, zinc concentrate, and slime, sold.

Alterations are being made to the mill with the object of obtaining a better extraction of metals, and treating the slime, and having to sell only lead and zinc concentrate. During the next few months, while the mill is in a transition stage, the output may be somewhat reduced.

Meanwhile, development is being pushed on underground, and facilities for breaking ore improved. The No. 10 level is opening up well. The No. 11 level plat is being cut, and a crosscut towards the lode will be started very shortly. After that, the shaft will be continued to the No. 12 level.

The total dividends paid amount to £474,332 2s. 11d. The last one was 4s. per share, in December, 1912.

## North Broken Hill.

The following resume of operations at this mine from July 1st, 1904, when the present general manager took charge, to Nov. 30th, 1912, has been kindly supplied to us:—Ore reserves at July 1st, 1904, 210,000 tons; crude ore mined, 1,334,955 tons; concentrates produced, 231,629 tons; containing lead, 162,887 tons; containing silver, 4,771,601 oz.; wages paid, £904,798; stores and material used, £481,376; dividends paid, £641,440; ore reserves at November 30th, 1912, 2,168,000 tons.

Broken Hill South.

## Amalgamated Zinc (De Bavay's) Limited.

The Amalgamated Zinc (De Bavay's) Ltd. was formed in October, 1909, to take over the assets of the De Bavay's Treatment Co. Ltd., and erect a large working plant capable of treating the output of tailings from the North Broken Hill Ltd., the Broken Hill South Co., and the B.H. Proprietary Block 10 Co. The plant is now and has been for several years past treating about 44,000 tons of tailings every four weeks, and producing about 12,000 tons of zinc concentrates in the same period.

## Broken Hill Block 10.

Block 10 mine is bounded by the B.H. Proprietary to the north and the Central to the south. The company was formed in 1887 in Melbourne, and is controlled by a Melbourne Directorate. There are three leases totalling 124 acres. Since the inception of the company 2,034,395 tons of ore have been mined, of which 1,911,388 tons have been subjected to concentration, and the balance sold in its crude state. It is estimated that the crude ore contained 36,632,752 oz. silver, 362,387 tons lead, and 343,011 tons zinc. In March, 1891, the first dividend was paid, and the total distributed to date amounts to £1,290,000, equal to £12 18s. per share.

This property is equipped with the most recent and up-to-date mill on the line of lode, and is now treating about 8000 tons of ore per month for a return of 1000 tons of concentrates, and has ore in sight blocked out for a period of rather more than two years at present rate of mining without further development.

The main shaft has been carried down to a depth of 1840ft., the lowest level opened up being at 1815ft. This is the deepest mine on the line of lode, but, unfortunately, the enterprise of the Directors in the way of deep sinking has not, so far, met with the success deserved, as no ore sufficiently high grade to be mined has been met with at either 1715 or 1815ft. levels.

The wages distributed fortnightly amount to about £2850.

## Broken Hill South.

The present capital of this company is £200,000, of £1 shares, of which 130,578 have been issued as fully paid up, and 69,422 paid up to 9s. 6d. The company was originally known as the Broken Hill South Silver Mining Company Limited. The property comprises blocks known as 7 and 8, an area of 68 acres, bounded on the north by the Sulphide Corporation mine, on the west by the Central Extended and water leases, on the south by the South Blocks, and on the east by the town of Alma. The lode runs in a north-east and south-west direction, through the middle of Blocks 7 and 8, over a length of 2250ft., of which 2150ft. have been developed. From the surface to the 425ft. level, the ore passed from carbonate to very high grade friable sulphides. There are at present few workings above the 425ft. level, but from the 525ft. to the 1070ft. the lode is of very large dimensions, in compact sulphide ore.

The mine started work 28 years ago, in the year 1885, under the management of Mr. W. H. Morish. Ore was first met with in sinking the shaft, and in the early part of 1888 oxidised ore was raised, and sold for treatment to outside smelter companies. In the same year Richard Piper, the then manager, started concentrating experiments with a Cornish jig. Three years later the company started smelting operations on the mine. A large plant, consisting of three 80-ton smelters, was blown in for active work in August; these smelters, after a very short life of two years, were closed down. A parcel of sulphide ore was, in 1893, sent to Moonta, and there treated by Captain Hancock. The results were satisfactory, and during the same year—chiefly through the efforts of Mr. Rodway—a concentrating plant, the first on the field capable of treating 1000 tons a week, was started; and on January 14th, 1894, concentrating plant, consisting of one 12in. x 7in. jaw breaker, one 27in. x 15in. Cornish roll, and one Hancock jig, was put into operation, treating high grade friable sulphides with satisfactory results. This plant was added to in 1895 by Cornish buddles.

The South mine was placed on the dividend-paying list by paying its first dividend of 6d. on January 22nd, 1897. Up to this period the concentrating plant was working with such satisfactory results that it was decided to increase the capacity of the mill to 2000 tons weekly, and at the same time effect certain improvements. In the latter part of 1898 these additions and improvements were completed. The operations at this stage became so extensive and progressive that the directors issued, in June, 1900, improved comprehensive half-yearly reports, giving full information of the work done during the half-year; this has since been continued. The surface and concentrating plants were re-modelled and extended in 1901, providing for the treatment of 3000 tons of crude ore weekly. The surface reconstruction included the replacing of the old Lancashire boilers by those of Babcock and Wilcox.

The South mine has for a long time been pursuing a vigorous policy of developmental and exploitation work, the benefit of which will be seen when the economies that must accrue from it will become a feature of its working account. The mine gradually developed ore reserves of such extent that the erection of a new mill, capable of treating 8000 tons per week, was decided upon; and this work was completed and the mill put into operation in April, 1908.

Too much space would be taken up if a detailed description of the underground workings of this mine were given; but, generally, it may be stated that from the northern boundary of Block 8 to the southern boundary of Block 7, a distance on the line of lode of 2500ft., the lode possesses all the chief characteristics of the Broken Hill lode, from the surface downwards, retaining, as an additional virtue, that increase in size and value at the lowest levels which gives the mine such stability. Right from the surface to the 300ft. level good grade carbonate ore has been extracted (though at all times the ore from this mine has been remarkable rather for its lead than for its silver value), and at the present time many of the old stopes are being reopened to obtain ore now profitable to extract. From the 300ft. to the 425ft. level, which is practically the transition zone from oxidised to sulphide ore, soft, friable and sulpho-carbonate ore has been mined in large quantities, and still occurs in bodies big enough for profitable mining. Between the 425 and 1070ft. levels, the usual sulphide ore (a close mixture of sulphides of lead and zinc, and silver) occurs, of uniformly good grade, and suitable for concentration, the stopes varying one from another mainly in the class of the gangue, the latter being accompanied by a rise or fall in silver and zinc values, i.e., rhodonite and garnet gangue means high silver and zinc, quartz-calcite gangue shows low silver and zinc. Although large quantities of sulphide ore have been extracted, there yet remains above the 1170ft. level, on a conservative estimate, 3,250,000 tons of ore. So much for the working levels, but below the 1070ft. level the mine is being opened up at the 1170ft. level, and the main shaft is being pushed on to the 1370ft. level.

## Broken Hill South Extended Limited.

This is the youngest of the Broken Hill mines, as it was only started 6 or 7 years ago. It is the most southern of the mines at present working, its boundary adjoining that of the South Blocks mine (Zinc Corporation). Though still in the flush of youth, it is a fairly deep mine, a level now being opened up at 1130ft., to operate on a very promising lode cut on the 930ft. and 600ft. levels. The lode has been driven on for a considerable distance at the 930ft. level, and after it is opened up at the 1130ft. level, it is anticipated that ere long the mine will take its place among the producing mines of Broken Hill.

## MINERS' PLAINT.

### Preference to Unionists Claimed.

An alteration has been made in the plaint lodged on behalf of the Federated Mining Employees' Association with the Federal Registrar on 4th April. This set out the hours of work and rates and conditions of pay which the association propose for adoption in the mining industry. No fewer than 258 respondents have been served with the plaint, the companies carrying on business in Victoria, New South Wales and Tasmania. Over ninety of the companies are registered in Bendigo, and about fifty in Ballarat. The Broken Hill Proprietary, Block 10, and the Mount Lyell Mining Co. are included amongst the respondents.

Formal notice has now been given to the respondents that the claimant organisation will, at the hearing of the plaint, apply for an amendment by the addition of the following clause (No. 74)—"That preference of employment be given to members of this organisation, other things being equal."

## MT. LYELL M. AND R. CO. (T.).

In moving the adoption of the reports and balance-sheet, at the half-yearly meeting of the Mt. Lyell Mining and Railway Co., at 31 Queen-street, Melbourne, on Friday, Mr. W. Jamieson, chairman, said the 1100ft. level at the engine winze end of the North Lyell mine was now out of water, and he expected the whole level would be clear this week. Ordinary conditions of working above that level were now being gradually restored. The South Lyell drive broke into the old workings on Thursday; the condition of the workings was excellent, and the breaking of pyrites there had recommenced.

The Lyell Comstock mine, Mr. Jamieson continued, had so far opened up better than had been anticipated. For the last two years the company had suffered severely from shortage of labour, but he was glad to say that conditions in that respect had improved, and there were now 985 men engaged in the mining department alone. The opening up of the Comstock mine involved the employment of additional labour, but notwithstanding that, the shortage of labour did not at present cause anxiety. The cost of production of blister copper did not show much increase on the usual figures—equal to 21s. 6.88d. per ton of ore for the March half-year, compared with 20s. 0.51d. per ton for the September term—but mining costs showed a considerable decrease. Smelting costs, however, were higher than usual. Good progress had been made with the hydro-electric water power scheme, and it was hoped that the whole work would be completed sooner than had been anticipated. As to the financial position, the liquid assets now stood at £494,519 compared with £544,657 six months ago, a decline due principally to the losses due to the North Lyell fire during the last half-year. In deciding that it was not advisable to pay a dividend out of accumulated profits, the board had to take into consideration the heavy expenditure on the Lake Margaret scheme. They had also to bear in mind that, as an increasing business was being done in superphosphates, sundry debtors increased, and more money was required to finance obligations. In view of these factors, the directors came with reluctance to the conclusion that the payment of a dividend next month would hamper the company's finances, and would prejudice the payment of the usual dividend in December next.

A shareholder asked the chairman whether he had any idea when regular dividend paying would commence. The mine could not be run year after year on sentimental lines.

The chairman replied that the directors saw no reason why dividends should not restart from December.

The motion was carried, and a vote of thanks to the officers was passed.

## NEW TASMANIAN COALFIELD.

According to a report furnished by Mr. Loftus Hills, Assistant Government Geologist, Tasmania, there are 5,000,000 tons of coal available in the Preolenna field, Wynyard. Mr. Hills, who recently visited the district, has come to the following conclusions:—

"We have at Preolenna a field in which are developed valuable deposits of coal and timber. For over 11 years the district has lain dormant, simply owing to the lack of proper communication with Wynyard. Several attempts have been made to open it up, but have all failed owing to the absence of an indispensable factor. The present examination has conclusively established the fact that there exists only one seam of kerosene shale in the area closely contiguous to the ninth mile, whereas previously it was believed that there were two such seams: that there is another altogether separate seam which carries some kerosene shale at Preolenna Creek, and that the total number of workable seams is four, with perhaps one other. As a result of his investigations the writer is convinced that in these coal measures there exists a high-class coal, the like of which is seen in no other coalfield in Tasmania, and which will be rivalled for certain specific purposes by very few in the world provided the sulphur contents does not abnormally increase in amount. Even if this latter contingency eventuates, the other excellent properties of the coal will still make it a very useful one. In any case, therefore, this coal is destined to prove of material benefit to Tasmania in general, and the North-West Coast in particular. The field is not a very large one, and the quantity of coal available (5,000,000 tons) does not compare with, say, the Newcastle or East Greta coalfields, yet the writer is sure that with careful, scientific, and efficient management a profitable and valuable industry can be initiated, provided that a tramway is available for transporting the products to market. A valuable timber industry could be initiated under the same conditions of transport facilities. The writer would therefore urge the necessity of a tramway from the Flowerdale railway station to the coal mining sections, which would incidentally serve the settlers on the intervening agricultural land. In the meantime, and to provide every justification possible for such tramway, he would advise the present owners of the property to carry out the putting down of bores and the placing of trial lots of coal for purposes of proving their most valuable commercial applications, thus enabling future operations to be based on scientific and economic principles. He would also strongly urge the desirability of prospecting the country west of the coal sections, with the object of finding the western extension of the coal measures."

## N.S.W. MINES AMENDMENT BILL.

### The Miners' Point of View.

A deputation waited on the New South Wales Minister for Mines last week, and brought under his notice several points they wished dealt with in the Mining Amendment Bill now under consideration. Referring to miners' phthisis, Mr. Fern, member for Cobar, who introduced the deputation, said cases were becoming more frequent in New South Wales, and the spread of the disease was due in a large measure to the presence of dust in mines. They desired to see the use of water jets on drilling machines made compulsory. Miners should be compelled to use them, and failure to do so should be made a punishable offence. The deeper the mines became the greater was the trouble from heat and dust. Considering the prevalence of phthisis among miners something should be done to provide support for men stricken by the disease, either out of the Miners' Accident Relief Fund or some other fund. At present a man might contribute for years to the fund, and because he was fortunate enough to escape accident drew nothing from it. At the same time he might be stricken with miners' phthisis, and at the end of his days find himself without means of support. They believed that provision should be made for those unfortunates. He would like to see lead-poisoning and all diseases which were likely to be contracted by miners placed in the same category. Drastic alterations were wanted with regard to the suspension of the labour covenants on leases. The law was very much abused at the present time, and it opened the door to jobbing in mining leases. He was not going to impute dishonesty to anyone, but the manner in which advantage was taken of the law at the present time was scandalous. Among many miners there was a feeling of unrest, due to the installation and working of Holman hoists.

The Minister of Mines said that if the ventilation of mines was only half as bad as had been stated, it presented a pitiable condition of affairs. He had been down metalliferous mines, and had experienced the great heat. Unfortunately, many of the mines only had one outlet. The regulations stipulated that where a mine was 300ft. deep the company could be compelled to either link up with another mine, or else provide a second shaft, both for air or for escape from the lower workings. He would promise them that he would look into the matter. With regard to the check inspectors, there was no necessity for 24 hours' notice to be given. No company had a right to demand such notice, and if it was insisted upon by any company he would ask the inspector to institute proceedings. He had been instrumental in introducing the Holman hoists here, as he looked upon them as great labour-saving devices. He undertook to say that he could learn to manipulate it in an hour.

A member of the deputation: I would not like to work below your hoist.

The Minister of Mines: If a man has brains and commonsense, I would sooner work under him with a hoist than half a dozen men with a windlass. It was proposed to make the men in charge of the hoists undergo a competency examination in the presence of an engine-driver, a mine manager, and an inspector. They would have ocular proof of his competency, and on that a certificate would be granted. No representations had been made to him by the mine owners with regard to the hoist. Objections were now being raised to it, and as far as he was concerned if the Bill came forward he would knock the provisions regarding the hoist out of it, and leave things as they were. He had nothing to do with railway rates. If they wanted any reduction they would have to see the Minister for Railways.

## INDUSTRIAL.

Messrs. Gardner, Waern and Co.'s Sydney office has been removed to commodious premises at 334 Kent-street, where large space is devoted to a show area for exhibiting the firm's various lines, including S.K.F. ball bearings, Swedish Diesel motors, etc.

* * *

On Tuesday, 27th inst., a demonstration was given by Messrs. A. H. McDonald and Co. with their "Imperial" oil tractor fitted with patent ped-rails. The trial took place on the rough sands near Port Melbourne. The rear driving wheels of the tractor have eight bearers affixed to each wheel. On these the wheels roll the full length of the bearer alternately. Heavy loads can be carried without risk of being stuck in soft ground, as was shown by the tractor pulling another tractor of the ordinary type. There were many engineering people at the trial, among them being representatives of Government departments.

# FINANCIAL

## BANK OF N.S.W.

### Half-Yearly Meeting.

The half-yearly meeting of the Bank of New South Wales was held in Sydney last week, Sir Charles Mackellar presiding. The report, which was adopted, showed that the net profit for the half-year ending 31st March amounted to £285,745, which the directors recommended should be appropriated as follows:—

£156,338 payment of dividend at the rate of 10 per cent.; £100,000 is being carried to the reserve fund; £10,000 to the officers' provident fund; £15,000 to the Buckland fund; £1742 interest at 5 per cent. on capital paid in advance; and £87,503 carried forward (as compared with £84,838 for the previous period). The chairman stated that the deposits showed very little change, as compared with March, 1912, being in the aggregate only £644,000 less. This was actually more than accounted for by a decrease in the Government deposits all round. The deposits from the general public showed an increase of several hundred thousand pounds, but not nearly so large an increase as had been usual during the last few years. As long as imports approximate to exports there was not likely to be a growth in the savings of the people, taken as a whole. The bills payable and other liabilities showed the large increase of £2,068,000. The ordinary bills payable were several hundred thousand pounds higher, owing to exchange activity, but the increase was principally due to the balances in various States at credit of the Commonwealth Bank, which had kept its account with the Bank of New South Wales since it started business in January last. The item was fully counterbalanced by the increase in the coin shown on the other side. There had been an increase to the capital account of a little over £250,000, which represented the first half of the new capital taken up, and some prepayment on account of the second series. The profit and loss account showed an expansion of some £75,000. This had been absorbed by a large allocation to the reserve fund, and by a vote which the directors recommended for sanction of £25,000 in aid of the funds of the provident fund and the Buckland fund, which was really a kind of general benevolent fund for the officers, to which they did not contribute personally, and claims had grown so much of late that it was barely doing more than holding its own, and the money shareholders were asked to vote was much needed, and would be well bestowed. The profits this half-year were exceptionally high, partly owing to the change in the incidence of the interest rates which always arose at the outset when deposit and advance rates were raised simultaneously. But the increase was also due to exceptional exchange profits.

Turning to the assets side, coin and Australian notes were higher by £1,382,000, which was the counterbalancing factor referred to on the other bank balances included with bills payable. Bills receivable in London or on the way there were about £765,000 higher, this exchange business having been very active. The total of what they took as their more liquid resources amounted to £21,512,576, which represented an increase of £2,600,000 on last year's figures, and might be considered very full for all requirements.

The advances were some £764,000 less than at last March, and shareholders will remember that the chairman had just referred to an increase of £750,000 in the bills receivable in London. Practically what had happened was that the money which had come in to them from realisation of wool and wheat by their borrowing clients had been utilised in the purchase of London bills, and had thereby helped to keep the market for these articles well supplied with funds for their transfer to their ultimate destination.

It would be realised that the year had been one of considerable activity. Locally the considerable expenditure, public and private, which had been going on during the year would in itself have caused them to adopt a conservative attitude. But when to this had been added the necessity for keeping a watchful eye on eventualities in Europe, it would be realised that it had been incumbent on them to maintain a steady, careful attitude in regard to the financial situation generally, and to exercise a judicious restraining influence on the lending side of the business. Legitimate and reasonable trade requirements they had always been ready to meet, but for accommodation which had meant going beyond those limits they have not been so ready to respond. So far as they could judge at this early period of the year, the prospects for next wool and wheat production were good, and, generally speaking, it would seem that the State might look forward to a full export trade. The adjustment of what they could only view as at present redundant imports to a reasonable ratio to the exports, would follow if the community grasped the true sense of the situation, and kept a check on expenditure in general. They might then expect that the accumulation of the savings of the people would be again in evidence, which was the healthy condition of a producing country like our own. This in due course would provide the needful capital to carry on the still further development of the interior, and bring about a return to a period of lower rates of interest than had prevailed of late, which had been the natural outcome of the existing conditions.

THE AUSTRALIAN MINING STANDARD.

# ENGINEERING and ELECTRICAL RECORD

Vol. XXVII. MELBOURNE AND SYDNEY, JUNE 5, 1913. No. 758.

THE ENGINEERING AND ELECTRICAL RECORD *is published every Thursday morning. Price Sixpence.*

*All communications should be sent to the Editor; those having reference to business matters should be addressed* CRITCHLEY PARKER.

CASUAL ADVERTISEMENTS *on this page 15s. per inch per insertion.*

THE FAMOUS
"Brimsdown"
"*Wirum*"
*BRITISH MADE* *Lamps.*
The most popular, reliable and economic lamp on the market.

Sole Agents:—
THE
LAWRENCE & HANSON
Electrical Co. Ltd.

405 LONSDALE ST., MELBOURNE.
33 YORK ST., SYDNEY.
and at WELLINGTON, N.Z.

## THE TERRITORY.

### Railway Commissioners in the North.

The Northern Territory Railway Commissioners took evidence at Darwin last week, the witnesses including local business people, the Administrator, Lieut. Hardy, R.N., and others acquainted with the country.

Captain Edwards, who has been in the Territory since 1884, and has a very intimate knowledge of the coast, said he had been up every harbour and river in the north. Next to Port Darwin in importance was Port Essington. The Roper and McArthur rivers were navigable for vessels with light draught, but no expenditure in deepening them for deep draught vessels would be justified. Surveys were much needed, and the Victoria River in particular would well justify a careful survey. He thought a good harbour could be found at the Pellew Group, off the mouth of the McArthur, but it would be necessary to lighter the cargo to this harbour. He favoured the direct route for the railway to the north and south. If the line were taken to the eastward what would become of the country in the west and centre? He considered that for development, defence and commercial purposes, and from a national standpoint, the line should go direct to Adelaide. He considered the establishment of a capital entirely uncalled for in the present state of affairs in the Territory.

Captain Hardy gave private evidence on defence questions. Dr. Gilruth was also examined, but his evidence is not yet available for publication.

Mr. J. E. Ireland, manager for Allen and Co. Ltd., considered there were many questions of more importance than the removal of the capital. He considered labour was so expensive as to afford no remunerative employment. A large tin mine in which his firm was interested could not work if compelled to employ miners at 13s. 4d. per day. At present Chinese were employed at 8s. per day. He looked on the farmers as a poor asset until such time as markets and quick despatch of produce were provided.

Mr. W. C. P. Bell, shipping agent, favoured the direct railway route without any deviation whatever, even though such might take in good country. He considered the line should go by the most direct route from north to south, and he believed that a heavy passenger traffic would flow when Singapore could be reached in ten days from Melbourne, and Hong Kong in eleven days.

Mr. Charles Stewart Gibson, mining geologist, considered that mining here was greatly handicapped by lack of crushing and transport facilities, and that Government assistance in these directions would be calculated to foster development. He had visited the mining fields of the Territory, and considered that there were no developments at present calling for railways.

Mr. T. E. Day, chief surveyor, considered the overland line should go from Pine Creek to Newcastle Waters, thence to Anthony's Lagoon, thence generally southwards through Corellai and Alroy Downs, thence south-west through the Frew River country, joining the telegraph line at Alice Springs, thence connecting with Oodnadatta.

---

## SYDNEY CITY COUNCIL.

The following recommendations were made by the Electric Light Committee to the Sydney City Council at its last meeting:—That extensions of electricity mains be granted as follow:—(a) Marrickville.—Underground cable from substation No. 42, Fitzroy-street, to Sydenham-road. Estimated cost, £710, of which cable troughing, etc., amounting to £400, are in stock, leaving £310 to be provided for; (b) Rashcutters Bay.—Laying two 4in. fibre conduits in trench while underground extension in New South Head-road to supply Rashcutters Bay hotel is being laid, to provide for future extensions. Estimated cost, £90.

That in accordance with a report by the city electrical engineer dated 5th May, 1913, authority be given for the preparation of drawings and specification and the advertising for tenders for the construction of watertight bunkers (on land adjoining the power-house, recently acquired by the council) capable of containing 6000 tons of coal, to be held as an emergency stock, the estimated cost being £15,000.

That approval be given for the expenditure of £60 in advertising in Redfern that the City Council is now supplying electricity in Redfern at a lower price than it was supplied by the Redfern Council.

That the agreement submitted by the city solicitor for the supply of electricity to the municipality of Concord, certified to by the city solicitor as not containing anything of a different nature to those which have been previously approved by council in similar cases, be approved, and authority given for the execution of the same by the Town Clerk.

That the overhead construction work in Mountain-street and Kelly-street, which has been superseded by underground cables, be removed at an estimated cost of £68 11s. 11d.

That in connection with the stock of "Angold" arc lamps, which are now coming into store more than are issued, approval be given for the sale to Messrs. Crompton and Co. of sixty lamps and thirty compensators at the price of £1 10s. per lamp and £1 per compensator.

That approval be given for the hire from Messrs. O. Ridge and Son of a crabwinch to lift motors and other heavy gear from the lane at the side of the Town Hall battery room to the rooms above the battery, at a cost of 10s. per week from 9th October, 1912, until such time as the hoist now being supplied under contract is fitted.

That twenty k.v.a. 1000-415 volt transformers for erection on poles and twenty sets of switchgear for these transformers be obtained for stock from the contractors, the Australian General Electric Co., at the contract price of £3000.

That approval be given for the purchase of a motor cycle for use by the assistant mains engineer (this being additional to the motor cycle recently authorised for use by the mains foreman), at an estimated cost not exceeding £70, and that the town clerk and city electrical engineer be authorised to select the two motor cycles.

That the Australian General Electric Co. be instructed to equip the spare panel on the control portion of the main switchboard erected at the power-house with the necessary apparatus for the additional 5000kw. generator on order from the Australian Metal Co., at a cost not exceeding £200, this price to include supply, delivery, fixing in place, and connection of the apparatus.

That work be carried out at substations as follows:—(a) Substation No. 5, Mountain-street. Erection of two distributor panels already purchased. Estimated cost, £30. (b) Substation No. 6, Oxford-street.—Purchase from the Australian General Electric Co. of an additional distributor panel required at this substation, provided that firm is prepared to supply at, or reasonably near to, the estimated cost of £91.

That approval be given for the settlement of a claim by Mr. L. Joel for loss of a horse alleged to have been killed by electric shock from a broken overhead wire in Pyrmont, by the payment of £30.

That approval be given to the purchase of the leasehold of the land adjoining the power-house, Pyrmont-street (of which the freehold was recently purchased), at the price of £1750.

That in view of the Woollahra Council having repudiated any liability for the cost of the removal of a tree in Darling Point-road, Woollahra, necessitated by the danger of such tree falling on the council's electric mains, approval be given to the whole cost, estimated at £10 10s., being borne by the city council.

That with regard to a claim by Mr. A. Shaw for damage alleged to have been caused through falling over a pole in the gutter of Ridge-street, a report by the city electrical engineer dated 23rd May, 1913, be adopted, such report stating that at any rate until more is known about the matter the council should resist all these claims to the uttermost.

That in connection with the preparation of the necessary agreement respecting the site for a substation at Botany on lease from F. W. Hughes Ltd., approval be given for the city solicitor proceeding with the matter and the payment by the council of the company's solicitor's costs in respect of the agreement.

That approval be given for the purchase from the British Insulated and Helsby Cables Ltd. of 500 25-amp. and 300 50-amp. fuse boxes at a total cost of £118 under the existing contract; also that authority be given under the conditions of contract for repeat orders for the purchase of any further quantity that may be required up to 30th September, 1913.

---

## AN INVENTORS' INSTITUTE.

A meeting was held in Sydney at the rooms of Mr. Petersen, George-street, to consider the advisability of forming an Institute of Inventors.

Mr. H. R. Whittell, who presided, said it had been suggested that an institute should be formed to affiliate with the London Institute of Inventors. It was essential that they should have legislation to protect the interests of bona-fide inventors, and if an institute were formed it would enable them to carry out their desires in this direction. The inventor would be enabled, if a branch were established, to obtain the necessary advice as to the best means of placing his invention on the market. They would be in a position, moreover, to bring before Parliament the disabilities under which they laboured at present.

Mr. E. H. W. Crossley said that one of the greatest evils at present was the payment of patent fees. It was wicked the way in which inventors had to pay for having their patents fully protected in different parts of the British Empire.

The chairman said that in South Africa, for example, it was necessary to take out patents in no less than five different States.

Mr. N. Borchardt explained that some time ago there had been an Institute of Inventors in Sydney, and it was incorporated by Act of Parliament.

The chairman suggested that it might be possible to resuscitate the institute.

A committee was appointed for the purpose of promoting the establishment of an institute.

## BRITISH AND EUROPEAN DEVELOPMENTS.

(From Our Correspondent.)

London, May 2nd.

Last night's meeting of the Institution of Electrical Engineers, in London, was given up to a National Physical Laboratory paper (the authors, Messrs. C. C. Paterson, E. H. Rayner and A. Kinnes, B.Sc., being connected with that institution), on the use of the electrostatic system for the measurement of power. After historical notes bearing on the matter, the authors said that they had used the electrostatic system for all their alternating current measurements at the above-named laboratory for upwards of six years. The instruments consist of electrostatic voltmeters and an electrostatic wattmeter, together with the supplementary apparatus which enables commercial alternating current instruments of any range and of the highest precision to be calibrated with ease and certainty. They said that the accuracy attained was considerably better than 5 parts in 10,000; and the long experience gained in the everyday use of the instruments had convinced them of the great value and convenience of the system in the work of a central testing laboratory. They had received several inquiries for a full description of the apparatus and methods used, and the object of their paper was to explain these in a way which might be of use to other experimenters who desired to work on the same lines. They said that there was no suggestion that the electrostatic wattmeter should take the place of any of the existing precision instruments used in station work—for this purpose it would prove troublesome—but where a system was required of the very highest accuracy, combined with a wide range of application and convenience in use, they expressed the opinion that at present there was none to be compared with the electrostatic system. The authors' apparatus had been evolved to meet the special requirements of the electro-technical instrument testing section at the Laboratory, two of the principal requirements of the work being a high degree of accuracy and adaptability over a wide range for measuring all kinds of load met with in such a laboratory. At the outset, the authors enumerated the outstanding advantages and disadvantages of the electrostatic system for the measurement of electrical quantities, as distinct from the system using instruments of the dynamometer type. They then, before describing in detail the method and apparatus for calibrating and using electrostatic instruments, indicated in a general way their functions in relation to one another. The different parts of the apparatus were fully detailed—the wattmeter, its method of use, calibration, and connection to the test circuit, and three-phase measurements; the quadrant voltmeter, mounting and adjustment; a description followed of the Campbell method, intended mainly for the measurement of large alternating currents above 500 amperes. In one of the appendices to the paper, "Notes on the use of Ebonite," the authors said that they had experienced so much trouble with ebonite used in their electrical apparatus that there must be a renewed warning on the subject. In the use of electrostatic instruments for measurements of the highest precision, the greatest care must be taken where ebonite was used as an insulator, particularly when it was exposed to strong diffused light. Not only was the effect to discolour the surface; the deterioration was accompanied by such a large drop in the resistance of the surface of the material that it might at times be regarded rather as a conductor than an insulator. The authors first adopted a plan of shielding switches and resistance boxes with glass having on it a film of yellow gelatine, with the object of cutting off the more actinic rays, but although action was retarded the trouble soon reappeared. The principle now adopted is that unless the ebonite used in an instrument is well screened from the light it must not be looked upon as an insulator. Another appendix related to the design of scales suitable for reflecting instruments of large angular deflection, and the conditions necessary to obtain the best results.

Several electrical manufacturing companies have issued their reports for 1912 since I last wrote. That of the British Westinghouse Electric and Manufacturing Co. contains accounts which show continued progress, a good share in the general trade improvement having been secured. Competition, it is stated, is still very keen in the electrical and allied trades, but the prices obtained are slightly better than in 1911. The gross profit was £157,871, out of which depreciation takes £43,450, interest on debentures and debenture stock £53,300, and a few other smaller deductions leave the net profit at £41,074, as compared with £21,708 in 1911. This net profit is added to the balance brought forward, so that £66,899 is now carried forward to 1913. But for the coal strike the result would have been better. The amount of £96,000 is still in suspense, as the Lot's Road turbine arbitration matter is still unsettled: as it stands referred back to the arbitration for further consideration. Orders received during 1912 for both home and export markets show an appreciable increase over 1911, and the business of 1913, so far as it has gone, shows an advance on 1912.

The statement issued by Callender's Cable and Construction Co. exhibits a very good rate of progress for 1912, the net result being some £20,000 better than for 1911. The gross profit for the year was £97,088, plus £58,531 brought forward. The ordinary dividend is 10 per cent. with a bonus of 5 per cent., and £91,745 is carried forward to 1913. This excellent showing has been secured in spite of the coal miners' and the River Thames strikes, which entailed heavy useless expenditure, and at one time threatened to close down the company's works. The company reports that its general trade continues to expand both at home and abroad. "The shops are full of orders, and enquiries for future work point to the likelihood of continued good business." This applies not only to underground mains, but to telephone cables now made at Erith, and to the rubber wire business of the Anchor Cable Co. at Leigh. Owing to the increased output for the Colonies and abroad, new capital had to be raised during the year.

A little further information has now been vouchsafed by the Indo-European Telegraph Co. regarding its Galletti wireless telegraph and telephone system. It is still stated that the technical details are at present more or less confidential, the system being still in the experimental stage; but the inventor claims that by its use a much larger proportion of the power used is made available in the aerial at the transmitting end, and, therefore, at the receiving end also, than by any other system. The current used is direct current, and, says the chairman of the company, "the view held by most experts to-day is that transmission by direct current is preferable to alternating current." It is said that the main patents give the system "a perfectly independent position amongst contemporary wireless systems." The Indo-European Company's directors are about to leave for Switzerland to witness a demonstration of the system over short distances. There are there two fully equipped stations to be inspected, working in both directions. The telegraphic signals will be transmitted and recorded by the Wheatstone automatic system. Long distance experiments will also be demonstrated at the same time. A transmitting station has been installed by the Galletti Company at Leschaux, some .60 miles from Geneva, but on French territory, where Mr. Galletti will experiment with high power with the object of reaching distant stations. Both the British and French Governments are stated to have rendered assistance in connection with the carrying out of the experiments.

(To be continued.)

## MISCELLANEOUS.

The New South Wales Railways are vainly clamouring for more locomotives, while the Government is endeavouring to make up its mind whether to supply the engines the Chief Commissioner has asked for. Although some time ago the Chief Commissioner informed the Minister for Railways that ample haulage had been provided for by the orders placed with the North British Company, the Clyde Company, and the Eveleigh workshops, the rapid expansion of the State, made painfully apparent by the last harvest, has called for greater railway facilities. Whilst it is well known that the McGowen Ministry has a prejudice against sending the orders abroad, it is faced with the difficulty that both the Eveleigh yards and Clyde have years of work in front of them in the orders already placed with them. The matter came up again at the last meeting of the Cabinet on a requisition from Mr. Johnson that a certain number of engines should be ordered from abroad, but was again shelved.

* * *

The Hart Ebbott Suction Gas Generator Ltd. has been registered with a capital of £30,000 in shares of £1 each, and will acquire a patent. The first directors are Messrs. George Georgeson and P. H. Ebbott.

* * *

The Wireless Hinge Manufacturing Company is being formed in Sydney for the purpose of acquiring from R. C. McConachy, G. W. Berry and others, the Commonwealth patent rights, and all rights in patents applied for or to be applied for elsewhere, of an improved hinge, made from sheet metal, and suitable for the lids of receptacles. The company proposes to manufacture and sell receptacles of sheet metal with or without the hinge and manufacture and sell can-making machinery. The capital of the company is £30,000 in £1 shares.

* * *

At an enquiry held in Sydney last week into the circumstances surrounding the death of Edwin Charles Cochrane, an electrician, who met his death whilst repairing wires at Greek-street, Glebe, N.S.W., a verdict of accidental death was recorded. The question of gloves arose at the hearing, and the counsel's representative intimated that the chief engineer considered the wearing of gloves should not be made compulsory. There was certain work which could not be done well if the worker wore gloves. It was recognised, however, that all electric light employees should be provided with gloves to be used at their option.

* * *

The Australian Metal Company has secured a contract from the Broken Hill Steel Works, Newcastle, for the supply of a complete lighting and generating plant, consisting of three 500 kw. Belliss-A.E.G. sets, switchboards for light and power, and complete accessories.

* * *

An examination of candidates for Certificate of Competency as Mine Electrician will be held at the Technical College, Ultimo, on Tuesday, 15th July, 1913, at 9.30 a.m. The final date for receiving applications is July 1st.

* * *

Speaking at the opening of the Potts Hill railway, Mr. Griffith, N.S.W. Minister for Works, said the Chief Railway Commissioner should have let the Government know a year or two ahead that he wanted railway engines, instead of springing the position upon them with a request that he should be permitted to cable for half a million pounds' worth. Mr. Johnson should have given warning, so that the Government could have taken steps to have the engines built in the country. The Clyde Engineering Works could have been got to double its output, and probably the Government works at Eveleigh could have doubled their output. If the Government had to send this order abroad, it would be very much against the grain of Ministers. Of course, the engines would have to be obtained, even if they came from China, but the Government would take all sorts of care that nothing of the kind was sprung on it again. In view of the rapid development of the railways, he prophesied that the Eveleigh works would soon be required wholly for repairs, and he thought the Government would soon have to establish big constructional works in the Rookwood district. There was no more suitable district in the State.

* * *

The railway from Rookwood to Regent's Park, N.S.W., opened last week, is two miles 30 chains in length, and has been constructed to transport material to be used in constructing the Potts Hill reservoir. A side line branches into the works of the Auburn Brick and Tile Company. The Minister of Works states he believes Botany to be potentially one of the great manufacturing centres of Sydney for a particular class of industry, and that within twenty years Rookwood and surrounding districts would be the great machinery and manufacturing centre probably of Australia. As estimates for the necessary carting in connection with the building of the reservoir were £33,000, besides the necessity of making a road costing £4000 to £5000, and the railway had cost only £30,000, he claimed it had been constructed for nothing. The Water and Sewerage Board was contributing £12,000 of the cost, leaving the Works Department only the balance to find. He could not compel the Commissioner to run passenger trains on the line. It was for the residents to agitate until the line was opened for traffic. The present Government, he added, had been spending £700,000 and £1,000,000 on railways construction, and if he could only get £2,000,000 he would spend it. More than half of the £6,000,000 being borrowed this year was being given to the Commissioner of Railways for duplications, engines, and other purposes. The average annual expenditure of their predecessors in office on railway extensions was about £300,000.

* * *

A deputation representing residents of the Forbes-Stockinbingal district, N.S.W., waited on the Minister for Works last week, and asked that efforts should be made to complete the line from Forbes, at least as far as Euroka Siding, by the end of next January, so that the wheat harvested could be railed to Sydney. The Minister in reply said that the earthworks of the line had been completed for 53 miles, but no rails had been laid. A difficulty was being experienced in getting sleepers, but if they came to hand he could assure them that at least 36 miles of

**P & O.** COMPANY'S ROYAL MAIL STEAMERS
FOR MARSEILLES, PLYMOUTH, AND LONDON.

Leave Sydney on the subjoined dates, calling at usual ports.

FIRST AND SECOND SALOON ONLY.

| Steamer. | Tons. | Commander. | Noon. | Melb., 3 p.m. |
|---|---|---|---|---|
| MARMORA | 10,500 | Lockyer | June 14 | June 17 |
| MEDINA | 12,500 | Notley | June 28 | July 1 |
| MOLDAVIA | 10,000 | Gordon | July 12 | July 16 |

PASSAGE MONEY TO LONDON—
Single, £41 16s to £82 10s.
Return, £69 6s. and £123 4s.

Return Tickets between Inter-State Ports are available for return by Orient, Messageries Maritimes, and N.D.L. steamers having room.

SPECIAL HOLIDAY RETURN TICKETS to COLOMBO are now issued, available for two months. Fares from Sydney, £45 2s. first saloon, and £31 18s. second saloon.

A. GORDON WESCHE, Superintendent IN AUSTRALIA, 68 Pitt-street, Sydney.

**The COLONIAL MUTUAL FIRE Insurance Company Limited.**

Principal Office: 60 MARKET-ST., MELBOURNE.

Branches in all the States.
Transacts Fire, Guarantee, Employers' Liability, Marine, Burglary, and Plate Glass, Accident, Workers' Compensation and Live Stock Insurances.

Send for Prospectus.
W. TUCKER, General Manager.

**Harringtons LTD.**

**ANALYTICAL & METALLURGICAL DEPT.**

Lowest fees for all kinds of Assay, Analytical, and Metallurgical work.

Expert Advice on Ore Treatment, Bullion Refining, Smelting, etc., etc. Directed by a qualified Analyst from Messrs. Johnson and Sons, London; Assayers to Bank of England; H.M. Mint, The Council of India, etc.

**HARRINGTONS LTD.**
**386 George Street, Sydney.**

rails would be ready for traffic by the end of January. That would carry the line to Euroka Siding, in the heart of the wheat-growing district, and materially help the settlers in getting their produce away.

* * *

Railway matters are very much to the fore at present in New South Wales. An important statement was made by the Minister for Public Works which is calculated to raise the hopes of the advocates of many extensions and new constructions now being put forward. "A proposal will be placed before Parliament as soon as the House meets," he states, "of a somewhat novel character. I cannot tell you what that proposal will be, because I consider that Parliament should have the first information concerning it, but I can tell you that the proposal, if agreed to, will enable those contemplated railways, the construction of which is estimated at the present time to extend over a period of ten years, to be completed in about three years."

* * *

The Invincible Motor Construction and Engineering Co. Ltd. has been registered in Sydney with a capital of £50,000 in £1 shares to acquire the business of the Invincible Motor Construction Ltd., and carry on the business of engineers, sheet metal workers, etc. The first directors are Konrad F. Boehm and William P. Hall. The registered office is in Sydney.

* * *

The Public Works Committee (N.S.W.) has decided that, in the opinion of the committee, it is expedient to connect Sydney and North Sydney by means of a bridge, and they recommend the adoption of the scheme submitted by Mr. J. J. C. Bradfield, engineer-in-charge, Sydney Harbour Bridge and City Transit, for the construction of a cantilever bridge from Dawes Point to Milson's Point, carrying four lines of railway, one 35ft. roadway, one 17ft. 6in. roadway, and one 15ft. roadway, at an estimated cost of £2,[illegible]00,000. The Minister for Works, Mr. Griffith, states that he is quite prepared to approach Parliament next session for authority to proceed with this and the other big scheme of city transport, the underground city railway. The adoption of the bridge scheme would not affect the underground railway system already adopted. If an enabling bill was passed by Parliament it would remain for the Cabinet to decide if and when the scheme should be proceeded with.

# *Tenders Invited and Accepted*

It is particularly requested that the information regarding contracts open, and the successful tenderers, be forwarded to The Editor not later than Monday of each week.

**The following contractions are used throughout:—S—supply; D—delivery; M—manufacture; C—construction; E—erection; P—purchase; I—installation; R—removal. Where no contractions appear, supply and delivery is understood. The date at the beginning of each paragraph refers to the closing of tenders.**

## INVITED

### Commonwealth.

**Specifications, tender-forms, etc., for tenders invited for the Postmaster-General's Department of the various States under this heading may be had as follows:—Victoria—Various State G.P.O.'s. New South Wales—Departmental Stores, Sydney, and various G.P.O.'s in other States. South Australia—Adelaide, Melbourne, Sydney and Brisbane G.P.O.'s Western Australia—Departmental Stores, Perth, and various G.P.O.'s in other States Queensland—Various State G.P.O.'s. All States—Various G.P.O.'s. If the Specifications, etc., may be had elsewhere in addition the places will be given in parentheses.**

POSTMASTER-GENERAL'S DEPARTMENT, Melbourne.—10th June.—S. and D. of incandescent electric lamps, as per schedule No. 862.

10th June.—Ironwork, as per schedule No. 890.

10th June.—100 fire alarm boxes, as per schedule No. 909.

10th June.—Iron letter-boxes and pillars, as per schedule No. 914.

10th June.—Sand, and the removal of spoil, from the 1st July, 1913, to the 30th June, 1914, as per schedule No. 949.

10th June.—100 six-block switches, as per schedule No. 954. (See advertising columns.)

17th June.—Metal toppings and screenings, as per schedule No. 888.

17th June.—S. and D. of wire, iron, etc., as per schedule No. 853.

24th June.—Telephone parts, as per schedule No. 867.

24th June.—Telephones, as per schedule No. 864.

24th June. — Hard-drawn copper wire, etc., as per schedule No. 855.

24th June.—Hard-drawn copper wire, as per schedule No. 854.

24th June.—15,000gal. of benzine, from the 1st July, 1913, to the 30th June, 1914, as per schedule No. 933.

1st July.—S. and D. of 30 nautical miles of submarine cable, as per schedule No. 858.

1st July.—S. and D. of telephone instruments, as per schedule No. 865.

1st July.—S. and D. of insulators, as per schedule Nos. 874 and 875.

1st July.—Switchboard parts, as per schedule No. 879.

1st July.—175 cable boxes, as per schedule No. 876.

1st July.—S. and D. of packing boxes, for a period of two years, from the 1st July, 1913, to the 30th June, 1915, as per Schedule No. 915.

8th July.—Instruments, telephone parts, as per schedule No. 866.

8th July.—India-rubber covered wire, as per schedule No. 873.

8th July.—Cast-iron pipes, as per schedule No. 885.

8th July. — Measuring instruments, as per schedule No. 871.

8th July.—Wire, I.R. covered, as per schedule No. 872.

8th July.—Batteries and battery material, as per schedule No. 880.

8th July.—Galvanised-iron piping, as per schedule No. 887.

8th July.—Switchboards, telephone, various, as per schedule No. 895.

8th July.—Measuring instruments, various, as per schedule No. 870.

8th July.—S., D., and E. of a common battery switchboard at Windsor, as per schedule No. 805.

15th July.—Telegraph and telephone material (switchboard parts), as per schedule No. 878.

15th July.—Galvanised-iron piping and fittings, as per schedule No. 886.

22nd July.—Batteries and battery material, as per schedule No. 881.

22nd July.—Wire (silk covered), schedule No. 884.

22nd July.—45 lb. wire (silk covered), as per schedule No. 883.

22nd July.—10,000 porous pots, as per schedule No. 882.

22nd July.—Ironwork, as per schedule No. 891.

22nd July.—Telephone switchboards, as per schedule No. 899

22nd July.—Telephone switchboard cable, as per schedule No. 856.

22nd July.—Telephone switchboard cable, as per schedule No. 857.

22nd July.—Sundries, as per schedule No. 892.

29th July.—Detectors, keys, staples, tongs and rosettes for table telephones, as per schedule No. 901.

29th July.—Sundries, as per schedule No. 893.

29th July.—Coach screws and spikes, as per schedule No. 904.

19th August.—105 miles of paper-insulated, lead-covered cable, as per schedule No. 906.

26th August.—300 coin-collecting devices, electrically controlled, as per schedule No. 916.

16th September.—S., D., E., and I., at the Telephone Exchange, Collingwood, Victoria, of a common battery switchboard, as per schedule No. 860, or an automatic, or semi-automatic, switchboard, as per schedule No. 859.

POSTMASTER-GENERAL'S DEPARTMENT, Sydney.—25th June (extended from 11th June). —Switchboard cable, to stores schedule N.S.W., 290; copper wire, etc., to stores schedule N.S.W., No. 291; wire, india-rubber covered, to stores schedule N.S.W., No. 292; wire, cotton, silk, or wool covered, etc., to schedule N.S.W., No. 293.

25th June. — (1) Battery material, as per stores schedule N.S.W. No. 298; (2) instrument ink, etc., as per stores schedule N.S.W. No. 299; (3) coal tar composition, etc., as per stores schedule N.S.W. No. 300.

9th July.—Eight multiple magneto incoming junction line switchboards, with associated equipment, as per schedule No. 205.

9th July.—Wire, galvanised iron, etc., stores schedule, N.S.W., No. 295; bridle rings, etc., stores schedule, N.S.W., No. 297.

27th August.—(1) Telephones to stores schedule N.S.W. No. 301; (2) switchboards to stores schedule N.S.W. No. 302; (3) lamps, electric, incandescent, to stores schedule N.S.W., No. 304.

POSTMASTER-GENERAL'S DEPARTMENT. Perth.—11th June.—S. and D. of metal filament lamps to W.A. schedule No. 274.

11th June.—Mild steel plates, cast-iron covers and frames, steel beams, etc., to W.A. schedule No. 288.

11th June.—Expansion bolts and shields, to W.A. schedule No. 285.

11th June.—Bricks, cement, and blue metal, to W.A. schedule No. 286.

11th June.—2700 conduits, 4 duct, to W.A. schedule No. 287.

18th June. — 20 tons of hard-drawn copper wire, to W.A. schedule No. 291.

25th June.—20 miles of wire (cotton, silk, or wool-covered), to W.A. schedule No. 292.

25th June.—Conduits, to W.A. schedule No. 290.

9th July.—S. and D. of wire, india rubber covered, and cotton, silk, or wool covered, to W.A. schedules Nos. 265 and 266.

9th July.—Insulators to W.A., schedule No. 277.

16th July.—S. and D. of wire, bronze and copper, to W.A. schedule Nos. 260, 267, and 273.

**Osborn's Truck Wheels & Axles**

**Osborn's Mushet High Speed Steel, Twist Drills, Mining Steels, Crusher Jaws and all classes of Castings.**

Samuel Osborn & Co. Ltd., Sheffield, are Standard Makers.

**Gibson, Battle & Co. Ltd.**

**535 Kent St., Sydney.** **486 Collins St., Melbourne.**

S.A. Agent: C. C. Deland, Victoria Square, Adelaide.

23rd July.—S. and D. of switchboards and parts, telegraph and telephone instruments, to W.A. schedules Nos. 254, 255, and 256.

30th July.—S. and D. of switchboard cable, to W.A. schedule No. 275.

**30th July.—S. and D. of steel towers, battery** material, wire and iron work generally, to W.A. schedules, Nos. 259, 262, 263, 268, and 269.

**6th August.—S. and D. of insulators, telegraph and telephone material, and iron poles, to W.A. schedules, Nos. 258, 261, and 264.**

POSTMASTER-GENERAL'S DEPARTMENT, Brisbane.—25th June.—S. and D. of letter-box fronts, as per stores schedule No. 249.

**27th August.—S., D., and E. at the Tele**phone Exchange, Brisbane, of five sections of **switchboard, common battery, multiple, and** other equipment to schedule No. 243, specifi**cation No. 458.**

**10th September.—Telephone Exchange, Brisbane, nine sections of a trunk line switchboard, to schedule No. 244, specification No. 461, and the general conditions, drawings, etc., attached thereto.**

POSTMASTER-GENERAL'S DEPARTMENT, Hobart.—9th June, 1913.—S. and D. of telegraph and telephone material to schedules 56 to 63.

16th June.—One motor car (petrol), complete, to schedule No. T.67.

POSTMASTER-GENERAL'S DEPARTMENT, Adelaide.—25th June.—1000 letter box fronts, as per schedule No. 288.

16th July.—Telegraph and telephone material, schedules Nos. 277 to 287.

13th August.—Telephone parts, as per schedule No. 292, and switchboards, as per schedule No. 293.

DEPARTMENT OF HOME AFFAIRS (Works Director, Victoria). — 7th July.—Cold storage installation at Naval College, Jervis Bay.

**DEPARTMENT OF HOME AFFAIRS.—** Federal Capital power plant.—16th June.—S. and D. for Queanbeyan, N.S.W., of six 100 k.v.a. three-phase oil-cooled transformers, indoor type; four 50 k.v.a. three-phase oil-cooled transformers, outdoor type; four 25 k.v.a. three-phase oil-cooled transformers, outdoor type; isolating switches for 5500 volts, oil switches for 5500 volts, 3-phase lighting panels; power panels; bus-bar materials.

DEPARTMENT OF EXTERNAL AFFAIRS. — **Port Augusta to Oodnadatta Railway.** — 17th June.—M., S., and D. of 550 pairs of wheels and axles, 3ft. 6in. gauge.

21st June.—M., S., and D. of bogie goods waggons, 3ft. 6in. gauge; and water tank waggons, 3ft. 6in. gauge. (See advertising columns.)

DEPARTMENT OF TRADE AND CUSTOMS.—1st July.—M., S., and D. (at Melbourne) of an automatic flashing light for Emery Point, Port Darwin, and also of an automatic flashing post light for Fort Point, Port Darwin.

20th August.—S. and D. of eight (8) automatic flashing lights.

DEPARTMENT OF DEFENCE.—Royal Australian Navy.—16th June.—Round iron bars for turbine nuts. (See advertising columns.)

Commonwealth Small Arms Factory.—16th June.—S. of fuel oil from 1st July, 1913, to 30th June, 1914.

## Victoria.

VICTORIAN RAILWAYS.—11th June.—Brass locomotive boiler tubes.

11th June.—M., S., and D. of 400,000 spring washers for 1in. dia. fishbolts.

18th June. — (a) One hoisting engine and boiler for pile driving, new or secondhand; (b) portable steam engine and boiler, 20n.h.p., new or secondhand; (c) one **air-compressor and** receiver, new or secondhand; (d) one steam pump, new or secondhand; (e) one portable petrol-driven **concrete (Batch) mixer and** Batch hopper.

18th June.—M., S., and D. of one truck traverser complete with motor, drills, and patterns. (Fresh tenders.)

25th June.—50 tons of good machinery cast iron scrap.

2nd July.—Copper plates.

**23rd July.—M., S., and D. of one hydraulic** flanging press.

30th July.—Balls and ball races for 70ft. turntables.

6th August.—Steel channel bars.

13th August.—Best steel boiler plates for steel cranes, boilers, etc.

**13th August.—30,000 lineal feet of wrought-iron steam pipe, 1in. diameter.**

**20th August.—M., S. and D. of (a) lathe, (b) sawing machine, (c) chisel mortiser, (d) cut-off machine, (e) moulding machine.**

**27th August.—Hollow chisels and bits.**

**3rd September.—S. of three petrol engines and pumps for use at Newport Workshops.** (Fresh tenders.)

3rd September.—Steel faced machine knives.

VICTORIAN RAILWAYS COMMISSIONERS. **—State Coal Mines.—25th June.—S. of 2 10h.p. portable oil engines, and boring plants and equipment.**

25th June.—S. of one 140 h.p. induction motor; and flexible belt and jointing material **for band conveyor.**

**13th August (extended from 25th June). — S. of electrical equipment.**

## New South Wales.

PUBLIC WORKS DEPARTMENT **(Tenders returnable to G. S. Mullen, Resident-Engineer, Broken Hill Water Supply, Umberumberka Dam, Silverton, N.S.W.)—9th June.—S. and C. of steel tank of 74,000 gallons capacity.**

PUBLIC WORKS DEPARTMENT.—16th June. —Monier plates and walings for Carrington Wharf, Newcastle.

**16th June.—S. and fixing steel window fames and sashes, new, Offices Department, Public Instruction. (Fresh tenders.) (See advertising** columns.)

11th August. — **Steel bridge for Macleay River, Wauchope, to Kempsey section, North Coast railway. (See advertising columns.)**

**11th August. — Steel bridges for Hastings River and flood channel, Wauchope to Kempsey section, North Coast railway. (See adver**tising columns.)

**3rd September.—Efficient steam tugs for use at Bellinger River and Cape Hawke, from 1st November, 1913.**

**RAILWAY DEPARTMENT.—11th June.—S. of one steam-driven boiler feed pump. (See advertising columns.)**

**11th June.—S. of one 20b.h.p. crude oil engine, to specification No. 419. (See advertis**ing columns.)

18th June.—S. of 8 automatic coal weighing **machines for White Bay Power House. (See advertising columns.)**

**6th August.—S. of one live steam feed water heater for Ultimo power-house. (See advertis**ing columns.)

**20th August.—S. of a pneumatic ash handling plant for White Bay power-house. (See adver**tising columns.)

METROPOLITAN WATER AND SEWERAGE BOARD.—10th June.—C. of 17,074 lineal feet of cast-iron and stoneware pipe sewers, in **the Municipality of Drummoyne. (Fresh ten**ders.)

16th June.—C. and E. of 1 mild steel elevated service tank at Wahroonga.

3rd September.—S. and D. of efficient tugs **for use at Bellinger River and Cape Hawke from** 1st November, 1913.

## South Australia.

SUPPLY AND TENDER BOARD. — **24th June.—S. and D. of four railway weighbridges.**

15th July.—S. and D. of best mild steel.

**15th July.—S. and D. of 500 bars bright drawn hexagon steel.**

**15th July.—S. and D. of cold-reeled mild steel bars.**

15th July.—S. and D. of solid drawn copper tubes.

**22nd July.—S. and D. of chain iron.**

PUBLIC WORKS.—17th June.—C. and D. of spare parts for dredges.

RAILWAYS. — 17th June.—C. of 132 waggons, 3ft. 6in. gauge.

24th June.—P. of old steel tyres, scrap steel springs, scrap spring steel, scrap steel boiler plate, cuttings, etc., scrap steel and iron mixed (thin).

15th July.—C. of 8 bogie passenger brakevans, 5ft. 3in. gauge.

15th July.—C. of 17 bogie goods brakevans, 5ft. 3in. gauge.

22nd July.—C. of 30 or 50 bogie waggons, 5ft. 3in. gauge.

**NORD DEUTSCHER LLOYD**

REGULAR SERVICE TO EUROPE.
REDUCED FARES TO LONDON.
TO MANILA, CHINA AND JAPAN.
Via New Guinea and Yap.
Fares to Hong Kong, £40; II., £26.
Full particulars will be sent on application to—
LOHMANN AND CO., General Agents,
7-9 Bridge-street, Sydney.
Ostermeyer, Van Rompaey and Co., Melbourne; H. Muecke and Co., Adelaide; L. Ratazzi and Co., Fremantle; Thos. Brown and Sons Ltd., Brisbane.

**The Mount Lyell Mining & Railway**
CO. LIMITED.

Purchasers of Ores containing Copper, Gold and Silver. Rates obtainable on application to the Secretary

Manufacturers of Coke for Smelting and Foundry Purposes, Acids, Etc.

HEAD OFFICE—
39 QUEEN-STREET, MELBOURNE.
D. G. LUMSDEN,
Secretary.

**Yes—Power cost is a big item in the Mine!**

Some Engines look all right, work well and have plenty of power. But, look into their running cost. That's the true test of their worth.
Does your Engine consume more than .35 lbs. per B.H.P. hour? If so, you are losing money.
*THE "ATLAS" ENGINE*
runs on this amount of fuel. It uses the very cheapest oil obtainable—such as Petroleum Residue—and develops plenty of power.
"Atlas" Engines are of the horizontal type, and made from 15h.p. upwards. No special skill is required to run it. They start at the first injection of the fuel oil, and require no device for ignition.
We know the "Atlas" will please you and reduce your power cost. Let us tell you more about it. Write to-day.

**Stawn Ltd.,**
Engineers.
343 KENT STREET, SYDNEY.
Specialists in Mine Machinery and Tools.

## Western Australia.

GOVERNMENT TENDER BOARD.—19th June.—Four overhead electric travelling cranes, as per schedule No. 101a, 1913.

19th June.—Engine tyres for Railway Department, as per schedule No. 98a, 1913.

3rd July.—Tubular iron poles, for Railway Department, as per schedule No. 118A, 1913.

31st July.—3520 pairs of fishplates for 46½ lb. material.

## Queensland.

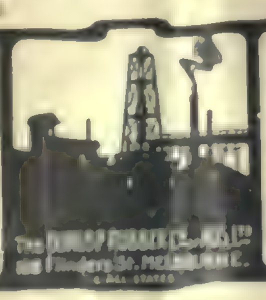
RAILWAYS DEPARTMENT.—10th June.—P. of brass borings, iron turnings, etc., on hand at Ipswich Workshops.

15th July.—M. and S. of steel super-structure bridge over Pioneer River.

15th July.—S. of one 120ft. steel super-structure (one span), Caboolture River bridge.

PUBLIC WORKS DEPARTMENT. — 20th June.—Assay laboratory, Technical College, Mt. Morgan.

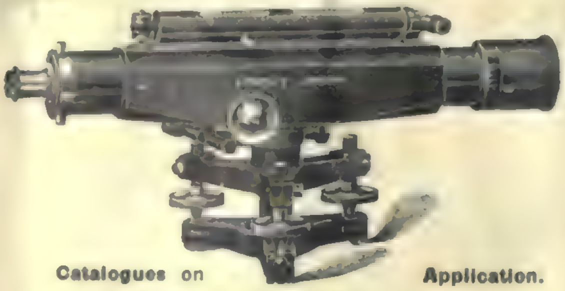
**Dunlop Mining Goods**
Are now used with satisfaction in many of the leading mines of [illegible]
Tenders & Samples submitted
Correspondence invited
Send for Illustrated Catalogue



**Dunlop Rubber Belting**
Is more efficient than Leather belting for Outdoor & Wet Work.
Sample & Price on application

**"FIBRO-CEMENT" Fireproofing**

Everyone about to build should obtain full particulars of this cool, weld-proof, ant-proof and fire-resisting material. The slates for roofs and the sheets for walls and ceilings are specially suited for the Australian climate. Used by the Federal and State Governments and by all the leading Architects and Builders.
ECONOMICAL AND EVERLASTING.
Full particulars, etc., from Sole Agents and Importers—
JAMES HARDIE & CO. Melbourne & Sydney



**Engineers and Surveyors**

We have pleasure in announcing that we have been appointed by

**W. F. Stanley & Co. Ltd., London,**

as their Sole Agents in N.S.W.

*All instruments at London Catalogue Price, plus only 15 per cent. importing expenses.*

We have absolutely the largest stock of Surveying and Drawing Instruments in Australia.

**Catalogues on Application.**

**FAIRFAX & ROBERTS LTD.,**
Vice-Regal Opticians.
**23 and 25 Hunter-street, Sydney.**

## General.

CITY OF MELBOURNE.—11th June.—Switchgear and instruments.

17th June.—Laying of 2 lines of steel tram track (principally labour).

MUNICIPAL COUNCIL OF SYDNEY.—12th June.—Extensions to turbine room at Generating Station, Pyrmont. (See advertising columns.)

7th July.—Arc lamp carbons.

CITY OF TOOWOOMBA (Q.) (extended indefinitely from 1st March).—Following plant:—(1) S. and E. of pumping plant of 25,000 gallons per hour capacity; (2) 10in. cast iron water pipes; (3) valves, special castings, etc. Tenders must be in accordance with specifications and conditions of tenders, copies of which may be seen, and tender forms obtained, at the offices of the town clerk, Sydney, Melbourne, Brisbane, and Toowoomba.

SHIRE OF MANSFIELD (V.) (E. W. Finlason, Secretary) (G. B. Lincolne and J. K. MacDougall).—16th June.—(a) and (b), S., D., and E. of one suction gas engine and plant, complete; (c) S. and D. of electrical plant and equipment; (d) E. of electrical plant and equipment; (e) S. and D. of wires and cables; (f) S. and D. of wood poles.

SHIRE OF SWAN HILL (V.) (A. W. D. Brown, Engineer). — 17th June.—P. of Fish Point punt.

SHIRE OF COLAC (V.) (D. M. Dunoon, Secretary).—14th June.—I. of electric light and power plant in township of Colac.

STEPHENS SHIRE COUNCIL (Q.) (A. E. Bale, Shire Clerk, Annerly).—7th June.—C. of 75 chains of earthenware pipe sewers, 9 and 12in.

MELBOURNE HARBOUR TRUST COMMISSIONERS (V.) (R. Rudd, Secretary).—10th June.—S. of electric light installation for dredging and transport service.

MELBOURNE AND METROPOLITAN BOARD OF WORKS (Geo. A. Gibbs, Secretary).—17th June.—S. and D., at the Metropolitan Farm, Werribee, of two steel wire plough ropes.

METROPOLITAN WATER AND SEWERAGE BOARD, Brisbane (Q.) (Geo. Johnston, Secretary). — 26th June.—S. and D. of 5000 water meters.

31st July.—41,000 casks Portland cement, under contract No. 10, 1913; and 41,000 casks Portland cement, under contract No. 11, 1913.

MUNICIPAL TRAMWAYS TRUST, Adelaide (W. G. T. Goodman, Chief Engineer and General Manager).—15th July.—M., S., and D. of steel rails.

29th July.—S. and D. of bonding material.

BOROUGH ECHUCA WATER TRUST (A. E. Castles, Tongala (V.), Trust Engineer). — 5th June.—132 chains of 12in., 57½ chains of 10in., and 12 chains of 8in. diameter pipes, with valves, fittings, and materials, etc.

W. J. Southerwood, Launceston, Tasmania.—9th June.—S. of 4 motor cars, passenger and luggage, with or without bodies.

Berry Co-op. Dairy Co., Berry (N.S.W.) (J. E. Wiley, secretary).—7th June.—S. and E. 20-ton refrigerator, boiler, tanks, coolers, etc.

"Battery," c/o Gordon and Gotch, Melbourne.—For sale, gold mining property. (See advertising columns.)

## ACCEPTED.

### Commonwealth.

POSTMASTER-GENERAL'S DEPARTMENT, Sydney.—40 wheeler baskets, £2 17s. 6d. each; 30 baskets, £3 17s. 6d. each—H. G. Packman, Sydney.

One lamp signalling switchboard of 9 trunk and 2 cable sections, together with one recording desk, associated racks, and parts, £2780; relays and mounting bars for switchboard, £79 5s. 10d.; additional cable for connecting trunk lines to main distributing frame, 10½d. per yard—The British General Electric Co., Sydney.

Semi-automatic switchboards at the telephone exchanges at Balmain, Glebe, and Newtown, £36,260—The Automatic Telephones (Australasia) Limited, Sydney.

DEPARTMENT OF DEFENCE.—Amended contract for the supply of waggons, limbered, G.S., and spare parts of vehicles. Felloes, No. 45, wheel.—80 ordinary, Mark III., 2s. 3½d.; 80 slip, Mark III., 2s. 3½d. Spokes, No. 45, wheel.—350 back, Mark III., 2s. 3d.; 350 front, Mark III., 2s. 3d.—Brunning Bros. Limited, Perth. This notice cancels same items as published in "Mining Standard" of 10th April, 1913.

### Victoria.

VICTORIAN RAILWAYS.—Induction motors, £45 each.—Pfaff, Pinschof and Co. Pty. Ltd.

Gravel ballast, where and as directed alongside siding at Woondellah Ballast Pits, 1s. 2d. per cubic yard—Sydney Smith.

Cast-iron retorts, 12 pairs, £15 per pair. (Not publicly advertised.)—Robison Bros. and Co. Pty. Ltd.

Coal, from "Bellbird" mine, 554 tons, 16s. 6d. per ton. (Not publicly advertised.)—Huddart, Parker Ltd.

Gas coke, 100 tons, £1 2s. per ton. (Not publicly advertised.)—Williamstown Gas Co.

Block Tin, 5 tons 1 cwt. 2 qrs. 24 lbs., £226 5s. per ton—Alex. Fraser Pty. Ltd.

Self-contained high tension magnetos; item No. 1 magnetos, to be fitted to imported engines, £4 12s. 6d. each; item No. 2, magnetos, to be fitted to locally-made engines, £4 each—Tarrant Motors Pty. Ltd.

Copper tubes, £5 3s. 6d. per cwt., delivered at Spencer-street railway station—M. C. Coates.

Rolled steel joists, angle braces, bedplates, bolts, etc., for superstructure of bridge at 142 miles 67 chains 45 links, Serviceton line, near Great Western; at rates—Dorman, Long and Co. Ltd.

Kerosene oil, from 1st August, 1913, to 30th June, 1914; at rates—Vacuum Oil Co. Pty. Ltd.

Engine buffers for 15 A2 engines and maintenance, £3 15s. each—Mephan Ferguson Pty. Ltd.

Copper ingot, £70 6s. 9d. per ton—A. Goldman.

Copper scrap, 10 tons, £65 10s. per ton—Moreland Smelting Works Pty. Ltd.

P. of certain Westinghouse brake fittings, £1142 10s.—Westinghouse Brake Co. of Australia Ltd.

P. of a quantity of lightning arresters, £46 5s.—British Insulated and Helsby Cables Ltd.

P. of a quantity of English dial clocks, £75—A. Benjamin and Son.

PUBLIC WORKS (PORTS AND HARBOURS)—100 cases gelignite, £2 2s. per case, £210—Dalgety and Co.

150 cases gelignite, £2 2s. per case, £315—McMicking and Co.

50 cases gelignite, £2 2s. per case, £105—Kynoch Ltd.

TREASURER.—P. without calling for public tenders of 1 Auto-Triumph folding machine, type E.D.A., with automatic feeder, £345—E. Lufft and Co.

MINES—One 5-head battery at Creswick, £240 14s. 6d.—Horwoods Foundry Co.

One gas engine at Creswick, £240 19s. 6d.—Dalgety and Co. Ltd.

STATE RIVERS AND WATER SUPPLY COMMISSION.—16in. diameter pipe syphon, 4733ft. long, for Lighting Hill, near Eaglehawk, £1233 5s.—Mephan Ferguson Pty. Ltd.

### New South Wales.

PUBLIC WORKS DEPARTMENT.—Installation of a fire service and chemical extinguishers at telephone exchange, Petersham—A. J. Brown, Paddington, £48 15s.

### Western Australia.

GOVERNMENT TENDER BOARD.—Public Works Department.—Permanent way materials, rails and fishplates, £7 15s. 4½d. and £9 15s. 2d. per ton respectively—G. Wills and Co. Dogspikes, £11 4s. 6d. per ton—Elder Shenton and Co. Ltd. Fishbolts, £15 0s. 5d. per ton—Gilson and Co. (per Agent General).

---

AGGREGATE BALANCE SHEET Of the

# BANK OF NEW SOUTH WALES, 31st MARCH, 1913.

LIABILITIES.

| | £ | s. | d. | £ | s. | d. |
|---|---|---|---|---|---|---|
| Notes in Circulation | 300,129 | 0 | 0 | | | |
| Deposits, Accrued Interest, and Rebate | 34,514,841 | 16 | 1 | 34,814,970 | 16 | 1 |
| Bills Payable and other Liabilities (which include Reserves held for Doubtful Debts and Amounts at Credit of Investments Fluctuation Account, Officers' Fidelity Guarantee and Provident Fund, the Buckland Fund, and amounts due to other Banks) .. .. .. .. .. .. | | | | 6,896,695 | 11 | 0 |
| Paid-up Capital bearing<br>6 months' dividend £3,000,000<br>3 months' dividend 253,540 | 3,253,540 | 0 | 0 | | | |
| Reserve Fund .. .. .. | 2,150,000 | 0 | 0 | | | |
| Profit and Loss .. .. | 370,584 | 15 | 0 | 5,774,124 | 15 | 0 |
| | | | | £47,485,791 | 2 | 1 |
| Contingent Liabilities – Outstanding Credits, as per Contra | | | | 1,242,385 | 5 | 3 |
| | | | | £48,728,176 | 7 | 4 |

ASSETS.

| | £ | s. | d. | £ | s. | d. |
|---|---|---|---|---|---|---|
| Coin, Bullion and Cash Balances .. .. .. .. | 9,247,332 | 3 | 5 | | | |
| Australian Commonwealth Notes .. .. | 1,213,320 | 0 | 0 | | | |
| Queensland Government Notes .. .. .. | 96 | 0 | 0 | | | |
| Notes of other Banks | 8,328 | 0 | 0 | | | |
| Money at short call in London .. .. .. .. | 2,160,000 | 0 | 0 | | | |
| Investments— | | | | | | |
| British and Colonial Government Securities .. .. .. .. | 3,056,561 | 0 | 9 | | | |
| Municipal and other Securities .. .. .. | 286,014 | 2 | 11 | | | |
| Due by other Banks | 106,296 | 14 | 2 | | | |
| Bills Receivable in London and Remittances in transit .. | 5,234,628 | 8 | 3 | 21,312,576 | 9 | 6 |
| Bills Discounted, and Loans and Advances to Customers .. .. .. .. .. | | | | 25,383,214 | 12 | 7 |
| Bank Premises .. .. .. .. .. .. .. .. | | | | 790,000 | 0 | 0 |
| | | | | £47,485,791 | 2 | 1 |
| Liabilities of Customers and others on Letters of Credit as per Contra | | | | 1,242,385 | 5 | 3 |
| | | | | £48,728,176 | 7 | 4 |

PROFIT AND LOSS, 31st MARCH, 1913.

| Dr. | £ | s. | d. |
|---|---|---|---|
| Balance proposed to be dealt with as follows: | | | |
| To Dividend at the rate of 10 per cent. per annum .. .. .. .. .. .. .. | 156,338 | 10 | 0 |
| " Interest at 5 per cent. per annum, to 31st March, 1913, on Capital paid in advance on other than the fixed dates .. .. .. .. .. .. .. | 1,742 | 7 | 11 |
| " Augmentation of the Reserve Fund | 100,000 | 0 | 0 |
| " Officers' Provident Fund .. .. .. | 10,000 | 0 | 0 |
| " Buckland Fund .. .. .. .. .. .. | 15,000 | 0 | 0 |
| " Balance carried forward .. .. .. | 87,503 | 17 | 1 |
| | £370,584 | 15 | 0 |

| Cr. | £ | s. | d. |
|---|---|---|---|
| By Amount from last Account .. .. | 84,838 | 16 | 1 |
| " Balance of Half-year's Profits after deducting Rebate on Current Bills, Interest on Deposits, paying Note and other Taxes, reducing valuation of Bank Premises, providing for Bad and Doubtful Debts, and fluctuations in the value of Investment Securities; and including recoveries from Debts previously written off as bad .. | 285,745 | 18 | 11 |
| | £370,584 | 15 | 0 |

RESERVE FUND, 31st MARCH, 1913.

| Dr. | £ | s. | d. |
|---|---|---|---|
| To Balance .. .. .. .. .. .. .. .. .. <br>(Of which £750,000 is invested in British Government Securities, and £500,000 in those of States where we are represented—in all, £1,250,000. The balance is employed in the business of the Bank.) | 2,250,000 | 0 | 0 |
| | £2,250,000 | 0 | 0 |

| Cr. | £ | s. | d. |
|---|---|---|---|
| By Balance .. .. .. .. .. .. .. .. .. .. | 2,150,000 | 0 | 0 |
| " Amount from Profit and Loss .. | 100,000 | 0 | 0 |
| | £2,250,000 | 0 | 0 |
| By Balance .. .. .. .. .. .. .. .. .. | £2,250,000 | 0 | 0 |

J. RUSSELL FRENCH, General Manager.
W. E. SOUTHERDEN, Chief Accountant.

S. E. LAIDLEY,
ALFRED G. MILSON, } Auditors.

## General.

CITY OF BRUNSWICK.—Cables, wires, etc., for electric light installation, £1150 12s. 4d.—Warburton, Franki and Co. Pty. Ltd.

NAMOI SHIRE COUNCIL (N.S.W.) (C. Mackenzie, C.E., Shire Engineer).—Road locomotive or traction engine, stone-crusher, with elevator, 6 gravel or metal waggons, grader, £2279. A. Leplastrier and Co., Sydney.

MELBOURNE CITY COUNCIL.—Motor spirits for 12 months, at schedule prices named in tender—Vacuum Oil Co. Pty. Ltd.

One 15-ton travelling crane for Heffernan-lane sub-station, £261—James Carrick and Sons.

## BANK CLEARINGS.

The Melbourne Clearing House reports as follows for the week ended 2nd June:—

| | | |
|---|---|---|
| Total Clearance .. .. .. .. .. .. .. | | £5,535,449 |
| Settled by Certificates | £441,000 | |
| Settled in Coin .. .. | 221,483 | |
| | | £662,483 |
| Clearance for corresponding week of 1912 .. .. .. .. .. .. .. .. | | £5,311,369 |

## Government Notices (N.S.W.).

Department of Mines,
Sydney, 26th May, 1913.

MINE ELECTRICIANS' EXAMINATION.

AN EXAMINATION of CANDIDATES for CERTIFICATE of COMPETENCY as MINE ELECTRICIAN will be held at the Technical College, Ultimo, on TUESDAY, 15th JULY, 1913, at 9.30 a.m.

Full particulars obtainable on application to Department of Mines, Sydney. The final date for receiving applications is July 1st.

E. F. PITTMAN,
(8a73) Under Secretary for Mines.

---

Department of Public Works,
Sydney, May 31, 1913.

TENDERS FOR PUBLIC WORKS AND SUPPLIES.

TENDERS for the WORKS, etc., specified below will be received at this Department until 2 o'clock p.m. on the dates mentioned:—

MONDAY, 16th JUNE, 1913.

SUPPLY and FIXING STEEL WINDOW FRAMES and SASHES, New Offices, Public Instruction Department. (Fresh tenders.)

MONDAY, AUGUST 11th, 1913.

MANUFACTURE, etc., of STEEL BRIDGES for Hastings River and Flood Channel, Wauchope to Kempsey Section, North Coast Railway.

MANUFACTURE, etc., of STEEL BRIDGE for Macleay River, Wauchope to Kempsey Section, North Coast Railway.

(6a 274) ARTHUR GRIFFITH.

---

New South Wales Government Railways,
Office of the Chief Commissioner,
Sydney, 26th May, 1913.

TENDERS will be received at this Office until 12 o'clock noon on the dates specified for the undermentioned WORKS, etc., viz.:—

WEDNESDAY, 11th June, 1913.

The SUPPLY of ONE STEAM-DRIVEN BOILER FEED PUMP to Specification No. 421. Price, 2s. 6d. each.

The SUPPLY of ONE 20 B.H.P. CRUDE OIL ENGINE.

WEDNESDAY, 18th JUNE, 1913.

The SUPPLY of EIGHT AUTOMATIC COAL-WEIGHING MACHINES for the White Bay Power House. Specification No. 414. Price, 2s. 6d. each.

WEDNESDAY, 6th AUGUST, 1913.

The SUPPLY of ONE LIVE STEAM FEED WATER HEATER for Ultimo Power House. Specification No. 397. Price, 2s. 6d. each.

WEDNESDAY, 20th AUGUST, 1913.

The SUPPLY of PNEUMATIC ASH-HANDLING PLANT for the White Bay Power House, to Specification No. 415. Copies, 5s. each.

All Specifications can be obtained at the Electrical Engineer's Office, 61 Hunter-street, Sydney.

Tenders are to be endorsed, "Tender for ——," or as the case may be.

The Chief Commissioner does not bind himself to accept the lowest or any tender.

By Order,
J. S. SPURWAY,
Secretary.

## Commonwealth of Australia.

Postmaster-General's Department,
Melbourne, 30th May, 1913.

TENDERS will be received at the office of the Deputy Postmaster-General, Melbourne, until 3 p.m. on the 10th JUNE, 1913, for the SUPPLY and DELIVERY of 100 SIX-BLOCK SWITCHES (Sch. 954). Tender forms, etc., may be obtained at the Stores Branch, G.P.O., Melbourne.

C. E. FRAZER,
(1207) Postmaster-General.

---

Department of Defence,
Melbourne, 28th May, 1913.

TENDERS FOR ROUND IRON BARS FOR TURBINE NUTS.

TENDERS will be received, subject to the conditions of tendering, until Twelve noon on Monday, 16th June, 1913, for the SUPPLY of ROUND IRON BARS FOR TURBINE NUTS.

The quantity required is 500 feet of 2½-inch diameter round iron bars. The material is to be delivered f.o.b. at the Commonwealth Dockyard, Cockatoo Island, Sydney.

Tender Form and Specification can be obtained from the Director of Navy Contracts, Navy Office, Melbourne, or from the District Naval Officer, Circular Quay, Sydney.

Tenders should be endorsed "Tender for Iron Bars" on top left-hand corner of the envelope, and addressed (if by post, prepaid) to the Director of Navy Contracts, Navy Office, Melbourne, or to the Director of Navy Contracts, care District Naval Officer, Sydney.

The lowest or any tender will not necessarily be accepted.

Tenders to be in all cases on the printed form, which can be obtained as above.

FRANK G. TUDOR,
For Minister of State for Defence.

---

PORT AUGUSTA TO OODNADATTA RAILWAY.

SEPARATE TENDERS, addressed to the Secretary, Department of External Affairs, Melbourne, will be received up to 11 a.m. on 24th JUNE, 1913, as under:—

MANUFACTURE, SUPPLY and DELIVERY of BOGIE GOODS WAGGONS, 3ft. 6in. gauge.

MANUFACTURE, SUPPLY and DELIVERY of WATER TANK WAGGONS, 3ft. 6in. gauge.

Specifications, plans, etc., will be on view at the following offices on and after 3rd June, 1913:—

Commonwealth Railways, 84 William-street, Melbourne.

Commonwealth Works Director, Customs House, Sydney, and

Commonwealth Works Registrars, Brisbane, Adelaide, Perth, and Hobart.

The charge for each copy of Specification will be £1 1s., and for each plan 5s., which must be paid before the documents can be issued.

Tenders are to be endorsed "Tender for ——" (as the case may be), and accompanied by the deposit mentioned in the Form of Tender.

JOSIAH THOMAS,
Minister of State for External Affairs.

---

FEDERAL TERRITORY—POWER PLANT TRANSFORMERS.

TENDERS will be received until 12 noon on MONDAY, 16th JUNE, 1913, for the SUPPLY and DELIVERY, f.o.r., Queanbeyan, New South Wales, of:—

SIX (6) 100 K.V.A. THREE-PHASE OIL-COOLED TRANSFORMERS, indoor type.

FOUR (4) 50 K.V.A. THREE-PHASE OIL-COOLED TRANSFORMERS, outdoor type.

FOUR (4) 25 K.V.A. THREE-PHASE OIL-COOLED TRANSFORMERS, outdoor type.

Tenders are to be endorsed "Tender for Transformers, Federal Capital," and addressed to "The Secretary, Department of Home Affairs, Russell-street, Melbourne."

Specifications and Tender Forms are available at the Office of the Works Director for Victoria, 151 Collins-street, Melbourne.

No tender will necessarily be accepted.

KING O'MALLEY,
Minister for Home Affairs.

---

FEDERAL CAPITAL—POWER PLANT.

SUBSTATION EQUIPMENT.

TENDERS will be received until 12 noon on MONDAY, the 16th JUNE, 1913, for the SUPPLY and DELIVERY, f.o.r., Queanbeyan, New South Wales, of the following:—

(1) Isolating Switches for 5,500 volts.
(2) Oil Switches for 5,500 volts, 3-phase.
(3) Lighting Panels.
(4) Power Panels.
(5) Bus-bar materials.

Tenders are to be endorsed "Tender for Substation Equipment, Federal Capital," and addressed to "The Secretary, Department of Home Affairs, Russell-street, Melbourne."

Specifications and Tender Forms are available at the Office of the Works Director for Victoria, 151 Collins-street, Melbourne.

No tender will necessarily be accepted.

KING O'MALLEY,
Minister for Home Affairs.

## Government Notice, (V.).

VICTORIAN RAILWAY COMMISSIONERS, STATE COAL MINES.

INDUCTION MOTOR AND FLEXIBLE BELT.

SEPARATE TENDERS, endorsed "Tender for ——," to be addressed to the General Manager, State Coal Mines, Wonthaggi, and delivered at his Office at Wonthaggi not later than 12 noon of 25th JUNE, are invited for the SUPPLY of the following:—Induction Motor, 140 h.p.; and Flexible Belt and Jointing Material for Band Conveyor. P.D.'s, £5 and £2 respectively. Particulars and forms of tender at the Melbourne Office of the State Coal Mines, Robb's Buildings, Collins-street, and at the Office of the General Manager, Wonthaggi.

No tender will necessarily be accepted.

G. H. BROOME,
General Manager.

## MUNICIPAL COUNCIL OF SYDNEY.

TO CONTRACTORS.

SEALED and ENDORSED TENDERS will be received until 3 p.m. on THURSDAY, the 12th JUNE, 1913, for EXTENSIONS to TURBINE ROOM at GENERATING STATION, PYRMONT.

It will be necessary for tenderers to lodge a deposit of £5 5s. in the City Treasury to procure a Bill of quantities.

The lowest or any tender not necessarily accepted.

Full particulars may be had upon application at the Office of the City Building Surveyor, Town Hall, Sydney.

TENDERERS please note that they must pay their CASH DEPOSITS direct into the City Treasury, and not enclose same with their Tenders, otherwise they will be rejected as INFORMAL.

THOS. H. NESBITT,
Town Clerk.

Town Hall, Sydney, 30th May, 1913.

## NORTH BROKEN HILL LIMITED.

NOTICE is hereby given that a DIVIDEND (the 30th) of Two shillings (2s.) per share has been declared, due and PAYABLE on the 26th JUNE, 1913.

Transfer Books will close at the Office of the Company, Collins House, 360 Collins-street, Melbourne, and London, on the 12th day of June, 1913, at 4 o'clock in the afternoon.

By Order of the Board,
HENRY M. FIEDLER, Secretary.

360 Collins-street, Melbourne, 28th May, 1913.

Shareholders are notified that their dividend will be posted direct.

## GREAT LANGI LOGAN G.M. Co. N.L.

NOTICE is hereby given that the Half-Yearly General MEETING of shareholders in the above Company will be held in the Board-room, 123 Queen-street, Melbourne, on THURSDAY, the 5th JUNE, 1913, at 11 a.m. Business:—(1) To receive balance-sheet and reports; (2) To consider any other business that may be lawfully brought forward. W. BRUCE FOX, Secretary.

## FOR SALE. FOR SALE.

GOLD MINING PROPERTY.

As a going concern. Battery now crushing. Principals only need apply.

Particulars and terms address—

"BATTERY," c/o. Gordon and Gotch, Melbourne.

NOTICE is hereby given that the Patentee of Australian Letters Patent No. 700/1911, dated 22nd March, 1911, for "Traction Engines," is prepared to satisfy any demands and all requirements of the public respecting said invention. Further information and particulars obtainable from EDWARD WATERS and SONS, Patent Attorneys, 414-418 Collins-street, Melbourne, and 7 Moore-street, Sydney.

NOTICE is hereby given that the owner of Australian Patent No. 18,223 for "Improvements in Stone-cutting Machines," dated 15th June, 1910, is prepared to satisfy all reasonable requirements of the public respecting said invention, or to negotiate with interested parties for the granting of licenses thereunder on reasonable terms. For information apply to BEDLINGTON BODYCOMB, Australian Buildings, 49 Elizabeth-street, Melbourne, Patent Attorney.

MINERS.—TENDERS are invited and will be received up to SATURDAY, 28th JUNE, for SINKING the LONG TUNNEL MINE SHAFT a further distance of 150 feet. Specifications can be seen and particulars obtained at the Offices of the Long Tunnel Gold Mines N.L., at Walhalla, or at 60 Queen-street, Melbourne. J. FINLAYSON, Mine Manager.

TENDERS are invited for the PURCHASE or WORKING on ROYALTY of A. Young and T. Rowlands's "IMPROVEMENTS RELATING TO THE MANUFACTURE OF HOLLOW ROLLED METAL RODS, BARS AND THE LIKE," covered by Commonwealth Letters Patent No. 10,504, of 20th December, 1907. The inventors will dispose of the whole or part interest in the patent, or will grant licenses to work the same, to fulfil the full requirements of the public. Address, Care PHILLIPS, ORMONDE and Co., Patent Attorneys and Consulting Engineers, 17 Queen-street, Melbourne.

**ARTHUR H. HASELL,**
GYPSUM, PHOSPHATES, GUANOS, MAGNESIA, INFUSORIAL EARTH, TIMBER, SULPHUR, Etc.
QUICKSILVER, BRASS and COPPER TUBES.
HEAD OFFICE: Lombard Buildings, 17 Queen-street, Melbourne. Tel. No. 281.
ANALYSES MADE FREE.
Branches: 2 Bridge-street, Sydney. Tele. No. 1193. Lipson-street, Port Adelaide. Tele. No. 198. Factory, Pt. Adelaide. Mines, Koonunga, Marion Bay, S.A.

## FROM FOREIGN SOURCES

(Specially Translated for the "A.M.S.")

Chief-engineer Seidel, of Berlin, who during the last few years had to professionally investigate many cases of accidents caused by coming into touch with electric current, recently lectured upon "Accidents Caused by the Electric Current, and the Means for Preventing Them." In the course of his address he stated that in comparison with former times, accidents caused by electricity have not inconsiderably increased in number. But considering the enormous increase in the number of electrical installations, this is not surprising. If one considers the increase in the number of the sources of danger, the increase of accidents appears even small. Out of the total number of accidents that have come under his professional notice as inspector, those caused by the electric current form but a fraction. In his district, 14,800 accidents in all were registered in 1907, of which only 43, or 0.3 per cent., had been caused by electricity. In 1912 the same district showed 15,100 accidents, of which 82, or 0.5 per cent., had been caused by electricity. In view of these facts, it is wrong to speak of the special danger of electrical installations. Moreover, out of the total number of accidents caused by electricity, very few occur during working. The majority of such cases occur while the installations are in course of erection. No regulations, but only personal precaution, can, therefore, afford protection.

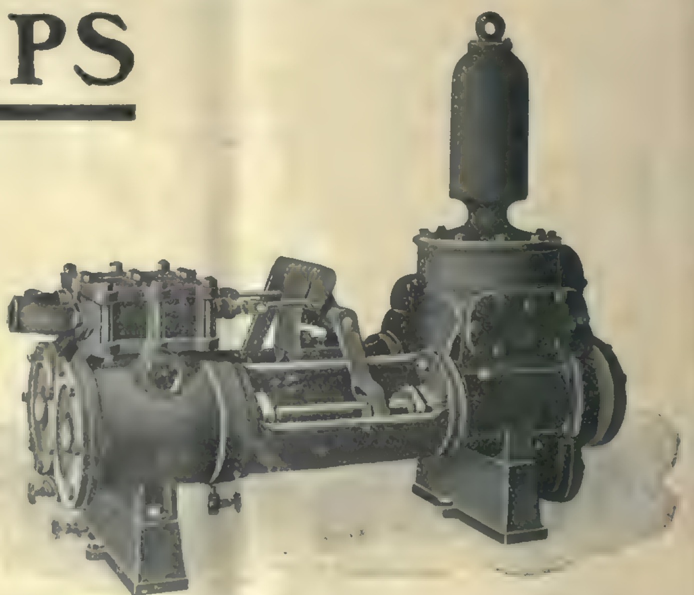
Professor Adolf Slaby, of wireless renown, died unexpectedly on April 6, at Berlin, the cause of death being cerebral apoplexy. The deceased, who, after teaching for close upon ten years at the Technical College, and the Technical Academy of Potsdam and Berlin, respectively, had, in 1884, been appointed director of the electro-technical laboratory of the Technical High School of Charlottenburg, held at the time of his death the chair of electro-mechanics at the same institution. He was a native of Berlin, and on April 18 would have completed his 64th year. Professor Slaby achieved special fame in connection with his important discoveries in the domain of wireless telegraphy. He was also a prolific writer on technical subjects.

One of the largest electrical power stations in Germany is that of the Brandenburg Electrical Works at Spandau. It applies at present light and power to not less than five large districts, viz., that of the city of Spandau itself and the four provincial districts of East and West Havelland, Ruppin, and Zauch-Belzig. Furthermore, negotiations are in progress with the object of connecting also the districts of Jerichor II. and East Prieguitz with the Spandau works, and as there is every likelihood of the contemplated agreement being concluded, there will be in the near future not less than seven large and populous districts obtaining their supply of electric power from the Brandenburg Electrical Works.

A process has been recently patented by Messrs. Siemens and Halske, Limited, for using, in connection with appliances which must be constantly working in water, an insulating lacquer of a character similar to that of enamel as a cover for such appliances and their fittings. A metal substance with such a coating is quite impervious to the action of water. The coating completely insulates the metal parts and possesses such a great resistance against chemical influences that electrolytical currents cannot develop, and decomposition or corrosion is consequently impossible. The lacquer in question, which is already used to a great extent for insulating wire, is known under the name of glaze or oven lacquer. It is composed of artificial asphalt and appropriate dissolvents. It is laid on the metal parts in thin layers, after which the parts are burnt at a heat of 250 deg. Centigrade. During the process of burning, the dissolvents evaporate and the mineral constituent parts of the lacquer are spread evenly and in a thin layer over the metal parts. When cold, the coating looks very much like enamel. It is not brittle, and adheres so firmly to the metal parts that it will not chip off, even under the blows of a hammer. This process can be employed even when the parts to be treated have to be fitted, leaving a play of not more than one-tenth of a millimetre, as will be the case, for instance, with the discs of disc water gauges.

Mercury switches with electro-magnetically actuated floats for closing and interrupting current are employed for a variety of purposes. They have all the inherent drawback that, when a certain attractive power is exercised by the coil on the float, the latter assumes a high speed in its upward movement, and reaches the upper end of the tube with a shock. Special difficulties have hitherto been met in protecting the glass tube from such concussions. Recently, however, the Siemens-Schuckert works have patented a device (German patent No. 254,797), which provides real protection for the glass vessel without modifying the same or the float. The advantage of the new design is that the coil to actuate the float is not arranged rigidly on the glass vessel, but is movable and under the influence of a pressure spring. This arrangement allows the coil, when electro-magnetically attracting the float, to first temporarily approach the latter and then carry the float along on reaction. This will lessen the force of the concussion of the float at the top end of the vessel, even if it does not entirely prevent it. The glass vessel consists, as usual, of a tube and a projecting branch tube. The tube pieces are provided with caps at the bottom extremities and sufficiently filled with mercury to produce an electric connection between both mercury columns, if the float is located in its lowest position, i.e., in its position of rest. On the other hand, if current passes through the coil, the float will be attracted. It will commence to rise, and the mercury level in the tube will sink until a separation of the two mercury columns takes place, with a consequential interruption in the current. As usual, the coil is carried by a pin fitted on the frame. But it is a novel feature that the coil is so fitted that it can slide on the pin and consequently on the glass tube. The coil-holder is pressed in its uppermost position on the pin against an adjusting unit by a spring. The size of the spring is selected so that the coil will remain in its upper position even when loaded by the electro-magnetically attracted float. The spring must not, however, be strong enough to prevent the temporary movement of the coil towards the float, on the occurrence of the electro-magnetor attracting force between coil and float. The movement of the coil towards the float will reduce the speed which would otherwise develop in the latter. On the recoil, the float will be carried along and moved into the necessary position; the concussion of the float on the top of the vessel will then be transmitted in the shape of a harmless concussion between the coil-holder and the frame. As the current coils on such switches are generally very small, a particularly favourable proportion in bulk between float and coil results. When using devices already known, this arrangement will therefore enable the desired object to be obtained by simple means, without adding much to the cost of the whole apparatus.

GARDNER PUMPS
FOR
Boiler Feed and General Service.
AIR COMPRESSORS,
VERTICAL AND HORIZONTAL.
GARAGE SETS,
PORTABLE AND STATIONARY,
From 2½ c.f. air per minute.
GARDNER GOVERNOR COMPANY,
FRANK R. PERROT, Sole Representative,
204 Clarence St., Sydney. 883 Hay St., Perth.
Victorian Agent: L. Bannister, 39 Queen-st., Melbne.



LIQUID FUEL for Diesel & all Crude Oil Engines.
"SHELL" SPIRIT, "SHELL" BENZINE, LUBRICATING OILS AND GREASES.
Prices and particulars on application to
THE BRITISH IMPERIAL OIL CO. LTD. Adelaide, Brisbane, Fremantle, Melbourne, Sydney and New Zealand

TRADE **"SIROCCO"** MARK

**MINE FANS.**

MAIN VENTILATION.

Substantially built Fans of either the single or double inlet type, capable of passing large volumes at high or low water gauges.

AUXILIARY VENTILATION.

Small in size, but capable of dealing with large volumes, Sirocco Fans are unequalled for this work. A motor-driven Fan is easy to instal, and will work for long periods without requiring any attention.

SINKING FANS.

Being comparatively light, and occupying little space, Sirocco Fans, direct coupled to electric motors, form ideal ventilating plants during sinking operations.

**DAVIDSON & CO., LTD.,**
**BELFAST, IRELAND.**

AGENTS:—

Sydney: **Ferrier and Dickinson, 12 Spring-street.** Perth: **Saunders and Stuart.**
Melbourne: **Fyvie and Stewart, 362 Collins-street.** New Zealand: **John Chambers and Sons Ltd., Wellington.**
Brisbane: **Engineering Supply Co. of Australia Ltd.** Adelaide: **Unbehaun & Johnstone, 100 Currie St.**

**Everything for Mining**

SUPPLIED BY US.

CANDLES,
EXPLOSIVES,
CHERSEN ROCK DRILLS,
WINDING ENGINES,
STONE CRUSHERS,
ROAD MAKING PLANT.

CARD CONCENTRATOR, Sole Manufacturers
DORR THICKENER,
DORR CLASSIFIER,
B and M TANKS,
TILGHMAN'S AIR COMPRESSORS.

QUARRY BARS.
WELL BORING PLANTS. BLOW OFF VALVES, ETC.

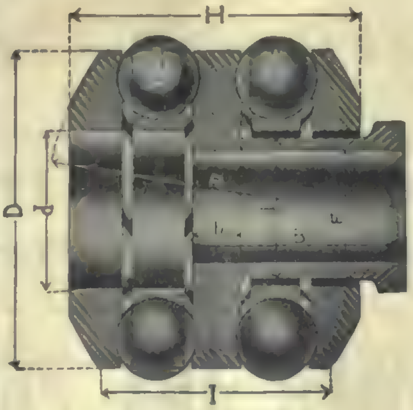
Agents in all CAPITAL CITIES of Commonwealth and NEW ZEALAND

**N. GUTHRIDGE LTD.**

Offices and Stores—SYDNEY and MELBOURNE.

**S. K. F.** BALL BEARINGS. .

A new system, being adopted by many factories and engineers for shafting, machines, fans, pumps, etc.



Saves up to 70 per cent. power, and use practically no lubricant.

Radial, Thrust, Double Thrust.

S.K.F. are self-aligning, thus overcoming the worst features of other bearings.

Swedish Diesel "Polar" Motors — the coming power.

General Electric Mfg. Co. of Sweden: Power Plants.

Motors, Dynamos, Transformers, Etc.

Dissolved Compressed Acetylene for Welding, Light, Etc.

Rewinding and all Electrical Repairs a speciality.

**Jungner Indestructable Accumulators.**

GARDNER, WAERN & CO.,
57 Queen Street, MELBOURNE.
334 Kent Street, SYDNEY.
*Stores and Showroom, 369 Flinders Street, Melbourne.*

"Allen's"

IMPERIAL

Manganese Steel

FOR

Dredging Pins and Bushes, and all Wearing Parts of Rock-Crushing Machinery, Points, Crossings, Etc.

SOLE MAKERS OF

THE "STAG" TUBE MILL

For Grinding Grit, or Tailings, and Granular Materials, to any degree of Fineness.

THE "STAG" BRAND OCTAGON MINING DRILL STEEL

EDGAR ALLEN & CO., LTD.,
Imperial Steel Works, SHEFFIELD.

Stocks on Hand of Mining and High Class Tool Steels.

AUSTRALIAN REPRESENTATIVES:
P. T. Taylor Ltd., 141 York Street, Sydney.

Established 1860.

Bondholders' Register

Publishes the Actual Numbers of all Drawn Bonds Throughout the World.

PUBLISHED FORTNIGHTLY.
10s. PER ANNUM.

73 Farrington St., LONDON, E.C.
Australian Offices,
376 Flinders Lane, MELBOURNE.

Perfect german-silver castings have been obtained by adding 4 oz. of cupro-nickel-vanadium to the molten bath about 5 minutes before the heat is ready to pour. The cupro-nickel-vanadium, either granulated or broken in small pieces, is wrapped in a piece of paper and dropped in the molten metal, and when it becomes cherry-red, is pushed below the surface and held there by an inverted cup-risc with a handle 4 feet long. It is held near the bottom of the pot until it is completely absorbed by the charge. Then stir the pot with a pumping motion and allow the charge to remain quiet about five minutes, during which the vanadium effects the purification. The vanadium is not deleterious to the crucible. When the metal reaches a clear, limpid condition, shown by its greater mobility, the heat is ready to pour. When the metal is in perfect condition, flames of zinc oxide flare up at the sides.

In reference to the decay of the Bessemer steel industry in the United States, "Metallurgical and Chemical Engineering" points out that while producers assert that in many cases the preference expressed by buyers for open-hearth steel is unreasonable, they do not take steps to correct what they denominate a misconception, whereas in many cases, particularly the rolling of sheets, the drawing of wire and the threading of tubes, Bessemer steel yields itself more readily to the mechanical operation. "The loss," continues our contemporary, "is not merely in Bessemer vessel capacity, and indeed that has been saved in some instances by the adoption of the duplex process, but covers also the complete rearrangement of works, if open-hearth is to be substituted for Bessemer, by reason of the much greater ground space required by open-hearth furnaces of equal tonnage output. There is no doubt that Bessemer steel possesses certain valuable qualities as compared with open-hearth, even though they cannot all be measured quantitatively, and Bessemer steel, merely shorn of certain objectionable qualities, would undoubtedly prove superior to open-hearth for many uses involving an enormous tonnage. The refining of molten Bessemer metal in the electric furnace will undoubtedly solve all technical problems, inasmuch as it will yield a metal that should satisfy all requirements. In the case of the consumer, the railway companies naturally hesitate to pay a higher price for rails made from electrically-refined steel until the evidence of the superiority of the 'electric steel rail' is complete. Now this complete evidence can only come from the experience with electric steel rails in the track for a series of years. The goal is to get the cost of the combined converter and electric furnace process down to the cost of the open-hearth. There is every reason to expect that this goal will be reached. When this is accomplished, it is evident that the Bessemer converter industry has been saved."

THE BROKEN HILL PROPRIETARY COMPANY LTD.

Smelters and Refiners.

TARIFF ON APPLICATION.

MANUFACTURERS OF:
SOFT PIG LEAD, FINE SILVER, ANTIMONIAL LEAD, COKE, SPELTER, AND SULPHURIC ACID.

Branch Offices.
LONDON, 3 Great Winchester-street, E.C.; ADELAIDE, Alfred Chbrs., Currie-street; SYDNEY, Imperial Chambers, O'Connell-street.

HEAD OFFICE.
Equitable Building, Collins Street, MELBOURNE.

## CONTENTS.

### JUNE 12.

EDITORIAL—

Election Irregularities .. .. .. .. 485
For Australia, Peace .. .. .. .. 485
Leaderettes .. .. .. .. .. .. .. .. 486
News and Notes .. .. .. .. .. .. 486
Investor's Column—
Emu Bay (T.) .. .. .. .. .. .. 487
Hampdens (Q.). .. .. .. .. .. .. 487
Personal .. .. .. .. .. .. .. .. .. 487
The Hercules Ores .. .. .. .. .. 488
Metal Quotations .. .. .. .. .. 488
Tasmanian Mining .. .. .. .. .. 489
Mining in New South Wales .. .. 489
Mining in Western Australia .. .. 490
The Coal Mining Industry .. .. .. 490
Brokers' Conference .. .. .. .. .. 491
Reports of Companies, etc. .. .. .. 491
A.I.M.E. .. .. .. .. .. .. .. .. .. 493
The Jukes-Darwin Field .. .. .. .. 493
The Dredging Inquiry .. .. .. .. 494
Darwin Strike "Off" .. .. .. .. .. 494
Correspondence .. .. .. .. .. .. .. 494
Mining in Queensland .. .. .. .. 494
Tenders Invited and Accepted .. .. 498
Royal Mint Returns .. .. .. .. .. 500

### Engineering and Electrical Record.

Wireless Telegraphy .. .. .. .. .. 495
British and European Developments 496
Miscellaneous .. .. .. .. .. .. .. 497

WELSBACH
WIRE LAMPS,
BRITISH MANUFACTURE.
SEND FOR CATALOGUE.
Welsbach Light Co. of Aust. Ltd.
302 Pitt Street, SYDNEY.
280 Lonsdale Street, MELBOURNE.
Creek Street, BRISBANE.
102 Victoria Street, WELLINGTON, N.Z.

FIRE. . BRICK
Our Products have proved their superiority.
FIRE CLAY GOODS For Every Purpose.
Darley Fire Bricks will withstand the most intense heat, and will not shrink. Our bricks are made near Bacchus Marsh, Victoria, and we supply all the States.
Specialities
High-Grade Firebricks & Retorts.
Prompt Delivery. For Prices, etc., write to—
DARLEY F. B. Co.,
Oliver's Lane, Flinders St. Melbourne

COKE!
NORTH BULLI COLLIERY
Limited
Supplies best quality hard
SOUTHERN
SMELTING COKE.
(Weekly output 1250 tons.)
H. G. Hyde, Secretary.
Royal Insurance Building, 16 Spring-street,
SYDNEY.

AUSTRALIAN MINING STANDARD.

Forwarded Post Free to any Address.

Australasia .. .. .. .. .. .. .. .. .. .. .. .. .. 26/- per
Abroad .. .. .. .. .. .. .. .. .. .. .. .. .. .. 30/- Annum.
Payable half-yearly or yearly, in advance.

All amounts should be made payable to order of "CRITCHLEY PARKER, Bank of Australasia."

12 O'Connell-street,
Sydney.

376 Flinders-lane,
Mebourne.

**BACK NUMBERS OF THE "MINING STANDARD."**

The following is the rate for back copies more than a month old. Applications by post must be accompanied with cash and postage added. In no case can we guarantee to supply copies, as our storage accommodation is limited.

A postcard will be sent if the number required is out of print.

For copies three months old, ninepence; six month, one shilling; and beyond that period, one penny per month per copy.

As there is a regular demand for back copies of the "Mining Standard," newsagents are requested to send back all returns uncut and in good condition, otherwise they will not be accepted.

All Returns from Newsagents must reach us by the end of each month (the whole paper must be sent). No credit will be allowed beyond this term.

Postage — British, 1d.; Foreign, 1½d.; Australasia, ½d. per copy.

Stamps will be accepted as pre-payment.

Address communications: Publishing Department, "Mining Standard."

**ALTERATION TO ADVERTISEMENTS.**

As our publishing arrangements necessitate the "Mining Standard" being issued simultaneously in Sydney, Melbourne and Adelaide on the same day each week, advertisers wishing to change their advertising matter must supply same ten days in advance of publication.

**CASUAL ADVERTISEMENTS.**

The rate for this class of advertisement is governed by the position it occupies.

If it appears on leader page or amongst or next to reading matter, the rate is 15s per inch (nonpariel) per insertion.

Towards end of reading section, set in brevier, 16 ems width, 6s. per inch per insertion.

If set in nonpariel the rate is 4s. per half inch.

**ADVERTISEMENT PROOFS.**

Proofs are submitted to advertisers in order to give them an opportunity of going over the advertisements before printing. Any alterations from the original copy will be charged for. Advertisers are specially requested to instruct their publicity departments, advertisement writers, etc., to give clear and definite instructions respecting changes of matter or new copy, to avoid incurring extra charges.

Advertising Copy must be typed and so arranged as to clearly indicate the display required for the more important features of the advertisement.

THE AUSTRALIAN MINING STANDARD.
ESTABLISHED 1888.

It is requested that all business communications be Addressed to Critchley Parker.

THURSDAY, JUNE 12, 1913.

## ELECTION IRREGULARITIES.

In the nineteenth century it was a favourite amusement of more or less amiable cranks to endeavour to trace to the lost tribes of Israel the descent of various peoples occupying various areas of the earth's surface eastwards from the British Isles to uttermost Mexico; and more than one harmless lunatic gave utterance to a profound conviction that the Anglo-Saxon race was "the real Mackay." There is, indeed, one characteristic of the dominant race in the United Kingdom which may be held to lend colour to these extraordinary fancies, inasmuch as it was a trait possessed in a strong measure by the most Hebraic of the Hebrews—the characteristic of Pharisaism. Even as so many of the Jews were always thanking God that they were not like other men, and even, indeed, as the entire nation wrapt itself up in the silly pride that led it to regard itself as God's chosen people; so there is in no small proportion of the English and Scottish peoples a tendency to regard themselves as quite superior to the rest of the world. One still hears in England, not merely occasionally and from the ignorant, but continually and from the educated, sneering allusions to foreigners, as if the races of the world were two in number—the people of Great Britain and the less fortunate others. This is precisely the same attitude as made the Jews regard themselves as the chosen race; and, as is natural in a people who form portion of the same family, we Australians are afflicted with the same complaint. An easy illustration of it is afforded by the attitude of the man in the street towards the American people on account of their "graft." We have always assured ourselves that the deplorable corruption that exists in America finds no place in Australian political and municipal life. In saying so we perhaps flatter ourselves; all that we can say with any certainty is that there have been no such revelations of corruption as have brought discredit upon the public life of the United States. Whether that is because the corruption does not exist, because it has not been found out, or because we lack the bold, capable, and public-spirited men who alone are equal to the task of cleansing the Augean stables is a matter which each man must decide according to his own bent of mind, his prejudices, his knowledge of human nature, and his acquaintance with the facts. It must be said, however, that those who have believed Australian political life to be immaculate cannot but feel uncomfortable (to put it mildly) at the insinuations of fraud which have been scattered so broadcast in connection with the recent Federal elections. If one-half of what is being said is true, both the rolls and the system of voting call for a thorough purification and remodelling. No men are angels, not even Australians, and we have it on very high authority that the most evil consequences arise from "the means to do ill deeds." The system of absent voting which pertains in this country offers remarkable opportunities for political scallywags to bring disgrace upon the country; but there are also assertions of various other irregularities that are not concerned with the absent-voting system. Even if all the stories be true and the revelations with which we are threatened prove to be unsavoury, as many people anticipate, we have at least one satisfaction; and that is that Great Britain cannot very well, at the present juncture, hold up her hands in holy horror, in view of the revelations that have been made regarding the very dubious proceedings of some of her own Cabinet Ministers. Let us, in fact, determine to do better than Great Britain is doing. There, there seems every likelihood of a very grave scandal being minimised and smoothed over as far as possible, and the whole incident treated not with a view to the purification of political life, but solely with the object of furthering the interests of a party. Let us not do that here; let us show the world that, if our political life has something to its discredit, we are manly enough and honest enough to confess it and to endeavour to root it out. It is to be hoped that the matter will not be treated in a party spirit, but that Liberals and Labourites will unite to appoint an impartial commission to ascertain the facts, and, if there have been grave irregularities and gross dishonesty, to see that there shall be no recurrence of such evils.

E. H. C. Oliphant, 376 Flinders-lane, Melb.

## FOR AUSTRALIA, PEACE.

People generally are inclined to look upon the results of the recent Federal elections as leading to a position that is highly unsatisfactory. We do not regard the matter in that light; yet we grant the premises. The Labour party still has a tremendously heavy majority in the Senate; while the Liberal party is in an inadequate majority in the House of Representatives—a majority so inadequate that, if a Speaker be elected from its ranks, it will have no majority at all. The result of all this, it is pointed out, must be a deadlock. Just so. That is why it is to be welcomed; for what will be the result of a deadlock? Not another appeal to the country: oh dear, no! The gentlemen elected are elected for a term of three years at a salary of £600 per annum, and that salary they are sure to want to draw for the full term for which they have been elected. They may, therefore, be trusted to see to it that matters will not reach such a pitch as to necessitate a general dissolution in accordance with the terms of the Constitution. But, it will be urged, that will mean three years of legislative inactivity, inasmuch as neither side will be able to do anything. Exactly; and what a mercy will that be for the country at large. Fancy three years of legislative peace, three years of freedom from the bungling meddlesomeness of political agitators, and when whose only ability is an ability to catch votes; three years without any tinkering with the tariff or any fresh proposals for an alteration of the Constitution; three years during which capital may feel itself free to spread itself throughout the land without fear of being appropriated by those to whom it does not belong! It is just what the country wants, and if the present position had been brought about by the intelligence of the electors instead of by merely fortuitous circumstance, a better job could scarcely have been made of it.

E. H. C. Oliphant, 376 Flinders-lane, Melb.

---

Mr. Justice Heydon, in Sydney, continues to uphold the dignity of the Industrial Court. In delivering judgment in a number of defended cases in which a group of employees of the Manly and Port Jackson Steamship Company were charged, at the instance of the N.S.W. Minister for Labour with having taken part in a strike on March 22nd, he said:—"With regard to the cases in which evidence has been directed to show that the defendants were not guilty, I don't think it necessary to make any remarks. If I were to look for an adjective to characterise the defences set up, I should think that 'childish' would be a good word to apply to them, and in the case of one defence, I should add the adjective 'impudent,' for it was certainly both. How men, over 21 years of age, possessing some little knowledge of the world, can suppose that a Court of Justice can be imposed upon by such silly statements and suggestions, really passes my understanding. I will not pay the defendants the compliment of analysing it, or going into it in detail." Dealing with the general considerations of the case, which, he said, had been put forward very fairly, His Honour proceeded:—"I am tired of imposing small penalties. I began with small penalties. The very first I imposed was one shilling, and since then, hoping against hope, I have imposed small penalties, thinking that the time would come soon, perhaps, when a better view might be taken of their responsibilities to the law which has given them so many benefits, by some workers. But the events of the past few months have brought home to me that the Court must not be any longer considered by the community as something that can be laughed at and disregarded. The plea of sympathy is to a certain extent a hypocritical plea, because, as soon as they held their meeting—which was called as soon as they could be got together after the stoppage—they made a demand for 48 hours for themselves. That was not exactly sympathy for other people. That was sympathy for themselves —and as a result, before the expiration of the agreement, which had some 11 weeks to run, they secured a substantial modification of those terms in their favour. So that these are not cases which I can look upon as of men hurried by a generous impulse into doing a thing that they were sorry for. Mr. Rose says they were sorry for it. I am sorry to say I can't believe it. Rather does it appear to me that they were proud of the result." Fines were inflicted as follows: Ireland, £10; all firemen, £8 each; all the greasers, £8 each; Deck-hands Dike, Jones, Roberts, Quintel, and N. Smith, £8 each; all other deck-hands, £7 each; Flynn (wharf boy), £2. Costs amounting to one guinea were also imposed in each case.

* * *

A curious, and undesirable, situation has arisen in St. Kilda (V.), where the working of the Balaclava-road electric tramway to the esplanade is being prejudiced, and the working expenses increased. The Railway Commissioners have refused to allow the through cars from Kew and Hawthorn to cross the railway at Glenferrie-road, Malvern, until the regrading works are finished, and a bridge erected, the plea being the Commissioners' desire to reduce the risk of accident by having the gates opened as seldom as possible. Meantime the result is that the returns per car mile are considerably less than they otherwise would be. It seems an extraordinary position. Is not the road a public one, and a right of way? If so, then the regulation of the crossing should be with the municipal authority, who should exercise that authority in the interests of those most concerned in the highway.

* * *

Over one thousand men are idle in the Cloncurry district of Queensland, the miners' union having refused to allow its members to continue the system of contract or piece work which has been in operation, under an agreement, for some time. As a rule upheavals in the industrial world have as their cause the allegation that the workman is not receiving fair remuneration for his toil. Here the position is quite the reverse; it seems as if the men, or some of them, have been earning too much money. In other words, they have been too industrious, and this does not seem to suit the book as drawn up according to the ideas of the union. At Cloncurry the standard wage rate is high, miners and timbermen being paid at the rate of 12s. to 15s. per day, and artisans from 15s. to 23s. By taking contracts, however, as much as 20s. per shift can be, and has been, earned, and this the autocrats of the Trades Hall have decreed must cease. Thus it is that trade unionism, in ordinary circumstances a most desirable movement, which has done much to improve the position of the worker, falls day by day into greater disrepute with the general public. The industrious, independent man is first forced into the union on the pretence that otherwise he may underbid his fellows, and having got him inside the union, makes a volte face, and sets a period to his earning abilities. "The Government Stroke" is, of course, not characteristic of piece work.

* * *

Fortunately for the mining industry, the experience of the Carpathian South Co., Ardlethan (N.S.W.), last week is not common. The venture is one heavily backed by Bendigo (V.) investors, the management emanating from that city. Some time ago the mine manager (Mr. Percy Wagstaff) forwarded a couple of small ore samples to the legal manager, Mr. J. Petrie, of Messrs. Petrie and Weddell, Bendigo. Mr. Wagstaff, in an accompanying note, intimated that he did not consider the samples of any value as regards tin contents, but suggested an assay to ascertain what the ore contained. This was duly entrusted to the Bendigo School of Mines' authorities. Then began a series of events strongly suggestive of the most barefaced corruption. In the first instance, the assumed result of the assay was known to outsiders long before any official report was received by the management. The well-informed duly secured parcels of scrip at low rates, a rise of nearly 100 per cent. in values following the official announcement of the yield. The result of the assays were given as equivalent to 69.9 per cent. tin and 69.5 per cent. tin in respect to the two samples. After the lapse of a few days, Mr. Petrie received a communication from Mr. F. Walters, the School of Mines registrar, to the effect that the results given were obviously wrong, in the face of a check assay having failed subsequently to reveal much more than a trace of tin. This information has since been confirmed. As there is no blinking the fact that the returns given were a true reflex of the assay, the tin being delivered to Mr. Petrie along with the official documents, the School of Mines' authorities are faced with the dual difficulty of tracing the leakage in what should surely be information of the most confidential character, and the fixing of the responsibility of the salting of the samples during the process of assaying. The duty is one that devolves upon the Council of the School to carry out unflinchingly. Every available means should be used to sheet home the criminality to the culprit or culprits, both in the interests of the mining industry and for the fair name of the Bendigo School of Mines.

---

## NEWS AND NOTES.

The application of the private members of the Victorian Dredging Inquiry Board for remuneration for their services, in addition to expenses, has been rejected by the State Government. Mr. J. H. Gray, the representative of the Chamber of Mines, has withdrawn his resignation, and has been re-appointed by the Government.

Mr. Bowes Kelly, chairman of directors of the Hercules Mining Company, is visiting Tasmania in connection with the conference to take place between the Premier and the Minister of Mines and Messrs. Kelly, Lindsay Tulloch, and H. Harris, manager of the Tasmanian Smelting Company, in regard to the Tasmanian Government continuing concessions now made in respect of the carriage of ore from Williamsford to Zeehan and other matters.

A report upon the proposed scheme for utilising the Lake Rolliston (T.) water shed as a source of hydro-electric power for several of the western mining fields, has been forwarded by the State Mining Engineer, Mr. Hartwell Conder, to the Minister for Mines. The text of the report has not yet been made public, but it is understood that there are no great engineering difficulties in the matter, and it is believed that power could be profitably supplied to the mining centres of Mount Read, Rosebery, Renison Bell, and Zeehan at an enormous saving on the present cost per horse-power, which is about £36 per annum.

Mr. H. Harris, manager of the Zeehan Smelters, and Mr. Lindsay Tulloch have had a private conference with the Tasmanian Premier and Mr. Mulcahy, regarding the continuance of Government assistance to the smelters. The question of amalgamation was also gone into. Certain proposals were made on behalf of the amalgamated companies by Mr. Tulloch, and on behalf of the smelters by Mr. Harris, and it was afterwards stated that, as far as they had gone, the negotiations had been satisfactory. Other authorities interested in the proposal will have interviews with the Government on an early date.

At the monthly meeting of the Ballarat Mining Managers' Association, at which Mr. Wm. Pearce presided, the question of federation was the principal business dealt with. The meeting was unanimously of the opinion that the time was ripe for a union of all branches of the association, and reports and suggestions on the subject from the Bendigo branch were approved. It was agreed to appoint delegates to meet the Bendigo representatives in conference.

During last month the export of gold from Wellington (N.Z.) was 42,606 oz., value £163,095, as compared with 49,618 oz., value £191,978 in May, 1912. The export for the last five months was 152,394 oz., value £599,053, as compared with 186,513 oz., value £734,410. The export of silver for May, 1913, was 78,109 oz., value £8243, and during May, 1912, the export was 173,463 oz., value £18,033. The export during the five months of 1912 was 456,257 oz., value £45,598, as compared with 530,777 oz., value £54,354, in 1912.

The secretary of the Austral-Malay Co. states that a company is to be formed in Sydney, to be called the Kampong-Kamunting Tin Dredging Limited, to take over the Kampong property, adjoining the Kamunting property, which was recently floated in London. The capital of the Kampong-Kamunting Company will be £150,000 in £1 shares, of which 130,000 will be issued and 20,000 will be held in reserve. Of the 130,000 shares, 80,000 will be issued as fully paid up, 30,000 going to the Austral Malay Company as its profit on the flotation; 50,000 shares will be offered for subscription, of which 15,000 will be underwritten in London and Penang, and 35,000 will be available for subscription in Australia. Mr. H. E. Pratten, chairman of the company, who is returning from Malaysia, arrives in Sydney next week. A general meeting of shareholders will be called for an early date to meet him.

The furnace at the Mammoth copper mine, Cardross (N.Q.), was blown in on May 21, and for 80 hours' run 250 tons of ore were treated for 70 tons matte, containing 25 tons copper. Up to the end of the month a further 25 tons of copper were produced. An output of 7 tons of copper per day is now being maintained. Further alterations to the plant are being made to admit of the furnace being worked to its full capacity.

Mt. Elliot Smelters (Q.) are to blow in again on July 1st. During the stoppage development work has been proceeded with in the mine. The Hampden Consols mine is also about to mine ore.

The Bendoc Welcome Stranger G.M. Co. (N.L.) was registered in Sydney last week with a capital of £10,000 in £1 shares, to operate at Bendoc (V.). The first directors are Messrs. Robert C. Dixon, Edward P. Johnson and Samuel H. Marks. The registered office is in Sydney.

The Mararoa Co. (W.A.) crushed 2730 short tons in May for 1005 oz. bullion, valued at £3250. The total value of the bullion won during the month was £5057 15s. 11d.

There are 1500 men idle, owing to the dispute over contract work at Cloncurry (Q.), instigated by the men's union, who have forbidden piece work on the mines. As a result of the trouble, the smelters have closed down.

A find of tin is reported from Yalgogrin, near Wyalong (N.S.W.). The find is adjacent to the Christmas Gift mine, and specimens show promise. The formation is quartz impregnated with cassiterite.

The amount received, to date, by the Premier of Tasmania towards the Mount Lyell disaster fund amounts to £22,211. The last contribution was a cheque for £1500 from Sydney.

The Victorian Lands Department has ordered the Freeburgh Dredge to cease operations on the public reserve at Bright. It is stated that the dredge was given permission by the Department to cross the reserve to a portion of its lease, on condition that a miner's lease was obtained, and that the lease has not yet been granted.

The battery house of the Frenchman's Reef Co., Daylesford (V.), has been entered by thieves, who carried away gold amalgam valued at £250.

A cablegram from London states that the Melbourne Electric Supply Co. has ordered additional generating machinery, which will increase the company's power capabilities by 10,000kw.

According to the latest reports from the men's officials, there are now only nine workmen outside the ranks of the Federated Mine Employees' Association in Bendigo (V.) district.

Silverton Tramway Co. (N.S.W.) award by the Wages Board has given an increase of 1s. per day to guards, and 6d. to shunters, but does not benefit the labourers. The award, which is the result of the recent strike at Broken Hill, is to remain in force for three years.

The Melbourne branch of the Royal Mint, during the week ended 7th June, received 19,262.11 oz. gold, and issued gold and bullion to the value of £4486 1s. 5d.

---

## PERSONAL.

Mr. H. C. Webb, who has held the post of chief accountant to Chillagoe Ltd. (Q.) since September, 1910, will shortly sever his connection with the company. Mr. Webb is well known in Zeehan (T.), as he was for 10½ years in the employ of the Tasmanian Smelting Co. Ltd. in a similar capacity.

Mr. Loring, of Bewick, Moreing and Co., Melbourne, leaves for London by the Medina on 1st July.

Messrs. Rankin (Beaufort), Heron (Canadian), and Fraser (Daylesford) have been elected to full membership of the Ballarat Mining Managers' Association.

Mr. R. Pratten, president of the Sydney Chamber of Commerce, returned to Sydney from Penang last week.

Mr. E. Carus Driffield, superintending engineer of the Mount Lyell Co.'s railway department (T.), has left the field on a three months' holiday trip to the mainland. For some time past Mr. Driffield has been in indifferent health, and his holiday is being taken with the hope that the change to a more congenial climate will be beneficial.

Mr. A. C. Chapman has been appointed by the State Government a member of the Victorian Coal Miners' Relief Board, in place of the late Mr. J. Connelly.

## THE INVESTOR'S COLUMN.

### Some Companies Attracting Attention To-day.

(By Our Exchange Reporter.)

### Hampdens (Q.).

The principal feature of the mining market has been the heavy and continuous selling of these shares, with the result that prices receded from rather over 45s. to 40s. 6d. This incident has served to illustrate the public confidence in the stock, for it is doubtful if any other outside of the principal Broken Hill companies could have borne so heavy an attack with so small a loss. There was naturally an anxious enquiry as to the cause of the selling, and the answer came on Friday with the announcement that all work had ceased at the mine in consequence of the men refusing to continue under the contract system. The expectation of this cessation of work was the original cause of the market weakness; but it is not unlikely that the unsettled state of the London market accented the anxiety to realise; and it is therefore satisfactory to know that a recovery has taken place in London, and some of the leeway made up. It is quite possible that the present lower range of values may offer a good opportunity for investment, for the monthly return just announced should be another favourable factor in bringing about a return of confidence, for it should have given a net profit of £20,000. In estimating the profit earning capacity of such big concerns, allowance must be made for stoppages and accidents; and, taking the last five months' returns as a guide, and with copper at an average price of about £67 or £68, there should be an annual profit of from £160,000 to £170,000 per annum. Whether the price of the copper will be maintained is a very difficult question to answer, for with this particular metal, it is generally the unexpected that happens. As far as statistics are concerned, the position seems sound, and likely to be conducive to higher than to lower values, but it is mainly a question of industrial conditions. Assuming that the yearly profit will be as estimated above, the question of whether the dividend will be at the rate of 8s. per annum, is one which requires consideration, for it must be remembered that the company has some fairly heavy obligations to provide for. If, therefore, ore production be suspended on account of labour troubles, it is apparent that the loss of earning which will have to be made up later on will be a serious matter, for the reason that the company has no reserve fund to draw upon during a period of inactivity. In other words, a prolonged strike must mean a postponement of disbursements to the shareholders, in which case shares would be put more freely upon the market and lower prices would follow.

With regard to the duration of the struggle, it is difficult to express a definite opinion, but it would be unwise to take an optimistic view of the position, as it is certain that the miners and probably other industrial unions throughout the Commonwealth will be called upon to assist the strikers and provide funds while they are out of employment. It is, perhaps, just as well for all concerned that the Mount Elliott has also been compelled to shut down all its mines, and that the Mount Cuthbert will probably have to follow suit, for this may have the effect of making the conflict between the forces of Capital and Labour more acute and decisive. It is improbable, however, that the strike of the Cloncurry miners will be found to be an ill-considered or isolated action, or that it will be confined to one State only. There seems to be a general desire in the minds of the miners' executive to do away with a system which, although it enables first-class workers to earn amounts much above the scheduled rate of wages, means also that the companies get the work done more expeditiously, and, as it seems to be the wish of members of the unions generally to get their complaints before the Federal Arbitration Court, which necessitates that the dispute should be an Interstate one, it is not at all improbable that this particular trouble has been brought about as the result of an understanding with the miners of Broken Hill, and that the extension of the dispute to that field will follow. If this be the case, then, the term of the cessation of work will probably depend upon the amount of business before the Arbitration Court, that is, unless priority can be obtained on the plea of urgency. The situation plainly bristles with unpleasant possibilities; but it is a favourable indication that the market was better towards the close of the week than for three or four days previously, the quotations showing a fair recovery from the lowest prices touched. If the workers be successful in their attack upon a system generally in force upon our mining fields, the result will not altogether be what they desire, for not only will the more energetic and ambitious among them be brought back to a footing with those who are satisfied with a level of mediocrity, but there must eventually be less employment owing to the discouragement to persons with a little capital to put it into what is already, under existing conditions, one of the most uncertain and unremunerative of all industries. Until the trouble is settled there is not much inducement to buy the shares in this company.

### Emu Bay (T.).

Investment stocks have for some time been rather dull, with a tendency towards lower prices, the want of support being probably largely owing to anxiety as to what might be the outcome of the Federal Elections, more especially in connection with the Referenda proposals. If the increased powers asked for had been granted, and a Labour Ministry elected to administer them, then a belief that any successful private enterprise might be made the subject of some form of attack would have caused many shareholders to realise. Under existing conditions, it is not, therefore, surprising that an improvement in the price of a stock is a matter for comment, and as the two different classes of shares in the Emu Bay Co. have had a fair rise in value, it was evident that some financial operation which would better the position of affairs was in progress. The returns of the company are announced regularly, so that its profit earning capacity in this respect can be gauged with reasonable accuracy; it was not likely that any surprise from this direction was likely to be sprung upon the public. The explanation for the stronger enquiry is to be found in the fact that a proposal has been made to and accepted by the shareholders, whereby one-half of the arrears of dividend which have accumulated upon the preference shares and which constituted a serious liability upon the company is to be written off and the balance is to be capitalised by the issue of funded certificates bearing interest from July 1st at the rate of 6 per cent. per annum, paid half-yearly. No date is fixed for repayment of these certificates, but in two years' time, that is, on or before June 30th, 1915, a sum of £500 will commence to be set aside annually to be used for the purpose of redemption either by purchase or by ballot. The total amount of accumulated arrears of dividend is now £29,331 16s. 1d., and as the amount required for the funded certificates will come to £14,687 10s., the saving to the company will be £14,644 6s. 11d.; a substantial reduction which will considerably improve the position of the ordinary shareholders, whose prospect of a dividend was very limited while an accumulated liability of close on £30,000 had first to be discharged. On the other hand, the proposal was an acceptable one to the preference shareholders, inasmuch as it gave them an interest-earning security, one also which will, no doubt, be marketable, in place of what was merely a non-interest bearing debt against the company. Another point which has been made prominent by the recent arrangement is that the preference shareholders would not have been entitled, in the event of a sale of the company's assets, to make a claim on account of these arrears of dividends, but the funded certificates now to be issued will rank prior even to the capital of the company. Some time ago considerable activity was shown in the shares, and at a range of value substantially higher than that now ruling. This market movement was owing to the possibility of a sale of the assets of the company, together with those of the Van Dieman's Land Co. to an English syndicate, but the negotiations fell through. It is not altogether improbable that the failure was partly owing to the difficulty in arranging for a fair adjustment of the accumulated claims of the preference shareholders, but whether this was the case or not, the arrangement just completed will provide against any such difficulty in the future. There are other reasons also why the arrangement will be satisfactory to the preference shareholders, one being that as only half of their preferential right is cumulative, that is, to the extent of £4000 out of £8000 per annum, the rate of interest being 8 per cent., if any arrears have to be paid out of the year's profits, four per cent., or £4000, is lost to the holders of these shares, but if the company gets into a position to pay its dividend of 8 per cent., the preference shareholders will save this loss. £7400 will be transferred from the reserve fund to the profit and loss account in order to provide for the dividend in the form of the funded certificates, leaving a credit balance of £15,076. As there is good reason for believing that the receipts of the company will be considerably increased by the successful treatment of the zinc ore deposits in the Rosebery mines, it is not unlikely that the shares will obtain a higher range of value than that of the market quotations of the last three or four years.

---

During May the Melbourne branch of the Royal Mint received 26,503.05 oz. fine gold.

# THE HERCULES ORES.

## Report by Mr. Morse.

Following is Mr. P. S. Morse's report on dezincking processes in operation in Germany. It is a report made to the chairman of directors of the Hercules Gold and Silver Mining Co. (T.), and is dated May 28.

The slag dezincking processes examined were: (1) The process of Herr Pape at Oker, a/Hartz; (2) that of Schmidt and De Graz, at Stolberg. I also obtained some information in regard to the process now being used by the Stollberger Zinchutten Geselschaft, of Aachen. The processes of dezincking slag depend on oxidation of the zinc, consequently the product produced in each case is a more or less flocculent oxide, carrying from 45 per cent. to 60 per cent. of zinc, with varying percentages of lead and silver. This oxide is marketable in Europe for a treatment charge of from fifty to sixty shillings per ton, usually plus or minus 1s. 6d. for each one pound rise or fall in the price of zinc above or below £20. The zinc is paid for, less 8 to 10 units, at 95 per cent. of the London price. Lead contents are paid for at about 1s. 6d per unit, with usually a deduction of the first eight units. The oxide is in most cases flocculent and bulky, and would be difficult to ship. It might have to be bagged, though by wetting down and compacting, it is said that the material can be shipped without much loss.

The Oker Process.—In this process, the slag is crushed and briquetted with coke breeze, and then smelted with coke in a shaft furnace, with blast. In melting, the zinc escapes as oxide, and is collected in a bag house. As a great deal of heat is evolved in the melting, Herr Pape places one or more boilers in the flue, and thus recovers some of the heat as steam. The capacity of the furnaces seen in operation was about twelve tons per 24 hours. In a new plant being erected in the same district with larger furnaces, an increased capacity of 20 tons per day was expected. The zinc recovery is said to be about 90 per cent. The cost of a plant for the Oker process for, say, 50 tons a day, would be in Tasmania probably over £30,000. The cost of working is in Germany about 15s. per ton. In Tasmania, with the higher cost of labour and fluxes, the cost would not be less than 30s. This process has been working for several years apparently successfully, on the Hartz slags, but as it works with small units, and requires a large amount of labour and coke, it does not seem suited as well to other districts where labour and coke are expensive. While on a very high zinc slag, with spelter above £24, the operation might give a profit. The adoption of this process in view of the possibilities of other processes is not to be recommended. The Oker process is also applicable to zinc ores, which are roasted before being briquetted. If there is any copper present, the copper can be recovered afterwards as matte from the dezincked slag. But as much of the lead and silver is not saved, the process is, in my opinion, only suitable for ores containing zinc and copper, with little silver or lead or even for such ores it would be a question if concentration would not give better results.

Schmidt and De Graz Process.—By this process the slag is treated in a molten condition in a reverberatory furnace, with anthracite, or coke breeze and lime or limestone, and the zinc is driven off as oxide by the reaction of the fluxes. The bulk of the lead in the slag, and part of the silver, are oxidised with the zinc and collected in the oxide. If cold slag is to be treated it must first be melted and delivered molten to the reverberatory furnace. The oxide fume formed in the reverberatory is treated in the same way as in the Oker process, being passed under boilers to recover some of the heat, and thence to a bag house, where it is collected. From the boiler attached to the flue, a certain amount of steam is produced. For the 50-ton plant inspected it was stated that 50,000 to 55,000 kilos of steam at fourteen atmospheres were made. Of this 6000 kilos were used in the producers. The fans, etc., attached to the plant used 24h.p. Therefore the process produces sufficient steam for its own working, and perhaps something available for power elsewhere. The plant examined was one constructed for the Rhein Nassau Smelting Works at Stolberg. Two reverberatories had originally been built, and were still used, but it is now found that the operation can be conducted in one furnace. About 50 tons a day are dezincked, each tapping a slag being in the furnaces from 4½ to 5 hours. Seven men and one boy are employed per shift on the furnaces, etc., and in the bag house, but this does not include the handling and shipping of the oxide. The labour on the furnace is heavy and hard on the men, but possibly arrangements could be installed to do some of this work mechanically. By the kindness of Director Von Schlippenbach of the Rhein Nassau plant, every facility was given us in our examination, and we were allowed access to the company's record books. From these books it would appear that slags varying from 7 per cent. to 11 per cent. zinc were being treated profitably. The dezincked slag was shown by the assays given to contain from 1.75 to 2.5 per cent. zinc, though occasionally an unsatisfactory charge was noted where the dezincked slag carried 4 per cent. or 5 per cent. zinc, but these bad charges, though somewhat frequent in the earlier operations, were very infrequent in the later records. The assays were all made by the Rhein Nassau staff. Herr Director Von Schlippenbach stated that as a result of long continued tests his company were preparing to entirely re-model the smelting plant in order to treat all their slag by the Schmidt and De Graz process, and that the drawings for the new plant were now well in hand. The cost of a complete plant for 50 tons a day was given as £9500, exclusive of motive power. This would probably equal £15,000 to £20,000 if constructed in Tasmania. The cost of working in Tasmania would be about as follows, for, say, 50 tons of slag per day:—

| | |
|---|---|
| Labour, 24 men at 9s. .. .. .. .. | 216s. |
| Ten tons coal, at 22s. .. .. .. .. .. .. | 220s. |
| Seven tons coke breeze, say .. .. .. | 210s. |
| Twelve tons crushed limestone .. .. .. | 60s. |
| Tools, repairs, etc. .. .. .. .. .. .. .. | 75s. |
| | 781s. |
| Per tons of slag .. .. .. .. .. .. .. | 15s. 7d. |
| To this must be added the cost of handling and melting, if the Tasmanian dump slag is to be used, say, 4s. .. .. .. .. .. .. .. .. | 4s. 0d. |
| | 19s. 7d. |

In the above estimation no allowance is made for general superintendence, amortisation or royalty.

The writer took samples of the slag treated on the day of his visit, in different stages of dezincking. The analyses of these are given below—No. 1 is of the slag as it originally came from the lead blast furnace. No. 2 is of slag half treated, and No. 3 of slag as it was sent away to the dump. No. 4 is an analysis of the oxide. No. 3 sample is very unsatisfactory, and would appear to be over the average in zinc.

| | No. 1. | No. 2. | No. 3. | No. 4. |
|---|---|---|---|---|
| | oz. | oz. | oz. | oz. |
| Silver .. .. .. | .3 | .3 | .3 | 1.1 |
| | Per ct. | Per ct. | Per ct. | Per ct. |
| Lead .. .. .. | 2.3 | 1.3 | .6 | 23.9 |
| FeO .. .. .. | 34.0 | 32.7 | 34.1 | — |
| MnO .. .. .. | 2.3 | 2.4 | 2.4 | — |
| CaO .. .. .. | 17.9 | 20.0 | 20.9 | — |
| $SiO_2$ .. .. .. | 28.9 | 29.8 | 30.0 | — |
| Zn. .. .. .. | 6.7 | 5.8 | 4.5 | 49.5 |

Estimating the Tasmanian slag to carry on an average 16 per cent. of zinc, as the weight of the dezincked slag is approximately equal to the original weight of the slag—if the dezincked slag should carry about 3 per cent. zinc, the recovery of zinc would be about 81 per cent. With an 80 per cent. recovery of zinc about four tons of slag would be required to produce one ton of oxide, with a total cost of working of 78s. 4d. The oxide produced from Tasmanian slags would not probably carry any payable lead, owing to lower lead and higher zinc contents in the Tasmanian slags to that treated at Stolberg, consequently the value would be in the zinc alone. The European formula of 95 P. (T.—8)—55s., would become for Tasmania, with freight at 42s. and spelter at, say, £25, 95 P. (T.—8)—104s., making the total value of the oxide about 95s. 2d. Allowing 5s. for getting the oxide in form to ship, this figure would mean about 3s. per ton of slag profit, if dump slag were used, and, say, 7s. if molten slag were treated. From these figures royalty and amortisation would have to be deducted.

Savelsberg Process.—While in Germany the writer's attention was drawn to another new deznicking slag process in operation at the Zink-Luitten Geselschaft Zu Aachen, of which Herr Savelsberg is general manager. Herr Savelsberg was seen at Aachen, but refused permission to inspect his plant, as the process had not been patented. He gave, however, the following information about his treatment: That it was performed in a blast furnace, and that the units could be of large size; that the cost of installation was small, owing to the large size of the units, and also to the fact that he could collect his oxide, which was granular, without the need of a bag house. The cost of operation was said to be in Germany under 10s. per ton, and the recoveries 90 per cent.

Summary.—The process used by Herr Pape at Oker does not seem to be suitable for Tasmanian conditions. The cost of the plant is large; the working costs are high, and the furnaces of small capacity. The Schmidt and De Graz process offers better possibilities, and its adoption woud apparently result in profitable working of the present slag dump at Zeehan, and of any future slag of similar composition produced there. The statements of Herr Savelsberg in regard to his process, in view of Herr Savelsberg's high reputation, seem well worth further investigation. I understand that Mr. Weinberg has arranged to inspect at an early date Herr Savelsberg's process on behalf of the Tasmanian Smelting Company, and doubtless you will be advised of his opinion of this process. I need not say that if the above statements are borne out, that this process offers superior advantages to the Schmidt and De Graz process. If, upon Mr. Weinberg's investigation, it would appear that the Savelsberg process does not warrant testing, and it is decided to instal a plant for the working of the Schmidt and De Graz process, I would not think it wise to proceed at first on other than experimental lines. The Schmidt and De Graz process is still new, and might have to be specially modified to suit Tasmanian conditions, consequently I would recommend that only a dezincking furnace with the necessary producer be erected, and that the oxide be wasted until the actual working results can be studied. In this way a large portion of the initial outlay for plant can be postponed until the process is actually proved under Tasmanian conditions. The furnace erected could easily be planned to form part of any future permanent plant, and its cost of erection would thus not be lost. For the trial of the process a 5-ton reverberatory would probably be the best size. This would treat about 25 tons a day of hot slag. As the present slag dump of the Tasmanian Smelting Company is an important consideration, it might be advisable to also erect a small cupola melting furnace, in addition, to melt the cold slag, and deliver it molten to the reverberatory; but while this might be the best way, it is not necessary, as the cold slag could be melted direct in the trial reverberatory furnace. Probably ten to fifteen tons dump slag could be melted and dezincked per day in the reverberatory furnace alone. The cost of such an experimental plant to treat, say, 25 tons of hot slag per day, would be from £2000 to £3000, and, as stated above, could be arranged to form part of any future permanent plant. In considering the question of dezincking slag from the Hercules Company's point of view, one aspect should be especially borne in mind. The product of all the present dezincking slag processes is an oxide which is of about the same value as zinc blende concentrates of equal grade in zinc. To get the zinc into this oxide condition, high smelting costs ana almost equally expensive slag dezincking costs have to be incurred. and at the end you have a product no more valuable than could have been obtained from the ore by concentration. It follows, then, that the proper way to treat the Hercules ore is to separate the lead and zinc by wet concentration methods before smelting, and thus keep the bulk of the zinc out of the lead smelting furnace.

---

# METAL QUOTATIONS.

## By Cable.

(From Our Correspondent.)

London, Tuesday.

The weakness which set in a week ago in the metal markets was further accentuated during the period under review, all the baser metals, with the exception of lead, falling below the average of recent trading. Standard copper, which was £68 15s. for spot a fortnight ago, has shrunk to £66 7s. 6d., yesterday's figures for the same position. Three months showed a similar fall. The supplies of copper for May amounted to 57,379 tons, deliveries 61,202 tons, stocks 29,604 tons, and 4000 tons afloat. The European visible supply is 40,187 tons. Tin followed the lead of copper, and from £213 5s. fell to £210 5s. for spot delivery, and from £210 5s. to £209 for three months. Lead, however, maintained a good position, and during the week touched £20. Spelter made up to £22 17s. 6d. Quotations were:—

COPPER.—Spot, £67, £66 17s. 6d., £66, ana £66 7s. 6d.; three months, £66 17s. 6d., £66 15s., and £66 17s. 6d.

ELECTROLYTIC.—£71 5s., and, to-day, £70.

TIN.—Spot, £213 5s., £211 15s., £208 15s., and £210 5s.; three months, £210 5s., £209 5s., £210 15s., and £209. Stocks amount to 14,663 tons, with 5055 tons afloat. The deliveries in May amounted to 2278 tons.

LEAD.—£19 2s. 6d. and £20.

SILVER.—27 11-16d. and 27½d.

ANTIMONY.—"Star" brand unchanged at £31, and 50 per cent. at £9 10s.

WOLFRAM (70 per cent. ore).—33s. 6d. per unit, or £117 5s. per ton, a decrease of £3 10s.

MOLYBDENITE.—Unchanged at 2s. 9d. per lb., or £308 per ton.

MANGANESE (50 per cent. ore).—Unchanged at 9¾d. per unit, or 40s. 7½d. per ton.

---

Mr. E. Mulcahy, Tasmanian Minister of Mines, says that, up to the present, no application has been made for assistance out of the money voted by Parliament for private prospecting or developmental work in the Beaconsfield district. He intimates that the lines generally followed in other districts have been found by the Department to be the best to work upon, namely, to help those showing initiative and a speculative spirit in developing known properties or in prospecting. For this the sum of £1000 has been set aside for assistance within the Beaconsfield district, and it appears as if the Department will now have no other course open than to send out some kind of prospecting party.

# TASMANIAN MINING.

## Mount Lyell District.

(From Our Correspondent.)

Queenstown, June 6.

After a number of vexatious delays, the North Lyell mine has been unwatered at the 1100ft. level sufficiently to allow of the recovery of the body of J. Bourke, the last of the 42 men who perished in the disaster of October 12th last. The body was found right alongside the main shaft; and as this is probably a couple of hundred yards away from the northern portion of the workings where Bourke was last seen by his shift boss, who was getting the other men up the rise from No. 41 stope to No. 40 stope at the 1000ft. level, it appears as if the unfortunate fellow, when he broke away from his mates, made his way along the drives through the smoke until he reached the shaft, when he collapsed. Bourke's was the only life lost at the 1100ft. level.

A remarkable feature in connection with the body of the deceased was the excellent state of preservation it was in. The man had been dead just about eight months, yet the body was quite rigid, and the features easily recognisable. Medical men ascribe this to the effect of the acid water, which they say practically "pickles" the flesh, and this good state of preservation was also assisted by the fact that the body would be excluded from the air. The funeral of Bourke will take place here on Sunday, and with his burial the close will be reached of the final chapter of one of the most lamentable mining disasters which has ever befallen Australia.

In mining matters generally there is not much of importance to note beyond the fact that, as **far as the Mount Lyell Company is concerned**, operations are proceeding with perfect smoothness and regularity. Up to the time of writing they have not been able to keep more than two furnaces going; but now that the North Lyell mine is free from water at the 1100ft. level, and the last of the bodies brought up, it will be possible to extend the stoping work at the 850ft. and 1000ft. levels, as the main shaft can now be used for legitimate mining and production work without interruption. Under difficult circumstances an output of 1200 tons a week has been reached, and with the steady removal of the difficulties in question this should shortly be increased to 2000 tons a week. As it is, the indications are that by the end of June, or very early in July, the company will have three furnaces in regular operation, and, under ordinary circumstances, with very little likelihood of interruption.

The labour supply for the **mines continues well** up to requirements, as far as numbers are concerned, although from the point of view of efficiency there is room for improvement. The company has somewhere about 1000 men employed at the different mines and contingent work, and among those working in the Mount Lyell mine open cut are some of the Maltese labourers, of whom there are now about 130 engaged in different departments of the company's surface operations. So far, no attempt has been made to put the Maltese underground, and it is understood that they have no desire to work anywhere but on the surface. And in any case, their ignorance of the English language makes them unsuitable for underground work.

So another of the Lyell mines, **which in the** boom days was the medium of heavy speculation, and in the development of which something like £20,000 must have been spent without getting as many shillings in return, has been absorbed by the Big Lyell Company; and at what a price! Writing from memory it is only about four years ago that, as the result of repeated applications to purchase the mine, the Mount Lyell Company asked the Crown people to put a price on their property. And it was understood at the time that the Crown directors asked £25,000. Needless to say, the Mount Lyell Company wasn't having any Crown at this price, and enthusiastically declined to do business. And now it has got the mine, lock, stock, and barrel, for £2500, or about 3d. a share.

It is hard luck for the Crown shareholders, many of whom bought in at a price a long way above this and have also had to pay a fair amount in calls. Still, what is bad for the Crown shareholders is good for the district, as the Mount Lyell Company is both able and willing to work the property, and this is more than the Crown Company could ever expect to do. In fact, in a few words, the Crown mine is practically of no value to anyone except the Mount Lyell Company, and it would have been better for the Crown people if they had recognised this years ago. And the writer wonders how long it will be until the Big Lyell Company gets possession of the only two other outside Lyell mines which are worth having—the Blocks and the Tasman and Crown—because there is nothing more certain than that in the future both these mines will be "gathered in" by the Mount Lyell **Company, and when they are it** will be at that company's own valuation. And although probably the Blocks or the Tasman and **Crown shareholders will be inclined** to **demur, it** will only be another instance of "the survival of the fittest."

# MINING IN NEW SOUTH WALES.

## Broken Hill.

(From Our Correspondent.)

Broken Hill, June 6.

Broken Hill returned to its normal quietude on Monday of this week, when the members of the Institute of Mining Engineers had departed, and the mines and their managers resumed their usual work. Hum drum has been the nature of things this week, except for the elections, the Wages **Board hearing of the Silverton Tramway** employees' dispute, and rumours of strike trouble **among the shop assistants. But Broken Hill** would not be Broken Hill if it hadn't some industrial dispute on.

**The visiting engineers left Broken Hill much as they found it, except that they will give the field** further advertisement. Great as the Barrier is as a mining centre, it can always accept a little extra puffing. The best business in the world must ad**vertise. Some of the Broken Hill mines have** standing advertisements in many papers, just like **other business concerns.**

**Broken Hill, of course, is known all the world over, but it is a wise step to keep its progress always** before the eye of the public. The visitors of last week have weight throughout Australia, and also outside the Commonwealth, and what they say **"goes." I had a chat with several of them (the visitors) the Saturday and Sunday of their de**parture. I endeavoured to obtain some opinions **for publication, but although everyone was willing to talk, each and all vetoed the suggestions of print. Said one: "We have been in Broken Hill** for a week. We have seen portion of some of your great mines, have visited portion of your gigantic **works. What right have we to say any**thing? We came to Broken Hill as students, we **must consider what we have seen and heard before** we even form an opinion. Some of us have been **in Broken Hill before and have kept in touch with its doings, but to the majority it has been a strange country, and we all have been merely seekers after information. To say the most of us have been surprised at what we have seen is to put the fact mildly."**

**Two developments that aroused special interest** during Congress week were the lode at the South **Blocks' 1180ft. level (No. 8). Here the lode was met with at 70ft. west, and was carried to 155ft. before any indications of the western wall appeared. This 85ft. of ore was not all of the same grade, but some of it was above the average, so the whole distance will show satisfactorily. In the ordinary condition of things, judging from** happenings, the ore body should be even wider at **the next level. In that case, as Mr. W. J. Loring** recently said, the mine would stand to rank as one **of the big concerns of the Barrier. Because there is also the zinc lode to be considered, as well as the probability of getting another run of ore further west, under the Zinc Corporation mill. The** main south drive at the No. 6 level is 525ft. long, **and the present face carries 17 per cent. ore. Further exploratory work is being done on the** zinc lode.

Then the lode was struck in the South Extended mine, at a depth of 1130ft. The lode was met **330ft. from the shaft, but it unfortunately walled 6ft. further in. This 6ft. only of ore is a disap**pointment, even though the ore assayed 27 per **cent. for zinc. Driving on the body to further test it is now in hand.**

The southern end of the field is certainly the **attraction of the moment. The Sulphide Corporation directors have found that they have enough money to spare to declare an interim dividend, so they have decided to distribute £96,250 among shareholders—2s. per share will be paid on pre**ference and 1s. 6d. per share on ordinary shares. This concern has become a "big" one with a ven**geance—its growth has astonished many of those who pinned their faith to it when Broken Hill was younger. The workings of the Central mine are** on a big scale, and the output of from 4000 to **4500 tons of crudes per week is surely calculated to please.**

**The Central's next door neighbour, the South, continues healthy, even though the recent dividend was a disappointment to some. But developmen**tal work is costly, and the South has more of this **work in hand than any other mine along the line** of lode. 'Tis a wise policy to do this in the "fat **years," when metals are firm, so that retrenchment in the "lean years" will not affect the output.** The South is going deeper and deeper. **A plat is being cut at the 1170ft. level in No. 1 shaft,** No. 2 shaft is down 1274ft., and No. 5 shaft has **reached 569½ft. The 1170ft. level is being ex**tensively opened up. The month's mill returns give the pleasing recovery of 78.3 per cent. lead and 57.3 per cent. silver. This ranks high for a **merely lead concentration.**

Kindness calls for no comment about Block 10, **the best part of which at present is the mill and the work it accomplishes.**

**The recent remarks of the chairman at the half-yearly meeting cover all that can be said about** Block 14. The mine is not done yet by any means, but it is more difficult to work and more costly, and the carbonates won are of lesser value.

The British continues to stand solid, and is **making the profits it deserves. The cost of the** new plant, of course, will stand against those profits, but it will not eat them all up—there will **still be something left for the shareholders. Good** ore is being won from both the No. 9 and No. 10 levels, Thompson's section, and the cage is running down to the No. 11 level. Crosscutting for the lode at this lowest level has been commenced.

**The Junction seems to bungle along—anyway,** it doesn't seem to satisfy the majority of the people, who know (or think they know) anything about the property and its work. Very significant **is the fact that both the mill superintendent and the engineer, who had borne the burden of the day in the erection of the plant, have resigned their positions. During the Mining Engineers' Con**gress a deal was said in favour of giving students proper training in practical work, but one ques**tions whether the speakers wanted the students to** be put into extra-responsible positions, such as **is apparently being done in this particular case.**

**The Junction North has been given quite enough prominence lately, and it might be as well to let** the new director have a look at the mine and make **his suggestions. 'Tis a strange thing, by the way, that the miners are not in love with this mine, and that the manager is always advertising for new men. If a man can get work elsewhere, he seemingly scouts the Junction North. The mill** figures for the past week read well, and tend to **confirm Mr. Rigby's late remarks.**

**Work at the 1250ft. level of the North continues to open up the lode in sections 6 and 7, and a new drive is being commenced in section 17. Crosscutting is in progress at the 1400ft. level, and at latest the cut was 58ft. from the shaft. The mill continues to treat a nice grade of ore, with high results.**

## Orange District.

(From Our Correspondent.)

Orange, May 7.

**Smelting operations have been discontinued at** the Mount Bulga copper mine, and a great quan**tity of matte has been despatched. The mine has been closed down temporarily, but it is expected that operations will be resumed before the winter is over.**

**Mining matters at Junction Reefs are proceeding smoothly, and the Lyndhurst Railway mines, under the management of Mr. J. Prosper, have been crushing some very nice ore with good results. A flying fox is about to be erected to convey the ore from the Mandurama side of the river to the battery, as through the winter months it is difficult for teams to cart ore over the hill. Mr. J. Hogan has been crushing ore from his sulphide lode, and reducing same on his concentrating table, and he intends despatching the concentrates** to Cockle Creek for treatment. He has taken up another lease for prospecting purposes. Messrs. W. Hogan and H. Burke have taken up a lease **adjoining Mr. J. Hogan's. Mr. M. Sheahan is crushing away with good results, and has completed a plant for treating slimes, which have in the past been allowed to run into the river.**

## Lithgow District.

(From Our Correspondent.)

Lithgow, June 5.

Mr. J. O. Armstrong, manager of the Lloyd copper mine, Burraga, who has taken considerable **interest in the effort being made to secure the construction of a branch line of railway from** Tarana, on the main western line, to Burraga, **about 45 miles, states that the haulage to and** from the mine would represent a very considerable sum per annum. The mine and surface works are now working most satisfactorily, one of the principal drawbacks being the lack of good, experi**enced miners, for whom several openings exist in the mine. Stoping has been carried out vigorously** in various stopes in the workings. The total quantity of ore raised during the past fortnight was 1822 tons, averaging 4½ per cent. copper. The whole of the stopes are looking well, and a rise from No. 10 levels shows 5ft. of ore, worth 8 per cent. The mills have treated 1800 tons of **ore, producing 261 tons 12 cwt. of concentrates,** and 97 tons 13 cwt. picked ore. Two working days were lost on one side of the mill owing to the **breakage of the spur wheel driving the rolls. Two furnaces worked full time for the fortnight, and** treated 344 tons 7 cwt. of concentrates and slag, producing 60 tons of matte, averaging 62 per cent. **of copper, 11.4 dwt. gold, and 12.6 oz. of silver.**

The last of the plant for the Carpathia tin mine, **Ardlethan, has been despatched from Sydney, and it is anticipated that the treatment plant will be** completed in a month's time. At present ore is being railed to Wyalong for treatment.

**Mr. J. P. O'Neill, of Bungonia, having inspected the Mt. Fisher copper field, Goulburn, reports that** in opening out on an outcrop of gossan a fine lode of copper ore was struck. About 100 tons of first-class ore is at grass, consisting of sulphide, oxide, and carbonate, with an occasional slug of native copper. The new discovery is about half-a-mile from Mt. Flora.

The British Australian Oil Company's works at [illegible], after being idle for about a week, are now proceeding with the erection of the retorts, which are not far off completion.

It is now stated that the reported find of petroleum at Taree was a hoax. A bore six feet deep had been put down by someone and filled with crude petroleum oil, the tins having been hidden in the bush.

---

## MINING IN WESTERN AUSTRALIA

(From Our Correspondent.)

Kalgoorlie, June 2.

The north drive at the 100ft. level from the south shaft on the Paringa or Geach's lode still continues in good values. This lode was discovered in April, 1910, by Geach, 125ft. west of the shaft, and, during his and Gourley's one year's tribute, produced £4206 from 1053 tons. Gourlay was then appointed underground manager in March, 1911, and opened up the lode at 200ft. The ore shoot was only 130ft. long, but produced £8147 from 3007 tons or 52s. 6d. per ton. The new north shoot is considerably richer than this. The original main shaft on the property is 800ft. deep, and is 700ft. north of the present workings. Most of the work done from it, as in the case of the south shaft, was on the eastern half of the property, in search of the Brown Hill-Iron Duke lode. In fact, in the annual report for the year ended June 30th, 1901, Messrs. Perry L. Ogle and Co., the then general managers of the mine, wrote:—"At a depth of 800ft., a crosscut east was driven to intersect the Brown Hill-Iron Duke lode, and this lode was cut at a distance of 175ft., and the crosscut was continued a further distance of 73ft. It will be seen from the above that we have been successful in finding the Brown Hill-Iron Duke lode, to which all our energies have been directed; it merely remains now to continue driving to reach the rich shoots worked in the Brown Hill mine." The Brown Hill lode is 350ft. east of the Paringa boundary. Tributers on the Paringa lease have treated, from April, 1908, to September, 1912, 20,882 tons for a return of £30,513, and the company has collected £1903 in royalties, or barely 6¼ per cent. This is vastly different to some of the mines, which charge from 5 to 25, and even 30 per cent. on the gross assay value, not recovery value, of all ore treated. For instance, the North Kalgurli, on the west of the Paringa, has collected, since 1906, £22,000 on 81,170 tons of ore, yielding £144,000, or at the rate of over 15 per cent. Tributers on the narrow telluride vein at the 200ft. level of the Paringa main shaft have just cleaned up 46 tons for £1900. This vein is in very hard country, and averages 4in. to 6in. in width.

The finding of 11ft. of ore, assaying 255s. per ton by diamond drill, 480ft. south of Edwards' shaft on the Great Boulder, although it caused a sharp rise in the scrip, hardly warranted it. The lode is only 5ft. from the Horseshoe boundary, and was previously worked in the Horseshoe. At the 1000ft. level, about 60ft. south of the present borehole, 7ft. of ore, assaying 57s. per ton, was located by the diamond drill some time ago, but very little has been heard of it since. This is probably the same lode. The western border of the Great Boulder has been riddled with boreholes and crosscuts from the 2800ft. level upwards, and except isolated lenses and patches nothing fresh is likely to be found.

The Great Unknown at Marda has cleaned up 112 tons for £2480 by amalgamation with ounce values in the tailings. This brings up the total returns—i.e., gold in residues—to 555 tons for £9000. The mine was bought early in 1911, as the result of the Bullfinch boom, for £2000 by Messrs. D. L. Doolette, Charlie Jones, A. W. MacIntyre, Ronald Bedford, and Gerald Williams, mine manager at Mt. Oxide. The two latter withdrew shortly afterwards. The reef at 100ft. runs from 12 to 18in. wide, but, unfortunately, no water can be found, and the ore has to be carted 12 miles to the Government mill at Mt. Jackson, and consequently only the best ore is sent.

Although the Sons of Gwalia Co. only superseded steam by producer gas for operating the whole treatment plant in October, 1912, the management has already decided to throw out the Thomson-Houston generator then installed, and replace it by the Commonwealth generator. This device is said to be an improvement on the Cambridge, and can utilise all sorts of scrap wood, and is the invention of Mr. Jordan, engineer of the Yuanmi mine. Although the Yuanmi mill only started running in March, 1912, with a charcoal generator, this was thrown out three months ago for a wood-consuming Commonwealth. The charcoal generator driving a 200h.p. engine operating a 20 stamp mill, crushing 185 tons a day, or 5500 a month, cost, with charcoal at 50s. per ton, £159, against the wood generator, with wood scrap at 16s. per ton, £74 per month, a saving of £85. On this basis the Sons of Gwalia using a 330h.p. engine, operating a 50-stamp mill treating 13,500 tons a month, should save £209 per month, or 3.71d. per ton crushed. The water used by the generator and engine only amounts to 6 lb. per b.h.p. per hour, also a big saving. The grate of the Commonwealth generator can be gleaned without a stoppage, and the one on the Yuanmi has run continuously for 52 days. When the Golden Mile mines will adopt the new process it is hard to say, as many directors and managers hold shares in the Kalgoorlie Electric Power Co., and various firewood companies, and the substitution would seriously interfere with their returns, and possibly shut some of them down.

The Westralia Mining Syndicate of Adelaide, a combine of the Kurnalpi and Havilah Syndicates, which abandoned Binti Binti, has secured an option on the Trafalgar at Ora Banda, adjoining the Victorious on the east. There is a shaft 120ft. deep on the Trafalgar, and it was in "made" ground to 80ft., which makes prospecting very difficult and expensive. Mr. Tom Creer is in charge, but, unless he has a fair amount of capital behind him, he will have a tough row to hoe. The ore-shoots on the Victorious are pitching east, which is in favour of the Trafalgar if sufficient capital is forthcoming.

The No. 3 winze on the Victorious is down to 62ft., the last 13ft. being in solid hard sulpho-telluride ore carrying visible gold and telluride, and assaying £16 per ton. The full 62ft. sunk averages 174s. per ton. The south crosscut at 460ft. is now on its way, and is expected to reach the lode the end of next month. The May return is not yet published, but the tonnage is short owing to a week's breakdown of the engines.

---

## THE COAL MINING INDUSTRY.

### New South Wales.

### Northern District.

(From Our Newcastle Correspondent.)

The Colliery Proprietors' Association met in Sydney recently, to consider, among other questions, the proposal to have a conciliation committee under the Industrial Arbitration Act, to deal with certain disputes in the Newcastle and Maitland collieries. The result of the meeting has not yet been made known, but it was stated that a communication on the subject has been sent to Mr. Carmichael, the Minister for Labour. During the last five months, the proprietors have consistently opposed the appointment of a committee on the lines of the old joint committee; and their expressed wish has been for the appointment of a Supreme Court judge to hear all matters in dispute in these districts that are of moment, the smaller disputes to be arranged between the men and the management of the collieries where they may crop up. However, they will probably agree to a board under the Act. At the same time, the delegate board of the Colliery Employees' Federation was meeting at Maitland to consider the attitude of the federation towards the proposal to appoint a judge to go into all these matters, without any representatives from either side. What the federation has asked for is a committee formed of representatives from both sides, with someone—probably a judge—as chairman. The executive of the federation contends that the appointment of a judge to sit alone will not meet with the wishes of the federation; but there are many miners who think that they can, with confidence, submit their claims to a judge like his Honour Judge Scholes, and that it would be a gain for the whole federation to have him permanently appointed to deal with disputes that arise between the men and the respective managements. It would also serve as an effective check to the making of local agreements, in which the federation may have no voice. The deliberations of the Board were in secret, but it is believed that the delegates will support any proposal that will give them relief in the matter of the working of the afternoon shift, and payment for small coal. It was stated that the misunderstanding of the Board had arisen through a mistake in asking for a Court instead of a board or committee. The whole matter had been explained, and the Government would now take steps to appoint a board, with representatives from each side, and a chairman nominated by the Arbitration Court. It appears most likely that his Honour Judge Heydon will be chairman of the board, but some of the delegates are inclined to favour Mr. A. Watt, barrister, as chairman. As the proprietors also have a say in the matter, the appointment will probably go to Judge Scholes, who has had much experience in this district, and also in the Southern and Western districts, in mining questions and mining disputes.

An agreement is to be signed by the representatives of the Abermain Coal Co. and the representatives of the miners working in that pit. It will cover the general working conditions and the payment for winning coal with the picks in the lower seam of the mine. There will also be agreements for the upper seam, where the machines are in operation, and for No. 2 Colliery—also a machine pit. It is stated here, and on good authority, that the management is prepared to abolish the second shift. If that is done, it will mean the sweeping away of the shift throughout the Maitland district, for Aberdare colliery already works only one shift, and the other mines will have to concede the same benefit to the men. It is also stated that the Abermain Co. intends to withdraw from the Colliery Proprietors' Association, and to run as an independent concern. Here, again, they will be following the lead of the Caledonian Collieries Ltd. (owners of the Aberdare pits), and the effect upon the coal trade may be far-reaching. It may mean that a period of competition in coal will set in, and if that comes about, some of the small collieries will go to the wall, or be absorbed in larger concerns. It is significant that when the Abermain No. 2 pit was commenced a couple of years ago, one gentleman connected with the management said, when asked the object of such a largely and finely-appointed mine, "We are preparing for contingencies." That remark was interpreted at that time to mean that the company was preparing to meet all competition if a break came in the proprietors' association, and apparently they think now that the time has come for withdrawing from that body. The developments in that direction will certainly be watched with interest.

The miners in some of the pits around Newcastle and Maitland are concerned about the quality of the air in certain parts of the mines. So far as the provisions of the Coal Mines Regulation Act are concerned, they are observed by the owners faithfully, and in many cases far more than the stipulated quantity of air per minute—100 cubic feet for each worker and each animal in the mine—is sent into the pits. But there are places in practically every mine that are difficult to ventilate, and the men wish samples of the air to be taken in those places, and if it is shown that they are as bad as the men contend they are, that something should be attempted in the direction of forcing pure air into them. The men are also desirous of samples of air being taken in the return airways regularly, so that any indication of gas in a mine might be ascertained, even where the ordinary tests in the working places fail to reveal any.

The miners working in what are called the Teralba pits—Pacific, Northern Extended, Rhondda, and Northumberland collieries—in the Newcastle district, are anxious to obtain an agreement with the proprietors of those pits for a period of three or five years. The executive officers of the federation were not opposed to an agreement for either of those periods, but they wished the proprietors to grant some additional concession in the way of rates paid for the winning of coal. This the proprietors were not willing to do, but the men appear willing to accept an agreement based on the present rates. At any rate, one of the lodges in that district has made overtures to the company, with that object in view. The federation is opposing the action of the men, and has communicated with them, asking them to stay their hand. It is feared that the making of such agreements may kill the small-coal question before it comes before the board soon to be appointed, for the proprietors would be able to say that a large proportion of the men had made agreements embodying payment for small coal in the general rate, and there would consequently be no need to go into the matter. A meeting of the Teralba men has been called, when the executive officers will endeavour to get the men to see the matter from the standpoint of the federation, and not from that of an individual lodge, which may think that there is some advantage to be gained in having an agreement for a long period.

The complaints about the weighing of coal at the Burwood colliery, in the Newcastle district, resulted in the Mines Department taking action against the management. The case came before the police magistrate, in the Summons Court, Newcastle, on the 5th inst., when John George Hutton, Inspector of Collieries, proceeded against Francis Henry Lambton Croudace, manager of the Burwood colliery, on an information alleging that defendant, "being the manager of the Burwood colliery, a mine to which the provisions of the Coal Mines Regulation Act applied, and where the amount of wages paid to the persons employed depended upon the amount of mineral gotten by them, was guilty of an offence against the Act, in that the mineral gotten by the persons so employed in the mine was not truly weighed at a place as near to the pit mouth as was reasonably practicable." The case for the prosecution was presented, it being contended that a weighbridge could be placed between the pit mouth and the tippler. At present, the coal travels 130ft. 5in. on one side of the pit mouth to the point where it is weighed, and 142ft. 7in. on the other side. The method of tipping the coal down a shoot, and passing it over the travelling belt, is said to cause a certain additional amount of small coal, to the detriment of the miners, who are paid only for the round (large) coal won by them. It was also contended that the breaking up of the coal by the boys who are employed to pick out "dirt" as the coal travels along the belt, causes a further diminution of the amount of large coal. Mr. Robison, of the Crown Law Department, appeared to prosecute, and he said that the miners contended that they should not be at the loss of the round coal which is turned into small during the passage of the coal over a belt for 130ft. before it is weighed. Mr. W. Sparke (for the defence): If that is conceded, it will revolutionise the whole of the coal industry of Newcastle. Mr. Robison: We are not concerned about that. Mr. Sparke: Well, we are, if you are not. It would mean a big difference in the price of coal. It is to the interests of the proprietors to get as much large coal as possible, and it would be suicidal for them to do as you suggest. On the application of Mr. Sparke the further hearing of the matter was adjourned until the 18th inst.

### Southern District.

(From Our Wollongong Correspondent.)

The electric light installation in the Bulli shire, which was set going with much rejoicing during the week, is probably the best illumination of the kind out of Sydney. Eight miles of the main road may now be said to be alight from end to end. It is not merely an alternation between lightness and darkness according to the range of the lamp; the light extends from lamp to lamp. The North Bulli Coal Co., who are nearest to the northern terminal of this lighting scheme, have written to the Council intimating that in six weeks' time they will have an up-to-date electric installation at the colliery, and would consider an application to supply current on the same terms as the Bellambi Coal Co., from the terminal on to Stanwell Park, another four miles of road. A year or two ago the Council asked this and other companies in that part to take on the continuation of the lighting, but none was then so inclined. There is now every prospect that in the course of another two years Bulli shire will have the most extensive electricity installation in the State, outside the two large centres.

During the late strike, the South Bulli Colliery management pushed on the installation of more new machinery of the latest type. For some years compressed air has been used in the mine for driving coal punchers and drilling machines. This mode of coal getting has done much to get rid of the deficient place trouble, the machines being used in hard sections. Now a larger and more modern air compressor (Ingersoll Rand) has been installed. It is said to be the largest at present in the Commonwealth. Electricity is the motive power. The installation was carried out in good order by the mine staff, and Mr. George Green, electrician. At present a powerful additional endless rope hauling engine is being placed. The whole plant will be in charge of one motor driver.

### Western District.

(From Our Lithgow Correspondent.)

Work at the local collieries has been fairly brisk during the past fortnight, and some encouraging orders are to hand, which will ensure a good pay for the ensuing fortnight. Ten shifts were worked at the Vale of Clwydd mine during the fortnight, one whole day being lost for want of trucks. The Lithgow Colliery worked 10½ days, and the Hermitage (belonging to the same company) about 8 days. Ten full days were put in at the Zigzag mine, and 9½ days were recorded at the Oakey Park Colliery. Full time was worked at the Great Cobar Company's mine. One day was lost at the Bouldon Colliery through want of trucks, whilst the failure to supply sufficient empties at the Invincible Colliery, Cullen Bullen, has caused much inconvenience of late. Out of an order for 40 trucks on Wednesday last, only 15 were obtainable. Under existing conditions only about half time is being worked at this colliery.

---

## BROKERS' CONFERENCE.

Stock Exchange representatives from Sydney, Melbourne and Adelaide are to meet in the Victorian capital in conference next month, when several matters of interest to brokers and public will be ventilated. Chief among these are: Uniform regulations for the admission of companies to the official lists of the stock exchanges; uniform market quotations, and the delivery of securities; timely notice of new issues of shares, and of closing transfer books; also locking up promoters' and vendors' shares in investment companies, as well as in mining companies.

As the outcome of the conferences between these exchanges, in 1903 and 1906, uniform regulations were adopted regarding the flotation of public loans and the issues of public companies; while the requirements of the stock exchanges from companies seeking official quotation were made more stringent—the fullest information being required as to the constitution of the companies, and upon other matters, with a view to affording larger protection to the public. These provisions have proved decidedly beneficial to investors. Further, it is claimed that the insistence of the stock exchange representatives in bringing before Ministers the desirability of amending the No Liability Act upon the lines aimed at by the last conference, has, indirectly, resulted in a decided improvement in Victorian legislation in this connection.

---

## REPORTS OF COMPANIES AND CORPORATIONS.

### Chillagoe Co. (Q.).

The Chillagoe output for the last two four-weekly periods was:—

| | | †Mar. 28. | *May 23. |
|---|---|---|---|
| Ore | tons | 6,073 | 5,216 |
| Copper | tons | 179 | 120 |
| Lead | tons | 247 | 407 |
| Silver | oz. | 21,788 | 32,930 |
| Gold | oz. | 223 | 377 |

†Copper and lead furnaces both ran 28 days.

*Copper and lead furnaces ran 16 and 23 days respectively.

There was no return for the four weeks ended April 25, as both furnaces were shut down during that period.

### Broken Hill Proprietary (N.S.W.).

Following is a comparison of the refinery products of the Broken Hill Proprietary Co. for the last two four-weekly periods.

| | | May 7. | June 4. |
|---|---|---|---|
| Own ores, silver | oz. | 301,065 | 171,849 |
| Do., do., lead | tons | 5,181 | 2,572 |
| Purchased ores, silver | oz. | 9,565 | 182,491 |
| Do., do., lead | tons | 1,829 | 4,195 |
| Gold | oz. | 619 | — |
| Antimonial lead | tons (est.) | 51 | 94 |
| Zinc concentrates | tons | 5,405 | 7,115 |
| Containing silver | oz. | 69,730 | 91,540 |
| Do., lead | tons | 400 | 529 |
| Do., zinc | tons | 2,482 | 3,281 |

### Hampden-Cloncurry (Q.).

The Hampden-Cloncurry Co.'s smelting returns during the last two months were:—

| | April.* | May. |
|---|---|---|
| Ore treated, tons | 4,900 | 6,600 |
| Metals recovered | | |
| Copper, blister, tons | 536 | 710 |
| Copper, fine, tons | 530 | 701 |
| Gold, oz. | 190 | 194 |
| Silver, oz. | 5,110 | 6,567 |

*25 days' smelting: 5 days lost owing to breakaway of foreheath, since repaired.

### Mount Morgan (Q.).

The Mount Morgan Company's smelting returns during the last two months were:—

| | April. | May. |
|---|---|---|
| Crude ore treated, tons | 20,436 | 15,640 |
| Many Peaks ore, tons | 8,299 | 6,271 |
| Production— | | |
| Blister copper, tons | 856 | 662 |
| Contents— | | |
| Copper, fine, tons | 847 | 655 |
| Gold, oz. fine | 10,058 | 9,169 |
| Approximate production from Many Peaks ore— | | |
| Copper, tons | 100 | 79 |
| Gold, oz. | 55 | 46 |
| Do. from secondary products— | | |
| Copper, tons | 28 | 20 |
| Gold, oz. | 188 | 893 |
| Estimated value of blister copper (with copper at £60 per ton) | £93,144 | £77,883 |

### Broken Hill South (N.S.W.).

The returns of the Broken Hill South Co. for the last two milling periods were:—

| | *3rd May. | *31st May. |
|---|---|---|
| Crude ore, treated, tons | 13,422 | 27,960 |
| Assay value— | | |
| Lead, per cent. | 14.4 | 14.2 |
| Silver, oz. | 6.1 | 6.3 |
| Zinc, per cent. | 13.6 | 13.7 |
| Concentrates produced, tons | 2,199 | 4,548 |
| Assay value— | | |
| Lead, per cent. | 68.7 | 68.7 |
| Silver, oz. | 20.0 | 22.3 |
| Zinc, per cent. | 6.8 | 6.9 |

*Four weeks.

### William Tell G.M. Co. (V.).

The half-yearly meeting of the above company was held at Phair's Hotel, Collins-street, Melbourne, on Friday, 30th May. Mr. R. W. Hinkson, chairman of directors, presided. In moving the adoption of the reports and balance-sheet, the chairman stated that the sinking of the main shaft to 400ft. had been completed, and crosscuttnig for the No. 1 East lode was now in progress. The latest advice from the mine manager stated that the crosscut was in 18ft. in sandstone country, interspersed with nice mineralised quartz leaders, and heavy water making in the face. In view of the fact that the heavy development work was completed for the present, and crushing operations were now in full swing, the directors considered the position of the company satisfactory, and they felt very confident that there was a prosperous time ahead.

The motion was seconded by Mr. Wm. Southwick, and carried unanimously.

The retiring directors, Messrs. R. W. Hinkson, F. J. Hobson, W. Plain, W. Southwick, and G. May, and the auditors, Mr. A. C. Macdonald, F.I.A.V., and Mr. Wm. N. Robertson, F.C.P.A., were re-elected.

### Great Langi Logan G.M. Co. (V.).

Presiding at the half-yearly meeting of the Great Langi Logan Co. in Melbourne on the 5th, Mr. J. L. Reilly, in moving the adoption of the reports, said that boring operations during the term had been very extensive, and the effect had been to enhance the value of the property owing to the definite nature of the information derived, and the good prospects of gold obtained from the bores. They had proved that either the lead made a very big bend, or else a tributary came in from the west. This meant they had proved enough lead to enable operations to be carried on by two or more companies. The results of boring had again been satisfactory in this respect, as it ensured that where they sank they would find the lead, and thus save perhaps thousands of pounds. Results obtained by adjoining properties more advanced in getting gold had materially increased the market value of this company's shares.

The reports and balance-sheet were adopted.

### Junction North (N.S.W.).

The mill returns of the Junction North Broken Hill Co. during the last two weekly treatment periods were:—

| | May 24. | May 31. |
|---|---|---|
| Crude ore, tons | 1,974 | 2,072 |
| Purchased ore, tons | 845 | 642 |
| Slimes, tons | 1,048 | 1,205 |
| Slimy zinc, middlings | 85 | 99 |
| Production— | | |
| Lead concentrates, tons | 681 | 657 |
| Assay value— | | |
| Lead, per cent. | 55.8 | 56.1 |
| Silver, oz. | 32.5 | 32.1 |
| Zinc, per cent. | 14.1 | 14.0 |
| Including second grade, tons | 76 | 77 |
| Zinc concentrates, tons | 358 | 348 |
| Assay value— | | |
| Lead, per cent. | 7.6 | 7.8 |
| Silver, oz. | 15.2 | 14.8 |
| Zinc, per cent. | 42.0 | 42.0 |
| Mill ran, hours | 141 | 144 |

### New Langi Logan.

The half-yearly meeting of the above company was held at 125 Queen-street, on Tuesday, 27th May. Mr. H. Dodd presided.

The chairman stated that the water pressure was going down very satisfactorily, and was now reduced to 38 lb. per square inch. He thought they would be into the wash sooner than was originally anticipated. The main reef drive was in splendid condition, and all initial difficulties had been overcome.

In reply to a question as to when he thought it likely that a rise to the wash could be started, the mine manager (Mr. W. H. Toole) stated that this could be commenced as soon as the water pressure was reduced to 25 lb., and if it eased as steadily as at present the rise should be started within three months' time.

The reports and balance sheet were adopted, and the retiring directors (Messrs. P. J. Winch, Walter Deans, and George Buchanan) were re-elected.

### Emu Bay Railway Co. Ltd.

An extraordinary meeting of the above company was held on Tuesday, 27th May, at Broken Hill Chambers, Queen-street; Mr. John Grice, chairman of directors, presided. There was a fair attendance of preference and ordinary shareholders.

The chairman produced and read a report in favour of a certain agreement between Mr. John Shearer, on behalf of the preference shareholders for the first part, Mr. George Neeve Hayward on behalf of the ordinary shareholders for the second part, and the company for the third part. Shareholders had been notified by circular as to the proposed agreement. Holders of 40,127 preference shares and of 112,813 ordinary shares were represented personally or by proxy at the meeting. It was (with the exception of one shareholder living in another State, who was probably not cognisant of the conditions) unanimously decided to accept the agreement. A second resolution—"That it is desirable to apply so much of the reserve fund balance standing to the credit of the profit and loss account as is necessary for the purpose in paying a dividend of 3s. 1d. per share in respect of preference shares numbered 250,001 to 300,000, and 2s. 9½d. per share in respect of preference shares numbered 300,001 to 350,000 to the registered holders thereof, on the 27th May, 1913, and accordingly the directors are hereby authorised to declare such dividend and to pay or pay and satisfy the same in cash, or partly in cash and by the issue of funded certificates, in terms of clause 2 of the said agreement"—was unanimously agreed to.

## Edna May Co. (W.A.).

The first half-yearly meeting of shareholders in the above company was held on Friday, 30th May, at 31 Queen-street. Mr. F. C. Tricks occupied the chair.

The chairman, in moving the adoption of the report and balance-sheet, referred in glowing terms to the prospects of the mine. **Eight months ago the company was practically non-existent. Now, at present market prices for** shares, the mine was estimated as worth £75,000. A credit balance of £3794 showed their finances to be in an unusually happy state for so young a mining company. The first shaft sunk was in untenable ground. **A second shaft was therefore being sunk close by. The** old shaft would be used for haulage from the **75ft. level. A battery of 10 stampers, costing** £1250 each, was being erected, and crushing **would start in the middle of next month. There** was 20,000 tons of stone, estimated to average ½ oz. to the ton, available, and 400 tons, which the manager expected to yield 1½ oz. The stone increased in value up to 3 oz. per ton as the **shaft went deeper. Without being unduly optimistic, he could say that the mine had a bright future.**

**The report and balance-sheet were adopted.**

## Mt. Cuthbert N.L. (Q.).

**The half-yearly meeting of the above company was held at 39 Queen-street, on Friday, 30th May. Mr. P. Pigott, chairman of direc**tors, presided.

**The chairman, in moving the adoption of the reports and balance-sheet, pointed out that the company's bank balances and outstanding debenture instalment showed a credit of £11,121,** being about £7000 less than the amount on **hand at the end of August. On 24th May the rails and line complete were laid for nine miles out of Cloncurry, while the line was in progress to 32 miles, a total of 255 men being employed. The directors hoped to visit the mine in July, in company with Mr. Corbould.**

**A supplementary report from the mine manager, dated 15th May, stated: — Kalkadoon Lease: Second lense of ore in south drive, 150 ft. level, followed for over 40ft.; so far, patchy values. Now turning west towards big iron**stone blow, under this expect to get a large **body of ore. Rise started in north drive in 20 per cent. ore; every chance it will continue in high-grade ore all the way up to old level, 83ft. above, as along floor of that level high**grade ore is showing. With regard to deeper **ground below 150ft. level, prospects good, rich ore showing along floor of drive. Sinking main shaft will be resumed shortly. Shaft will be sunk to 400ft. Crosscuts will then be opened** out at 250ft. and 350ft. levels. Mighty Atom: Rich ore, 25 per cent. to 30 per cent. proved to **40ft. Veins narrow, but show long, continuous outcrops of rich ore along surface. This indicates they will probably live in depth. Only working two veins; others equally promising.**

**The reports and balance-sheet were adopted.**

---

A deputation from Casley's Red, White, and Blue mine, Bendigo, waited upon the Minister of Mines last week, and stated that further development work on the mine was being hindered owing to the lack of funds. The reef was known to exist, and £1000 was wanted to continue the work at the south end of the mine, near the Sheepshead line. A sum of between £4000 and £5000 had been spent on machinery at the mine. The company was willing to contribute at the rate of pound for pound given by the Government. The **Minister promised to make an investigation as to** the position of the mine. The main object was **that the reef, if it did exist, should be determined** in the cases where the Government lent its support. Now that the greater developmental scheme for the district had been laid aside, he would make an immediate investigation of the facts surrounding Casley's Red, White and Blue mine, **with the object of laying before the Cabinet certain recommendations, provided always that the company was willing to submit to certain conditions, not very stringent, and to contribute pound** for pound.

# SOME PROMINENT BENDIGO MINES (V.).

## The "Golden Pyke" Group.

(From Our Bendigo Correspondent.)

The companies constituting the "Golden Pyke" **group, stocks of which have been on the active** list for some time past, are, in the order of leases from north to south: Constellation, Golden **Pyke, Golden Age, Princess Dagmar.** Through**out, operations are at present concentrated on the** eastern backs of what is known as the "Pyke" anticlinal fold. Opposite the Princess Dagmar and Golden Age, this reef channel lies parallel with and immediately west of the Garden Gully line, the latter fold rolling out entering the **Golden Pyke lease, leaving a broader expanse** of east dipping beds pertaining to the "Pyke" **anticline in this and the Constellation properties. This "Pyke" fold is actually the continuation of the Garden Gully line of reefs, taking up the running northward from where the latter double**folds, with a list to westward, in the northern portion of the Golden Age ground. Two anticlines **existing southward from this point for about half-**a-mile, the long eastern backs with which the auriferous quartz is being found associated in the **Golden Pyke and Constellation shorten in this** direction, forming the syncline in which trough reefs have existed in the two southerly mines. As previously pointed out in the "Standard," it is these altered geological conditions that make **it difficult to identify the reefs at different points, though both the Golden Age and Princess Dag**mar Companies claim to be working the continua**tion of the Golden Pyke present productive reef. Till a connection is effected between the Golden** Age north shaft and the Golden Pyke 643ft. level, no definite statement can be made on this particular point. For the present, it is sufficient to say that the whole of the companies are opening up gold-bearing quartz associated with eastern backs of the "Pyke" anticline, in approximately the same zone. That this auriferous quartz is the direct outcome of the faulting of the beds, chiefly **by westerly dipping slides, is beyond question. Two very pronounced faults are observable along this section, a feature of the Golden Pyke work**ings being the number of minor, and frequently **local breaks, running through the east back of the 447ft. reef.**

## Golden Pyke Company.

## The Latest Development.

A decided fillip was given to scrip values by **the entering of richer stones with the rise over the 543ft. level on the 25th May. The rise is 200ft. north of the shaft, and just about half-way to the Constellation boundary. Starting from the stopes, at 36ft. above the rails of the main level, a height of 31ft. has since been attained. It is in the last 6ft. of rising that the outlook** rapidly improved, coarse gold showing freely in 2ft. 3in. of solid reef. The quartz is highly **mineralised, and contains "splashes" of very black mineralised slates, which probably accounts, in some measure, for the enrichment of the reef. The best prospects were showing on the south side of** the rise on the date of inspection. Though not of as high grade as the first couple of firings, the **quartz in the top of the rise is still of excellent** quality, and maintaining the same dimensions. There is rather more than 35ft. of ground yet to **penetrate before the rise reaches the 447ft. level. As the reef is only a few inches thick in the latter, it is not anticipated that at present very favourable prospects will be continuous throughout. As** far as opened up in rising the shoot is a good one, **and the visible prospects being about equivalent to those disclosed in the last 40ft. of the rise from 643ft. to 543ft., opposite the shaft, and which,** by the way, has not been reached by the stoping **from 643ft. On the boundary at 543ft., the Constellation rose 75ft. on the formation above their 525ft. level. This rise revealed 6in. to 5ft. of reef,** the greater width being traversed in the last 20ft. **The better quality stone was opened up in the previous 30ft., and the whole is stated to have been of profitable quality. The Constellation crosscut, with which a connection has just been made by stoping 8ft. above the 543ft. level, is 50ft. inside the Golden Pyke lease, the latter company granting a tribute to a height of 15ft. above the rails some time ago. As it was in driving and stoping to 50ft. north to reach their own ground that the Constellation had their best results, the** Golden Pyke appear to have a particularly good **block of ground between 543ft. and 447ft., north of the shaft, bearing in mind the prospects of the rise on the boundary and that now in progress at 200ft. further south. There is evidence of the good quality of the reef in the leading stope at 543ft., operating at a few feet above the level and 80ft. from the end of the lease. There is 9in. to 12in. of quartz in this stope, which is the only one in commission between these rises at present. At 100ft. further south the stope shows a full width of crushing material, of fair quality. The** average elevation of the stoping from here back **to the shaft would not exceed 40ft. above the level. Southward there are only two stopes operating over a length of 300ft., the average elevation being also about 40ft. The front stope is over 130ft. from the Golden Age boundary, and 70ft. south of the No. 2 rise. The latter showed a little gold through to 447ft., but was not as productive as anticipated. In stoping north and south, however, prospects altered considerably, the reef widening and improving greatly in quality.** At present the leading face reveals quartz of a **payable character. From the rise the reef enlarges to 3ft. and 4ft. of higher quality stone over a length of 40ft., but is standing at present. The other stope is close to the shaft, where a minor fault is visible, and the quartz of fair quality. At 643ft. there is 6in. to 15in. of fair-looking quartz, in advancing the level to within 70ft. from** the Golden Age ground. A little gold has been seen in the last 40ft., but the shoot of good stone **seen in the higher reaches of the rise connecting 543ft., opposite the shaft, has not yet been found continuous in this direction. The one stope working is 50ft. behind the level, extending to 25ft.** overhead. Here the reef is low grade and 6in. to **2ft. thick. The beating of this stope into the boundary is expected to disclose better prospects. As intimated, no stoping is being carried out for the length 180ft. back to the shaft. The workings here are approximately 45ft. over the level, and** the bringing along of another stope south from the rise should show some indication of the good shoot of stone referred to. As there are several **profitable faces above 543ft., no anxiety is being displayed to reach the intervening shoot, and a stope off the rise may not be started for the present. North of the shaft, the company are limited to a depth of about 40ft. along the reef below 543ft. This should be sufficient to encompass the greater portion of the profitable quartz passed through in the rise, especially as the pay shoots** have shown a southerly pitch. The fact of the 543ft. north level opening up good prospects for **the last 250ft. is also an assurance of profitable results from underfoot, later on. At 447ft., the north level is extended to 270ft. and 130ft. from the end of the lease. There is only 2in. to 3in. of reef in the face, of low grade. When the 543ft.** rise gets through, this level will be pushed ahead. The most advanced stope, just over the timber, is 110ft. further back, taking 2in. to 12in. of quartz, showing a little gold. Nothing is being done in the next four stopes, where the reef is smaller than above 543ft. In the next stope there is 8in. to 10in. of profitable quartz, at 15ft. below the turnover of the east leg. Above this, the old workings along the cap and the upper portion of the east and west legs are exposed. The stope going south is working hand labour, taking 1ft. to 1ft. 3in. of stone, at a few feet below the cap, and a little more gold has been seen of late. The level is 70ft. short of the Golden Age boundary. During last week very fair gold was officially reported in rising on the outer reef, known as the "tributers'" back, near the north boundary. As the back is further east than the main reef, the company's ground northward extends only to 120ft. beyond the main crosscut. It was on the strength of the payable yields got by tributers from the small reef allied to this back further north that the company reconstructed, and in crosscutting with this, as the chief objective, the 447ft. east back was rather unexpectedly found most productive. The outer back is intersected by a steep pitching southerly fault close to the crosscut, and has been opened by driving and stoping for a length of 120ft. along the course of the slide. There has been a little gold at intervals, but nothing of value. On the south side of the crosscut, the stopes are standing at 20ft. above the fault. The recent development resulted from rising through the same break at 18ft. above the north level. All the indications pointed to the enrichment here being due to the faulting, and the conditions did not favour permanency in this shoot. The more regular stone followed by the tributers evidently exists higher up, and may not be located yet awhile. It is proposed to first connect these old workings, the exact position of which is largely a matter of conjecture. On holing through, it will be possible to start stoping, if the statement be correct, that payable stone was left behind by the tributers, who worked this small reef to a considerable depth from one of the shallow levels, by means of an underlie winze. After the half-yearly meeting, it is intended to extend a crosscut at 743ft., to tap the continuation of the "main" reef, which is a fair width along the bottom of the 643ft. south level. To date the company have made a profit of about 16s. per share from the 447ft. east back, including the expenditure on new machinery. Being now equipped with an air compressing plant and a crushing mill, shareholders are assured of steady dividends for some time.

(To be continued.)

---

The amount of gold purchased by the banks of Bendigo and Eaglehawk during the month of May was 14,480 oz. 11 dwt. 11 gr.

## A.I.M.E.

## The Broken Hill Congress.

(By Our Special Commissioner, J. Malcolm Newman, B.E., Assoc. Inst. M.M., M. Aust. Inst. M.E.)

### Some Features of Broken Hill Mining.

The series of papers on this subject was preceded by a valuable general statement of the peculiarities in the mode of occurrence of the ore-bodies which resulted in the adoption of the various methods afterwards described. Of these peculiarities the most important are:—

1. The shape of the ore-bodies, which are stated to be "irregular in shape, of tremendous width in parts, and enclosed within rotten walls." Developments at depth indicate that the lodes will be narrower and more regular, but it is a strange fact that even in the deeper levels the walls are often rather "rotten."

2. The physical properties (texture, etc.) of the ores, which vary from dense strong sulphides to porous friable sulphides and loose "vughy" carbonates. In addition to the natural variations in texture is that induced by the crushing of blocks of ore as a result of previous mining operations.

The evolution of the methods characteristic of the field as a whole is put clearly by the authors as follows:—

The first method of stoping employed was on the open principle, involving the use of "clap-me-down" sets of local gum timber. This was found unsuitable, on account of the weakness of the ore and of the walls and the size of the deposits.

Then came the Deidesheimer square-set from Comstock, and with it a number of American engineers to supervise its use. It was employed in overhand stoping, was put in in horizontal floors, and was reinforced with angle bracing and bevel pieces—features of the original design; but, so long as the timber was relied upon as the only support for the depleted ground, the stopes continued to fall in.

Then came the winzing system, and the filling of the sets with mullock quarried at surface. That modification made the square-set method a success, and enabled many thousands of tons of friable ore to be extracted.

The square-set system is still being used extensively, and is not likely to be displaced for exploiting crushed and broken ground, although, on account of the greater attention being paid nowadays to filling, the angle-bracing is rarely seen in its completeness. An important change, however, in the manner of using the sets has been made on the field. In the picking-up of bottoms, in crushed workings, and in the mining of old pillars, the sets are now used in conjunction with underhand stoping. In this system of exploitation the trouble with a weak back is minimised, the work rendered more safe, and the cost per ton reduced.

With increase in depth the ore changed from the oxidised to the sulphide minerals, which at shallow levels were in the friable condition, but at greater depths were hard and compact. The alteration to sulphides meant a lower grade ore and a concentrating charge. Still, under the disadvantages of metallurgical difficulties and unfavourable metal market the friable stopes showed profit on square-set work; but when the hard ground was properly entered it was perceived that, in addition to the sets being too expensive, they were also unsuitable.

Then came the introduction of the open stope proper, embracing the use of timbered gangways on the sill floor only, filling of depleted ground with mullock, and the utilisation of pig-sties or bulks in the working place. And, although many changes have been made in detail, the same system (in principle) prevails to a considerable extent to-day.

The special characteristics of the underground operations of individual companies are described as follows:—

South Blocks.—The South Blocks (Zinc Corporation) at present is working a narrow ore-body, practically vertical, and having only one wall. The conditions are such that rill stoping, combined with filling from continuous passes, skip haulage and fathomage contracts, is possible, and is successfully accomplished.

South Mine.—The South mine is operating open stopes in large, irregularly-shaped masses on the 970ft. and 1070ft. levels; and above are picking up bottoms, and working away old pillars, with underhand square sets on a cross-cut system.

Central Mine.—The Central mine (Sulphide Corporation), on the deepest levels is open stoping a new ore-body east of the one previously worked; and, higher up, is depleting with square sets old workings and old pillars that have "crept," and are still slowly subsiding.

Block 10.—This mine is the deepest on the Barrier, and, as the lode is narrow at depth, the stoping operations are on an open rill system. There are many problems here, though similar to the Central Mine (the "creep" having affected both properties), and they are dealt with in a similar manner by square-setting. This work is going on under old bottoms, on both an underhand and flat-floor system.

Proprietary Mine.—This mine is also open-stoping at the deepest levels, but upward its problems are, perhaps, more varied than those of any other company. The square-set method predominates, and is employed in all classes of ground—e.g., hard ore under bottoms, crushed ore in "crept" stopes and "bridges," and loose running material partially oxidised underneath the open cut and in proximity to an old fire.

Block 14 Mine.—This company is engaged on the recovery of carbonate ore from old stopes on shallow levels with the aid of square sets, and on the stoping of compact sulphides at depth in open workings.

British Mine.—This is distinctly an open-stope mine, mainly on account of the hardness and strength of the ore. Both the lower portions of "a lift," and the bottoms as well, are worked on the bulk system, booms, of course, being freely used for the last slice. Only in the case of friable ore are square sets called into requisition.

Junction Mine.—The Junction mine is re-working old stopes left unfinished, and re-entering others that had "crept," with the aid of square-set timber. On the deeper levels the strength of the ground warrants the use of the filling and bulk system.

Junction North Mine.—Here, again, the strong nature of the ground allows of the employment of open stopes until the bottoms are being approached, when a change is made to set timber. At present the 1200ft. level is open; but above it bottoms are being secured on the usual system.

North Mine.—This mine possesses two ore-shoots, having good walls and pitching with remarkable uniformity downwards in a north-easterly direction. The strength of the ground allows of open stoping, and the regularity of the deposit generally makes possible a standard system of drives, cross-cuts, and winzes, and the installation of an efficient and cheap method of handling filling.

### Rill-Stoping on Zinc Corporation's South Blocks Mine.

By B. V. Barton.

Mr. Barton includes skip-haulage in the title to his paper, but limits his remarks on this subject to a brief description of the underground shaft bins.

A bin is excavated of approximately 150 tons capacity—minimum slope of bottom 60 deg. into the shaft. The bin plat is about 50ft. below the main plat, the bin being 10ft. x 6ft. in the clear. A 10in. grizzly is placed over this, 6ft. below the rail level and a tippler above to facilitate emptying trucks, of which there are four, of about 1 ton capacity, with roller bearings and 15in. wheel base, for a level 1100ft. long, producing about 4000 tons per month.

The method of opening up and working on the Rill is described by Mr. Barton as follows:—

At right angles to the main crosscut, drives 8ft. x 8ft. in the clear are made in opposite directions along the last wall of the lode. If the lode is over 10ft. in width, east and west wall-drives are put in. When one of these has reached a point 200ft. from the cross-cut, stripping and leading stope is started from the crosscut. The driving of the west drive is continued whilst stripping, stoping and timbering are being completed on the east drive, and vice-versa.

When a point 60ft. from the crosscut has been reached an offset from the timber is put in with long 10in. x 10in. sills and caps so as to form a winze chamber. The winze is then sunk 50ft. in ore so as not to disturb the east wall, which is treacherous.

When the timber has passed this point a rise to the winze above is started, 7ft. x 5ft. in the clear, and is carried up in the east-wall mullock and holed through to the winze above. These rises are spaced 120ft. centres right along the lode, and are used for filling, ventilation and occasional ladderways.

Ladderways are carried up every 150ft. through the filling, and are constructed of 10in. x 3in. hardwood gwyndering, 3ft. 6in. square in the clear.

Levels are spaced 150ft. apart, vertical, and as soon as a rise is completed the stope is started. The first stope is cut up 15ft. at the rise, and is allowed to taper off to the timber. This is then filled with sand chutes. Ladderways and air-pipes having been built up to within 5ft. of the back, when a fresh cut is taken off. This process is continued till the level above is reached. The most suitable angle of stope is 30 degrees. This angle not only combines filling of stope with minimum of handling and maximum of safety in removal of broken ore, but also cuts the flat heads of the ore-body at a sufficient angle to make the use of timber unnecessary even in widths up to 60ft.

The rise being the highest point of the stope, when this reaches to within 10ft. of the level above, the stope is gradually flattened off and timber bulks erected until the whole stope, from rise to rise, becomes an ordinary flat-back stope. In widths up to 15ft. this can then be carried up to within 3ft. of the level above. This ore is left in, as the expense of winning it would be more than its worth.

The method as described is easily understood when read in conjunction with the introductory statement quoted above, "a narrow ore-body, practically vertical and having only one wall," and Mr. Barton's words that the Rill angle of 30 deg. "cuts the flat heads of the ore-body at a sufficient angle to make the use of timber unnecessary, even in widths up to 60ft." The nett result should be cheap and safe mining.

The paper also gives details of plats, drive-timbers, tracks, chutes, and air-pipes.

In the discussion on Friday evening, your correspondent pointed out that evidently the question of compressed air transmission had not received due consideration; for though a six-inch main would be sufficient to supply 15 to 20 large drills, a two-inch pipe, say, 300ft. long should not be asked to feed more than two such drills at ordinary air pressures. Yet here we have two-inch level pipes supplying two-inch branch stope-pipes. Inattention to such matters may result in heavy losses due to frictional losses and far heavier indirect losses due to low pressures at the drills.

---

## THE JUKES-DARWIN FIELD.

### Assistant Geologist's Report.

Mr. Loftus Hills, Assistant Government Geologist of Tasmania, has presented a preliminary report on the Jukes-Darwin mining field, situated on the southern portion of the West Coast range, and lying to the south of Mount Lyell, the centre of the field being distant therefrom about 12 miles; Mounts Owen and Huxley and the peaks intervening between Mount Lyell and the mountain range of this field, which comprise Mounts Jukes, Darwin and Sorell. From these mountain masses, the peaks of which reach a height of 2800ft. above the sea level, the country slopes steeply downwards towards Kelly Basin, which forms the southern boundary of the area examined. The whole region is extremely rugged and precipitous. There are two main means of access to the field, both of which involve the utilisation of the North Lyell railway from Kelly Basin to Linda. The first route is via Queenstown, thence by road to Linda, from which point the railway is available (at present on two days in the week) to either Crotty (12 miles) or Darwin (16 miles), whence the approach to the mining properties may be made by steep mountain tracks. The second means of access is via Strahan, thence by boat to Kelly Basin, whence Darwin or Crotty can be reached by rail, being distant respectively 13 miles and 17 miles from Kelly Basin. There is another route available by pack track from Lynchford. This track, starting from the latter station, on the Mount Lyell railway, crosses the King River by a bridge near Harris' Reward and then ascends the northern end of Mount Jukes as far as the Mount Jukes Proprietary mine.

The field was first prospected in 1897. In 1900 Mr. W. H. Twelvetrees, Government Geologist, paid a short visit of examination to the district, and in 1903 Mr. G. A. Waller, Assistant Government Geologist, reported on Findon's sections on Mount Darwin. These two reports comprise the whole of the investigations which had been undertaken up to the time of the present geological survey.

Great activity was displayed whilst the North Lyell Mining Co.'s smelters at Crotty were under construction, and during their operation. The failure of these smelters and the amalgamation with the Mount Lyell Co. and the consequent concentration of smelting operations at Queenstown, brought about a paralysing effect on the field. This, together with the other causes of the stagnation of the field, are described at the conclusion of this report.

At present there is only one property on the field where active work is being carried on. This is the Mount Jukes Proprietary, which is at present employing three men.

The whole of the mountain masses is composed of various members of (1) porphyroid series, and (2) conglomerate and breccia. The former series (the porphyroids) consists of an interesting and varied assemblage of quartz porphyries, felspar-porphyries, felsites, schistose felsite, chloritic and talcose (?) schists. Granite is developed on Mount Darwin, and forms a rather extensive plateau on the southern end of that mountain. This is not the Devonian granite, but belongs to the older series of igneous rocks, which have been designated collectively as the porphyroids. The whole of these rock types are more or less mineralised, but the mineralisation is confined more especially to those rocks the softness and general permeable character of which have been favourable to the circulation of ore-bearing solutions. The more promising ore deposits are therefore found in the schistose felsites, chloritic and talcose (?) schists.

The conglomerate is the same rock as occurs generally on the West Coast ranges, almost invariably capping the mountains. It occurs over the greater part of Jukes, and covers the whole of the long ridge of Sorell, but is missing from Darwin, with the exception of two isolated patches. The evidence obtained during this survey has conclusively shown that the conglomerate is younger than the felsites, granite, etc. The lower members of the conglomerate series consist of breccias, composed of angular fragments of felsite, granite, etc. These pass upwards by an increase in the number of quartz and quartzite pebbles into the normal conglomerate. The comparatively flat country on the east and west flanks of these mountains consists of silurian sandstones, slates, and limestones, in part overlaid by glacial morainal deposits. An occurrence of scientific interest is the discovery of irregularly shaped fragments of acid glass on the eastern side of Mount Darwin, the origin of which is a mystery, as it has been conclusively proved not to be of artificial origin. The whole district shows abundant evidence of glaciation in quite recent times. There are four general types of ore deposits developed in this field, viz.—(1) Detrital gold deposits, (2) the copper-silver-gold ore bodies, (3) haematite and magnetite deposits, and (4) deposits in fissure lodes.

Detrital gold deposits occur exclusively on Mount Darwin and in the valley of the Clarke River, between Mounts Darwin and Sorell. A peculiar feature is the absence of alluvial gold in the alluvial deposits at the foot of the mountain, the gold being confined to the higher parts of the range. It occurs in creeks and terraces, especially in sections 5207M, 3295M, 2581M, 3196M, 1203M, and 3352M. The occurrences are very irregular, a notable feature being the absence of gold in wash of any thickness, the precious metals being confined mostly to the portion of alluvial deposits which are thinnest. The gold is generally waterworn, and is remarkable in being uniformly in coarse grains, fine gold being absent. The largest nugget obtained up to the present weighed 6½ oz., the commonest size being from 1 to 2 dwt. The gold is very pure. Altogether, somewhat more than 500 oz. have been won from these alluvial workings, which are not yet exhausted, although no work was being done at the time of the writer's visit.

The copper-silver-gold ore bodies are the most important ore deposits of the field. They occur exclusively in the rocks of the porphyroid series (felsites, etc.), being widely spread throughout these rocks, but being concentrated into deposits of possible economic value only in these portions of the rock system which have been rendered schistose. The copper ore is almost always chalcopyrite, bornite being developed in one deposit only (Lake Jukes), while metallic copper occurs in small amounts throughout the field. The associated minerals are quartz, iron pryites, haematite, and magnetite, whilst galena and fahl ore are occasionally present in small amount.

The report proceeds to give short descriptions of some of the properties on which formations of this type are known to exist.

The haematite and magnetite deposits occur widely distributed throughout the Jukes-Darwin district, but more especially towards the south end of Darwin, in the neighbourhood of the granite intrusion in that locality. There are apparently three distinct varieties of haematite developed in this field. One variety occurs on Mount Jukes in felsite, and may be classed as red haematite. Another variety is that at Lake Jukes associated with the bornite veins, and is bluish-grey in colour. The third variety includes specular iron and micaceous haematite. These three varieties apparently have different modes of origin, but require the more minute investigation, which will accompany the compilation of the complete bulletin on this field, before any definite statements thereon can be made.

The magnetite and háematite deposits of South Darwin are most probably connected with the granite intrusion. There are a large number of these occurrences, constituting well-defined "blows." Some of these deposits contain iron and copper pyrites.

There are very few true fissure lodes on this field. The only undoubted lodes of this type are the deposits of barytes, which occur in the felsites and granite and certain quartz lodes on South Darwin. There smaller lodes carry a very small amount of iron pyrites and some chalybite and a very small amount of gold, but otherwise appear to be devoid of metallic contents.

The field as a whole is in a comatose condition, and has been so for some years. The causes which, in the writer's opinion, have been instrumental in bringing about this state of things are the following:—(1) The difficulties of access to the mining sections; (2) the closing down of the North Lyell smelters at Crotty, and the consequent removal of a convenient market for copper ores. This gave the field a distinct set back, which was accentuated by the resultant withdrawal of the incentive to North Lyell investors to persevere in the attempt to locate sources of ore adjacent to their smelting works. (3) The mistaken assumption based on the fortuitous juxtaposition of haematite and the pyritic ore body at Mount Lyell, that all outcrops of haematite constituted the capping of pyrite deposits. This resulted in the waste of money in exploiting bodies of haematite which are in no way connected with the pyritic copper deposits. (4) The formation of small syndicates with a small capital to exploit observed outcrops. Whether or not the surface indications show geological features which would justify the expenditure of capital, the result in the case of the majority of these small syndicates has been the same—viz., the cessation of operations before they had proceeded far enough to prove anything at all, either favourable or otherwise, owing to the exhaustion of the capital. These remarks are undoubtedly applicable to this district, which, with the exception of the alluvial gold deposits, is distinctly not a poor man's field.

The failure of these small syndicates to obtain results and the non-success of the larger companies to disclose ore bodies of exceptional value have been instrumental in inculcating in the minds of the mining community generally a very poor opinion of the potentialities of the field. The Jukes-Darwin field therefore is one which requires much capital for its development, and calls for the attention of the broad-minded and courageous mining investor with large resources of capital. The only factors which will influence or bring about the expenditure of this essential capital are the deductions from geological investigations as to the nature of the observed ore deposits, and the possibility of their developing into deposits of adequate economic importance. If in any case such deductions are favourable, then work on that deposit should be proceeded with on bold but scientific and systematic lines.

Since this report has been compiled immediately on the writer's return from the field, it is not possible to express at the moment a definite opinion on every ore occurrence; the more minute investigations which will accompany the preparation of the complete bulletin are necessary before final conclusions can be formulated. In several cases, however, the evidence is such as to justify the writer in forming favourable opinions. The Mount Jukes Proprietary (J. Soutar, lessee), the Darwin Proprietary and South Mount Lyell Darwin sections (J. Wood, lessee) and the Hal Jukes (R. S. Taylor, lessee) all present features which would warrant the adoption of a progressive policy of development work.

## THE DREDGING INQUIRY.

The Victorian Dredging Board took evidence at Bright last week, all the members of the Board being present.

A. C. Campbell, the local mining inspector, in reply to questions, said he did not think that the placing of soil on the debris of dredged land would make it as valuable as the choicer lands of the Western districts, though such resoiling had cost nearly £54 an acre. Dredging leases had been in the past granted over agricultural land. High river banks, heavily timbered, had been dredged away. The dredges had removed logs from the bed of the river. At Sandy Bank, where resoiling conditions were supposed to be in force, the soil had been left in a very uneven condition.

Thos. Gallagher, farmer, of Smoko, gave evidence unfavourable to dredging.

Thos. Hall, manager of the Buffalo Star Dredge, explained the method adopted of resilting the tailings, but admitted that it was not attempted, except on freeholds. He had resoiled a few acres, by placing about a foot deep of loam on the debris of the dredge, and contended that such ground was more valuable than the original deep soil which it replaced. The cost of such resoiling had been nearly £54 per acre. Part of the lands being dredged were freehold, and on an average £16 an acre had been paid for them agriculturally. The same land, before being dredged, was not worth 40s. an acre. It was worth £4 an acre after he had resoiled it.

John Blair, of Freeburgh, complained of damage by flooding on portions of his farm, caused by a dam placed across the river by a dredge. The river had been silted up.

Evidence of damage done to fertile land was given by Thos. Blair, of Freeburgh, and Henry Oakes, dairyman.

I. Sloane stated that on the whole the dredges had been beneficial to the district. It was a great sin to destroy good land as had been done. The bulk of the dredged areas was, however, poor land, and the dredging had improved them. He deprecated the sudden closing down of the dredging industry. If dredging closed down by degrees the men employed would find mining employment in the surrounding hills, where there was plenty of gold awaiting discovery.

On the following day the Board sat at Myrtleford, where additional evidence from agriculturalists was against the extension of draining.

## DARWIN STRIKE "OFF."

The Darwin (N.T.) Branch of the A.W.U. last week "officially" called off the local strike, which has been dead for nearly a fortnight. At a meeting of that body the following resolutions were passed:—

(1) That although this branch does not expect a party that is not even just to its creators and supporters to be generous, still it does expect a Minister of the Crown to be honorable enough to keep his promise, which the branch had from him both verbally and in writing, and in which it is laid down clearly and distinctly that the wages here are to rise automatically as wages rise in the south, with a 25 per cent. addition, and an extra tropical allowance.

(2) That having fifteen days ago furnished the Administrator with proof that a rise of wages has taken place in the south, and, therefore, that the wages here should rise accordingly, and having only received shuffling and evasive answers from the Administrator, this branch is of opinion that the Administrator, by his dilatory methods, is trying to prolong the strike and destroy unionism here; also that the statements made by the branch that the Administrator is unsympathetic, unjust, and totally opposed to unionism is proven.

(3) Be it therefore resolved that this branch, ignoring the Administrator altogether in the matter, and relying wholly on the assurance of the Minister, advises its members to return to work forthwith, while the branch will arrange to have its further demands adjusted by arbitration, and will place all cases of victimisation before the Minister and the national Government.

As the places of the strikers have nearly all been filled many will find difficulty in obtaining employment in the Government departments.

## CORRESPONDENCE.

(To the Editor.)

Sir,—Referring to article headed "Lessons in Geography" in your issue of the 5th inst., I note the following:—"Not only in the United States, but also in every part of South Africa (in Basutoland and Bechuanaland Protectorate, Rhodesia and the Union of South Africa), the black races have been multiplying much more rapidly than the white."

In contradiction of the above, I beg to refer you to Report of the Department of Commerce and Labour, Bureau of the Census, Washington D.C., entitled "Color, Nativity, and Parentage of Population, by States," issued December 23rd, 1911, from which you will note the following:—

| | Number (in thousands). | | Increase, 1900-1910. | |
|---|---|---|---|---|
| | 1910. | 1900. | Number (thous'ds). | Per cent. |
| United States. | | | | |
| Total .. .. .. | 91,972 | 75,995 | 15.978 | 21.0 |
| White, Total .. | 81,733 | 66,809 | 14,923 | 22.3 |
| Native white, total .. .. | 68,389 | 56.595 | 11,794 | 20.8 |
| Native parents | 49,488 | 40.949 | 8,539 | 20.9 |
| Foreign parents | 18,901 | 15,646 | 3,255 | 20.8 |
| Foreign white .. | 13,344 | 10.214 | 3,130 | 30.6 |
| Negro .. .. .. | 9,828 | 8,834 | 994 | 11.3 |
| All other .. .. | 411 | 351 | 60 | 17.0 |

From the above you will note that, according to the Government statistics, your statement in regard to the increase of negro population in the United States is erroneous.—Yours faithfully,

C. S. WALLACE.

[Our correspondent evidently has at his disposal later figures than we have at ours. Our statement was, so far as concerned the United States, based upon the figures for the decade ended 1900, as given in the "Statesman's Year Book." These show that for that period the general increase by reproduction amounted to 14.87 per cent., while the increase among the negro population amounted to 18.05 per cent. With the figures for the 1910 decade before us, the statement made would have been modified; but our contention as to the incorrectness of the assertion in the work we were criticising that the numbers of the black race were "small and diminishing" would not have been affected.—Ed. "A.M.S."]

## MINING IN QUEENSLAND.

### Anakie Field.

(From Our Correspondent.)

Sapphiretown, May 30.

Mr. M. Heiser, a gem dealer and optician, of Rockhampton, while visiting this field recently did a little prospecting, and was fortunate enough to unearth, close to the township, a green sapphire of 26 dwt. Other fair stones being obtained, Mr. Heiser promptly pegged out and registered the ground, and states his intention of putting men on. He values the green sapphire at £40. It is one of the largest of this colour ever obtained on the field.

THE AUSTRALIAN MINING STANDARD.

# ENGINEERING and ELECTRICAL RECORD

Vol. XXVII. MELBOURNE AND SYDNEY, JUNE 12, 1913. No. 759.

THE ENGINEERING AND ELECTRICAL RECORD *is published every Thursday morning. Price Sixpence.*

*All communications should be sent to the Editor; those having reference to business matters should be addressed* CRITCHLEY PARKER.

CASUAL ADVERTISEMENTS *on this page 15s. per inch per insertion.*

Australian
General Electric Co.
217 Clarence Street, Sydney.
Tel—Central, 3495, 4397; City, 2381.
"Penfold House," Cr. Queen and Little Collins Sts., Melbourne.
Tel. Central, 2647.
Representing—
GENERAL ELECTRIC CO., U.S.A.
The
BRITISH THOMSON-HOUSTON CO. LTD., of Rugby, England.
The GUARANTEE of EXCELLENCE on GOODS ELECTRICAL

## WIRELESS TELEGRAPHY.

### Findings of Expert Committee.

(From Our Correspondent.)

London, May 2.

Last night, the Committee appointed by the Postmaster-General to report on the merits of the various existing systems of long-distance wireless telegraphy, particularly as to their capacity for continuous communication over long distances, required by "the Imperial chain," issued its report. Appended are extracts:—

"Immediately after our appointment we took measures to ascertain what systems of wireless telegraphy there were in existence, and by whom such systems were controlled. These systems appear to be the following:—(1) The Marconi, controlled by the Marconi's Wireless Telegraph Company Ltd.; (2) the Telefunken, controlled in this country by Messrs. Siemens Brothers; (3) the Poulsen, controlled in this country by the Universal Radio Syndicate; (4) the Goldschmidt, controlled by the Anglo-French Wireless Company; and (5) the Galletti, controlled by the Galletti's Wireless Telegraph and Telephone Company. It appears, however, that the Admiralty, while in the main making use for communication between His Majesty's ships and shore stations and between ship and ship, of apparatus similar to that employed by the Marconi Company, claim, nevertheless, to have introduced important improvements. These improvements may be of some materiality; for the Admiralty desire that each station in the proposed chain shall be capable of communicating with His Majesty's ships. It should be considered, therefore, whether any system adopted by the Post Office for the purposes of the Imperial chain ought not to be capable of being worked in conjunction with the Admiralty appliances, especially as to the wave-lengths to be employed.

"The term 'System of Wireless Telegraphy' is not really apt. Each company or firm engaged in working a wireless station uses apparatus protected by its own patents, and has to avoid the use of apparatus and devices protected by the **patents belonging to other companies or firms. The** main differences in the apparatus and devices at present in use centre in the high-frequency generator; but there are other apparatus or devices protected by patents, such as special aerials, different types of automatic high speed transmitters and of receivers and recorders. Any company or firm which makes use of apparatus or devices which others are precluded from using because of the existence of some patent may claim to have its own system of wireless telegraphy, but the term 'system' is misleading, inasmuch as by far the major portion of the buildings and plant could with minor modifications be used equally well with any high-frequency generator or other patented device. The existence of a patent may seriously interfere with the normal development of an industry, for it tends to prevent the general use of the means best adapted for securing the end in view. It may well be that a competent engineer, if asked to erect and equip in the most efficient manner a chain of wireless stations such as the Post Office contemplates, would desire to combine apparatus, the combination of which is difficult if not impossible because of the existence of patent rights. In this connection we desire to lay stress on the fact that the Government is not fettered by considerations arising out of patent rights, but can use any patent on fair terms, under section 29 of the Patents and Designs Act, 1907.

"Subject to the above criticism on the use of the word 'system,' the existing systems of wireless telegraphy may be divided into two classes according to the type of high frequency generator used. In the first class, the production of high-frequency currents depends on spark discharges giving groups of oscillations and therefore intermittent trains of ether waves. In the second class the generator produces oscillations which for practical purposes may be treated as continuous, and, therefore, as giving continuous ether waves. To the first class belong the Marconi and Telefunken systems and to the second class the Poulsen, the Goldschmidt and possibly the Galletti systems. The Poulsen high frequency generator is a modification of development of the singing arc fed by direct current. The Goldschmidt high frequency generator is a dynamo, giving an alternating current of a fundamental frequency of the order of 10,000 periods per second. The frequency is increased by the use of suitably tuned oscillation circuits, each successive circuit adding the fundamental frequency of the machine. The Galletti generator involves a series of spark gaps arranged to operate in a cycle so that the discharge of each causes, and is immediately followed by, the discharge of the next in the series, the sequence of discharges being so rapid that the resulting oscillations may be viewed as practically continuous. Though at present making use of generators depending on spark discharges producing groups of oscillations, both the Marconi Company and the Telefunken Company are developing and experimenting with generators of their own, producing continuous oscillations. The Marconi continuous high frequency generator consists essentially of a rapidly rotating contact maker in a direct current circuit with special dispositions of other circuits to give continuous oscillations in the aerial. The Telefunken continuous high frequency generator consists of an alternator constructed to give as high a fundamental frequency as may be convenient in the first instance, the frequency being doubled or quadrupled by a polarised transformer method. In making use hereafter of the term Marconi system or Telefunken system, we do not include either of these generators.

"In order to test the efficiency of the various systems to which we have referred for the purposes of the Imperial chain, we invited the companies or firms by which these systems are controlled to give us practical demonstrations thereof, if possible on a commercial scale, and if possible, over distances of 2000 miles and upwards. Except in the case of the Marconi system, we did not, however, obtain any demonstrations on a commercial scale, or any demonstration over a distance of even 1000 miles. It is right, however, to state that, according to the information given to us, it was in several cases impossible for the companies concerned to arrange for the demonstration as desired within the short period which we could allow for the purpose. . . .

"The Marconi Company is, we are satisfied, working on a commercial scale between Clifden and Glace Bay, a distance of about 2300 miles, though at present the number of messages transmitted either way is not so great as to require duplex working or high speed transmission. We were, however, present when messages were transmitted automatically at the rate of 60 words (of five letters) a minute, and we see no reason why this rate should not be considerably increased if it becomes necessary. The communication is practically continuous, though there are, no doubt, periods when the signals become very weak, and even occasional periods when no signals can get through. Periods of this nature are due to natural conditions, and will be incident to the working of any system. During such periods communication can, in our opinion, be insured only by the use of great power in the aerial. We understand that for this reason, and having regard to the increased power required for high-speed transmission, the Marconi Company proposed to employ for the Imperial stations practically double the power now used at Clifden. Even so, we think there may be periods when communication is impracticable, especially in tropical regions where atmospheric disturbances may be expected to cause more difficulty than over the Atlantic.

"With regard to the Telefunken system, which, like the Marconi, is largely used, its practicability on a commercial scale for distances of 2000 miles has not yet been proved. Experiments are now being made between Nauen and Togo, a distance of 4000 miles, and the results indicate that communication over this distance is already possible at night. With regard to the Poulsen system, we are satisfied that it is practicable for short distances. The Poulsen arc has been tried between San Francisco and Honolulu, a distance of about 2100 miles, but as to its practicability over this distance we have no evidence except that which was in the possession of the Post Office long before our appointment. The results obtained do not appear to have been very satisfactory. In our opinion the power used was insufficient. No one tendered any evidence on behalf of the company which is working between San Francisco and Honolulu, and the firm controlling the system in this country was apparently in ignorance of how it is now working in America. We have recently been informed of important experiments between Arlington and the U.S.S. 'Salem' and between Arlington and Gibraltar, using both the arc and spark transmission; but full details are not yet before us. We conclude that if the Poulsen system is to be so developed as to be practicable for commercial purposes over distances of 2000 miles or upwards, the arc will have to be constructed so as to supply the aerial with higher power, or use will have to be made of a more sensitive receiver.

"Similarly, with regard to the Goldschmidt system, it is no doubt successful over short distances, and the only thing required to make it practicable over long distances is a machine of the necessary power. When the Goldschmidt station near Hanover and the corresponding station on the other side of the Atlantic are complete and in working order, we expect that communication between them will be established by the use, either alone or in conjunction with improved receiving apparatus, of the Goldschmidt machine which we inspected at the station near Hanover, and which was admirable both in design and workmanship. Though continuous waves may be somewhat more efficient than intermittent trains of waves, and though the strength of the received signals may probably be increased by the use of improved receiving apparatus, we are of opinion that having regard to the experience of the Marconi Company, and in view of the demand likely to arise for high speed transmission, it would be desirable in the first instance to insist on high powers for the Imperial chain whatever system be adopted. At present, with the exception of the Goldschmidt machine at the station near Hanover, we have seen no continuous high frequency generator capable of putting into the aerial as much power as is put in by the Marconi Company at Clifden for their Transatlantic service. We may add that both the Poulsen arc and the Goldschmidt machine are admirably adapted for high speed transmission. Though we have not seen transmission by either at higher speed than in the case of the Poulsen arc 70, and in the case of the Goldschmidt machine 60 words a minute, we have no doubt that these speeds could be increased. We have had no evidence as to the practicability of the Galletti system even over short distances.

We report, therefore, that according to our investigation the Marconi system is at present the only system of which it can be said with any certainty that it is capable of fulfilling the requirements of the Imperial chain, but this must not be taken to imply that, in our opinion, the Marconi Company must necessarily be employed as contractors for all the work required for the Imperial chain. Indeed, in some respects it might, we think, be better for the Government themselves to undertake the construction and equipment of the necessary stations, acting for that purpose under the best technical and scientific advice which can be obtained, and employing the most suitable contractors for the various portions of the work or plant. On the other hand, it may be said, and is no doubt the fact, that at the present moment the Marconi Company alone has had practical experience of the sort of long distance work required, including experience in putting down stations, in organising the traffic and staff and in coping with the difficulties that arise in a new industry, and the value of such experience and organisation may well outweigh other considerations, if rapid installation and immediate and trustworthy communication be desired. Further, in our opinion, wireless telegraphy is in a condition of rapid development, and this development will in all probability involve the ultimate substitution of high frequency generators producing continuous oscillations for high frequency generators dependent upon spark discharges which produce groups of oscillations. Continuous oscillations should allow of more accurate tuning and greater selectivity, and may be better adapted for use in conjunction with improved receiving apparatus. The need of high frequency generators producing continuous oscillations has long been felt by telegraph engineers, and has led to the various devices for the generation of continuous high frequency oscillations to which we have already referred. The only continuous high frequency generator we have yet seen tried with success over long distances is the Marconi continuous high frequency machine, to which we have already referred. For the purpose of witnessing Transatlantic experiments with this machine we paid a second visit to Clifden, and experiments were made with it in our presence. Using it, Mr. Marconi, on the 26th and 27th of April, 1913, sent from Clifden to Glace Bay messages prepared by us for the purpose, such messages being at our request at once repeated from Glace Bay by means of the company's ordinary plant and correctly received at Clifden. The power put into the aerial by this machine for the purpose of the experiments was not sufficient for commercial purposes, but there seems no reason why higher power should not be obtained. These experiments, in our opinion, warrant the belief that all or any of the devices for the generation of continuous waves, to which we have referred, may at no distant date be shown to be capable of successful use for the purpose of long-distance wireless telegraphy. Many engineering firms are also engaged in designing high frequency alternators, and it seems probable that various other devices suitable for long distance wireless telegraphy may shortly be available. Again, there is some evidence that the design of the aerial is in a transition stage. At present there are engineering difficulties in building perfectly satisfactory aerials for the longer waves which appear to be most appropriate to long-distance telegraphy. Aerials, especially high aerials, are frequently blown down or damaged by wind. The directive aerial used in the Marconi system has the advantage of not requiring very great height and of giving preference in the desired direction. Its use in connection with the separate receiving station comparatively close to the transmitting aerial makes duplex working practicable. We see no reason why this form of aerial should not be capable of use with any form of high frequency generator. Moreover, the development of the aerial may facilitate the use of still longer waves for long distance work, and this may profoundly affect the problem of the righ frequency generator, by rendering possible the employment of simple alternators for the production of the frequency required, high though it must still be. Receiving plant may take many forms. Thus the first receiver may be a crystal contact or some discharge valve on the lines of the Fleming valve, and this may work any one of various kinds of relay; and the record may be made by a Morse inker, by photography, by a phonograph, by simple telephone or otherwise. There is a wide field here for experiment and development.

Complete Liberty of Action Recommended.

"Having regard to these facts, it is, in our opinion, undesirable that in constructing and equipping the stations of the Imperial chain the Post Office should be pledged to the continued use of any apparatus now used in any so-called system or be subject to any penalty by way of continued royalties or otherwise for the disuse of any apparatus which may be installed in the first instance. It is, we consider, imperative that in any contract which may be entered into the Post Office should reserve complete liberty of action in this respect. Further, the stations should be constructed and equipped with a view to the possible and probably rapid development of the art, and we think it would be wise that at any rate two of the stations should be used at once not only for commercial purposes, but as experimental stations in which the various high frequency generators hereinbefore referred to, and also any suggested improvements in any part of the apparatus, should as far as possible be thoroughly tested. This would involve the employment of a highly trained staff with an engineer of special knowledge and of high standing at their head; but the information thus obtained would be invaluable for the construction and equipment or the improvement in the design of the stations. Even when all the stations are constructed, equipped and in working order we do not think it would be wise to cease using some of the stations for experimental purposes. We have already referred to the possibility that the existence of patents may fetter the normal development of an industry. A Government monopoly may stop its growth altogether, and is almost sure to do so unless the Government department which works the industry is ready to welcome and test any new invention or improvement, to adopt and use it if the test be satisfactory, and to pay for it on fair terms if it be adopted. For the purpose of testing, examining and, if necessary, further developing any new invention or suggested improvement in wireless telegraphy, a trained staff with an engineer of special knowledge and standing at its head will be necessary. Under the guidance of such a staff and engineer we see no reason why the Post Office wireless stations should not be ultimately equipped with apparatus far more efficient than that now used in any so-called system, more especially as the Post Office will be able to combine, in spite of existing patent rights, apparatus or devices which, because of the existence of such rights, cannot now be combined by anyone else. We desire to add that the provisions of the agreement, now the subject of inquiry by a Select Committee of the House of Commons, are not, in our opinion, within the terms of our reference; but nothing we have said in this report must be taken as expressing our approval of such provisions."

---

## BRITISH AND EUROPEAN DEVELOPMENTS.

(From Our Correspondent.)

London, May 22.

The latest additions to the Blackpool municipal electric supply system consists of 1500-k.w. and 800-k.w. turbo-generator sets — the former for lighting and the latter for traction. The 1500-k.w. plant is a British Thomson-Houston turbo alternator which exhausts into a barometric condenser of the Klein type, the auxiliaries being an electrically driven vertical dry air pump of 30 h.p., and a Rees-Roturbo electrically driven circulating pump capable of dealing with 200,000 gallons of water per hour. The condenser is capable of maintaining a vacuum on full load of 27½ inches. The air to the alternator passes through a special Balcke filter, filtering air at the rate of 9000 cubic feet per minute. This brings the capacity of the Blackpool plant up to 4300 k.w. for lighting. The smaller plant is a Brush mixed pressure turbo-generator, bringing the total capacity for traction up to 2250 k.w. This 800-k.w. set is of special design to permit of the exhaust low pressure steam from the existing Ferranti and Browett Lindley engines being utilised when these are in service, thus reducing the demand for high pressure live steam from the boiler-house. The air of this generator passes through a Balcke filter smiliar to that for the 1500-k.w. set, and ensures clean air for ventilation purposes. On the occasion of the public opening of these two sets a few days ago, an excellent exhibition was organised by the borough electrical department, under Mr. Furness' supervision, at which a strong effort was made to impress visitors — possible consumers — with the variety and good qualities of numerous electric cooking and heating devices, vacuum cleaners, electric carpets, bed warmers, electric laundry washers, flashing signs, etc., that have been introduced or improved since the last exhibition in the city.

An interesting account of the electrification of Cannock Chase colliery was given by Mr. S. F. Sopwith before the South Staffordshire and Warwickshire Institute of Mining Engineers. The Cannock Chase company adopted electricity with a view to reducing colliery consumption and providing a means of transmitting power underground for haulage and other purposes. The substitution of electric drives for the screens and picking belts formed the nucleus of the scheme. The power station generates a three-phase 3000 volt 50 periods current, which is distributed by overhead bare copper conductors, supported on creosoted red-wood poles, to substations at four pits, where it is transformed to 600 volts. Mr. Sopwith gave the following figures summarising the cost of the entire installation:—

| | | |
|---|---|---|
| Power-Station and Transmission Lines. | | |
| Power-house, boiler-house, buildings, boiler-seatings, engine-foundations, etc. .. .. .. .. .. .. .. | £4,000 | |
| Two 200-kilowatt steam-alternators | 2,500 | |
| One 500-kilowatt steam-alternator | 2,574 | |
| Switchboards and fittings .. .. .. | 520 | |
| Three boilers, pipework, feed-pumps, superheaters, feed-water heater, etc. .. .. .. .. .. .. .. | 3,289 | |
| Transmission-lines to connect to sub-stations .. .. .. .. .. .. .. | 562 | |
| Total .. .. .. .. .. .. .. | | 13,445 |
| Sub-stations. | | |
| Adapting old buildings at Nos. 3 and 8 Pits, and building new houses at Nos. 2 and 7 Pits, say | 200 | |
| Transformers .. .. .. .. .. .. .. | 1,167 | |
| Switchboards and fittings, cables, etc. .. .. .. .. .. .. .. .. .. | 2,059 | |
| Motors, haulage-gears, pumps, etc. | 3,888 | |
| Labour and excavation for motor-houses, laying cables, etc. .. .. | 500 | |
| Total .. .. .. .. .. .. .. | | 7,814 |
| Total capital outlay .. .. .. | | £21,259 |

In certain cases, additional steam power would have been necessary to carry out what is now being done electrically. The author said that the cost of generation compared favourably, even in the case of a comparatively small plant, with the cost of buying current from a public company, but the latter method possessed undoubted advantage, and had there been a company at hand the question of purchase would have received serious consideration. The cost for the last half of 1912 worked out thus:—

| | £ | s. | d. |
|---|---|---|---|
| Wages .. .. .. .. .. .. .. .. .. | 223 | 4 | 0 |
| Fuel, 1506 tons of slack at 6s. per ton .. .. .. .. .. .. .. .. | 451 | 16 | 0 |
| Stores .. .. .. .. .. .. .. .. .. | 40 | 0 | 0 |
| Depreciation and interest on the total outlay on the power-station and transmission-lines, at 10 per cent. on £13,445 .. .. .. .. .. .. | 672 | 0 | 0 |
| Total .. .. .. .. .. .. .. .. | £1,387 | 0 | 0 |

| | |
|---|---|
| Total units .. .. .. .. .. .. .. | 337,000 |
| Cost per unit .. .. .. .. .. .. .. | 0.987d. |
| Normal load .. .. .. .. | about 350 kilowatts. |
| Load-factor .. .. .. .. | 15 to 20 per cent. |

The saving, which represents about 18½ per cent. interest on the capital outlay, apart from any saving derived from the use of portable compressor plant, and power drills, was detailed as below:—

| | | |
|---|---|---|
| Colliery-consumption 6,875 tons at 4s. 6d. per ton .. .. .. .. .. .. | | £1,546 |
| 25 horses less at 10s. for fodder, etc., per week .. .. .. .. .. .. | £650 | |
| 50 boys at 2s. 6d. each, equal £6 5s. per day, or for year of 250 days | 1,562 | |
| | £2,212 | |
| Less wear and tear on ropes, haulers' wages, etc. (10 men at 5s. per day, or for year of 250 days), say .. .. .. .. .. .. | £662 | |
| | | 1,550 |
| Reduction in haulers due to the substitution of main-and-tail for endless haulage .. .. .. .. .. | | 500 |
| Substitution of mechanical for hand-sawing of timber .. .. .. .. | | 250 |
| Screen-engine boys, etc. .. .. .. .. | | 100 |
| Total annual saving .. .. | | £3,946 |

The advantages derived from electrification were summarised thus:—

(1) The colliery-consumption has been reduced by at least 1¼ per cent., say, 6875 tons.

(2) Some 25 horses have been dispensed with underground.

(3) A great reduction in labour has resulted from the substitution of mechanical for horse haulage.

(4) The Lancashire boilers no longer required

(owing to the conversion of steam to electric power) are being utilised at other pits to supersede old egg-ended boilers, thereby reducing labour and consumption.

(5) The current is available underground for further extensions in the way of auxiliary haulage, coal-cutting, etc., and for lighting up important stations, which, if not actually economical, is more convenient and safer.

The Point Fives Club has just admitted to its enterprising and charmed circle three more borough electrical engineers, namely, Mr. S. E. Fedden, of Sheffield; Mr. Pickvance, of Wrexham; and Mr. H. Gray, of Accrington, all of whom have adopted the Norwich system plus ½d. per unit. It has been arranged that the club shall hold a meeting on May 23rd in London at the I.E.E., when there will be discussion on standardisation as it relates to Point Five ambitions, i.e., standardisation of electric cookers, and standardisation of the rateable value plus ½d. per unit for domestic supply. The members of the club have shown their dissatisfaction with the weak policy of the Electric Supply Publicity Committee in a very definite manner, by itself arranging for the production of posters and publicity postcards, which it will sell to anybody desiring them.

The Iron and Steel Institute began its meetings in London yesterday and is continuing them today for the discussion of a number of papers, including two of electrical interest that have already been named here. The Association of Mining Electrical Engineers met at Sheffield last Saturday to consider a paper by Mr. C. Jones on "Cable Jointing, Junction Boxes, etc.," and at the East of Scotland Branch Mr. J. McCann dealt with the installation and manipulation of coal cutters, on the previous night. Further evidence of the continued progress of the movement among charge and other engineers was available at an excellent gathering of the new Association of Electrical Station Engineers held in London last week. Many branches have been formed successfully, and it is intended in a few months' time to hold a big meeting at which delegates representing most parts of the United Kingdom will be present.

The Birmingham Corporation new power station scheme is now published. The capacity of the existing Summer Lane station and two smaller stations will, when extensions now on order are completed, aggregate 36,500 k.w. The new station will be at Nechells, and as the result of inspections of gas driven and turbo-electric plants in other places, it is proposed to adopt turbo plants, that being regarded as the best and most economical for a large station. The Nechells station will be entirely H.T. alternating current, supplying current at 5000 volts 25 cycles to the whole of the area of the greater city, via the Summer Lane station or the substations, and also direct current to high tension consumers. The ultimate capacity of the station will be 100,000 k.w., the first portion being 25,000 k.w., some 15,000 k.w. of this being in readiness for the 1915-16 winter. The main coal store will be in the open on the wharf, and there will be an auxiliary coal store on adjoining land. The total capacity of these stores will be 10,000 tons, with available space for ultimate increase to 50,000 tons. Coal will be handled by transporter cranes, which can be used for the double purpose of filling or emptying the flues and for feeding the conveyors which will supply to the bunkers over the boilers. These conveyors may also be fed from railway trucks tipping coal direct into them. The engine house will contain turbo-alternators running at 5000 volts and fitted with surface condensers, air, and circulating pumps. It is proposed to instal at the outset three machines, each having a capacity of 5000 k.w. Later on a larger type, probably 10,000 k.w., will be installed. Marine type water tube boilers with superheaters and overhead economisers will be adopted. Short iron chimneys will be used, the draught being controlled by means of motor driven fans. This arrangement is stated to make the running of the plant more flexible, and results that have been obtained in other large stations so equipped prove that greater economy in the burning of the coal can be obtained than is the case with underground brick flues and natural draught chimneys. The heavy cost of large brick chimneys and long lengths of underground flues is entirely avoided. Seven boilers will form the first equipment for the three generators. For removing the ashes it is proposed to adopt a new system operated by air suction. The system is in operation at Newcastle, and the ashes are removed simply, cleanly, and with ease. Large totally enclosed ash receiver drums are installed, from which the air is exhausted by motor-driven exhausters. The drums are connected to pipes which run under the ash pits beneath the boilers, and the rush of air is thus continually maintained through these pipes. The ashes are dropped out of the ash pits into a small movable crusher, thence through openings into the pipes, and drawn by the rush of air into the receiver drums. The latter are emptied into barges, carts, or railway wagons. The basement of the boiler-house is in this way kept quite free of all dust, and from the corrosive fumes given off from the ashes when slaked.

A switch-house will be constructed over the entrance cartway to accommodate the whole of the switch-gear required for controlling the generating plant, the outgoing feeder cables, and the various lighting and power circuits within the station. It is stated that the advantage of having switch-gear removed from generating plant is that the attendant has no need to divert his attention from the switch-board and its control, and experience elsewhere has proved this to be an important consideration.

Large cooling ponds will be arranged on land adjoining the engine room, divided up into sections, so that any section can be emptied for cleaning purposes. Over these ponds there will be cooling towers. The effluent water from the filter beds of the Birmingham, Tame, and Rea District Drainage Board will be used for circulating in the condensers. At first twelve cooling towers will be installed. The cost of the foregoing scheme, which is, of course, the work of the city electrical engineer, Mr. R. A. Chattock, including the sub-station equipments for the next five years, together with underground mains required during two years, will be:—Land and buildings, £132,500; plant and machinery, £156,000; sub-stations' equipment, £50,000; underground mains, £161,500; total, £500,000.

The system of hire and hire purchase of motors introduced in 1906 has been quite successful—there are 894 motors aggregating 5749 h.p. on hire, the total expenditure thereon having been £23,070. It is proposed to continue the system and borrow a further £20,000 for the purpose of extending it.

A few figures respecting the business of the Birmingham Electric Supply Department at March, 1913, will be of interest:—7435 consumers; 25¼ million units sold for low tension and lighting and power, and 17 millions for high tension power, making 42¼ millions in 1912-1913.

The Technical Sub-committee of the Wireless Select Committee has published its report on the merits of existing systems of long distance wireless system suitable for distances involved in the Imperial chain. As might have been expected, they say that the Marconi system is at present the only one definitely capable of meeting the requirements of the case. The committee, however, say that this must not be taken to imply that in its opinion the Marconi Company must necessarily be employed as contractors for all the work required for the Imperial chain. The members of the committee were:—Mr. Duddell, Dr. Glazebrook, Sir Alex. Kennedy, Mr. J. Swinburne, and Mr. E. H. Rayner. They investigated the Marconi, Telefunken, Poulsen, Goldschmidt, and Galletti systems.

## MISCELLANEOUS.

A most favourable report has been published of the first week's working of the municipal electric tramway from Malvern to Hawthorn and Kew, via Glenferrie-road. The opening took place on the afternoon of Friday, 30th ult., and on the following Thursday the traffic returns were made up. These showed that for the six days 3683 car miles had been run, and 38,745 passengers had been carried. The number of passengers carried per car was 10.519. The revenue received amounted to £257 9s. 7d., or 16.778d. per car mile. The Prahran-Malvern Trust, which is working the tramways for the municipalities concerned, estimated that about 1s. per car mile would pay interest on capital and cost of working, so that the return of the first week of nearly 1s. 5d. per car mile shows a very profitable margin. During the six days of working, there was a stoppage of four hours on Sunday last through the electric supply giving way, therefore the returns are even better than the figures indicate.

* * *

The Commonwealth Public Service Commissioner (Mr. D. C. McLachlan) has notified that an examination will be held on 4th and 5th August next to fill vacancies for assistant engineers in the Electrical Engineer's Branch of the Postmaster-General's Department. The examination will be open to persons outside the Commonwealth Public Service. The positions, which are classified in the Professional Division, carry a salary of £216 (minimum) to £312 (maximum) per annum. Applications to attend the examination close on 28th June, with the Secretary to the Commonwealth Public Service Commissioner, Customs House, Melbourne, from whom particulars as to subjects and conditions may be obtained.

* * *

A large number of municipal representatives, including the Lord Mayor of Melbourne and the Mayor of Ballarat, and the heads of the Victorian Health Department, last week inspected the new refuse destructor installed by the Prahran town council. The visitors were received by the Mayor of Prahran, and conducted over the premises. Special attention was paid to the feeding of the furnaces, the combustion chamber, ventilating chamber, which has the effect of drawing all foul odours, dust, etc., into the furnaces, the electric generating plant, tar mixing department, stables, etc., and the orderliness of the place and its freedom from odours was remarked by visitors, some of whom contrasted this satisfactory state of affairs with the nuisances emanating from tips. A Richmond councillor stated that houses built over an old tip in Richmond had settled down very much out of plumb, following the sinking of a shaft into the filled-in area, whilst a Prahran councillor declared that a gas light could be procured by inserting a pipe into an old local tip and applying a match. After the inspection, the mayor invited the visitors to partake of refreshments at the town hall. The destructor has cost £12,000, and the annual deficit, after meeting all expenses, ranges from £150 to £250, which can be covered by by-products. The town "tip" used to cost between £400 and £500 a year.

* * *

At the council meeting of the Sydney Chamber of Commerce, held last week, special attention was drawn to the following motion which is to be submitted to the Associated Chambers' Conference on June 17, by the Melbourne Chamber:—"That the Associated Chambers of the Commonwealth think it necessary to impress on the Chambers of Commerce of the States the desirability of using every effort to see—(a) That the Registration of Firms Acts in existence in the various States are properly and efficiently administered; (b) that defaulting traders are adequately punished; (c) that, so far as may be necessary, the Acts are amended and improved so as to secure the better observance of their provisions." It is suggested that it will be of great assistance if the representatives from the various capitals will come to the Sydney meeting of the Associated Chambers with data as to—(a) The extent to which which the Act is being evaded in the various States; (b) the steps taken to enforce compliance with its provisions; and (c) the fines imposed when defaulters are brought before the Court. Suggestions are also invited for the more effective administration, or the improvement of existing legislation on the subject. The council decided to have inquiries made in the direction indicated in the motion.

* * *

The Provincial Electric Development Co. Ltd. have placed the contracts for the electric lighting and power equipments for Dandenong and Daylesford in the hands of the India Rubber, Gutta Percha and Telegraph Works Co. Ltd., Silvertown Telegraph Works, Melbourne.

* * *

Our Lithgow (N.S.W.) correspondent writes:—Owing to various causes, operations at Lithgow ironworks and blast furnace have been rather quiet during the week ending Thursday, 5th inst. The rail mills have been at work on an urgent order for fishplates and light rails. A consignment of nearly 1650 tons of steel rails has just been despatched from the works, the destination being Port Augusta, for the trans-Australian railway. The iron and steel moulding shops are at present very busy, getting out immense castings for use in the erection of the second blast furnace and other extensions now being proceeded with. A serious mishap occurred at the blast furnace a few days ago, which has deterred operation and the output of pig iron. Owing to the scarcity of coke, the iron ore put in the furnace to be reduced to pig settled in a mass at the bottom of the chamber, and there cooled off, thereby stopping the operations of the furnace. Efforts were for a couple of days directed to shift the impediment, oil and oxygen being used to attain that object. Latest reports indicate that an improvement has been effected, and it is expected that the furnace will be in full work again in a couple of days.

* * *

The Electrical Association of N.S.W. held its usual monthly meeting on Friday night last, Mr. A. E. C. Burgess occupying the chair. Mr. H. G. Carter, B.E., Assoc. M. Inst. C.E., who recently returned from a trip round the world, read a paper on "The Underground Electric Railway as a Means of Relieving Traffic Congestion," dealing very comprehensively with the question.

* * *

The opening of the first section of the Moree to Mungindi railway has been postponed to the 27th inst., owing to the inaccessibility of Garah, brought about by the state of the Black Soil plains.

* * *

The State Executive has passed an order under the Electric Light Act empowering the Toora (V.) Electric Light and Power Supply Company, of Stanley-street, Toora, to supply electric light to the township and surrounding district of Toora. The price was fixed at 1s per unit.

* * *

The steamer "Montoro," one day out from Joana, established wireless communication with Perth last month, a distance of 1800 miles being bridged, which, considering intervening

**P & O.** COMPANY'S ROYAL MAIL STEAMERS
FOR MARSEILLES PLYMOUTH, AND LONDON.

Leave Sydney on the subjoined dates, calling at usual ports.

FIRST AND SECOND SALOON ONLY.

| Steamer | Tons. | Commander. | Noon. | Melb., 3 p.m. |
|---|---|---|---|---|
| MARMORA | 10,500 | Lockyer | June 14 | June 17 |
| MEDINA | 12,500 | Notley | June 28 | July 1 |
| MOLDAVIA | 10,000 | Gordon | July 12 | July 15 |

PASSAGE MONEY TO LONDON—
Single, £41 16s to £82 10s.
Return, £69 6s. and £123 4s

Return Tickets between Inter-State Ports are available for return by Orient, Messageries Maritimes, and N D L steamers having room.

SPECIAL HOLIDAY RETURN TICKETS to COLOMBO are now issued, available for two months Fares from Sydney, £45 2s. first saloon, and £31 18s second saloon

A. GORDON WESCHE, Superintendent IN AUSTRALIA, 63 Pitt-street, Sydney.

**The COLONIAL MUTUAL FIRE Insurance Company Limited.**

Principal Office 60 MARKET-ST., MELBOURNE

Branches in all the States.
Transacts Fire, Guarantee, Employers' Liability, Marine, Burglary, and Plate Glass, Accident, Workers' Compensation and Live Stock Insurances.

Send for Prospectus.
W. TUCKER, General Manager

**Harringtons LTD**

ANALYTICAL & METALLURGICAL DEPT.

Lowest fees for all kinds of Assay, Analytical, and Metallurgical work.

Expert Advice on Ore Treatment, Bullion Refining, Smelting, etc., etc. Directed by a qualified Analyst from Messrs. Johnson and Sons, London; Assayers to Bank of England; H.M. Mint, The Council of India, etc.

HARRINGTONS LTD.
386 George Street, Sydney.

land, was in the nature of a record. The "Monitor" has now, however, eclipsed this performance by "wirelessing" from 130 miles north of Batavia to Perth.

* * *

The third general meeting of the Northern Engineering Institute of New South Wales was held in the Council Chambers, Newcastle, on Saturday evening, the 31st May, 1913. Mr. J. L. C. Rae, vice-president, occupied the chair, there being a good attendance. The following were duly elected as members of the Institute:—Messrs. E. J. Jackson, T. Hynd, W. E. Price and G. Rosenthal. The principal business of the evening was a paper by Captain J. M. C. Corlette, B.E., Assoc. M. Inst. C.E., of the Australian Intelligence Corps, on "Military Topographical Surveying Methods, with a description of the survey of the district around Newcastle." He dealt at length with topographical surveying, and during his remarks referred to the necessity of having such surveys made all over the Commonwealth for the purpose of defending the country, and also described the maps that had already been prepared of surveys of the Newcastle district reaching as far as Port Stephens on the north, and Wallarah on the south. The address throughout was practically illustrated by a plane table diagram and numerous topographical maps. At the conclusion of the address, a vote of thanks, on the motion of Mr. A. F. Hall, seconded by Mr. H. Mouat, and supported by Col. Ranclaud, Col. Burnage, Col. Paton, Major Clark, Capt. Elis, and Lieut. Coucher, visitors present by invitation, and Messrs. Pulver, Davis, H. S. Vogan, Gardiner, Collins, and the President, was tendered to the author for his very interesting paper.

* * *

Preston Shire Council (V.) has notified Northcote Council that it has agreed to the recommendations of the conference on the electric light supply. The terms of the agreement are that the municipalities should combine to obtain the current from the Electric Supply Co., Northcote, to carry out the work and to put down feeders, etc., Preston Council to pay the cost in its territory, which would amount to about £600. The current would be supplied to Preston at an increase of 1½ per cent. on the cost to Northcote to allow for loss of power in transmission. As Northcote Council has already agreed to the recommendations, the work will be immediately put in hand.

# *Tenders Invited and Accepted*

**It is particularly requested that the information regarding contracts open, and the successful tenderers, be forwarded to The Editor not later than Monday of each week.**

The following contractions are used throughout:—S—supply; D—delivery; M—manufacture; C—construction; E—erection; P—purchase; I—installation; R—removal. Where no contractions appear, supply and delivery is understood. The date at the beginning of each paragraph refers to the closing of tenders.

## INVITED.

### Commonwealth.

Specifications, tender-forms, etc., for tenders invited for the Postmaster-General's Department of the various States under this heading may be had as follows:—Victoria—Various State G.P.O.'s. New South Wales—Departmental Stores, Sydney, and various G.P.O.'s in other States. South Australia—Adelaide, Melbourne, Sydney and Brisbane G.P.O.'s. Western Australia—Departmental Stores, Perth, and various G.P.O.'s in other States. Queensland—Various State G.P.O.'s. All States—Various G.P.O.'s. If the Specifications, etc., may be had elsewhere in addition the places will be given in parentheses.

POSTMASTER-GENERAL'S DEPARTMENT, Melbourne.—17th June.—Metal toppings and screenings, as per schedule No. 888.

17th June.—S. and D. of wire, iron, etc., as per schedule No. 853.

24th June.—Telephone parts, as per schedule No. 867.

24th June.—Telephones, as per schedule No. 864.

24th June. — Hard-drawn copper wire, etc., as per schedule No. 855.

24th June.—Hard-drawn copper wire, as per schedule No. 854.

24th June.—15,000gal. of benzine, from the 1st July, 1913, to the 30th June, 1914, as per schedule No. 933.

1st July.—S. and D. of 30 nautical miles of submarine cable, as per schedule No. 858.

1st July.—S. and D. of telephone instruments, as per schedule No. 865.

1st July.—S. and D. of insulators, as per schedule Nos. 874 and 875.

1st July.—Switchboard parts, as per schedule No. 879.

1st July.—175 cable boxes, as per schedule No. 876.

1st July.—S. and D. of packing boxes, for a period of two years, from the 1st July, 1913, to the 30th June, 1915, as per Schedule No. 915.

8th July.—Instruments, telephone parts, as per schedule No. 866.

8th July.—India-rubber covered wire, as per schedule No. 873.

8th July.—Cast-iron pipes, as per schedule No. 885.

8th July. — Measuring instruments, as per schedule No. 871.

8th July.—Wire, I.R. covered, as per schedule No. 872.

8th July.—Batteries and battery material, as per schedule No. 880.

8th July.—Galvanised-iron piping, as per schedule No. 887.

8th July.—Switchboards, telephone, various, as per schedule No. 895.

8th July.—Measuring instruments, various, as per schedule No. 870.

8th July.—S., D., and E. of a common battery switchboard at Windsor, as per schedule No. 805.

15th July.—Telegraph and telephone material (switchboard parts), as per schedule No. 878.

15th July.—Galvanised-iron piping and fittings, as per schedule No. 886.

22nd July.—Batteries and battery material, as per schedule No. 881.

22nd July.—Wire (silk covered), schedule No. 884.

22nd July.—45 lb. wire (silk covered), as per schedule No. 883.

22nd July.—10,000 porous pots, as per schedule No. 882.

22nd July.—Ironwork, as per schedule No. 891.

22nd July.—Telephone switchboards, as per schedule No. 899

22nd July.—Telephone switchboard cable, as per schedule No. 856.

22nd July.—Telephone switchboard cable, as per schedule No. 857.

22nd July.—Sundries, as per schedule No. 892.

29th July.—Detectors, keys, staples, tongs and rosettes for table telephones, as per schedule No. 901.

29th July.—Sundries, as per schedule No. 893.

29th July.—Coach screws and spikes, as per schedule No. 904.

19th August.—105 miles of paper-insulated, lead-covered cable, as per schedule No. 906.

26th August. — 460 coin-collecting devices, electrically controlled, as per schedule No. 916.

16th September.—S., D., E., and I., at the Telephone Exchange, Collingwood, Victoria, of a common battery switchboard, as per schedule No. 860, or an automatic, or semi-automatic, switchboard, as per schedule No. 859.

POSTMASTER-GENERAL'S DEPARTMENT, Sydney.—25th June (extended from 11th June). —Switchboard cable, to stores schedule N.S.W., 290; copper wire, etc., to stores schedule N.S.W., No. 291; wire, india-rubber covered, to stores schedule N.S.W., No. 292; wire, cotton, silk, or wool covered, etc., to schedule N.S.W., No. 293.

25th June. — (1) Battery material, as per stores schedule N.S.W. No. 298; (2) instrument ink, etc., as per stores schedule N.S.W. No. 299; (3) coal tar composition, etc., as per stores schedule N.S.W. No. 300.

2nd July.—2450 backboards for automatic wall sets, as per stores schedule N.S.W. No. 312.

2nd July.—150 brass office seals; 1800 hardened loose type; as per stores schedule N.S.W. No. 318.

9th July.—30 Morse registers, as per stores schedule N.S.W. No. 310.

9th July.—2350 relays and 88 mounting plates, as per stores schedule N.S.W. No. 311.

9th July.—Eight multiple magneto incoming junction line switchboards, with associated equipment, as per schedule No. 205.

9th July.—Wire, galvanised iron, etc., stores schedule, N.S.W., No. 295; bridle rings, etc., stores schedule, N.S.W., No. 297.

27th August.—(1) Telephones to stores schedule N.S.W. No. 301; (2) switchboards to stores schedule N.S.W. No. 302; (3) lamps, electric, incandescent, to stores schedule N.S.W., No. 304.

POSTMASTER-GENERAL'S DEPARTMENT. Perth. — 18th June.—20 tons of hard-drawn copper wire, to W.A. schedule No. 291.

25th June.—20 miles of wire (cotton, silk, or wool-covered), to W.A. schedule No. 292.

25th June.—Conduits, to W.A. schedule No. 290.

9th July.—S. and D. of wire, india rubber covered, and cotton, silk, or wool covered, to W.A. schedules Nos. 265 and 266.

9th July.—Insulators to W.A., schedule No. 277.

9th July.—Ironwork generally to W.A. stores schedule No. 293.

16th July.—S. and D. of wire, bronze and copper, to W.A. schedule Nos. 260, 267, and 273.

23rd July.—S. and D. of switchboards and parts, telegraph and telephone instruments, to W.A. schedules Nos. 254, 255, and 256.

30th July.—S. and D. of switchboard cable, to W.A. schedule No. 275.

30th July.—S. and D. of steel towers, battery material, wire and iron work generally, to W.A. schedules, Nos. 259, 262, 263, 268, and 269.

6th August.—S. and D. of insulators, tele-

**Osborn's Truck Wheels & Axles**

**Osborn's Mushet High Speed Steel, Twist Drills, Mining Steels, Crusher Jaws and all classes of Castings.**

Samuel Osborn & Co. Ltd., Sheffield, are Standard Makers.

**Gibson. Battle & Co. Ltd.**

535 Kent St., Sydney. 486 Collins St., Melbourne.

S.A. Agent: C. C. Deland, Victoria Square, Adelaide.

graph and telephone material, and iron poles, to W.A. schedules, Nos. 258, 261, and 264.

POSTMASTER-GENERAL'S DEPARTMENT, Brisbane.—25th June.—S. and D. of letter-box fronts, as per stores schedule No. 249.

27th August.—S., D., and E. at the Telephone Exchange, Brisbane, of five sections of switchboard, common battery, multiple, and other equipment to schedule No. 243, specification No. 458.

10th September.—Telephone Exchange, Brisbane, nine sections of a trunk line switchboard, to schedule No. 244, specification No. 461, and the general conditions, drawings, etc., attached thereto.

POSTMASTER-GENERAL'S DEPARTMENT, Hobart.—16th June.—One motor car (petrol), complete, to schedule No. T.67.

POSTMASTER-GENERAL'S DEPARTMENT, Adelaide.—25th June.—1000 letter box fronts, as per schedule No. 288.

9th July.—17,000 cast-iron brackets and 8500 steel spindles, as per schedule No. 298.

16th July.—Telegraph and telephone material, schedules Nos. 277 to 286.

13th August.—Telephone parts, as per schedule No. 292, and switchboards, as per schedule No. 293.

DEPARTMENT OF HOME AFFAIRS (Works Director, Victoria). — 7th July.—Cold storage installation at Naval College, Jervis Bay.

DEPARTMENT OF HOME AFFAIRS.—Federal Capital power plant.—16th June.—S. and D. f.o.r. Queanbeyan, N.S.W., of six 100 k.v.a. three-phase oil-cooled transformers, indoor type; four 50 k.v.a. three-phase oil-cooled transformers, outdoor type, four 25 k.v.a. three-phase oil-cooled transformers, outdoor type; isolating switches for 5500 volts; oil switches for 5500 volts, 3-phase; lighting panels; power panels; bus-bar materials.

DEPARTMENT OF HOME AFFAIRS.—Kalgoorlie-Port Augusta Railway.—2nd September.—M., S., and D. of 80 lb. steel rails and fishplates; M., S., and D. of iron dog spikes and steel fishbolts and nuts for 80 lb. rails.

DEPARTMENT OF EXTERNAL AFFAIRS. — Port Augusta to Oodnadatta Railway.—17th June.—M., S., and D. of 550 pairs of wheels and axles, 3ft. 6in. gauge.

24th June.—M., S., and D. of bogie goods waggons, 3ft. 6in. gauge, and water tank waggons, 3ft. 6in. gauge.

DEPARTMENT OF TRADE AND CUSTOMS. —1st July.—M., S., and D. (at Melbourne) of an automatic flashing light for Emery Point, Port Darwin, and also of an automatic flashing post light for Fort Point, Port Darwin.

26th August.—S. and D. of eight (8) automatic flashing lights.

DEPARTMENT OF DEFENCE.—Royal Australian Navy.—16th June.—Round iron bars for turbine nuts.

Commonwealth Small Arms Factory.—16th June.—S. of fuel oil from 1st July, 1913, to 30th June, 1914.

24th June. — Engineering equipment and stores for the Government Small Arms Factory, Lithgow, New South Wales.—Electric motors, belts, pulleys, bearings, grinding wheels, saws (band and circular), steel, die blocks, drill rods, shafting and rubber tyres.

## Victoria.

VICTORIAN RAILWAYS. — 18th June. — (a) One hoisting engine and boiler for pile driving, new or secondhand; (b) portable steam engine and boiler, 20n.h.p., new or secondhand; (c) one air-compressor and receiver, new or secondhand; (d) one steam pump, new or secondhand; (e) one portable petrol-driven concrete (Batch) mixer and Batch hopper.

18th June.—M., S. and D. of one truck traverser complete with motor, chills, and patterns. (Fresh tenders.)

25th June.—50 tons of good machinery cast iron scrap.

30th June.—Oil for gas making, as ordered, during period ending 30th June, 1914.

2nd July.—Copper plates.

23rd July.—M., S., and D. of one hydraulic flanging press.

30th July.—Balls and ball races for 70ft. turntables.

6th August.—Electrification of the Melbourne suburban railways—(a) circulating water and sump pumps with motors; (b) air and water extraction pumps and motors; (c) surface condensers, hot wells, piping, and sundries.

6th August.—Steel channel bars.

13th August.—Best steel boiler plates for steel cranes, boilers, etc.

13th August.—30,000 lineal feet of wrought-iron steam pipe, 1in. diameter.

20th August.—M., S. and D. of (a) lathe, (b) sawing machine, (c) chisel mortiser, (d) cut-off machine, (e) moulding machine.

27th August.—Hollow chisels and bits.

3rd September.—S. of three petrol engines and pumps for use at Newport Workshops. (Fresh tenders.)

3rd September.—Steel faced machine knives.

VICTORIAN RAILWAYS COMMISSIONERS. —State Coal Mines.—13th June.—Steel haulage wheels.

23rd June.—Mine timber.

25th June.—S. of 2 10h.p. portable oil engines, and boring plants and equipment.

25th June.—S. of one 140 h.p. induction motor; and flexible belt and jointing material for band conveyor.

13th August (extended from 25th June). — S. of electrical equipment.

PUBLIC WORKS DEPARTMENT. — 26th June. — Refrigerating machinery and other plant, new cool stores Victoria Dock; contract No. 5; copper cooking vessels, Hospital for Insane, Ararat.

## New South Wales.

PUBLIC WORKS DEPARTMENT.—16th June. —Monier plates and walings for Carrington Wharf, Newcastle.

16th June.—S. and fixing steel window fames and sashes, new, Offices Department, Public Instruction. (Fresh tenders.)

11th August. — Steel bridge for Macleay River, Wauchope, to Kempsey section, North Coast railway.

11th August. — Steel bridges for Hastings River and flood channel, Wauchope to Kempsey section, North Coast railway.

3rd September.—Efficient steam tugs for use at Bellinger River and Cape Hawke, from 1st November, 1913.

RAILWAY DEPARTMENT.—18th June.—S. of 8 automatic coal weighing machines for White Bay Power House. (See advertising columns.)

6th August.—S. of one live steam feed water heater for Ultimo power-house. (See advertising columns.)

20th August.—S. of a pneumatic ash handling plant for White Bay power-house. (See advertising columns.)

METROPOLITAN WATER AND SEWERAGE BOARD.—16th June.—C. and E. of 1 mild steel elevated service tank at Wahroonga.

3rd September.—S. and D. of efficient tugs for use at Bellinger River and Cape Hawke from 1st November, 1913.

## South Australia.

SUPPLY AND TENDER BOARD. — 17th June.—S. and D., in trucks, at any railway station to be named by tenderer, or on Government wharf, Glanville, of 360 tons of limestone flux, to sample to be submitted with tender; delivery to be made at the rate of 60 tons per month, the first not later than 1st July, 1913.

24th June.—S. and D. of 27,000 wrought iron standards; 27,000 cast iron sockets.

24th June.—M., in South Australia, S., and D., at the Waterworks yard, Kent Town, of 12 turbine water meters, 2in.; 12 turbine water meters, 3in.

24th June.—S. and D. of four railway weighbridges.

15th July.—S. and D. of best mild steel.

15th July.—S. and D. of 500 bars bright drawn hexagon steel.

15th July.—S. and D. of cold-reeled mild steel bars.

15th July.—S. and D. of solid drawn copper tubes.

22nd July.—S. and D. of chain iron.

PUBLIC WORKS.—17th June.—C. and D. of spare parts for dredges.

RAILWAYS. — 17th June.—C. of 132 waggons, 3ft. 6in. gauge.

24th June.—P. of old steel tyres, scrap steel springs, scrap spring steel, scrap steel boiler plate, cuttings, etc., scrap steel and iron mixed (thin).

15th July.—C. of 8 bogie passenger brakevans, 5ft. 3in. gauge.

15th July.—C. of 17 bogie goods brakevans, 5ft. 3in. gauge.

NORD DEUTSCHER LLOYD
REGULAR SERVICE TO EUROPE.
REDUCED FARES TO LONDON.
TO MANILA, CHINA AND JAPAN.
Via New Guinea and Yap.
Fares to Hong Kong, £40; II., £26.
Full particulars will be sent on application to—
LOHMANN AND CO., General Agents,
7-9 Bridge-street, Sydney.
Ostermeyer, Van Rompaey and Co., Melbourne; H. Muecke and Co., Adelaide; L. Ratazzi and Co., Fremantle; Thos. Brown and Sons Ltd., Brisbane.

The Mount Lyell Mining & Railway
CO. LIMITED.
Purchasers of Ores containing Copper, Gold and Silver. Rates obtainable on application to the Secretary.
Manufacturers of Coke for Smelting and Foundry Purposes, Acids, Etc.
HEAD OFFICE—
39 QUEEN-STREET, MELBOURNE.
D. G. LUMSDEN,
Secretary.

THE
-PACIFIC CABLE BOARD-
Cablegrams should be Marked
"VIA PACIFIC."
(Not Charged for.)

The quickest and most accurate route for Cablegrams from Australasia to United Kingdom, Canada, United States, Germany, New Zealand, and Pacific Islands.

This route is owned by Great Britain, Australia, New Zealand, and Canada. Australia being the largest part owner (having one-third interest), the public are urged to support the National Cable.

RATES—

| | Ordinary. | Deferred |
|---|---|---|
| UNITED KINGDOM | 3/- | 1/6 |
| GERMANY | 3/- | 1/6 |
| CANADA | 2/4 | 1/2 |
| UNITED STATES | 2/4 to 2/8 | 1/2 to 2/4 |
| NEW ZEALAND | 4½d. | Nil |
| FIJI | 8d | Nil |

DEFERRED RATES (IN PLAIN LANGUAGE ONLY) have now been arranged to most Countries where ordinary rate exceeds 10d. per word.

Enquiries for further information, pads of cablegram forms, maps and tariff cards, address to -

The Superintendent, SOUTHPORT, QUEENSLAND;
The Officer in Charge, 408 Collins-street, MELBOURNE telephone 2588;
The Officer in Charge, 42 Hunter-street, SYDNEY; telephones, City 1346, City 3684;
J Milward, Manager in the Pacific, 64 Pitt street SYDNEY; telephones City 1346, City 3684.

22nd July.—C. of 30 or 50 bogie waggons, 5ft. 3in. gauge.

## Western Australia.

GOVERNMENT TENDER BOARD.—19th June.—Four overhead electric travelling cranes, as per schedule No. 101a, 1913.

19th June.—Engine tyres for Railway Department, as per schedule No. 98a, 1913.

3rd July.—Tubular iron poles, for Railway Department, as per schedule No. 118A, 1913.

31st July.—3520 pairs of fishplates for 46½ lb. material.

RAILWAYS DEPARTMENT.—26th June.—P. of, approximately, 1000 tons of mixed scrap, mostly mild steel, suitable for a rolling mill, lying at Midland Junction.

## Queensland.

RAILWAYS DEPARTMENT.—24th June.—S. of 5000 spiral bearing springs, to code drawing No. 9. (See advertising columns.)

15th July.—M. and S. of steel super-structure

Dunlop Mining Goods
Tenders & Samples submitted
Correspondence invited
Send for illustrated Catalogue

Dunlop Rubber Belting
Is more efficient than Leather belting for Outdoor & Wet Work.
Sample & Price on application

Note this on every belt.
Be sure you get
"DICK'S"
We know there are numerous imitations. Dick's maintains its high reputation for strength and efficiency. Every belt guaranteed. Sole agents:
JAMES HARDIE & CO.
Melbourne and Sydney.

The Fx and R Watches

are the most extraordinary Watches of the age. They are ¾ plate levers. They have brequet over coil balance springs. They have compensated and adjusted balances. They have jewel Ruby Rollers. They are specially made to stand Rough Riding and Knocking About. They go with profound accuracy. They are guaranteed for 15 years, and kept in order free of charge (breakages excepted) for two years. With 15 jewels in Open-faced Oxidised Cases 33/-. In Solid Silver case, 45/-. Write for Watch Catalogue.

FAIRFAX & ROBERTS LTD.,
The Oldest Jewellery House in Sydney.
23 and 25 HUNTER STREET.

Gent.'s Full-sized Open-faced Oxidised Watch, with 15 Jewels, 33/- With 7 Jewels, 28/-.

bridge over Pioneer River. (See advertising columns.)

15th July.—S. of one 120ft. steel super-structure (one span), Caboolture River bridge. See advertising columns.)

29th July.—S. of steel superstructure for three 149ft. 6in. spans for widening Bremer River bridge. (See advertising columns.)

PUBLIC WORKS DEPARTMENT. — 20th June.—Assay laboratory, Technical College, Mt. Morgan.

### General.

CITY OF MELBOURNE.—13th June.—P. of scrap lead-covered cables and wires, brass, copper, aluminium, etc., old lamp bases, broken glass, wrought and cast iron.

17th June.—S. and D. of No. 36 rubbish baskets.

17th June.—Laying of 2 lines of steel tram track (principally labour).

MUNICIPAL COUNCIL OF SYDNEY.—7th July.—Arc lamp carbons.

CITY OF TOOWOOMBA (Q.) (extended indefinitely from 1st March).—Following plant:—(1) S. and E. of pumping plant of 25,000 gallons per hour capacity; (2) 10in. cast iron water pipes; (3) valves, special castings, etc. Tenders must be in accordance with specifications and conditions of tenders, copies of which may be seen, and tender forms obtained, at the offices of the town clerk, Sydney, Melbourne, Brisbane, and Toowoomba.

TOWN OF NORTHCOTE (V.) (W. G. Swift, Town Clerk).—7th July.—S., D., and laying of underground electric cables.

SHIRE OF MILDURA (V.) (G. B. Lincolne, J. K. MacDougall, Managers Electric Supply Department).—14th June.—S. and D. of machine-broken metal, on truck Mildura railway station; S. and D. of cement on truck Mildura railway station.

SHIRE OF MANSFIELD (V.) (E. W. Finlason, Secretary) (G. B. Lincolne and J. K. MacDougall).—16th June.—(a) and (b), S., D., and E. of one suction gas engine and plant, complete; (c) S. and D. of electrical plant and equipment; (d) E. of electrical plant and equipment; (e) S. and D. of wires and cables; (f) S. and D. of wood poles.

SHIRE OF SWAN HILL (V.) (A. W. D. Brown, Engineer). — 17th June.—P. of Fish Point punt.

SHIRE OF COLAC (V.) (D. M. Dunoon, Secretary).—14th June.—I. of electric light and power plant in township of Colac.

MELBOURNE AND METROPOLITAN BOARD OF WORKS (Geo. A. Gibbs, Secretary).—17th June.—S. and D., at the Metropolitan Farm, Werribee, of two steel wire plough ropes.

METROPOLITAN WATER AND SEWERAGE BOARD, Brisbane (Q.) (Geo. Johnston, Secretary). — 26th June.—S. and D. of 5000 water meters.

31st July.—41,000 casks Portland cement, under contract No. 10, 1913; and 41,000 casks Portland cement, under contract No. 11, 1913.

MUNICIPAL TRAMWAYS TRUST, Adelaide (W. G. T. Goodman, Chief Engineer and General Manager.—1st July.—S. and D. of wooden poles. (See advertising columns.)

15th July.—M., S., and D. of steel rails.

29th July.—S. and D. of bonding material.

19th August.—M., S., and D. of steel poles. (See advertising columns.)

Specifications relating to the S. and D. of copper cable and wire may be obtained on application to W. G. T. Goodman, Engineer and Manager. Tenders will be invited at 48 hours' notice, at a later date, and specifications are now issued to facilitate prospective tenderers obtaining quotations. (See advertising columns.)

THE BROKEN HILL SOUTH S.M. CO. N.L. (F. C. Howard, Managing Director). — 27th June.—S. and D. of stores and mining requisites for the 12 months ending 31st July, 1914.

BRIGHT STAR GOLD DREDGING CO. N.L. (C. B. Norton, Manager, 430 Chancery-lane, Melbourne).—13th June.—C. of screen table, drive, chute, etc., for the company's dredge.

A. E. BEARD AND CO LTD. (in liquidation) (C. B. Norton, W. L. McFadyen, Liquidators; Brentnall, Norton and Co., 430 Chancery-lane, Melbourne). — 17th June.—P. of 1 horizontal steam engine, 16h.p., with hand-reversing gear; 1 Cornish boiler, [illegible] x 15ft., 4 years in use.

CHILLAGOE LTD. (C. L. Hewitt, Secretary, 39 Queen-street, Melbourne).—23rd June.—S. of stores required for the 12 months ending 31st July, 1914.

O.K. COPPER CO. N.L. (in liquidation) (Sidney Cornish, 23 Brookman's Building, Adelaide, S.A.)—21st July.—P. of large traction plant; also smelting, converter and mining plants, buildings, stores, etc., estimated to have cost £75,000, comprising engineering plants, 30-ton weighbridge, 4 Babcock boilers, also number of engines of mines, smelter and converter plants, air compressor, pumps of various descriptions; also 9 traction engines, number of trailers, together or separately; also large quantity of stores and sundries. The whole mine and plant as a going concern, or the mine, including all leases; the whole of the plant, in one lot; any article of machinery and plant separately. (See advertising columns.)

BALLARAT WATER COMMISSIONERS. — 18th June.—S. of galvanised iron pipes and fittings, and brass stop taps.

BENDIGONIA UNITED G.M. CO. N.L. (G. A. Petrie, Bendigo).—19th June.—P. of winding plant and accessories, complete.

MELBOURNE TRAMWAY AND OMNIBUS CO. LTD.—16th June.—P. of about 300 tons of heavy cast-iron wheels and gears.

CAIRNS HARBOUR BOARD (Q.) (T. R. Hall, Secretary).—26th June.—S. of a quantity of mild steel round bars.

COLLINGWOOD TECHNICAL SCHOOL (M. Richmond, Principal).—12th June.—S. and fitting up of engineering, turning and fitting machinery.

## ACCEPTED.

### Commonwealth.

POSTMASTER-GENERAL'S DEPARTMENT, Brisbane.—12,000 copper binders, for use with 200 lb. wire and insulators, pattern "A," £3 0s. 10d. per 1000—The India Rubber, Gutta Percha and Telegraph Works Co. Ltd., Melbourne.

2500 jointing sleeves, for use with hard-drawn copper wire 80 mils in diameter, £1 18s. 9d. per 1000; 10,000 jointing sleeves, for use with hard-drawn copper wire 67 mils in diameter, £1 16s. 3d. per 1000—The Lawrence and Hanson Electrical Co. Ltd., Sydney.

12 tons wire, hard-drawn copper, 300 lb. per mile, £88 12s. 6d. per ton; 62 tons wire, hard-drawn copper, 200 lb. per mile, £88 12s. 6d. per ton—R. Johnson, Clapham and Morris Ltd., Sydney.

POSTMASTER-GENERAL'S DEPARTMENT, Perth.—24 switchboards, magneto cordless, 6-line equipped for 4-line, £5 15s. each; 24 switchboards, magneto cordless, 6-line fully equipped, £6 each; 10 switchboards, magneto cordless, 10-line fully equipped, £8 10s. each—J. Bartram and Son Pty. Ltd., Melbourne.

DEPARTMENT OF DEFENCE. — Military Forces of Commonwealth.—27 chests, veterinary, 84 lb., with contents, £16 each; 38 chests, veterinary, 25 lb., with contents, £3 5s. each; 23 wallets, veterinary, with contents, £3 10s. each—Elliott Bros. Ltd., Sydney.

### Victoria.

STATE RIVERS AND WATER SUPPLY COMMISSION.—3000 casks of cement, 11s. per cask—Australian Portland Cement Co.

### Western Australia.

RAILWAYS DEPARTMENT.—Carriage and waggon wheels and axles, item 609, £13 17s. 3d. per ton; item 611, £14 19s. 9d. per ton — G. Wills and Co.

12in. all-geared lathe, £328 10s.—J. Lang and Sons (per Agent-General).

GOVERNMENT PRINTER. — Printing machinery, etc., rates obtainable upon application—Middows Bros., Gordon and Gotch, W. Detmold Ltd., H. Summers, S. Cooke Pty. Ltd.

PUBLIC WORKS DEPARTMENT. — Mild steel piping, rates obtainable upon application —Hoskins and Co. Ltd.

WATER SUPPLY DEPARTMENT. — Deep well pump, £186 10s.—G. Kent Ltd.

### General.

MELBOURNE AND METROPOLITAN BOARD OF WORKS.—1000 tons of 4in. cast-iron water pipes, of Australian manufacture, £8 17s. 6d. per ton—J. Danks and Son Pty. Ltd., J. Nixon and Sons, J. and T. Muir, and Mephan Ferguson Pty. Ltd., 250 tons each.

1000 ¾in. water meters, £2 11s. 9d. per meter —J. Danks and Son Pty Ltd., and Davies, Shephard and Co.

COMMERCIAL TRAVELLERS' ASSOCIATION OF VICTORIA.—Vacuum cleaning plant for Commerce House — Vincent and Cerutty, East Melbourne.

## DIVIDENDS OF MINING COMPANIES.

The following dividends and bonuses of mining companies in Australia have been declared and are payable on the dates mentioned:—

June.

13th.—British Broken Hill, 1s., £48,000.
13th.—Llanberris No. 1, 6d., £600.
14th.—Y Water, 1s., £3000.
17th.—Tongah Compound, 1s. and 2s. bonus, £7500.
24th.—Sons of Gwalia, 1s. (less I.T.), £17,500.
24th.—Great Boulder, 9d., £56,250.
25th. — Broken Hill Block 10, 1s. and 1s. bonus, £10,000.
26th.—Zinc Corporation, 1s. 6d. (ord. and pref.), £89,882.
26th.—North Broken Hill, 2s., £60,000.
27th.—Broken Hill South, 6s., £60,000.

July.

2nd.—Sulphide Corporation, 1s. 6d. ordy. and 2s. pref. (less British I.T.), £96,250.
4th.—Broken Hill Water, 1s. 6d., £15,000.
18th.—Williams' Fancy, 1s., £1200.

## BANK CLEARINGS.

The Melbourne Bank Clearing House reports for the week ended 9th June (5 days) as follows:—

| | | |
|---|---|---|
| Clearance ... ... ... ... ... ... ... ... | | £5,033,590 |
| Settled by certificates ... | £379,000 | |
| Settled in coin ... ... ... ... | 223,609 | |
| | | 602,609 |
| Clearance for the corresponding week of 1912 (6 days) ... ... ... ... ... ... | | 5,485,457 |

## ROYAL MINT RETURNS.

### Perth Branch.

The weight of metal received from each district in Western Australia during the month of May was as follows:—

| | Fine oz. |
|---|---|
| Coolgardie | 3,879.19 |
| Kalgoorlie | 71,503.49 |
| Menzies | 4,262.35 |
| Niagara | 1,330.93 |
| Ularring | 242.10 |
| Kanowna | 1,384.16 |
| Mt. Malcolm | 7,521.04 |
| Mt. Morgans | 912.76 |
| Mt. Margaret | 1,052.23 |
| Cue | 679.64 |
| Day Dawn | 3,239.75 |
| Mt. Magnet | 918.27 |
| Meekatharra | 7,626.73 |
| Black Range | 6,535.74 |
| Marble Bar | 613.91 |
| Nullagine | 678.00 |
| Yalgoo | 427.84 |
| Yilgarn | 6,793.55 |
| Total | 124,759.45 |
| Since 1st January | 392,153.95 |

## Government Notices (Q.).

Commissioner for Railways Office,
Brisbane, June 2nd, 1913.

### SUPPLY OF SPIRAL BEARING SPRINGS.

TENDERS will be received at this office until 2 p.m. on TUESDAY, 24th JUNE, 1913, for the Supply of Five Thousand (5,000) Spiral Bearing Springs to code drawing No. 9.

Tenders to be endorsed, "Tender for Springs," and accompanied by a preliminary deposit equal to one (1) per cent. of the amount of the tender (the minimum being £5).

Drawings and specification may be seen, and any further information obtained, at the Locomotive Offices, at Ipswich and Brisbane, and at the Offices of the Secretaries to the Railway Commissioners at Sydney and Melbourne.

The lowest or any tender will not necessarily be accepted.

By order of the Commissioner for Railways,
ARTHUR J. CROWTHER,
Secretary.

---

### QUEENSLAND RAILWAYS.

### SUPPLY AND MANUFACTURE OF STEEL SUPERSTRUCTURE, BRIDGE OVER PIONEER RIVER.

TENDERS will be received at the office of the Commissioner for Railways, until 2 p.m. on TUESDAY, 15th JULY, 1913, for the Supply and Manufacture of STEEL SUPERSTRUCTURE BRIDGE over Pioneer River.

Tenders to be endorsed, "Tender for Superstructure, Pioneer River Bridge," and accompanied by a preliminary deposit of one per cent. on the tender, with a minimum of £5.

Plan, specification, etc., may be seen at the office of the Chief Engineer, Brisbane; District Engineer, Maryborough; Maintenance Engineer, Rockhampton, and Station-master, Bundaberg.

The lowest or any tender will not necessarily be accepted.

---

### QUEENSLAND RAILWAYS.

### SUPPLY OF ONE 120ft. STEEL SUPER STRUCTURE (ONE SPAN), CABOOLTURE RIVER BRIDGE.

TENDERS will be received at the Commissioner for Railways' Office, until 2 p.m. on TUESDAY, 15th JULY, 1913, for the supply of one 120ft. STEEL SUPERSTRUCTURE (One Span) Caboolture River Bridge.

Tenders to be endorsed, "Tender for Caboolture River Bridge Duplication (120ft. span)," and accompanied by a preliminary deposit of one per cent. on the tender, with a minimum of £5.

Plan, specification, etc., may be seen at the office of the Chief Engineer, Brisbane; District Engineer, Maryborough; Station-masters, Ipswich and Bundaberg.

The lowest or any tender will not necessarily be accepted.

By order of the Commissioner for Railways,
ARTHUR J. CROWTHER,
Secretary.

---

### SUPPLY OF STEEL SUPERSTRUCTURE FOR WIDENING BREMER RIVER BRIDGE.

TENDERS will be received at this Office until 2 p.m. on TUESDAY, JULY 29, 1913, for the Supply of Steel Superstructure for three 149ft. 6in. Spans for widening Bremer River Bridge—Branch Line to Ipswich Workshops.

Tenders, to be endorsed, "Tender for Spans, Bremer River Bridge," and accompanied by a deposit of one per cent. of the tender, with a minimum of £5.

Plan, specification, etc., may be seen at the Office of the Chief Engineer, Brisbane; District Engineer, Maryborough, and Station-masters, Ipswich and Bundaberg.

The lowest or any tender will not necessarily be accepted.

By authority of the Commissioner for Railways,
ARTHUR J. CROWTHER,
Secretary.

## Government Notice (N.S.W.).

### NEW SOUTH WALES GOVERNMENT RAILWAYS.

Office of the Chief Commissioner,
Sydney, 10th June, 1913.

TENDERS will be received at this Office until 12 o'clock noon on the dates specified for the undermentioned Works, etc., viz.:—

WEDNESDAY, 18th JUNE, 1913.

The Supply of Eight Automatic Coal-weighing Machines for the White Bay Power House. Specification No. 414. Price, 2s. 6d. each.

WEDNESDAY, 6th AUGUST, 1913.

The Supply of One Live Steam Feed Water Heater for Ultimo Power House. Specification No. 397 (price, 2s. 6d. each).

WEDNESDAY, 20th AUGUST, 1913.

The Supply of Pneumatic Ash-handling Plant for the White Bay Power House, to Specification No. 415. Copies 5s. each. All Specifications can be obtained at the Electrical Engineer's Office, 61 Hunter-street, Sydney.

Tenders are to be endorsed "Tender for Coal-weighing Machine," or as the case may be.

The Chief Commissioner does not bind himself to accept the lowest or any tender.

By order,
J. S. SPURWAY,
Secretary.

## Commonwealth of Australia.

### COMMONWEALTH PUBLIC SERVICE.

### VACANCIES FOR ASSISTANT ENGINEERS (PROFESSIONAL DIVISION), POSTMASTER-GENERAL'S DEPARMENT.

A Competitive Examination far appointment to the above vacancies will be held in Victoria on 4th and 5th August, 1913. The examination will comprise the subjects of Telegraph and Telephone Engineering, Line Construction, and Equipment, and is open to males between the ages of 21 and 40. Salary, £216 (minimum) to £312 (maximum), per annum.

Full particulars of the examination and the method of submitting applications are contained in the Commonwealth Gazette of 31st May, 7th and 14th June. Extracts from the Gazette may be obtained from the Secretary to the Commonwealth Public Service Commissioner, Customs House, Melbourne, with whom applications close on 28th June, 1913.

D. C. McLACHLAN,
Commissioner.

W. J. CLEMENS,
Secretary.

---

## PORT OF HOBART IMPROVEMENTS.

TENDERS will be received at this Office until noon, on TUESDAY, 24th inst., for the supply of:

(1) OREGON AND DEAL TIMBER.

(2) GALVANISED IRON, ETC.,

required in the construction of sheds on the New Pier.

Specifications may be obtained at the Marine Board Office, Melbourne.

J. ADAMS,
Secretary.

Marine Board of Hobart,
7th June, 1913.

---

## THE SULPHIDE CORPORATION LIMITED.

The Directors have declared an INTERIM DIVIDEND of 2s. per share on preference shares, and 1s. 6d. per share on ordinary shares, payable 2nd July, 1913, less English Income Tax, at rate of 1s. 2d. in the £.

GIBBS, BRIGHT and Co., Agents.

34 Queen-street, Melbourne, June 6, 1913.

---

## CHILLAGOE LIMITED.

TENDERS are invited and will be received at 39 Queen-street, Melbourne, up till 23rd June, 1913, for the SUPPLY of STORES required for the 12 months ending 31st July, 1914.

Copies of schedule can be obtained at the office of the Company, 39 Queen-st., Melbourne, and from R. N. Kirk, 16 O'Connell-st., Sydney, and R. D. Frew, 14 Telegraph Chambers, Queen-st., Brisbane.

By order of the Board,
C. L. HEWITT, Secretary.

39 Queen-st., Melbourne, June 7, 1913.

## Government Notices (V.).

### VICTORIAN RAILWAYS.

### ELECTRIFICATION OF MELBOURNE SUBURBAN RAILWAYS.

SEPARATE TENDERS are invited for the following plant in connection with the Electrification of the Suburban Railways:—(a) Circulating Water and Sump Pumps with Motors; (b) Air and Water Extraction Pumps, and Motors; (c) Surface Condensers, Hot-wells, Piping and Sundries. Specifications and forms of tender for each section can be obtained at the Contractors' Room, Railway Offices, Spencer-street, Melbourne, and at the Office of the Agent-General for Victoria in London (where tenders will also be received).

For any further information, application should be made to the Consulting Engineers, Messrs. Merz and McLellan, 32 Victoria-street, Westminster, London, S.W., or the Acting-Secretary for Railways, Melbourne. Tenders may be submitted for any or all of the above sections.

The charge for each specification is £5 5s. for the first copy, and £2 2s. for each further copy; and the sums paid will be refunded on receipt of bona fide tenders.

Tenders, endorsed "Tender for Electrification of Melbourne Suburban Railways," must be lodged in the Tender Box, Railway Offices, Melbourne, or at the Office of the Agent-General for Victoria, in London, at or before 11 a.m., on Monday, 4th August, 1913.

No tender will necessarily be accepted, and ample security will be required from the successful tenderers.

E. B. JONES,
Acting-Secretary for Railways.

---

### VICTORIAN RAILWAYS COMMISSIONERS.

### STATE COAL MINES.

### INDUCTION MOTOR AND FLEXIBLE BELT.

Separate Tenders, endorsed "Tender for ——," to be addressed to the General Manager, State Mines, Wonthaggi, and delivered at his Office, at Wonthaggi, not later than 12 noon of 25th June are invited for the supply of the following:—Induction Motor, 140h.p.; and Flexible Belt and Jointing Material for Band Conveyor. P.D.'s, £5 and £2 respectively. Particulars and forms of tender at the Melbourne Office of the State Coal Mines, Robb's Buildings, Collins-street, and at the Office of the General Manager, Wonthaggi.

No tender will necessarily be accepted.

G. H. BROOME,
General Manager.

---

## THE MUNICIPAL TRAMWAYS TRUST, ADELAIDE.

TENDERS FOR STEEL AND WOODEN POLES.

TENDERS will be received until 3 p.m. on TUESDAY, 19th AUGUST, 1913, for the MANUFACTURE, SUPPLY, and DELIVERY of STEEL POLES.

Tenders will be received until 3 p.m. on TUESDAY, 1st JULY, 1913, for the SUPPLY and DELIVERY of WOODEN POLES.

In each case the sum of £1 1s. will be charged per copy of specification, which, together with the conditions of contract and tender forms, may be obtained on application to the undersigned, and such deposit will only be refunded on receipt of bona fide tender and return of specification.

Tenders must be endorsed "Tender for Steel Poles" or "Tender for Wooden Poles," as the case may be, and addressed to The Chairman, The Municipal Tramways Trust, Adelaide, and the Trust does not bind itself to accept the lowest or any tender.

By order,
W. G. T. GOODMAN,
Chief Engnr. and Gen. Mgr.
Hackney-road, Adelaide, June 4, 1913.

---

## THE MUNICIPAL TRAMWAYS TRUST, ADELAIDE.

TENDERS FOR COPPER CABLE AND WIRE.

SPECIFICATIONS relating to the supply and delivery of Copper Cable and Wire MAY BE OBTAINED ON APPLICATION to the undersigned. Tenders will be invited at 48 hours' notice at a later date, and Specifications are now issued to facilitate prospective tenderers obtaining quotations. The sum of £1 1s. will be charged per copy of the Specification, which will be refunded on receipt of bona fide tender and return of Specification.

By order,
W. G. T. GOODMAN,
Chief Engnr. and Gen. Mgr.
Hackney-road, Adelaide, June 4, 1913.

## FOR SALE BY TENDER.

LARGE TRACTION PLANT, also SMELTING, CONVERTER and MINING PLANTS, BUILDINGS, STORES, etc., estimated to have cost £75,000, comprising:—Engineering Plants, 30-ton Weighbridge, 4 Babcocks Boilers, also number of Engines of Mines, Smelter and Converter Plants; Air Compressor, Pumps of various descriptions; also 9 Traction Engines, number of Trailers, together or separately. Also large quantity of Stores and Sundries. Full schedule obtainable from BURNS, PHILP and CO., Sydney, Brisbane, Townsville, Cairns, or Charters Towers, or from the undersigned.

Also the whole of the BUILDINGS and MINERAL LEASES of the O.K. Copper Co. N.L. (in Liquidation), situated at O.K., North Queensland.

Tenders are invited for: (1) The whole Mine and Plant as a going concern; or (2) the Mine, including all Leases; (3) the whole of the Plant in one lot; (4) any Article of Machinery and Plant separately.

Tenders close 4 o'clock, July 21st, 1913. No tender necessarily accepted.

SIDNEY CORNISH (for Liquidators).
23 Brookman's Building, Adelaide.

---

## SWISS MOUNT QUARTZ-MINING Co., N.L.

APPLICATIONS are invited up till 25th June, for the PURCHASE of the above MINE, as a going concern, including all machinery, which comprises complete winding plant and mining equipment, consisting of horizontal engine, 18in. cylinder, 3ft. stroke; double drums, wire ropes, large Cornish galloway tube boiler, 26ft. x 6ft. 6in., poppett heads, smith shop, tools, cages, tanks, trucks, etc. Full inventory and plan of the mine workings on application to 90 William-street, Melbourne.

WM. LASCELLES, Manager.

---

The Patentee of Australian Patent No. 18092, of 3rd June, 1909 (Heinrich Carl Werner), for "Improvements in Reinforced Concrete Railway Sleepers" is prepared to enter into negotiations for and to complete arrangements by way of licence or otherwise on reasonable terms with any persons desiring to exploit or to adopt and carry on such invention in Australia.

Inquiries to be addressed to W. J. SPRUSON, Patent Attorney, 91 Elizabeth-street, Sydney, New South Wales.

---

## CENTRAL RED, WHITE AND BLUE Mining Company No Liability.

A DIVIDEND (the 38th) of two shillings per share has been declared, PAYABLE at the Company's office, City Chambers, High-street, Bendigo, and at the Bank of Victoria, Collins-street, Melbourne, on Thursday, 12th June, 1913. Transfer Books close on Tuesday at noon.

J. H. McCOLL (McColl and Rankin), Manager.

---

## WILLIAMS FANCY GOLD MINING Co. (Berringa) No Liability.

A DIVIDEND (the 39th) of sixpence a share, with a bonus of sixpence a share, has this day been declared, PAYABLE at the office of the Company, Lydiard-street, Ballarat, on Wednesday, the 18th day of June, 1913. Transfer Books will close on Saturday, the 14th, at 12.30 o'clock p.m.

S. STRETCH, Manager.

Ballarat, 6th June, 1913.

---

### NEW SPECIMEN HILL GOLD MINES, NO LIABILITY, Daylesford.

NOTICE.—The Half-yearly General MEETING of the Company is hereby convened, and will be held at the Stock Exchange Bldgs., Collins-st., Melbourne, on Wednesday, the 18th day of June, 1913, at half-past three o'clock in the afternoon. Business: To confirm the minutes of the previous meeting; to receive and adopt reports and statements of accounts; to elect 3 directors for 12 months; to elect 2 auditors; general.

Transfer books will be closed from Saturday, 14th inst., until after the meeting has been held. Notice, in writing, of shareholders, others than retiring directors, of intention to be nominated for the office of director, must be lodged with the manager 7 clear days prior to the holding of the meeting. Proxies must be deposited with the manager 24 hours before the commencement of the meeting.

J. H. DILL, Manager.
67 Queen-st., Melbourne, 6th June, 1913.

---

Chrome-vanadium and carbon steel springs have been given service tests by the Illinois Central Railroad Co., and showed 248 and 129 per cent. in favour of the former steel in mileage run, and 31 to 54 per cent. less in cost.

## MIXED MEMS.

The Victorian Parliament will resume operations early in July. The following is the list of measures from which the Government will make a selection to be dealt with in the new session:—Greater Melbourne Council; Price of Gas Regulation; Workmen's Compensation; Redistribution of Seats; Local Government Amending; Public Health; Hospitals and Charities; Factories Acts Amending Bill; Consolidations—Constitution Act Amending Acts, Local Government Acts, Land Acts; Suburban Tramways—Brunswick and Coburg, South Melbourne, Hawthorn; County Courts; No Liability Mining Companies Mines Act Amending; South Melbourne Markets; Trade Descriptions; Municipal Rating System; Country Sewerage; Lake Victoria Agreement; Murray River Bridge and Railways; Tramway Fares, based on report of commission of 1911; Provident Societies; Secondhand Dealers; Juvenile Offenders; Evidence (oaths); Crimes (evidence of accused persons); Carriers Licences; Petroleum Storage; Benefit Societies (to require that certain associations which carry on friendly societies' business shall conform to friendly societies' regulations); Spirit Merchants' Licences (to enable companies to obtain licences); Metalliferous Mines Relief Fund; Registration of Teachers; Technical Schools; Water Acts, Amending; Workmen's Dwellings (to authorise municipalities to manage dwellings for workmen); Unused Roads; Savings Banks Interest; Wine Adulteration; Railways Act Amendment; Milk and Dairy Supervision; Sunday Observance; Mildura Crown Lands; Wire Netting Charges; Willaura Lands; Thistle Act Amendment; Marriage Act Amendment; Fire Prevention; University Amending.

The Administrator of Papua, Mr. Staniforth Smith, who has returned from a third trip to the Valila oilfield, states that one of the three experimental bores sunk by Mr. Grebin, the Russian expert, has struck good oil at a depth of 228ft. Mr. Grebin's second bore is down 110ft. in shale, with good indications of petroleum and a strong escape of gas. The third bore, sunk by Mr. Locke, the Australian expert, on the eastern bank of the river, is down to a depth of 183ft., also with promising indications. Since his arrival, Mr. Locke has done a tremendous amount of work. Houses for both whites and natives have been completed, and a machinery shed erected. This is a remarkable achievement in the time spent, seeing that all the material had to be brought up a dangerous waterway. Mr. Locke's machinery is working without trouble, and news of his success is expected at any moment. The Administrator brought back with him a few gallons of oil from Mr. Grebin's bore, this being the first parcel of any importance received. This will be forwarded to the Commonwealth.

The following official circular has been issued to shareholders in the British Australian Oil Co. Ltd., under date May 5:—I am instructed by the directors to inform you that Mr. Robertson Lawson has just returned from Australia, and is now busily engaged in the preparation of his report on the position of the company generally. He hopes to be in a position to submit his full report to the directors within the next few days, and immediately thereafter the directors will communicate further with the shareholders. In the meantime, Mr. Lawson has reported verbally to the directors in regard to several important matters. On account of a dispute between two unions, which had nothing whatever to do with the company, the miners came out on strike, and for this and other reasons it was decided to close down the company's retorts for the time being. In the present financial position, the trustees for the debenture stockholders have considered it advisable, and are taking steps, to appoint a receiver to protect the assets of the company, pending the submission of a scheme for the rearrangement of its finances.

From the account of some experiments made by Mr. E. A. Barrier, a Boston engineer, and embodied in a report made under the direction of the Associated Factory Mutual Fire Insurance Companies, it would appear that saw-dust possesses some special merits as a fire extinguisher when dealing with small outbreaks of liquid combustibles, such as lacquer and petrol, which are usually difficult to extinguish by ordinary means. Sand is generally looked upon as the best substance to use in such cases when it can be applied promptly, but the tests showed sawdust to be superior.

A Colorado Springs despatch, the "Engineering and Mining Journal" says, announces the election of Miss Olive L. Granfield, of Mount Vernon, N.Y., as president of the Cripple Creek Gold Mining Co., C. K. and N., succeeding W. H. Davis. This is said to be the first time in Colorado that a woman has been put at the head of a company owning a real mine. Miss Granfield inherited a large block of C.K. and N. stock from her father, Horace Granfield, the founder of the company, who was killed in an automobile accident in Colorado a few years ago. Miss Granfield spent the winter in California, and was on her way home when she was asked to attend the stockholder's meeting and was prevailed upon to accept the presidency. The C.K. and N. company is the defendant in an apex suit, involving over 1,000,000 dollars, the complainant being the El Paso company. As Miss Granfield is reported to be "handsome and in the early twenties," it is hoped, for the ends of justice, that the president of the defendant company will not be called into court.

A good test of cyanide solutions, devised by Mr. Dowsett of the Brakpan mill, Johannesburg, to determine whether precipitation on zinc dust or shavings is good, is as follows:—1000 c.c. of cyanide solution is poured into a wide-necked bottle, to this is added three drops of saturated solution of lead acetate, and the mixture is then shaken. Add 0.75 gm. of zinc dust and shake again. Add 20 c.c. of saturated solution and shake for 30 seconds. Pour into an evaporating dish and allow dust to settle. Pour off solution, put dish on a spirit lamp, and dissolve zinc dust with about 10 c.c. of aqua regia; boil this until the bulk is reduced to a volume of about 4 c.c. Allow the chloride of lead to settle, and then pour the solution into a test tube. Cool the solution in the tube, and add two drops of a solution of tin chloride. If gold is present to the extent of 0.02 dwt. per ton of the original cyanide solution, a very slight coloration will be perceived in the liquid; 0.03 shows a slight yellow; 0.04 slight pinkish yellow; 0.06 strong pink; 0.08 the purple of Cassius. The great advantage of a test of this nature lies in the fact that the shiftsman can make it in a few minutes.

It is gratifying to learn that the estimates of the New South Wales Public Works Department are in future to be prepared on business-like and common-sense lines. On investigating the matter thoroughly the Minister found that prior to the appointment of the Constructor of Building Works, the methods of estimating costs were merely to measure up the cube contents of a building on the cost of other buildings of similar capacity, and on this data to frame an estimate. In the great majority of cases haphazard calculations of this sort have proved utterly misleading, and the practice has now been established of basing estimates on properly worked-out bills of quantities, so that in future the estimates for the cost of public buildings will be a reliable guide as to what ought to be the actual cost. Another fruitful reason of the wide discrepancies above referred to is that estimates of buildings made two, three, and four years ago have not been amended to meet the altered conditions, and the cost of labour and materials. By way of an example of the discrepancy between the estimate of the Architect's branch prepared on the old system and the lowest tender, the Minister stated that the estimate for the University Union buildings was £1740, while the lowest tender was £2470. On the other hand, as showing how nearly accurate estimates can be made by careful calculations of quantities, Mr. Griffith pointed out that Mr. Bruce's estimate for the Daceyville cottages was £1011 11s. 2d. per pair, and the actual cost was £994 4s. 3d., thus showing a difference of only £17 6s. 11d. per pair. Both these figures are inclusive of electric lighting.

Various railway propositions that are expected to come before Parliament under the Railway Development Act which was passed during last session were discussed by the Victorian Cabinet last week. The Minister for Railways was asked, as a result, to draw up a report for submission to the Cabinet at its next meeting, showing the nature and extent of the proposed extensions. The necessary steps will be taken when Parliament meets to obtain authority for the construction of the more necessary country railways. In the meantime, reports will be obtained on the subject from departmental officers.

LIQUID FUEL for Diesel & all Crude Oil Engines.
"SHELL" SPIRIT, "SHELL" BENZINE, LUBRICATING OILS AND GREASES.
Prices and particulars on application to
THE BRITISH IMPERIAL OIL CO. LTD. Adelaide, Brisbane, Fremantle, Melbourne, Sydney and New Zealand

Telephone—5866 Central. Cable Address—"PORPHYRY."

**Edward Dyason and Co.**

*MINING ENGINEERS AND METALLURGISTS,*

EXAMINE, REPORT ON, AND VALUE MINING PROPERTIES.
CONSULTING ENGINEERS. MANAGERS OF COMPANIES.

*60 QUEEN STREET - - - MELBOURNE,*

Codes A.B.C. 5th Edition. Moreing and Neal.

**"INGREY"**

**PATENT WEIGHING & RECORDING MACHINES**

ARE

Installed in H.M. Dockyards.
Certified by the Board of Trade.
Accurate and Reliable.
Automatic in action and
Pay for themselves in a year!

**H. A. HARVEY & CO. LIMITED, LONDON.**

Australian Representative — LASCELLES PARRINGTON & BRACHÉ.
London House, 97 Elizabeth Street, Melbourne.
New Zealand Buildings, Pitt Street, Sydney.

Established 1860.

**Bondholders' Register**

Publishes the Actual Numbers of all Drawn Bonds Throughout the World.

PUBLISHED FORTNIGHTLY.

10s. PER ANNUM

73 Farrington St., LONDON, E.C.

Australian Offices.

376 Flinders Lane, MELBOURNE.

The financial year of the New South Wales Railway Department ends on June 30, and the Treasurer, Mr. Cann, announced recently that for the period mentioned the railways and tramways of New South Wales will have been run at a loss. To turn this loss into credit balance next year, Mr. Cann stated that it was probable that an increase in fares and freights would be necessary. There is now a persistent rumour afloat that this suggestion, which, it is understood, comes from the Chief Railway Commissioner, is to be carried into effect. It is stated that returns have been supplied to the Treasury showing the traffic carried under the workmen's and season-ticket systems, and that the increase proposed for the season tickets amounts to 20 per cent. on the present prices charged, while the return dealing with the workers' weekly tickets has been referred back to the Railway Department for further information. Should the Government agree to these increases in fares, they will come into force on July 1. No increase in the cash fares is proposed now on the heavier class of goods traffic, but an increased rate may be charged on goods carried under special rates.

* * *

According to the "Pravitelstvennei Vyestnik" (St. Petersburg) of 16th April, the total output of gold in the ten Ural mining districts during 1912 amounted to about 265,966 oz.

**CENTRIFUGAL PUMPS**

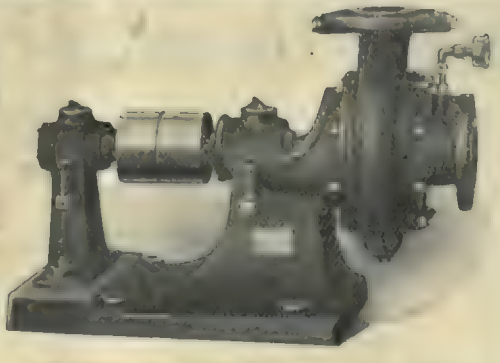
Low Lifts, Middle Lifts, High Lifts, Single and Multi Stage

THE SPECIAL ADVANTAGES OF

**WEISE AND MONSKI PUMPS**

are

EFFICIENCY 70—80 per cent. SIMPLICITY OF CONSTRUCTION.
NO END THRUST. PARTS INTERCHANGEABLE & easily replaced.
EASY ADAPTATION of same pump for variations of height and capacity within wide limits.
LOW PRICE — QUICK DELIVERY — STOCKS, SYDNEY & PERTH.



**FRANK R. PERROT, Representative,**
204 Clarence Street, SYDNEY.
883 Hay Street, PERTH.
Melbourne Offices—L. BANNISTER,
39 Queen Street.

**GREAT COBAR LIMITED,**

COBAR, N.S.W.

MINE OWNERS, SMELTERS, COLLIERY PROPRIETORS, PURCHASERS OF COPPER ORES AND MATTES.

VACANCIES FOR COMPETENT MACHINE MINERS.

SYDNEY: Australasia Chambers, Martin Place. And at Lithgow and Singleton. LONDON: 65 New Broad Street, E.C.

**HORNSBY GAS ENGINE & SUCTION GAS PLANT**

Received the GRAND PRIX—the highest award—at the INTERNATIONAL EXHIBITION, held at Turin, and was selected as the power to provide Electric Light for the Exhibition—a proof of its RELIABILITY.

The Only Efficient, Reliable and Economical Power Plant on the Market. Write for our Catalogue and consult Users if confirmation needed.

**Sole Agents for the "BRISBANE" Charcoal Retort. Superior in every way to any other make. Retort can be placed near to Engine, attended to by the man in charge at NO EXTRA COST. Converts one cord of wood into one ton of charcoal.**

**R. HORNSBY & SONS LTD.,**
**Melbourne - Sydney - Brisbane.**

**QUEENSLAND MINES DEPARTMENT**

**GEOLOGICAL SURVEY PUBLICATIONS. REVISED LISTS FORWARDED ON REQUEST**

**Charters Towers School of Mines.**

SUBJECTS AND INSTRUCTORS:

Geology, Mining Geology, and Mineralogy.—The Director, H. I. McGillivray, M.A. (Melb.).
Chemistry, Assaying, and Metallurgy.—J. A. Hughes, F.C.S.; W. H. Bowater, F.C.S.; P. Harvey, A.C.T.S.M.,
Mechanics, Materials and Structures, and Physics.—A. R. Wright, F.S.A.S.M.
Mining, Ore Dressing, Surveying, and Mechanical Drawing.—E. C. B. Heden, B.A., B.E., B.Sc. (Syd.).
Mathematics.—G. F. Clinton, A.C.T.S.M.
Secretary, J. F. Horrigan.

Candidates prepared for Associateship in Mining and Metallurgy, Diploma as Chemist and Assayer, the Mine Managers' Examination, and in all branches of Metallurgical Work, such as Cyaniding, Chlorination, etc.

Scale of Fees.—15s. per class per term (three terms of three months each per year), or £2 per class per year. A full course of six or more classes for £10 10s. per annum. Full particulars on application to the Director.

Managers of Mines, Mills, and Smelters requiring trained Assistants are invited to communicate with the Director.

**Queensl'd Government Mining Journal**

**A Monthly Publication Issued under the Authority of the MINES DEPARTMENT.**

Containing Official Reports, Statistical Tables, and other Authentic Information relating to

**MINING IN QUEENSLAND.**

SUBSCRIPTION—Per Annum, 6s.; Posted within the Commonwealth, 6s. 6d. To any place beyond, 8s.

PUBLISHERS—GORDON & GOTCH, Brisbane, and at 15 St Bride-street, Ludgate Circus, London, E.C.

**Department of Mines Western Australia**

SCHOOL OF MINES, KALGOORLIE.

Situated in the Chief Mining District.

SCHOOL TERMS commence end of February and May, and the middle of August. EXAMINATION at the end of November

SUBJECTS.

Mathematics, Geology, Physics, Chemistry, Assaying, Metallurgy, Electricity, Mineralogy, Petrology, Mining, Mining Geology, Surveying, Applied Mechanics, Building Construction, Engine-driving, Mechanical Drawing, Engineering Subjects, Fitting and Turning.

PREPARATORY CLASSES for beginners will be held in Mathematics, Mechanical Drawing, Chemistry, Physics and Physiography. Fee, 15/- per term per subject Scholarships of £15 and upwards are offered annually for competition

CLASS FEES, 15/- to 1½ guineas per subject per term.

F. B. ALLAN, M.A., B.Sc., Director.

**MINING PUBLICATIONS OBTAINABLE.**

| | Price each—s. d. |
|---|---|
| Maps of the State of W.A., in one sheet, scale 50 miles to an inch | 1 0 |
| Route Maps, in book form (2 vols.), scale 10 miles to an inch | 2 6 |
| Route Maps, in separate sheets (8 sheets), scale 10 miles to an inch | 1 0 |
| Maps of each Mining Centre, showing Mining Leases, Town sites, Roads and Reserves, etc., scale 20 and 40 chains to an inch | 1 0 |
| Stock Route, Kimberley to Eastern Goldfields, by A. W. Canning | 1 0 |
| The Mining Act, 1904, including Mining on Private Property Act and Sluicing and Dredging for Gold Act | 2 0 |
| Annual Reports of Department of Mines from 1894 (illustrated) 6d. to | 3 0 |
| Mines Regulation Act, 1906 | 0 9 |
| Coal Mines Regulation Act, and Regulations, 1902 | 2 0 |
| Mines Development Act, 1902 | 0 9 |
| The Inspection of Machinery Act, 1904 | 1 6 |

| | Price each—s. d |
|---|---|
| Explosives Act, 1895 | 2 0 |
| Explosives Act, Amendment Act, 1902 | 1 0 |
| Enginedrivers' Regulations, 1905 | 0 6 |
| Report on the Pilbara and West Pilbara Goldfields, by A. Montgomery, M.A., F.G.S., State Mining Engineer, 1907 | 1 0 |
| Also on Northampton Mineral Field | 1 0 |
| Kanowna Mines, 1908 | 1 0 |
| Yilgarn Goldfield, 1908 | 1 0 |
| Waverley or Siberia District, 1909 | 1 0 |
| Progress of Mining in the Districts Between Leonara and Wiluna | 1 0 |
| Murchison and Peak Hill 1909 | 1 0 |
| Kunanalling and Broad Arrow 1910 | 1 0 |
| List of Cancelled Gold Mining Leases (Postage 2d.) | 1 0 |

**GEOLOGICAL MAPS AND REPORTS ISSUED BY THE GEOLOGICAL SURVEY OF WESTERN AUSTRALIA.**

| | £ s. d. |
|---|---|
| Geological Map of Northampton | 0 2 6 |
| Geological Map of Coolgardie | 0 10 0 |
| Geological Map of the North Lead, Kanowna | 0 1 0 |

| | £ s. d. |
|---|---|
| Geological Map of Kalgoorlie (scale, 10 chains per inch) six sheets | 1 1 |
| Geological Map of the Boulder Belt, and Sheet of Horizontal Sections | 0 12 6 |
| Annual Reports of the Geological Survey, from 1898 | 0 1 |

**BULLETINS.**

I. Bibliography of the Geology of Western Australia (out of print). II. The State of Mining in the Kimberley District, and the probability of obtaining Artesian Water between the Pilbara Goldfield and the Great Desert (out of print). III. The Coolgardie Goldfield, 1s. IV. The Mineral Wealth of Western Australia (out of print). V. The Phillips River Mining District (out of print). VI. Notes from the Departmental Laboratory, 2s 6d. VII. The Auriferous Reefs of Cue and Day Dawn, 2s. 6d. VIII. Lennonville, Mt. Magnet and Boogardie, 2s. 6d. IX. The Northampton Mining District, 2s 6d. X. Palaeontological Contribution to the Geology of Western Australia, 1, Carboniferous Fossils from the Gascoyne District, 2s. 6d. XI. The Country between Edjudina and Yundamindera (out of print), XII. Mulline, Ularring, Mulwarrie and Davyhurst, 2s. 6d. XIII. Leonara (out of print). XIV. Part of the Murchison Goldfield (out of print). XV. Preliminary Report on the Pilbara Goldfield (out of print). XVI. The Mineral Production of Western Australia up to end of 1903 (out of print). XVII. Southern Cross, Yilgarn Goldfield, 2s. 6d. XVIII. Mt. Morgans and Mulgabbie (out of print). XIX. Minerals of Economic Value, price 1s. XX. Further Report on the Pilbara Goldfield (out of print). XXI. The Norseman District, Dundas Goldfield, 2s. 6d. XXII. Menzies, North Coolgardie Goldfield (out of print). XXIII. Third report on the Pilbara Goldfield (out of print). XXIV. The Laverton, Burtville, and Erlistoun Auriferous Belt, 2s. XXV. Artesian Water in the Kimberley District, 2s. XXVI. Miscellaneous Reports by various members of the Geological Survey Staff, 2s. XXVII. Palaeontological Contribution to the Geology of Western Australia II (out of print). XXVIII. Lawlers, Sir Samuel, Darlot, Mt. Ida, and part of Mt. Margaret Goldfield, 2s. XXIX. Cue and Day Dawn Districts, Murchison Goldfield, Parts I. and II., 3s. XXX. The Distribution and the Occurrence of the Baser Metals in Western Australia, 1s. XXXI. The Bonnievale and Kunanalling Districts, and the Black Range District, 2s. XXXII. The Greenbushes Tinfield; Mt. Malcolm Copper Mine, Eulaminna; and Fraser's Gold Mine, Southern Cross, 2s. XXXIII. Geological Investigations in parts of the Gascoyne, Ashburton and West Pilbara Goldfields, 2s. 6d. XXXIV. The Barrambie, Errolls, Gum Creek and Wiluna, 2s. XXXV. Gold and Copper Deposits of the Phillips River Goldfield, 2s. 6d. XXXVI. Palaeontological Contributions to the Geology of Western Australia, III., 2s. 6d. XXXVII. Geological Features along the Route of Transcontinental Railway in W.A., 2s. XXXVIII. Irwin River Coalfield and adjacent districts from Arrino to Northampton, 2s. 6d. XXXIX. Wiluna, Hall's Creek, and Tanami, 2s. XL., Pilbara Goldfield (Reprint of B. 15, 20, 23), 2s. 6d XLI. West Pilbara Goldfield, 2s. 6d.

**IN PREPARATION.**—Kalgoorlie Goldfield. Kimberley District; Yilgarn Goldfield. Meekatharra, Murchison Goldfield. Geology and Mineral Resources of Western Australia. Also Annual Reports of the State Mining Engineer, Reports of Royal Commissions, Lithographic Plans, Code of Signals in Mines, General Rules. Miscellaneous Maps, etc., etc., etc.

Fuller List of publications, post free, to be had on application at the Department of Mines, Perth, Western Australia.

HON. P. COLLIER, M.L.A.,
Minister for Mines.

H. S. KING,
Secretary for Mines

## CONTENTS.

### JUNE 19.

EDITORIAL—

- Mining Speculation ... 505
- Festina Lente ... 506

Leaderettes ... 506
News and Notes ... 507
Personal ... 508
Metal Quotations ... 508

Investor's Column—

- British Broken Hill ... 508
- Ajax Centrals (V.) ... 508

Mining in New South Wales ... 509
Victorian Mining Activities ... 510
Tasmanian Mining ... 510
South Australian Mining ... 511
Mining in Western Australia ... 511
Queensland Mining ... 511
Mineral Returns ... 511
The Coal Mining Industry ... 512
Preference to Unionists ... 512
Scientists' Visit ... 512
Royal Mint Returns ... 512
Commonwealth Oil Corporation ... 512
A I M E. ... 513
Commonwealth Oil Corporation's Affairs 515
Discovery of Refined Oil ... 515
The Dredging Inquiry ... 516
Sludge Abatement ... 516
Reports of Companies, etc. ... 516
Publications Received ... 516
Tenders Invited and Accepted ... 520
The Naval Dockyards ... IX.
N.S.W. Pipe Contract ... IX.
Daylight Cinema ... IX.

### Engineering and Electrical Record.

Electrification ... 517
N.S.W. Telephones ... 517
The Brighton Line ... 517
N.S.W. Engineering Achievement ... 517
British and European Developments ... 518
Wyalong-Lake Cudgellico Railway ... 519
Pyrmont Power House ... 519
Miscellaneous ... 519

HENLEY'S
Electric Wires and Cables
AND INSULATING TAPES
ARE THE BEST.
W. T. HENLEY'S Telegraph Works Co. Ltd.
545 COLLINS ST., MELBOURNE.
61 YORK ST., SYDNEY.

BELTING!
Largest stock of all kinds of Machine Belting in the Commonwealth.
Conveyor and Elevator Belting for all purposes.
HOPKINS BROS. & ODLUM PY. LTD.
LEICESTER ST., CARLTON, MELBOURNE.
'Phone, Central 754 and 5202. Box 377 G.P.O.

COKE!
NORTH BULLI COLLIERY
Limited
Supplies best quality hard
SOUTHERN
SMELTING COKE.
(Weekly output 1250 tons.)
H. G. Hyde, Secretary.
Royal Insurance Building, 16 Spring-street,
SYDNEY.

## AUSTRALIAN MINING STANDARD.

Forwarded Post Free to any Address.

| | |
|---|---|
| Australasia | 26/- per |
| Abroad | 30/- Annum. |

Payable half-yearly or yearly, in advance.

All amounts should be made payable to order of "CRITCHLEY PARKER, Bank of Australasia."

12 O'Connell-street,
Sydney.

376 Flinders-lane,
Mebourne.

**BACK NUMBERS OF THE "MINING STANDARD."**

The following is the rate for back copies more than a month old. Applications by post must be accompanied with cash and postage added. In no case can we guarantee to supply copies, as our storage accommodation is limited.

A postcard will be sent if the number required is out of print.

For copies three months old, ninepence; six month, one shilling; and beyond that period, one penny per month per copy.

As there is a regular demand for back copies of the "Mining Standard," newsagents are requested to send back all returns uncut and in good condition, otherwise they will not be accepted.

All Returns from Newsagents must reach us by the end of each month (the whole paper must be sent). No credit will be allowed beyond this term.

Postage — British, 1d.; Foreign, 1½d.; Australasia, ½d. per copy.

Stamps will be accepted as pre-payment.

Address communications: Publishing Department, "Mining Standard."

**ALTERATION TO ADVERTISEMENTS.**

As our publishing arrangements necessitate the "Mining Standard" being issued simultaneously in Sydney, Melbourne and Adelaide on the same day each week, advertisers wishing to change their advertising matter must supply same ten days in advance of publication.

**CASUAL ADVERTISEMENTS.**

The rate for this class of advertisement is governed by the position it occupies.

If it appears on leader page or amongst or next to reading matter, the rate is 15s. per inch (nonpariel) per insertion.

Towards end of reading section, set in brevier, 16 ems width, 6s per inch per insertion.

If set in nonpariel the rate is 4s. per half inch.

**ADVERTISEMENT PROOFS.**

Proofs are submitted to advertisers in order to give them an opportunity of going over the advertisements before printing. Any alterations from the original copy will be charged for. Advertisers are specially requested to instruct their publicity departments, advertisement writers, etc., to give clear and definite instructions respecting changes of matter or new copy, to avoid incurring extra charges.

Advertising Copy must be typed and so arranged as to clearly indicate the display required for the more important features of the advertisement.

# THE AUSTRALIAN MINING STANDARD.

ESTABLISHED 1888.

It is requested that all business communications be Addressed to Critchley Parker.

THURSDAY, JUNE 19, 1913.

## MINING SPECULATION.

It is astonishing how large a proportion of speculators in mining ventures think that the only question they have to consider is, What are the prospects of the mine as a mine? Needless to say, the successful speculator, who must have the caution either of intelligence or of experience, knows that there is much more in it than this; but then the majority of speculators are not successful. They are not successful for the very reason we have indicated; they are apt to judge a mine on its real, or supposed, merits as a mine, and not to take into consideration all the other circumstances that will affect a speculation in the shares. It may be well to detail some of these. In the first place, consideration must be given to the financial strength of the company that is working the property. An excellent little show may prove a failure for lack of capital for its development; and if the capital can be obtained it can, of course, be obtained only at the expense of the shareholder, the value of whose shares is accordingly prejudicially affected. It is necessary, too, that not only should there be a sufficiency of capital available, but there should also be capable management of those finances, otherwise the sufficiency of money may be frittered away, and an insufficiency developed. For that reason the speculator would do well to consider to whose hands the affairs of the company have been entrusted, and to take cognisance of the management of the affairs of other companies in the same hands. He must have regard not merely to the financial ability of the secretary or legal manager of the company, but he must also take into consideration his reputation and the reputation of the directors of the company for honesty and fair dealing. If the reputation of any one of them be bad, it behoves the speculator to be very careful how he risks his money in a concern which, he must remember, is liable to be manipulated on the share-market to his disadvantage. And not only must he have regard for the status, the reputation and the business ability of those who manage the business affairs of the company, but he must also assure himself that the mining operations of the company are likely to be conducted efficiently. For this purpose it is necessary that a mine manager should be one above suspicion, and also that he should be a man of some scientific qualifications and of practical experience in the working, not only of a mine, but of a mine of the particular class of the one of which he is in charge, and either of general acquaintance with or else of capacity sufficient to enable him rapidly to assimilate and comprehend the conditions pertaining on the field. And it is advisable, too, that either the legal manager or one of the directors should have a fair measure of knowledge of mining, and of ability to understand and to assess the value of the facts and the theories put before them by the mine manager. These are very elementary facts for the speculator who goes about his work carefully and intelligently; but it is astonishing (except, doubtless, to brokers, who have the best reasons for knowing) how rare this individual is; and even then there are so many other points that have to be borne in mind by anyone who wishes to secure himself against avoidable losses. He must take into consideration, for instance, the nature of the country, the depths of the working, the size of the ore body, the distance of the workings from the shaft, and all those other matters that affect the question of costs. It is not enough to have good reason for saying that the ore reserves are tremendous and the values excellent, if the cost of working a mine, of freeing it from water, of winning the ore and getting it to the surface, are to be such as to eat up most of the profits. And then, too, there comes the question of treatment. Many and many a mining investor can tell a sad tale of the result of meddling with refractory ores in mines full of incalculable riches. And, except in the case of gold, one has also to take into consideration the metal market, and to bear in mind that this market is liable to extreme fluctuations, such as are capable, within a very few months, of turning a splendidly payable proposition into one that cannot be worked profitably. These are all matters that the rash speculator, even when he is a man of intelligence, is apt to overlook, though they are commonplaces to the careful man. But there are one or two other considerations that even the prudent speculator is apt to forget. One of them is the inadvisability of buying shares in an unproved mine which must be entirely dependent on its own resources. Where a mining property is one of many on a field, there is always the chance that, even if it strike nothing good, its shares may advance by reason of successful developments in neighbouring mines; whereas the mine that stands alone can never be so affected. And another matter to which thought should be given is whether a mine in the vicinity of another mine is capable of depending on its own resources. It may, for example, be "squeezable" by a strong neighbour; its excellent prospects of getting a rich lode traversing a neighbouring property may be utterly brought to nought by the refusal of those working that property to exploit the lode. There may be a lack of means of access, or in half-a-dozen other ways a property which is seemingly possessed of excellent prospects may be destined to fall very cheaply into the grasping hands of a more powerful neighbour. All these things the mining speculator must bear in mind; and even then he will find that there is plenty of chance for things to go wrong as the result of the eccentricities or trickeries of Nature, or the failure of those responsible for the conducting of operations to work amicably together in the interest of the entire body of shareholders.

## FESTINA LENTE.

It is not to the credit of the electoral authorities of Australia that, although nearly three weeks have passed away since the general election was held, the results of it are yet in doubt. On each of the Referenda there were less than two million votes recorded; surely a fortnight should have been a reasonable time for the counting of them. But the delay in this matter is not so disgraceful as the fact that there are still incomplete Senate returns. Of these, the one creating the most interest has been unquestionably the Victorian, because it was the only one where there was a chance until yesterday of the still uncounted votes effecting an upset. Victoria is, of all the States, the most compact, and it is, with the exception of Tasmania, the smallest; yet it has taken nearly three weeks to achieve the counting of less than 600,000 votes. It is not too much to say that this work should have been done easily in a week. Still more discreditable is it that there is even yet no absolute certainty as to the result of the contest in one of the electorates for the House of Representatives. This electorate is certainly a large one; but it is almost midway between Melbourne and Sydney, and three or four days should have been sufficient for the gathering in and counting of the votes recorded, totalling, as they did, little more than 23,000. Much of the delay in all the cases to which we have referred has been due to the facilities accorded for absent voting; but, even when due allowance is made for this fact, the delay that has taken place in the issuing of definite results is deplorable. In Hume, the House of Representatives electorate whose decision is still in doubt, the rate at which absent votes are counted is not above 300 per day. On Monday last, in fact, the total number counted was only 195. If this were not a particularly easy-going country, the Hume returning officer would probably be shaken up and asked to do a minimum of, say, 200. In England, in the United States, probably anywhere but in Australia, he would be expected to get through fully 20 times that number; but due allowance must be made for what is universally known throughout the continent as the "Government stroke." The business of the Government of the country is absolutely at a standstill at the present time because the Ministry professes to be awaiting the result of the election in this one constituency, before deciding whether to attempt to carry on the work of administration or to resign; and so we have the extraordinary fact, which people who do not know Australia will find it very difficult to believe, that the entire administration of the Commonwealth is at the present time held up by the dilatoriness of a returning officer in one single electorate. It is to be said in excuse for him that he is a customs official, and has his ordinary duties to attend to. That being so, he should not have been appointed returning officer. We seem to have a faculty for the creation of Gilbertian situations, and this is not the least striking of the many that have been evolved. It is to be hoped that we shall never again have in Australia an election so hopelessly mismanaged, conducted in so dilatory a fashion, attended with so many suspicious circumstances, and based upon a law that even under the best of circumstances must make the issuing of results a painfully slow matter.

E. H. C. Oliphant, 376 Flinders-lane, Melb.

---

The Acting Premier of Victoria, Mr. Murray, is to be congratulated upon the determined front he showed to a deputation from Wonthaggi, which waited upon him last week to ask him to appoint a Board of Appeal to settle disputes occurring in the Victorian State coal mine. The miners had been on strike for nearly a fortnight as a protest against the dismissal of two men, and the deputation did not find Mr. Muray at all sympathetic. He pointed out that the strikers had left their work before their shift was finished, and questioned their right to start and knock off work at their own discretion. In answer to an enquiry by him as to whether the men made so much money that they could afford to go on strike whenever they liked, Mr. Norman, one of the Railway Commissioners who was present at the interview, said that the earnings of the men ranged from 9s. 6d. to 20s. a day, the average being about 13s. 6d. They already, he remarked, had the right to appeal to the mine manager, to the general manager, and to the Railway Commissioners, and they had been informed that the Commissioners would not deal with their complaints until they had returned to work. Mr. Murray entirely endorsed the action of the Commisioners, and doubted the advantage of giving the miners yet a fourth Court of Appeal, pointing out that any decisions which were not in favour of them would be regarded with dissatisfaction. He added that though the troubles to which Wonthaggi was exposed were common to all coal-mining towns, the men in Wonthaggi had, in view of the extent of their earnings, as little reason to strike as any men of their occupation in the world. It is not surprising, in view of this uncompromising reply, that the Wonthaggi miners have returned to work; and it is probable that the proposal for the establishment of a Board of Appeal will now be taken into consideration, though, as Mr. Murray said, it is exceedingly doubtful if the establishment of such a Board will do any good.

* * *

The report of the Victorian Sludge Abatement Board for the year, which will be found in another column, goes a long way towards dispelling the misapprehension which has been created in the lay mind by recent newspaper articles regarding the alleged devastation of agricultural land and river pollution by gold dredging operations. The statements which have appeared in the press, the report says, "are evidently due largely to an imperfect knowledge of the facts." Old workings, which were a nuisance, gave shelter to vermin, and were a danger to stock, were dredged, and can in the future be usefully employed. Hitherto they were worse than useless. Only small patches of good land have been worked, and within the past four years no land worth more than £2 per acre has been leased in the Ovens Valley. It is questionable whether the improvement to the old mined ground does not compensate for the damage that has been done. Objections, the report goes on, have been raised by anglers, but it is scarcely reasonable to ask that an industry returning to the State, annually, gold worth over £300,000, and employing a large number of men at good wages, should be interfered with merely because it affects the sport of a few individuals. These findings were confirmed at a recent meeting of the Buckland Star Dredging Co. (V.), by Mr. E. C. Dyason, who declared that much of the dredging done had left the land in a better state than it had been in before. Attention, he said, should not be paid to vague and general accusations.

* * *

It would be difficult to conceive a more extraordinary set of circumstances than that which has surrounded the operations of the Carpathia South Co. during the past few weeks. In our last issue reference was made to the fact of the assay of samples from the lode in the 80 acre block, treated at the Bendigo School of Mines, showing an average of about 67 per cent. tin; where scarcely a trace of tin could subsequently be found with a check assay. The leakage of information regarding the result during the process was also commented upon. While these sensational developments were maturing, the mine manager (Mr. Percy Wagstaff) wired that a "very rich lode" had been found at a depth of 23ft., in the 21 acre (north) lease. In his next fortnightly report to the board of directors, the mine manager confirmed the opinion expressed in the telegram, stating that the first 2ft. 6in. of the lode penetrated consisted of very rich ore. Samples of this portion of the lode were forwarded for assay. The treatment of the ore was entrusted to the Bendigo School of Mines and the Edwards metallurgical works, at Specimen Hill, Bendigo. The board of management also instructed Mr. Wagstaff to have a third assay carried out on the Ardlethan field, N.S.W., where the mine is situated. The results were that Edwards' works reported "not a trace of tin"; the assay on the field, "a trace of tin oxide"; and the Bendigo School of Mines, "7 per cent. tin." It is now a moot point whether shareholders were more astonished at the 67 per cent. result when the management were not expecting anything from the first assay from the lode in the 80-acre lease, or the disclosure of next to nothing when excellent results were confidently anticipated from the new lode in the smaller lease. It has been ascertained that there was something peculiar about the first assay of 67 per cent. at the Bendigo School of Mines, and "how the tin was produced" has since formed the subject of an inquiry by the executive of the School. As was to have been expected, this has proved abortive; for only "a trace of circumstantial evidence was left by the party guilty of error or malpractice," and the executive, apparently, did not feel justified in proceeding further with the matter. In justice to the Director of the School (Mr. Anderson), it has to be stated that this regrettable affair occurred during his absence at Broken Hill. It is satisfactory to learn that steps are to be taken to prevent the recurrence of such a regrettable incident.

* * *

In these days when an endeavour is being made to educate the public on the uses of electricity as a sanitary and economical medium of lighting and heating the Electrical Committee of the Melbourne City Council sadly lags in the rear. In the course of meeting the requirements of their consumers of electricity, they have to supply, free, some 26,000 lamps. When a purchase came before the Council for confirmation this week, the surprising statement was made that the committee proposed to expend £455 in the purchase of carbon filament lamps. It was pointed out by Councillor Andrews that the carbon lamp was out of date, and should not be foisted on the public, and that the metallic filament lamp gave three times as much light on the same current. But the committee argued that it would not "pay" to give away lamps which cost three shillings each, and they had their way. If the Council wishes to discourage the use of electricity as an illuminant it has taken an excellent course in supplying obsolete fittings.

* * *

The Victorian Public Works Department is in search of an electrical Admirable Crichton, but as the remuneration it offers for his services is only nine shillings a day, it is not likely to get him. To fill the bill of temporary electrical assistant, the requirements are that the applicant should have workshop training and practical skill in regard to the construction and maintenance of telephone and electric bells, also of alternating and direct current motors and accessories, knowledge of wiring jobs, ability to report reliably on biograph and picture theatre installations, and to make rough copies of circuit diagrams. The man who gets the job will have the supervision of men better paid than himself, ordinary wiremen receiving, under the Wages Board award, 10s. 6d. per day. Should the Department not be overwhelmed by applications for the position it need not be surprised.

• • •

Probably the most important measure foreshadowed by the Victorian State Parliament is the bill which will solidify the scattered councils of the capital in a Greater Melbourne. Such a desirable consummation is long overdue. This is forcibly illustrated by the position in the suburbs regarding the provision of electric road traction. There is a danger of strong over-lapping authorities coming into existence, an over-lapping which could have been avoided had a Greater Melbourne Council been ready to take in hand and guide the remarkable developments which are taking place. As things are at present, we find neighbouring councils jealous of the progress of each other. The endeavour of one tramway authority to find a way to the beach via Albert Park has been thwarted by some body in authority, while elsewhere an undesirable want of unanimity exists. The existing cable company blocks the way to the laying of an electric tramway from Burwood to Prince's Bridge, via Richmond, and the Railway Commissioners are raising the objection that the new means of locomotion is likely to take away traffic from the railways. There is nothing, not only more likely, but more certain: and the railway authority which hopes to compete with more than moderate success against an up-to-date service of electric cars within a certain area of the city is beating the air All experience in the Old Country shows that local railway traffic must give way to the car and that the province of the railway is on the long road. Public convenience demands the best and handiest means of transit, and will have it. The Premier has promised that the Commissioners' objections will not be allowed to stand in the way, and that a special bill will be introduced in Parliament to meet the requirements of the case This is as it should be. The bill provides for the taking over of the Burwood-Prince's Bridge line by the Greater Melbourne Council, but unless it also provides for acquiring all the undertakings in progress and in existence within the proposed new city, it will fall short of the needs of the situation. The patronage which has been extended to the lines already running is remarkable. On the Kew-Hawthorn section of the Glenferrie-road route, which has only been opened for a week or two, the traffic on a recent Sunday, although the service was, owing to a breakdown in the current, held up for several hours, gave the extraordinary return of 3s. 10d. per car mile run, while the average daily earnings were 15.779d per mile. On the Prahran-Malvern lines the earnings for the week ending 11th June were 16.819d. per car mile These figures give eloquent testimony of the support with which up-to-date electric traction will meet when the obsolete cable system has died a protracted death. These lessons must be taken to heart by the Railway Commissioners.

• • •

The miners' associations in the Commonwealth seem determined to make as difficult as possible the carrying on of the mining industry, by the introduction of absurd and petty conditions. At Cloncurry nearly one thousand men have lost their employment, and the mines have been hung up, by the ridiculous determination of the men's society that work shall not be undertaken by contract, or by the piece. At Bendigo, in Victoria, the non-union question is slumbering, and the trades officials threaten to arouse it to vindictive activity at any moment. Now the Broken Hill body has discovered grievances, imaginary or otherwise, over which trouble is threatened The Association is even more absurd than its Queensland colleague Here objection is being raised to the payment of bonuses A special meeting has passed a resolution "requesting" members on contract work not to accept bonuses for any special work not provided for in their contract:—"That they be advised to demand wages or a set price before undertaking such work, and that the secretary be instructed to write to the managers of the various mines requesting that no mine foreman or shift boss put contractors on wages without giving them a note to that effect." This is, of course, another step in the direction of the minimum effort and maximum pay, which is throttling the willing and able worker, and making the task of mine management, day by day, more difficult.

---

## NEWS AND NOTES.

The first of the 20 locomotives which are being constructed by Walkers Ltd., the Queensland engineering firm, at Maryborough, for the Victorian Railways Commissioners, is ready for delivery. The engine is to be conveyed in sections to the Newport workshops (V.), and re-assembled there under the supervision of a representative of the firm. It is expected that the remaining 19 locomotives will be delivered by the end of the present year, in lots of four in each month. In this connection, it may be mentioned that the New South Wales Government finds itself faced with the necessity of ordering a large number of locomotives abroad to meet its requirements, all the local works being too busy to undertake a large contract at short notice.

A kindly action has been done by the directorate of the Llanberris No. 1 Mining Co., Ballarat (V.). About six months ago a youth named J. Young was injured at the mine. The boy was engaged to wash battery blankets, but went to a place where his duty did not call him, and was caught in the shafting, his left arm being injured. Since then the company has paid him £1 a week, and arrangements have now been completed to give him two years' schooling. He will be given a commercial education, including typewriting, shorthand, and bookkeeping, at the company's cost, and during that period will also be allowed 10s. a week for clothing and incidental expenses.

A meeting of the Mount Lyell Consols, Wallaroo, Copper Co. (S.A.) has been called in Melbourne next month to consider a reconstruction of the concern. The proposal is to sell the assets of the company to a new company with a nominal capital of £250,000.

It is reported by the manager that the shares of the Bald Hills Osmiridium Co. (T.) have been over applied for

At an extraordinary meeting of shareholders in the Hope Extended Co., Beaufort (V.), held at Ballarat on Friday, a resolution was passed authorising the directors to purchase Thompson's lease, adjoining the property, for £1250. Of this, £500 will be in cash, and £750 out of the proceeds of the gold won—at the rate of 25 per cent. per washing—until £500 is paid, and the remaining £250 at 20 per cent. of the gold won. It is believed that the newly-acquired ground will be found to carry about 4000ft. of lead, including the Hope and the Main gutters.

The balance of the purchase money, viz., £54,375, due by the Hampden-Cloncurry (Q.) Company on account of the purchase of the property of the MacGregor-Cloncurry copper mines was paid last week. A final dividend of £18 18s. 4d. per 100 shares in the MacGregor Company is now available.

The municipality of Albury (N.S.W.) is issuing £10,500 in debentures bearing interest at 4½ per cent. from July 1st, payable half-yearly. Tenders will be received at the Town Hall, Albury, up to 1st July, at 4 p.m.

The Amalgamated Miners' Association has passed a resolution deciding not to unite in the effort that is being made by the local authorities to beautify Broken Hill (N.S.W.)

Extensive alterations and scrapping of plant, it is stated, are required at the Newport (V.) railway works. An expenditure of nearly £500,000 is estimated as the price of making the place up-to-date.

The Royal Society, at a meeting in Melbourne, decided to raise £1500 on debentures to erect a new hall for the society, and as a revenue producer.

Preparatory work in connection with opening up the Mount Mulligan (Q.) coal measures, so as to provide for an output of 500 tons per day, has been commenced by the Chillagoe company. The manager of this department of the undertaking, Mr. J. T. Watson, has selected a site for the coking plant. Considerable progress has been made with railway construction to link up the Mount Mulligan field with the Chillagoe line, and it is officially stated that the company has, in accordance with its agreement with the Queensland Government, provided funds to cover the extra expense involved in carrying out this work in the most expeditious fashion.

Concerning the opposition offered by a section of the London shareholders to the reconstruction of the Chillagoe Company, Mr. S. S. Kennedy, the principal objector, has followed up his protest. In a circular recently issued by him in London it is stated that instructions were given by him for the issue of a writ against the company, claiming a declaration that valid notices had been served by Mr. Kennedy, and for an injunction restraining the liquidator from parting with the assets. On the issue of the writ the company's solicitors in Melbourne undertook not to transfer the assets without ample notice being given, and it was pointed out that the contract between the old and new company gave a lien over the assets for any compensation to dissenting shareholders. The motion for the injunction has been adjourned pending the exchange of communications by mail between the parties.

The receipts of the Emu Bay Railway Company for May amounted to £5979, compared with £5966 in May, 1912, making the total receipts for five months £29,469, against £27,092 for the corresponding period of last year.

At the Lake Hochstetter Gold Fields Ltd. (N.Z.) a telephone line is being erected from the lake to the township of Ahaura along the survey line of the water-race. The poles are laid along the line from Ahaura to Riverview, the latter being the nearest point to the company's property. A boat has been purchased, and is now on the lake to convey stores and materials from Nelson Creek side to the works at the lake end of the tunnel, and has been found very useful in this connection. The pit-sawing contractor has started work, and the first contract has been let for 10,000 super feet of hardwood, chiefly for truck rails for tunnels. All the timber required in the construction of the race can be cut on the property. A cage has also been put across the Ahaura River at a point opposite the Little Fox's Creek for the purpose of conveying supplies and materials up to the end of the first tunnel and along the line of race, and affording the workmen a means of crossing the river.

The Ardlethan tin field (N.S.W.) is to be provided with a water supply, both for mining and domestic purposes. The Minister for Mines (Mr. Edden) last week received a communication from Mr. J. Davis, Director-General of Public Works, intimating that approval had been given for a survey to be carried out in order to locate a dam for water for mining purposes. It had also been decided to sink a well to obtain water for domestic use. Tenders are to be invited at an early date for sinking a shaft, which will be used in connection with the domestic supply.

A report from Maitland (N.S.W.) says that R. Somerfield and W. Makepiece have unearthed a nugget of gold weighing 10 oz. 7 dwt. on their alluvial claim there.

At a meeting of the New Zealand Gold Mines Co. in Melbourne next week a proposal will be considered to wind up the company voluntarily under the provisions of the Companies Act of 1890.

The gold received at the Melbourne branch of the Royal Mint during the week ended 14th June amounted to 8548.69 fine oz., the value of the gold and bullion issued being £53,600.

A deputation, representing the Northern Colliery Employees' Federation, last week waited on the N.S. Wales Minister for Labour and Industry (Mr. Carmichael). Mr. Peters, acting-president, said the employees had understood that the proposed special court would consist of a judge and representatives of both sides. The employees asked that some tribunal—with representatives of both parties—be appointed that would be capable of dealing with the whole of the matters in dispute in the northern district. Mr. Carmichael, in reply, advised the men to appeal to Mr. Justice Heydon for the appointment of a wages board. If that were done, he (the Minister) had no doubt that a board would be appointed without delay.

The closing of what is probably the oldest mine in Ballarat (V.)—the New Imperial—has been decided upon. The mine, which is situated close to the spot where the late Thomas Hiscocks discovered gold in the district in 1851, was first worked by a co-operative party, who did well by the venture. For a considerable time the shareholders have struggled on, hoping for developments, but, as sufficient funds were not forthcoming, the mine is to be shut down.

Making an unexpected visit underground, the manager of the Catherine Reef mine, Bendigo (V.), is said to have come upon three men overhauling the ore in the stopes. A prosecution will, probably, follow.

There is now some hope of the strike against the contract system in the Cloncurry district (Q.) being amicably settled. It is unlikely that the dispute will spread to the men employed at Mt. Cuthbert.

There is no change in the non-union situation at Bendigo (V.) According to reports by the stewards there are now only eight non-unionist miners working on the field.

# THE INVESTOR'S COLUMN.

## Some Companies Attracting Attention To-day.

(By Our Exchange Reporter.)

### British Broken Hill.

Although this company during the last two years has regained and kept its position in the select group of dividend payers at Broken Hill, its shares have not ceased to experience those fluctuations which immediately after the discovery of the ore bodies (which led to the opening of practically a new mine) gave such excellent opportunities for profit making. The quotations which during the Balkan war fell to about 36s. had, under the prospects of peace, improved to 45s., a substantial recovery, very welcome to those who had bought in at 60s., and in some cases a little higher. It is true that the stock had since then been watered by the issue of another 60,000 shares at 50s., but even allowing for this increase in the share register a substantial decline in market value is noticeable—namely, as 300,000 shares at £3 represent £900,000, while at £2 the 360,000 now issued are only worth £720,000—a serious difference.

The decrease in value cannot, however, be said to be peculiar to British, for a similar decline has concurrently taken place in Broken Hill Proprietaries, which, after being supported up to well on to 60s. some months ago, are now down to 37s. In neither instance can it be said that unfavourable developments at the mine are responsible for the weakness, and it is, no doubt, largely owing to the lower prices ruling in the metal market, but it is worth noting at the same time that the quotations for Norths and Souths have not been nearly so materially affected, and for this reason it may be assumed that there is some special reason for the decline, but this does not appear to be so in the case of British, for, although the results of the operations are not so good as for the previous half-year, still they have been of a satisfactory character. A dividend of 4s. per share was paid in December last and another of the same amount has just been receivable, so that the total payment for the last year's operations was 8s. per share, which is equal to 20 per cent. per annum on a price of 40s. This is a very satisfactory rate of interest, for it must be borne in mind that the best mining stocks of Broken Hill are regarded both in England and Australia more as investments than speculations, and rightly so, for the deposits of ore are so immense and the demand for the different metals they contain so great, that it is mainly an engineering and metallurgical question which has to be answered in order to make them as marketable as most forms of merchandise. In the case of the British both of the above problems are attracting attention at the present time. Some time ago the opinion was expressed that it would be necessary to sink a new shaft, and such a belief undoubtedly affected the price of the shares. It is satisfactory, therefore, to learn that the managing engineer does not consider that this will be the case, as Thompson's shaft is very conveniently placed for working the ore bodies in its vicinity. Later on it may be found advisable to enlarge and increase the capacity of this shaft. Provision is being made for milling in the future 20,000 tons of ore per month, the company raising from its three working shafts at the present time a little over 200,000 tons per annum. The greater portion of the ore is coming from Thompson's shaft, the proportion for the half-year being—Thompson's 60,395, Marsh's 23,000, and Blackwood's 16,811 tons, this tonnage being, apparently, somewhere about the full capacity under existing conditions. It has been decided to instal a Minerals Separation process plant for treating the residues from the lead mill and generally improving the present method of lead and zinc concentration, and plans and specifications for this purpose have been prepared. Other important alterations are also taking place both in the lead mill and the power plant. These will, no doubt, cost a fair amount of money, but it is estimated that the ultimate result to the company will be an increased profit of £30,000 per annum, with lead and zinc at £15 and £23 respectively. The main benefit to be derived from these alterations will be improved working conditions and better metal recoveries. One of the most important features of the recently issued report is the statement that the ore bodies in the lower levels, namely those which are being developed below the No. 6 in Thompson's shaft, are taking a direction which appears to make them identical with those located on the boundary of the Junction Company. As this point is apparently eight or nine hundred feet north of Thompson's shaft, it can easily be seen that a great increase in the amount of the reserves can be regarded as practically assured. An arrangement has been made with the Junction Company whereby the latter will allow the No. 6 level of Browne's shaft to be utilised by the British Company, so that the lode will be developed both from the north and the south at this level. South of Thompson's shaft the lode is opening up well at levels 2, 3 and 5, and still further south, that is, towards the boundary of Block 14, a body of sulphide ore has been located from Blackwood's shaft at the No. 2 level. Promising developments have taken place at other points, and generally speaking there seems to be good reason for anticipating that the exceptionally large holding of this company on the main lode of Broken Hill will prove to be the great mine that in the early days of the silver boom it was expected to be—that was when the shares rose to a price of between £7 and £8. This expectation has for a number of years seemed likely to be unfulfilled, for, although dividends to the extent of £532,500 have been paid, the results are generally regarded as disappointing. There is some prejudice here against Australian companies which are managed in England, for the reason that the local shareholders are often in the dark as to what mining and financial developments are taking place, and this feeling, rightly or wrongly, has existed with regard to this company since the issue of the last 60,000 shares. There were then already 300,000 issued, namely, 240,000 paid up to 20s. and 60,000 paid up to 8s. The former were worth slightly over 60s. in the market when the directors, with the object of strengthening the financial position, determined to offer 60,000 more to the shareholders at 50s. per share. The announcement to this effect naturally caused those shareholders who were seized of the position early to sell freely, knowing that the placing of 60,000 shares at 10s. to 11s. below the existing market quotations would bring down the price. This certainly happened, but it was not at first thought that the shares would fall below 50s. Such, however, was the case, for the steady selling, combined with the increase in the share regsiter, gave the stock a severe set-back from which it has never really recovered, although a week or so ago it seemed on the way to do so to some extent.

In estimating the value of these shares as an investment it must be remembered that the success of the company, like other metal producers, depends largely upon trade and industrial conditions whereby the value of their products is mainly influenced. The outlook in regard to these matters is not, perhaps, as assured or as promising as it was a year or so ago, more especially with regard to spelter, as there is some reason for believing that the Broken Hill companies which are not parties to the zinc convention have been taking full advantage of the recent high prices, and pouring out their products. It may be some time before the metal market improves again, nevertheless, making due allowance for this contingency, British shares are now at a range of value which should make them worth buying and locking up. The tendency seems to be an improving one.

### Ajax Centrals (V.).

A rise of 6s. per share in the price of the shares of this company is one of the refreshing incidents of the week; and, although a large part of the buying was perhaps of a professional character, there were evidences at the close of good outside support. The latter enquiry was, no doubt, owing to the satisfactory, though slightly reduced yield, and to the regularity with which the dividends are being paid. It has long been recognised "On 'Change" that mining investment has become associated with so many disappointments that the members of the public have, to a great extent, become discouraged, and although money still seems to be available for promising local ventures, the market transactions have been on a much reduced scale. This regrettable state of affairs, not only from a broker's, but also from a national point of view, will not be remedied until there is a substantial increase in the number of dividend-payers, and for this reason the disbursements of the Ajax Central are beginning to attract attention—and increase business. The position of affairs at the mine was explained at some length in these columns not long ago, and although several changes have taken place, it will be sufficient at present to state that two different lines of reef are now being operated on with good, payable results in each case—the Ajax reef being well opened up at four different levels, namely, the 4, 5, 6 and 7, and the western vertical at three, the 5, 6 and 7. One of the main reasons for the recent improvement in the price of the shares is the fact that a rise from the north drive at the No. 4 level on the Ajax lode has been put up 110ft. in good payable stone all the way, the width at the top of the rise being 6ft. This development work promises to prove another level for the mine, and a crosscut will be put out from the shaft to locate the continuation of this stone at a point further south. The closing transactions on Monday afternoon this week were at 40s., a good business being transacted. This price was a good improvement from 34s., at which a sale took place, just prior to the announcement of the yield, an impression having been formed that it would be poor. Varying estimates of the quantity and quality of the stone "in sight" have been made, but, although these will both be increased when the No. 3 level is opened up, it is doubtful, making due allowance for the possibilities here, whether they are equal to 40s. per share—although, perhaps, not much less. It will depend greatly upon the average value of the stone. It should be remembered, however, that there are good chances of further payable stone being developed at the higher levels on the Ajax lode, and also at a lower level in the western vertical. Under these circumstances, the shares appear to be a good mining investment, but there is another important possibility ahead of the company, and that is the cutting of McMillan's lode in the crosscut which is going out east at the No. 6 level. The Ajax Co. paid 30s. per share in dividends from this reef, and its intersection might mean a great deal to the "Centrals."

# PERSONAL.

Probate is being sought of the will of the late Mr. Zebina Lane, of Perth (W.A.), a well-known mining engineer, who died on 20th October last. By his will, dated 12th December, 1911, he left property in Western Australia valued at £124,317 and personal estate in Victoria, valued at £3885 to his son and his brother.

Mr. H. W. Leonard, of the Publicity Department of the General Electric Co., was given a first prize at a fancy dress carnival at Birmingham, England, recently for a costume representing Aladdin and the wonderful (Osram) lamp.

Prior to his departure on a six months' holiday, Mr. Duncan Ross, of the Superintendent of Lines Staff of the N.S.W. Railway Department, was presented with a camera by fellow members of the staff.

Mr. Kavanagh has been elected to the vacancy on the Beechworth (V.) Mining Board. The other candidates were Messrs. Foster and Wells.

Mr. E. H. W. Westwood, Melbourne manager of the Union Electric Co. of Australia, Ltd., has been elected an Assoc. Member of Inst. of Mechanical Engineers.

Mr. H. J. H. Blow, Under Secretary for Mines in New Zealand, who has been in Australia for some weeks, returned to Wellington by the "Moeraki" last Saturday.

Judge Murray, Governor of Papua, returned to Melbourne from Tasmania on Saturday, and was entertained at luncheon at Government House by Sir John Fuller. His Excellency returns to Papua next month.

Mr. A. Rutter Clarke, of the Melbourne Stock Exchange, who, accompanied by Mrs. Clarke, has been on a tour of Europe, has returned to Victoria.

# METAL QUOTATIONS.

## By Cable.

(From Our Correspondent.)

London, Tuesday.

The metal market during the week has shown a better tone, there being a general improvement in nearly all the dealings. Copper on spot opened at £65 10s., and improved that position by 15s. for both positions. Electrolytic was to-day quoted at £69 10s. Tin, which was as low as £206 for spot quotation a week ago, strengthened to £210 5s., while lead touched £20 10s. Quotations were as follows:—

COPPER.—Spot, standard, £65 10s., £65 12s. 6d., £65 10s., and £66 2s. 6d.; three months, £65 7s. 6d., £65 10s., and £66 5s. American copper stocks amount to 67,474,000 lb.

Electrolytic.—£70, £69 15s., and £69 10s.

TIN.—Spot, £205 15s., £206, £208 5s., and £210 5s.; three months, £206 5s. and £210 5s.

LEAD.—£20 7s. 6d., and £20 5s.

SPELTER.—£22 12s. 6d.

SILVER.—27½d., 27 7-16d., and 27¼d.

ANTIMONY.—"Star" Brand, £31, unchanged; 50 per cent. ore, £8 10s., a decrease of £1.

WOLFRAM (70 per cent. ore).—33s. 6d. per unit, or £117 5s. per ton; no change.

MOLYBDENITE.—Unchanged at 2s. 9d. per lb., or £308 per ton.

MANGANESE (50 per cent. ore).—9d. per unit, or 37s. 6d. per ton; a decrease of 8s. 1½d.

---

It is reported from Ballarat (V.) that some difficulty has arisen over the question of the boundaries of the North Nuggety Ajax and the Ajax Central companies, the suggestion being that the former has trespassed. It is probable that an amicable arrangement will be come to.

# MINING IN NEW SOUTH WALES.

## Broken Hill.

(From Our Correspondent.)

Broken Hill, June 13.

Broken Hill is again a "hive of industry." Great productive work is being accomplished, and the output for May (despite the interruption of engineering visitors) was something to be satisfied with. The values of the minerals exported is set down at £452,491, approaching nearly half-a million. The actual distribution of these figures was:—

| | |
|---|---|
| Silver lead concentrates, 34,778 tons .. | £332,400 |
| Zinc concentrates, 39,922 tons .. .. .. | 115,285 |
| Silver lead crudes, 1837 tons .. .. .. | 4,421 |
| Silver lead slimes, 718 tons .. .. .. | 385 |

The April figures were only £184,488, but April was the strike month, and the returns are not really comparable. But May is the best month of the year so far.

Not only did the mines produce with a special vigour, but all the stuff that was produced was sent away. The April trouble in Broken Hill allowed the "Stacks" at Port Pirie to be sent away oversea, so an opening was made for the new concentrates. These were sent away by big trains of trucks. The zinc concentrates "stock" at Burns on the South Australian border, was also broken last week, and a start was made shipping this accumulation. There are still several heaps of ore left at Broken Hill; these will go away when the trucks are available. The April industrial trouble, in a way, did good: it allowed the clearing up of "remnants," and has placed production and export on a more normal basis.

The mines, as a whole, are running full time, though some of them are again short of men. The Junction North appears to be particularly unlucky in this respect. Contracting parties are advertised for daily, to fill the vacancies of men leaving.

An endeavour was made early in the week to get up another "creep" scare (I'm still writing about the Junction North), but it was only the old, old trouble—the steady settling down of the ground, which has been going on for many months. There is no use denying the fact that the ground in the Junction north "moves" so it does in the Central, but it is foolish for the men to keep up a perpetual sensation.

The Junction North mill is kept going full time, and the returns show that good work is being accomplished. The costs, of course, have not been given out since the recent meeting; and extra timbering and protection mean money.

The Junction mill figures for the past official week show—

| | |
|---|---|
| Ore treated | 1409 tons |
| Concentrates produced .. .. | 191 tons |

A ratio of nearly 7½ tons to one is no good. Neither is the value of concentrates up to the necessary mark—59 per cent. lead, 25 oz. silver, 6.7 per cent. zinc. The management blames the men for not turning up after pay-day—the men would turn up if they were anxious for their work.

The delayed report of the British for the six months ending December 31st came to hand this week. The report is interesting, and full of good news—news which the local officials do not make known. It is made clear that the new Minerals Separation plant (replacing the Elmore plant) should be ready for work by October, and that the additions to the lead mill are expected to be ready by February next. Another fact made clear is that Mr. W. H. Woodhead has become a member of the board, and that Mr. C. J. Emery is the local general manager. No mention, however, is made of the part Bewick, Moreing and Co. are taking, or intend to take, in the control of the mine's business. Still, the figures put forward by the directors are very satisfactory, and should please those shareholders who thought the board was dividending too freely.

The British at the present moment is looking pleasant. The lower levels are doing all that could be expected of them—the No. 10 and No. 11 levels in particular, and the eastern portion of the mine leaves no scope for cavil. The mill, too, is doing its work.

The Proprietary had a development the other day. It is explained thus in the official report: —"In boring west of Delprat shaft, on the 650ft. level, a mineralized zone showing small veins of sulphide ore was entered at a point 410ft. west, and was continued for about 50ft.; nothing payable has been met with. Bores will be put in to test this ground at other places."

This is fairly vague and lacks much detail; but the management seemingly thinks that something will follow. The various plants of the company are reported to be in A1 condition, and all doing good work.

Important development work continues at the 1070 and 1170ft. levels in the South mine, where the workings are opening up satisfactorily at various points. A plat is being cut at the 1170ft. level in No. 1 shaft.

Some comparisons of Zinc Corporation and Amalgamated Zinc work are interesting—

| | Zinc Corporation | Amalgamated Zinc |
|---|---|---|
| Tailings treated .. .. | 27,670 tons | 46,960 tons |
| Zinc concentrates produced .. .. .. .. .. | 7,991 „ | 12,603 „ |
| Lead concentrates produced .. .. .. .. .. | 4,415 „ | 137 „ |
| Estimated profit .. .. | £14,403 | £12,917 |

The Zinc Corporation, of course, has the South Blocks as a producing asset, whilst De Bavay's treats tailings only. But the comparison assists.

The South Blocks (Zinc Corporation) develops well, both as regards the main lode and the zinc lode. The latest official figures are:—Main lode (No. 8 level)—"Main west crosscut—Extended to a distance of 175ft. from west side of shaft. The west wall was cut at 155ft. on the south side and 165ft. on the north side, the remainder of the crosscut being in country rock. The values from 160-165ft. (north side) were 6.5 per cent. lead, 1.2 oz. silver and 5.3 per cent. zinc." Zinc lode (891ft. level, west crosscut 880ft. south)—"Extended to a total of 12ft. from the west side of drive. The values for the first 8ft. of the crosscut were 3.9 per cent. lead, 1.3 oz. silver and 18.6 per cent. zinc, the last 4ft. being in country rock. This crosscut has disclosed a width of 14ft. of ore at this point of an average assay value of 4.1 per cent. lead, 1.2 oz. silver and 13.4 per cent. zinc."

These figures put the case clearly. They show just what is, and no amount of comment could make them plainer. They show, too, that the men of the moment must watch more intently the southern end of the line of lode. Not, of course, that the North mine developments are to be sneezed at—it would be a brave man who would discriminate between the value of North and South mines.

## Orange District.

(From Our Correspondent.)

Orange, 13th June.

Mr. F. C. Richard, late metallurgist at the Mount Bulga copper mine, and Mr. Crozier, the assayer, have returned to Melbourne. In all probability these gentlemen will return when the temporary closure of the above mine has terminated.

That there is a bright future before the Cadia copper mine may be gleaned by a visit to the field. Everything in the mine is running smoothly and the latest mechanical appliances for treating the ore have been installed. Electricity is to play an important part in the general lighting of the mine and works, and it is proposed to run the mine for about another month and then cease operations while the electrical fittings are being installed. Already the company have the dynamos for generating the current on the ground, so that, all being well, the miners will not be idle long.

Vigorous development work in the latter end of last year, and the early part of this, involved the company in heavy expenditure, but that outlay is being recouped by the quantity of ore at present being raised. At present there are about 130 men employed there, and the prospects were never better, there being a tremendous body of ore in sight. The amount of high grade matte obtained per shift amounts to 2½ tons, and the last run treated gave the splendid return of 57 per cent. of copper. There had been some difficuly in the smelting operations owing to there not being a sufficient quantity of sulphides in the ore, but this difficulty seems to have been overcome. Besides copper there is a big deposit of iron ore at Cadia, which is considered second to none in the world, both in point of quality and quantity. The reason that this deposit has not been worked, and the iron at Corcoar (which is decidedly inferior to the grade at Cadia) mined, is chiefly on account of the roads being impassable for teams, owing to the natural rough condition of the country.

At the present juncture about £1500 per fortnight is being paid away in wages at Cadia, and it is quite on the cards that after the electric lighting plant has been installed at the copper mine fully 200 men will find employment there.

## Bathurst District.

(From Our Correspondent.)

Bathurst, June 13th.

Mining operations at the Mountain Run copper mine, near Rockley, are of an encouraging character. There is an incline tunnel 170ft. into the hill, at which point it strikes the lode at a depth of about 100ft. from the surface. A shaft is sunk 180ft. deep, and is still going down. The lode so far as disclosed shows a formation of about 12ft. wide, carrying 3ft. of good sulphide ore. Twenty tons sent away for treatment went 10 per cent., and there appears to be a big quantity of similar grade ore available. It is said a working option of the mine has been given, and if further developments turn out as anticipated no doubt it will be exercised.

Napoleon Reef mine has been inspected by Mr. Maugher, of Ballarat, and it will doubtless rest upon the nature of his report as to whether the mine resumes work again or not. At present the company has a short period of suspension of labour conditions granted it. As matters stand further capital must be put up, before operations can be re-started, another judgment having been obtained against the company, and the warden's bailiff advertises a further sale of plant, etc., to satisfy the claims.

In the Amalgamated Hill end, main north level, they have 3 small veins, the one on the hanging wall carrying coarse gold, but very patchy. But the country is of a kindly nature, and they are now getting away from the hard, tight ground that obtains in the southern end of their leases, and the possibilities, as the drive proceeds, are undoubtedly good. They are now 300ft. below the level of some of the old time rich reefs and these can be tapped by crosscutting, so that shareholders may have some heartening news ere long.

Rowley's Reef Co., on the new reef, recently found in Hawkins' Hill Reward grounds, are driving along it, and they are expecting to hit something good when the indicator is encountered. The latter company are making good progress with the erection of hauling machinery at Exhibition shaft, and when completed, they will be able to run their ore direct into the mill, and costs of mining, etc., will be materially reduced. A few weeks work should finish this work, when their 20-head battery will be running full time, as abundance of ore is ready to stope out.

## Lithgow District.

(From Our Correspondent.)

Lithgow, June 12th.

A Lithgow gentleman interested in mining matters at Burragorang, on the south-eastern side of the district, declares that the silver-mining industry in that part of the country is positively languishing from lack of railway transit. One mine is lying idle altogether, with a lode of splendid and payable silver stone in it. On the other hand, specimens from a practically unworked show are on view, which go 900 oz. of silver to the ton. That a field of such promise, or, rather, performance, should be so little known, seems passing strange. Another old mining expert sets down a low estimate of the output of the field, slowly worked as it is, at 7000 tons annually. On this the rate of haulage to the railway trucks at Camden—some 45 miles distant from the mines—is £2 5s. per ton, which is nearly £16,000 per annum. It is further estimated that there are ten years of vigorous life on the present rich stone as known to exist. Then, there are millions of tons of low-grade ore, which would never pay £2 5s. per ton cartage rate, but, at the same time, would yield an excellent profit at purely railway haulage rates.

Quite a number of district gold and other mineral shows are forging ahead evenly, and development work, in many instances, is being carried out under encouraging circumstances. At Glanmire, the new shaft on Mr. Cecil H. Slade's gold mine has just been sunk 45ft., but work has been temporarily discontinued owing to the sudden influx of water from an old workings; on the same mine, a second shaft has been repaired and re-timbered to a depth of 70ft. The company is arranging for the installation of adequate pumping machinery, with a view to coping with the water difficulty. At the Fontana gold mine, in the same locality, Messrs. Davison and Wilkinson have their second shaft down 48ft. A drive from the north has been cleared out for 145ft., and extended a further 60ft., with the object of getting well under the former workings, and prospecting the lower levels.

The Peelwood Company has been working well, with the result that the drive at the 175ft. level has been continued to 79ft. from the shaft; the ore is being stoped overhead. The company's present plant is valued at over £3000, but, as the ore is gradually becoming more complex, it is necessary that a more complete and up-to-date plant should be installed at an early date. Some 328 tons of quartz have been treated for a return of 78 oz. of refined gold. The slimes and tailings have been reserved for treatment as soon as the new plant is available.

Mr. J. Dippel got out 20 tons of ore, which were treated at Cockle Creek Works for satisfactory results. In addition to substantial aid from the Government prospecting vote, the proprietor has expended between £400 and £500 during the past four months, testing the property.

At the Big Oakey gold mine, Messrs. James McKinney and party have finished unwatering over 450ft. of their old workings, and, as showing the faith they have in the property, it may be mentioned that the re-timbering of 450ft. of the main shaft has been accomplished. The party have lately treated 200 tons of quartz by battery for a return of 194 oz., valued at £724.

That snug little mining syndicate—Messrs. Reilly, Moyle, and Button—of the Little Oakey mine, is sinking its main shaft to a depth of 165ft., and has driven 40ft. south, connecting with the winze from the 120ft. level. Here the average width of the reef is 2ft. Latest returns from this show record a treatment of 50 tons of stone for £119 worth of gold.

Messrs. Crawford and party, of the Caledonian gold mine, have put through 15 tons of quartz for 10 oz. of gold. Unfortunately, the prospects of this mine are at present not so favourable as they were a few months ago.

Shares in the Black Range West G.M. Co., to the number of 2250, were sold at auction in Sydney last week at 3d. per share. The shares had been forfeited for non-payment of a call of 3d. per share.

The Lloyd Copper Company for the fortnight treated 1339 tons, which yielded 212 tons of concentrates of 14.4 per cent. and 75 tons picked ore, averaging 18.4 per cent. The furnace treated 375 tons concentrates, ore and slag, for 68 tons matte, averaging 64 per cent. copper, 13.6 dwt. gold, and 14½ oz. silver per ton. The erection of the oil flotation plant is nearing completion, and the shafting and pulleys are being put in position. Labour is scarce.

# VICTORIAN MINING ACTIVITIES

## Castlemaine and District.

(From Our Correspondent.)

Spring Gully's rosy anticipations of a payable return were not realised by its last crushing. From the 200ft. level 220 loads were sent to the battery, and the result was 40 oz. 2 dwt. The management still expects payable crushings. At the 240ft., in the east crosscut, 75ft. in spurs were passed through, from 3in. to 7in. thick, showing colours of gold. The spurs have gone back over the crosscut. In the 200ft. level the north drive is out 143ft. A rise is being put up at 130ft. to connect with the stopes. The stopes at the east of the main level are showing 30in. of stone with gold, and improving in appearance. At 80ft. to the north a rise is up 12ft. where a flat make of stone has been cut, showing gold. It is now intended to open out north and south. The intermediate level south below 200ft. has gone through sandstone bars and spurs showing gold. In stoping on the west side there is 3ft. of stone, also showing gold. The intention of the company is to at once drive 30ft. south in the slate beds at 240ft. and then rise to connect with intermediate below 200ft.; also to drive north to intersect several makes of stone that were worked with profitable results further north in the same channel above 240ft. level.

The South Wattle Gully Co. is doing a good deal of surface prospecting on its lease, in addition to the ordinary work in the main shaft. The manager professes to be encouraged by the outlook. The main drive at the 300ft. level has been extended to 286ft. It seems there that the west leg of the saddle is a little over the back of the level. A good flow of water is coming in, and a leader has appeared on the main wall. Two prospects were tried, and each yielded a little gold. At the new find on the surface, the shaft has been timbered and a windlass fixed. A winze has also been sunk on a rich-looking leader 4in. wide. About 50ft. north-east from this shaft there are two leaders on the surface 4ft. apart. An open cut has been put on them, and they are each carrying gold.

The locally-owned Burnt Creek Reefing Co., at Dunolly, reports good outlook. The south drive has now reached 54ft. from the shaft, and the indicator is much more defined. A good stream of water is coming in from a point in the laths, and this is held to be a favourable indication.

The Quartz Hill tunnel is in 80ft., and the western lode has been passed through 2ft. thick, showing traces of gold. It underlies west. Stone carrying minerals is underlying east a few feet back from the face, and this will be driven on north.

The Campbell's Creek bucket dredge is maintaining a gross average of about 50 oz. per week from the two plants.

## Maldon.

(From Our Correspondent.)

That the faith of the shareholders in the old South German mine remains unshaken was demonstrated last week when 8687 shares in the hands of the directors were offered to the shareholders at 6d. per share. Applications were made for 19,000, and on a pro rata distribution each applicant will get 50 per cent. of his offer. At the same meeting the tender of C. Hill and party for driving the intermediate level below 1750ft. level to the north for 100ft. was accepted, work to begin forthwith. They are now engaged timbering and securing the level. Baxter and party are driving north and south from the winze below 1750ft. level, and good payable stone is being broken at both ends. This party sent 113 tons to the mill, and the battery return was 74 oz. 15 dwt.; from 18½ tons of pyrites £96 worth of gold; tailings assay, 8½ dwt. per ton. The whole was worth £600, of which the company get 33 per cent.

New Day Dawn have cleaned out the well and completed the ladder way to No. 2 level; rails have been laid to the north face, where a start will be made to drive on a large body of stone reported to be carrying gold in the prospects.

Maloney's Red, White and Blue mine, at Gowar, in company with many smaller shows on the same line, has been under a cloud for some months, but the tide seems to have turned, and last week the best return for several months was reported. From 58 tons of dirt 29 oz. gold was returned, and similar stone is being broken out.

Oswald's Estate mine, which will no doubt be called in the future its real name, the North British, is now under the management of the company that took it over a few weeks ago. The final crushing to the estate was the best for a very long time, and the new owners should have dividends from the very start. Several parts of the property have just undergone repairs, and work was resumed at the beginning of the present week.

The Derby United stopes at 700ft. have been stopped and the machines shifted into the 680ft. level south, where there is a promising reef 12in. wide. The reef to the north of the intermediate rise has been slightly disturbed, and carries colours of gold. The intermediate south of the old rise has been extended to 82ft., where there has been further slight disturbance. After a connection has been made there, driving south on fair quality stone will be resumed.

At Newstead work is going on at most of the claims as usual. Blow Reef reports breaking out payable stone in the rise to the north of the shaft, and is continuing the crosscut off the south drive without change.

The adjoining claim, Uncle Sam, is going down steadily, being now over 150ft. deep.

In the old alluvial gullies in the Yandoit district a lot of fossicking is being done, and an old man named Hoffer struck a patch in what is known as the Old Nuggety Gully. In virgin country he found a nice lump of gold that returned him £80 net. The adjacent gullies are looked upon as being payable by dredging, but there is no water available for the purpose.

## Daylesford.

(From Our Correspondent.)

The yields for the Nuggety Ajax group for the month's milling aggregates a total of 1616 oz. from 3680 tons, against 1801 oz. from 4138 tons last month. The stoppage of five heads at the North Nuggety Ajax, and a like number at the Central Ajax, for several days through breakages at one of the shafts, were responsible for a considerable reduction in the output at these two mines, and lessened the yields accordingly. The North Nuggety Ajax, on Friday, had another mishap, and a further 5 heads are hung up, leaving only 5 stampers crushing, which will retard the amount of crushing this month considerably. The returns were pretty well up to anticipations, and form a good guide to the quality of the stopes and faces being operated upon on this line, which has nothing much in the way of new developments to report.

The Central Ajax are making good headway in the erection of their additional power, which will probably not be ready for crushing for a couple of months yet.

The North Ajax are now on with the bottom level drives northwards. There is a fine body of stone in the face, about 9ft. thick, of a profitable value; while to the south there is stone of similar value coming down strong from above the drive. As soon as possible other levels will be opened up, but in this direction too much cannot be expected until the new winding gear is in going order, which must take a little time yet. In the meantime the best use is being made of the old plant. The fact that this payable stone is making strong to the north certainly enhances the property, as in that direction the company have a greater area than to the south, and will certainly have the effect of setting the "pups" working at an early date.

At the Nuggety Ajax nothing of value has been met in the rise over the No. 6 level stopes, but the shoot of gold-bearing stone at this level is showing up a trifle stronger. While it continues of very fair quality the size is not all that could be wished for.

The New Specimen Hill stopes are reported to be looking about as usual and a fair average yield is expected previous to the half-yearly meeting. A start has now been made in deepening the shaft.

The Olive Branch have put through another crushing of 60 tons from the old Abundance reef, which they are now operating upon some 60ft. below the surface. They secured 27 oz. of gold. Though hardly up to the previous return, it is a payable one.

# TASMANIAN MINING.

## Mount Lyell District.

(From Our Correspondent.)

Queenstown, June 13.

Matters generally in connection with the operations of the Mount Lyell Company continue to proceed with perfect smoothness, and a gratifying feature, in the form of three furnaces again in blast at the Reduction Works, has materialised since last writing. This has occurred a bit sooner than was anticipated, but that does not make it any the less welcome or desirable, and unless anything unforeseen in the way of industrial troubles happens along the present satisfactory condition of affairs is not likely to be interrupted—in fact, it is pretty certain that the company's operations will, under ordinary favourable circumstances, show a considerable extension in more ways than one during the next eighteen months.

At the North Lyell mine an examination of the 1100ft. level since unwatering shows that the workings as far as the stopes and drives are concerned have not suffered any damage through their seven months' submersion. The working plant (rails, machines, pipes, etc.) has, of course, as at the 1000ft. and 850ft. levels been pretty well destroyed by the corrosive properties of the "copper" water, and most of the plant will have to be renewed. This, however, does not trouble the management as long as the stopes have retained their usual good order.

Production from the North mine is being actively prosecuted, and the output is now approaching 1500 tons a week, while it is understood that a fair proportion of this is appreciably over the 6 per cent. average grade of the mine. A small tonnage is being won from the nearly depleted stopes of the 400 and 500ft. levels, but the main bulk of the output is coming from the 850ft. and 1000ft. levels, where in the firstnamed three, and in the last, four stopes are being vigorously attacked. Within another six weeks it is expected to have the 1100ft. level in productive order, and it will not take long for the North Lyell mine to get back to its normal output of approximately 2500 tons a month.

In addition to the winning of ore a good deal of activity is being displayed in regard to development and other work underground. Rising and sinking to form an entirely new mullock pass connection between the 300ft. and the 850ft. levels is in active progress, this work being done in sections, and chiefly by contract. Another work which is receiving the close attention of the management is the mullocking of the stopes throughout the mine. In the concluding portion of his recent report on the condition of the mine, Mr. Montgomery laid a good deal of stress on the necessity which existed for filling the underground excavations as thoroughly as possible with mullock so as to depend less and less on timber as the means of support. It is, therefore, satisfactory to note that the recommendations of Mr. Montgomery in this respect are being given effect to in a practical manner, and a large amount of labour is now employed in the North Lyell open cut in the work of breaking dirt for filling the stopes right up to requirements in every part of the mine.

At the Mount Lyell mine the output is being gradually increased in conformity with melting requirements. The output is now between 4000 and 5000 tons a week, which, with the exception of a small quantity which is being shipped to the superphosphate works on the mainland, is all going to the Reduction Works. Connection with the South Lyell workings from the No. 8 or lowest level of the Mount Lyell mine has been completed, and the preliminary work for stoping the South Lyell pyrites body in conjunction with that of the Big mine is well advanced. This connecting drive intersects the South Lyell workings at about 8ft. below the shaft of that mine, and the material won will be included in that sent out from the Mount Lyell mine. The connecting of the two mines has greatly improved the ventilation of the workings in the Mount Lyell mine, and in this important respect this mine is now pretty well as perfect as possible.

Operations at the Lyell Comstock mine, the supply from which is now supplementing to an appreciable extent that from the Mount Lyell and North Lyell mines, are being carried on in the same energetic and systematic manner which has prevailed ever since the mine was first opened up as a consequence of the North Lyell disaster. The output continues at about 600 tons a week, and, in addition to ore breaking in four different levels from 50ft. to 400ft., an open cut has been started and is contributing a small tonnage to the ordinary output. The mine is now developed, and the workings opened up well enough to allow of the whole of the output being produced with one shift instead of two, with the result that the afternoon shift has been discontinued, and the change is satisfactory to both the company and the employees.

As previously mentioned three furnaces are now in regular commission at the Reduction Works, the third having been blown in yesterday. The management is fully confident that it will be able henceforth to provide a sufficient supply of ore to keep the three furnaces in permanent work. The labour supply at the mines is fairly well up to requirements, and assuming that it will continue so, it is practically certain that the anticipations formed will be realised. When the North Lyell mine gets into full productive order again, which should be within another six or eight weeks, they will be able to send out an aggregate output from the three mines of not less than 30,000 tons a month—made up, say, of 18,000 tons from Mount Lyell, 9000 tons from North Lyell, and 3000 tons from Lyell Comstock. This tonnage will keep three furnaces in full swing, and, basing the whole tonnage on the ordinary average realised, the resultant production of copper should be about 650 tons a month, or over 8000 tons a year.

Between the Mount Lyell and North Lyell mines there are about 850 men employed, while the Comstock provides work for another 150, so that, altogether, there are 1000 men employed at and in connection with the three mines, this being the greatest number ever employed in mining operations alone by the company at any previous time in its history. And providing they can get workers enough to man the mines up to their full productive capacity, there is never likely to be any difficulty in getting sufficient labour for the Reduction Works, where the work generally, although not quite so well paid for, is of a more congenial character than at the mines.

## SOUTH AUSTRALIAN MINING.

Mr. H. Jones, Inspector of Mines, in a report dated May 29, deals as follows with the Radium Hill mine, near Olary, which he inspected on May 21:—A large amount of good development work has been done at different points on the property. Five underlie shafts have been sunk to various depths of from 70 to 100ft., driving and stoping has been done in the lode formation at the 60ft. level, and considerable quantities of the lode material extracted from the various workings, crushed and concentrated by the magnetic separator on the mine, and the various grades of concentrates obtained, amounting to 10 tons per week, have been forwarded to the Sydney works for further treatment. Driving and stoping is in progress at the 25ft. level in No. 2 shaft; the south-western drive is in a total distance of 31ft.; the formation disclosed in the workings is from 2 to 4ft. wide of schist and iron veins, with impregnations of carnotite through the matrix. The drive north-east opposite the last one has been extended in the ore body a distance of 30ft., and at that point in the drive a small fault in the country occurs, bearing east and west and dipping south at an angle of 45 degrees. The fault apparently makes a clean break in the formation of several feet to the east, on the north side of the break (or displacement) two underlie shafts have been sunk in fairly good ore to a depth of 70 and 100ft. respectively. This proves that the formation has not been disturbed to any great extent by the fault, and that the main ore body continues to extend in a north-eastern direction. The plant on the mine consists of rock breaker, rolls, magnetic separators, one petrol and one oil engine, all being housed with strongly constructed wood and iron buildings, and everything appears in good order for carrying on the work of crushing and concentrating the ore.

## MINING IN WESTERN AUSTRALIA

(From Our Correspondent.)

Kalgoorlie, June 9.

A syndicate, which recently started work on the long-abandoned Viking mine, at Norseman, have struck phenomenally rich ore at a depth of 600ft. In a drive of 4ft. in length about 3 tons of ore have been broken out, which is estimated to contain 500 oz. per ton. This lease, along with 17 others, containing 227 acres, was held by the Norseman Gold Mines Ltd. for 8 years, and was finally abandoned in 1904, after being in the hands of syndicates for three years. In 1900, the Government agreed to grant the company a subsidy of £1 for £1 to sink the main shaft from 450ft. to 700ft. Work was suspended in 1901 at 574ft., as the result was unsatisfactory. The present holders, after sinking 26ft., struck phenomenally rich ore for the first time in the history of Norseman at such a depth. The reef runs up to 5ft. wide and average 2 to 3ft., and contains a good deal of galena. Between 1897 and 1904 the leases produced £221,000 from 79,300 tons, besides 25,000 oz. of silver, but costs swallowed the whole. Many of the other leases held by the old company have been idle for years, but will probably now be given another chance. The Norseman reef strikes north and south, and underlies east at an angle of 45 deg., and outcrops for a distance of 7000ft.

The water supply in the Victorious has increased from 30,000 to 60,000 gals. daily, and it begins to look as if the Government water scheme from Black Flag, which cost £33,000, will become a white elephant. No. 1 west winze at the 360ft. level has been sunk from 35ft. to 45ft. in ore assaying £12 per ton for a width of 77in. This winze was stopped for a considerable time, as the ore shoot dipped out of it, and this new development proves the shoot to be much longer than anticipated. The return and profit for May was curtailed owing to a week's breakdown of the mill engines.

Messrs. Bewick, Moreing and Co. have decided to instal a Commonwealth gas generator on the Sons of Gwalia mine in place of the generator which started running in October. The Commonwealth is claimed to be an improvement of the Cambridge, and like the latter can be run on refuse wood. One of these generators started running on the Yuanmi mine 3 or 4 months ago, and it is claimed that there is a saving in cost of £85 a month in burning wood instead of charcoal. This works out at 3.71d. per ton of ore treated. On this basis the Sons of Gwalia would save £200 a month, which would very soon pay for the new generator. The doom of the steam engine cannot be long delayed on the big mines, as the wood-burning gas generator would bring about an enormous saving in cost as well as in wood consumption, and every year's wood has to be railed further and further to the mines.

The south drive in Chaffers on 4 lode at 16 level extended 283ft., the ore assaying 29s. per ton for an average width of 78in. for the full distance. A branch of No. 3 lode has been cut 427ft. west of the shaft and assays 32s. per ton for a width of 36in. No fresh developments have been recorded in the south end of the Golden Horseshoe, but the mine continues to open out well, and the workings in places are in very rich ore.

The Bullfinch Prop. are now owners of the Chaffinch. The lease adjoins the Bullfinch on the north, and may yet prove to be a valuable property, as the Bullfinch lodes going north are resuming the north and south trend of the country. The ore reserves of the Bullfinch are estimated as 158,300 tons assaying 51s. 9d. per ton, or sufficient to keep the mill going for fully two years. Since the mill started, developments have been pushed and reserves are steadily increasing. No ore below 210ft. is included in the estimate.

## QUEENSLAND MINING.

### North Queensland Fields.

(From Our Correspondent.)

Mareeba, May 31st.

Matters in connection with mining are much brisker since the cessation of the rain. We have had an abnormally wet season, which has hindered operations in many mines, but which has proved a godsend to the alluvial miners.

There is a great demand for molybdenite, or "Lig," as it is popularly called in these parts. The district west of Cairns is one of the most productive in the world of tungsten metals. At Wolfram (late Wolfram Camp) there are situated some of the best wolfram, molybdenite and bismuth mines in the world. For a long time the miners confined themselves to alluvial wolfram mining, then they discovered the pipes containing the above three metals in association. These pipes were followed down in their erratic course by means of windlass and whip-horse. The field then languished for awhile until machinery was installed. The latter has proved the ore bodies to exist at a depth, and active mining operations are now in progress. The splendid prices of wolfram, £112 10s. per ton, molybdenite, 2s. 9d. to 3s. per lb., on the field has aroused the mine-owners to a state of great activity. The most successful mine on the field is Murphy and Geaney's. By means of the old underlay shaft some hundreds of tons of wolfram and molybdenite were won, and when this old shaft became unworkable, the owners decided to sink a new straight shaft to tap the spar lode below the old workings. A fortnight ago this shaft bottomed in the lode, which proved to be exceptionally rich in molybdenite and wolfram, principally the former. There is no doubt but that this mine will rank as the leading "lig" producer in Australia for some time to come. In close proximity, and on the same line, is the "Larkin and Wade" mine, which has been a most consistent producer. Similar conditions prevailed as in the Murphy and Geaney mine, and the new straight shaft intercepted a previously-unknown body. This is now being worked while the sinking of the main shaft continues. This mine will run the Murphy and Geaney mine very close as a producer of molybdenum and tungsten. The developments in these mines considerably enhance the value of the Leisner wolfram blocks, which, as its name implies, is a block mine on the two others abovementioned. The three-chambered shaft on Leisner's ground is down between 250 and 300ft., and indications are at present very favourable. It is not anticipated, however, that (unless an unknown lode is located) the shaft will bottom on the lode sought for under 300ft. An intrusion in the shaft of indurated slate, however, is considered a favourable sign, and it is probable that the metal may be located at a shallower depth. This mine in the future should be a big supplier of ore to the French Rare Metals Co.'s works, which are now in full swing. These works are a revelation, and there is nothing in their line so up to date in Australia. No expense has been spared to secure the best possible machinery. Experts from France, Germany and England have superintended the erection of the portion of the plant purchased in those countries. The machinery is all working smoothly, and is a credit to those responsible for its erection. Mons. Poulet has been practically in charge since the company commenced operations, but during the past few months Mons. Clere, one of the directors of the company, has been at Wolfram. The mill is at present treating the dumps purchased by the company. In the early days of the field the miners used to treat all stone raised by means of hand-jigs, and, in consequence, the finer particles of molybdenite were lost.

It is estimated that these dumps will average over 2 per cent. for molybdenite, and if this is so, they will prove to be very remunerative to the company. There are many thousands of tons of these dumps to be treated, so by the time these are finished several more shafts will be down into the deeper ground. This field is one of the most interesting in Australia, and a good deal of attention is being paid to it by people resident in Germany, France, England and America. Australia has not yet reached that stage when it can use the molybdenum-tungsten metals, so, in consequence, the demand is all from the older-established manufacturing centres. It is safe to predict that molybdenite will see even higher values than what are at present ruling. There are many buyers of mines now on the field, and eager prospecting of the surrounding country is taking place by parties of miners.

At Mt. Carbine, the Irvinebank Mining Co. has installed an additional 10-head of stampers, and the 20-head are now working full time on wolfram-bearing stone. The mine is amply developed to keep a supply of stone going to the battery for a long time to come. Several other propositions are also being worked on this field, which is one of the soundest wolfram fields in the north.

At Bamford the production of wolfram has fallen off a good deal, due to the wet season, but the owners of the mines are now getting them unwatered, and the production during the next few months should be very heavy. Mr. Achurch has a very promising molybdenite show in close proximity to Bamford.

At Fossilbrook-Galala, a promising wolfram centre off the Etheridge railway, steady mining operations are being carried on, and a good quantity of the tungsten-bearing ores are being treated. This field has received very little attention from the outside speculators' speculations.

## MINERAL RETURNS.

The Western Australian State gold yield for May was 110,178 oz. fine, valued at £468,010, and which is 1066 oz. less than that in April, and 2786 oz. more than in May, 1912.

The gold yield of Queensland in May amounted to 23,509 fine oz., valued at £99,860, compared with 32,776 oz., valued at £139,224 in May of 1912. For the first five months of 1913 the total yield was 111,662 fine oz., valued at £474,310, a decrease compared with the corresponding period of last year of 30,903 oz., valued at £131,268.

The yield of gold in Victoria for May was 33,771 oz. gross, or 30,990 oz. fine, valued at £131,636. Compared with the yield for May of last year a decrease of 19,360 oz. fine has occurred. The yield for the last five months was 182,260 oz. gross, or 168,628 oz. fine, valued at £716,288. This shows a decrease of 22,408 oz. fine compared with the quantity won during the corresponding period of last year.

The return furnished by the Under Secretary for Mines (N.S.W.) shows that the gold yield recorded for this State for the month of May is 13,395 oz. crude, equal to 10,204 oz. fine, valued at £43,769, compared with 25,223 oz. crude, equal to 20,284 oz. fine, valued at £86,160 for the same month in 1912. The yield for the first five months of this year amounts to 72,640 oz. crude, equal to 57,849 oz. fine, valued at £245,727, compared with 83,469 oz. crude, equal to 69,489 oz. fine, valued at £295,171 for the same period in 1912, thus showing a decrease of 11,640 oz. fine and £49,444 in value.

# THE COAL MINING INDUSTRY.

## New South Wales.

### Southern District.

(From Our Wollongong Correspondent.)

The district has during the past two months had an excessive rainfall. On such conditions landslips on the sides of the Illawarra Range are apt to occur. Corrimal-Balgownie and Mt. Pleasant, which have lines of rails along the range, have been having some trouble with these slips.

Both coal and coke trade continue good. This district continues to be the great source of supply of coke for the Commonwealth.

At the North Bulli mine the tunnel which has been driving into a new portion of the property got to the seam, and proved to be about 4ft. 9in. in height, which is much more than the colliery had to work at the commencement.

The rains have filled up the Cataract dam (Metropolitan water supply) to a greater extent than it has ever been, the water coming up to near the Corrimal-Balgownie ventilation shaft.

In the Warden's Court, J. A. Fleming applied for a three months' suspension on Crown leaseholds, now in course of prospecting at West Dapto. These leaseholds were included in the property upon which was floated the late Smelting Company of Australia. They appeared in the prospectus which was successfully launched upon the London market as the "Ocean Steam Collieries." Mr. Fleming informed the Warden that his party are endeavouring to acquire the line which, since its construction 15 years ago, has been unused. Suspension of two months was granted, with a hint not to ask for any more.

Having seen the announcement that the Minister for Works contemplated establishing an engineering plant for locomotive manufacture, Wollongong Council has hastened to remind the Minister of the suitability of this district. The Government own a considerable area of land at Port Kembla, which was resumed as part of the scheme of harbour making, which could be so utilised.

The Chief Commissioner for Railways for New South Wales (Mr. Johnson) has accepted the following tenders for the supply of large coal for the year ending June, 1914:—South Clifton Coal Mining Company (South Clifton), 90,000 tons; Southern Coalowners' Agency (Coalcliffe) 100,000 tons; Invincible Colliery Company (Invincible), 30,000 tons; J. B. North (Main Range), 10,000 tons; Lithgow Coal Association, Lithgow Mines, 55,000 tons; Caledonian Collieries Limited (Aberdare), 10,000 tons; Newcastle Coal Mining Company (Whitburn), 6000 tons; H. F. Madden (Ellesmore Vale), 30,000 tons; Abermain Colliery Company (Abermain), 50,000 tons; Central Greta Colliery Limited (Central Greta), 17,000 tons; Rothbury Estates (Rothbury Colliery), 22,000 tons; W. Longworth (Rosedale Colliery), 24,000 tons; Centenary Coal and Coke Manufacturing Company (Cullen Bullen), 18,000 tons; Gunnedah Coal Company (Gunnedah), 19,000 tons; Stockton Borehole Colliery (Bore hole), 12,000 tons; Sydney Harbour Collieries (Balmain), 990 tons.

## Victoria.

### Powlett River District.

(From Our Wonthaggi Correspondent.)

The miners employed at the State mine, after having been out on strike for a week and a half, have decided to return to work, and it cannot be said for them that their last action has redounded to either their credit or sense. The trouble arose, in the first place, over two men being suspended by Mr. McLeish, the mine manager, for ceasing work before the proper time. At the time the suspension took place Mr. Broome, the general manager, was absent on a visit to Broken Hill, but was expected home in a day or two. With him rested the responsibility of either discharging the men altogether, or fixing the period of suspension. As soon as the men employed in the Nos. 9 and 10 pits knew that the men had been suspended, they decided not to go to work. This was done without the men giving Mr. Broome a chance to deal with the matter, and without their own union officials being consulted. However, the action of the men was practically endorsed at a subsequent meeting of the V.C.M.A. The stopping of the whole mine did not tend to improve the case of the suspended men, and was tantamount to an attempt to coerce the management to do just as the men wished. Mr. Broome on his return took a firm stand, and in view of the men's action, decided that the suspended men should be discharged. He either had to do this, under the circumstances, or turn down the mine officials under him, and leave it to the men to say who should be put on or off. The union officials had several interviews with Mr. Broome, but were not successful in their efforts to get him to shift from the stand he had taken. A ballot was taken to decide if the men should return to work, pending negotiations for a settlement of the trouble, but there was a majority against doing so. The men then asked if Mr. Broome would agree to the matter being referred to arbitration if they returned to work, and this was refused. It then became evident to the union officials that the men were in an awkward position, and the mayor, Cr. Bird, was requested to call a meeting of citizens to consider the advisability of asking the Acting Premier to appoint an appeal board to deal with the disputes which arise at the State mine. The meeting decided to support the request, and a deputation was appointed to interview the Acting Premier on the matter. The result was only what could be expected—Mr. Murray declining to deal with the matter until the men returned to work. The Railway Commissioners also declined to have anything to say to the union officials who waited on them until the men returned to work. The men held a special meeting on Saturday to deal with the report of the officers on their visit to Melbourne, and after a good deal of wrangling, it was decided to take a ballot to see if the men were agreeable to return to work, so that the proposal for an appeal board could be discussed with the Commissioners. The result of the ballot was that 274 voted for returning to work, and 213 against—or a majority of 61 for terminating the strike. At a special meeting held on Sunday, the result of the ballot was announced, and it was decided to return to work on Monday. It was also decided to pay the men discharged victimised pay at the rate of £2 per week, and their case was left in the hands of the committee to do the best they could for them. Thus ended, with a loss in wages to the men of over £3000, what is generally admitted to be the most foolish strike the miners in the State mine have ever entered on, and that is saying a good deal.

In a statement made during the strike by Mr. Broome, he said that with the same number of men as previously employed, and notwithstanding the introduction of coal-cutting machines, which did a great deal more work than could be done with a pick, the output had been reduced by 300 tons per day. In No. 9 more coal was got out with the picks than is now being obtained with the machines. In No. 10 pit additional parties had been put on, but the output had not increased. These facts were significant, as the prices to be paid for the future working of the mine had to be arranged before the end of this month, and there was evidence of the men having come to some arrangement as to the quantity to be sent up by each party. The men ridiculed Mr. Broome's statement at the time, but at Sunday's meeting it was stated that one of the parties working in No. 9 had broken away from the arrangement come to, to earn only about 13s. 6d. per shift, by earning as high as 17s. per shift. The meeting was very lively whilst this question was discussed, and when it was asked if the "dag" was off there were loud cries of yes.

# PREFERENCE TO UNIONISTS.

## Miners' Application Refused.

Mr. Justice Higgins has refused the application of the Federated Mining Employees' Association (V.) to order a compulsory conference to consider the question of preference to unionists.

In making an announcement on the subject, the Industrial Registrar said that some months ago the miners filed a plaint concerning their rates of pay, but in that plaint the question of preference to unionists was not raised, and the president of the Arbitration Court consequently had no jurisdiction to deal with that point. Then, again, the dispute as to preference to unionists was confined to Bendigo, and for that reason also it was beyond His Honour's power to interfere in that matter. Union officials had given notice of motion with a view of having preference to unionists included in the plaint already filed, but as preference to unionists had not been included in the plaint which crystallised the dispute, it could not be included as an afterthought.

# SCIENTISTS' VISIT.

The Prime Minister, Prof. Masson, Dr. McFarland, Prof. Spencer, Dr. Carty Salmon, Mr. Deakin, Dr. Barrett, Dr. Rivett, Dr. Chapman, and Mr. Shepherd, attended a meeting of the Federal Council at Melbourne last week in connection with the 1914 visit of the British Association to Australia.

The organising secretary (Dr. Rivett) reported the result of his visit to the various States, and explained that the matter of State handbooks was well in hand, but that the desire for uniformity in size and general make-up would have to be given up, as it was found in some States it was not possible to fall into line, owing to the different conditions existing. The questions of the distribution of State and Federal handbooks, the trip across Queensland and the Northern Territory, membership fees, and sectional meetings, were all considered, but no definite decision was arrived at. These matters will be brought under the notice of the British Association in London by Dr. Rivett, who is now on his way to England. It was reported that the local committees in the several States were doing good work, and matters generally with regard to hospitality, travelling facilities, etc., were well in hand.

# ROYAL MINT RETURNS.

## Sydney Branch.

During May the Sydney branch of the Royal Mint received 59,823 fine oz. of gold for coinage, value £254,112, compared with 54,902 oz., value £233,476, in May last year. During the first five months of this year, the gold receipts were 249,080 fine oz., value £1,058,023, against 248,466 oz., value £1,056,443, in the corresponding five months of 1912. Included were 43,588 oz. of New South Wales gold (against 40.142 in the corresponding period last year), 109,156½ oz. Queensland gold (against 121,178½), 89,145 oz. New Zealand gold (against 77,891), and 6586 oz. of Papuan gold (against 5574). During the same five months the sovereigns issued were 870,000, half-sovereigns nil, gold bullion £9110, and silver bullion £98. Australian silver coin was issued to the value of £37,100, and bronze coin nil, while £17,943 worn silver was withdrawn, and £24,475 British silver coin was exchanged.

The receipts for May and since 1st January were:—

| Coinage— | May, 1913. Fine Gold. Oz. | Since the 1st January. Fine Gold. Oz. |
|---|---|---|
| New South Wales .. .. | 7,198.21 | 43,588.37 |
| Queensland .. .. .. .. | 30,792.12 | 109,156.55 |
| New Zealand .. .. .. | 21,071.49 | 89,144.65 |
| Northern Territory .. .. | — | 82.23 |
| Tasmania .. .. .. .. .. | — | 47.22 |
| Western Australia .. .. | 10.85 | 158.49 |
| Papua .. .. .. .. .. .. | 729.29 | 6,586.26 |
| Other Countries .. .. .. | 6.52 | 32.60 |
| Coin .. .. .. .. .. .. .. | 14.67 | 283.36 |
| Total .. .. .. .. .. | 59,823.15 | 249,079.73 |

Gross value of the above £254,112 8s. 8d. and £1,058,022 14s. 1d.

# COMMONWEALTH OIL CORPORATION.

The Torbane mine and works of the Commonwealth Oil Corporation Ltd. (N.S.W.) are being closed down by the receivers and managers, in view of the early exhaustion of payable shale there, and in order to concentrate all the funds available under the reconstruction scheme in development at Wolgan. The time necessary for such development at Wolgan is more than would permit of the Wolgan works taking up the business when the Torbane mine was exhausted. Hartley Vale works, however, will continue refining operations for the present, and stocks of oil on hand there are sufficient to meet all current contracts, besides admitting of the company's retention of its connection in the open market.

The Golden Gate and Nancy Lee Company, Croydon (Q.), crushed 1050 tons for 1718 oz. gold, valued at £4673. The heavy and late wet weather caused a great influx of water, and the lower levels, whence the higher grade stone is obtained, could not be worked. Consequently the shallower and poorer ground was worked. Some of the stopes opened out well, but the cost of equipping them has eaten up the profits. It is estimated the next crushing will be made three months hence.

## A.I.M.E.

## The Broken Hill Congress.

By Our Special Commissioner.
Mr. J. Malcolm Newman, B.E., Assoc. Inst. M.M., M. Aust. Ins. M.E.

## Open Stoping on Wide Lodes (South Mine Practice).

By Andrew Fairweather.

The South mine adjoins the South Blocks, where the Rill system above described is practised. The same system has been tried in the South mine, but was abandoned in favour of the "open stope with flat back," with the limitation that only the bottom 70ft. of each 100ft. left is taken out in this way. The remaining 30ft. is taken out as follows:—"The rises are placed at intervals of about 100ft. The stopes are opened out from the crosscuts or drives leading from the shafts and stoping commences as soon as the ore is struck. The sill floor stoping is done in two operations. The first is a cut 9ft. high, where only side-shooting is allowed, and which is carried for the full area of the ore body before the second operation begins, which consists in taking a 7ft. slice off the back, thus making the cavity 16ft. high. Timber and filling closely follow the back-stoping miners." In timbering, the set used in the gangways is a plain "clap-me-down" of round stringy bark 12-15in. diameter, side lathed with 10in. x 4in. oregon and covered with 10in. x 6in. oregon, and of a size within to accommodate a double track road of 15in. gauge. Sets in the gangway stand at 4ft. centres. Ore passes are placed at an interval of 25-30ft.; ladderways at about 100ft., except that each stope has at least two ladder roads.

Bottoms.—When the timber work has been completed as high as 12ft. above the sill, and the stope is ready for filling, bottoms are laid over the whole of the ground outside the gangways. The method of procedure consists in first running down some tailings from the rise, spreading it to a smooth surface 12in. thick, and upon this laying 14ft. and 12ft. 10in. x 4in. oregon boards, close, level, and firmly bedded, with their joints broken. The direction of laying is parallel to the main run of the ore body. More filling is then run in until the toe of the rill comes to the edge of the boards already laid. Further laying of boards and filling then proceeds simultaneously, the material required for spreading under the bottoms being obtained from the advancing toe of the mullock.

The filling used is the rejected material from the mineral-separation process of the Central mine, and has been proved to set well under the wet conditions of the stopes that now obtain.

The first layer of filling goes in to a height of about 12ft., thus covering the gangways with about 3ft. of material, and leaving an opening of about 4ft. under the back.

Distribution from the rises is effected by side-tip trucks running on lines supported on trestles made of 10in. x 2in. laths. These laths are subsequently drawn out of the filling, and used over again.

The next stope taken off is 9ft. thick, and starts from a rise, water-holes being used in the lower portion of the breast and flat holes in the top portion.

Sollars.—Sollar boards of 10in. x 4in. stringy bark, 6ft. long, are laid close on the mullock previous to firing to keep the ore clean of tailings and provide good shovelling for the men. For boring the holes in the ground 3¼in. Holman and Horsefield machines are employed; but subsequent trimming is effected by Sullivan poppers and by spalling.

Bulks.—As stoping proceeds, bulks or pig-styes of 6ft. 10in. x 10in. oregon are built behind the miners in places where the ground shows any tendency to "blister," or where, from the neighbourhood of "heads," it is expected to become heavy. The interval apart is about 12ft., which allows of the reaching up of ground between adjacent bulks by 14ft. 10in. x 10in. or 10in. x 6in. stringers.

Where the back is strong, however, and gives no sign of weakness, the bulks are not omitted, the spacing then being 20ft., and the stringers not being used.

The filling follows the stoping miners as closely as circumstances will allow, and the thickness of the layer corresponds to the depth of the stope, which is almost invariably 9ft. As it is customary to carry the back 13ft. high, this leaves an open space of 4ft. above the mullock. When a stoping party has squared up its end, either to a pitching wall or a low-grade intrusion, it goes back to the original rise to beat off another slice, and the mullocking of the end is accomplished from a rise near by.

To render this method of flat stoping as safe as possible, the following rules are laid down and enforced:—

(1) Back stoping in an open working proceeds with one party usually, but if more than one is operating they always stope away from one another—never towards one another.

(2) The direction of work is always parallel to the strike of the ore-body; thus, in a dipping shoot, with wall striking N.E. and S.W., the stoping may be in either of those directions. In a pitching shoot the direction of work is N.W. and S.E., parallel to the strike of the "pitching" walls.

(3) Upper holes, that is, holes bored above the horizontal, are absolutely prohibited; and strong holes, especially in the upper portion of the breast, are not fired until they have been relieved.

(4) Work underneath the "belly" is never permitted, especially during boring operations. Sollars may only be laid under the "belly" when the machines are stopped, and then only if there be no doubt about the strength of it.

(5) As soon as it is known that a piece of ground is bad, work is concentrated on that piece with the object of bringing it down. If possible, a crack is fired, otherwise a hole is bored and fired. If the piece be comparatively small, and any firing might tend to make the back worse, extra bulks are built under it.

(6) Ore-breaking contracts do not include the building of bulks, as the special gang does most of the work. Should the stoping contractors have to build one, they are compensated for such work by a special bonus to the party, arranged between themselves and the foreman.

The conditions which guided the management in adopting this method are clearly set out by Mr. Fairweather.

The ore-body on the South mine is a combination of pitching and dipping shoots, all connected at some point (as so far discovered) with the narrow vein running along the footwall fault. The dip is north-westerly and the pitch south-westerly.

The pitch is the predominating feature—that is to say, the lodes are altered in position from level to level more under its influence than under that of the dip. While the dip is only marked on the north end of the mine (throwing the lode there 25ft. north-west in a 100ft. lift), and has faded out practically 1500ft. further south, the pitch continues practically without change for each particular shoot. On the western ore-bodies this pitch is pronounced, throwing the lode 160ft. south-west in a 100ft. lift, but is less in the ore-bodies nearer the footwall, where the displacement would be 100ft. It affects also the narrow lode on the footwall, for all the enlargements of that lode are found further south as progress is made downwards.

The "dipping" walls are schists, especially weak on the north end of the mine and elsewhere in the narrow footwall lode. The "pitching" walls are also schists, and also weak when exposed.

Although every pitching shoot has a wall under foot, there is not always a wall overhead. In this case the ore gradually loses value on the south-western end, finally merging into barren quartzite or felspar. Another good feature is that, between the ore and the overhead wall of one of the flattest pitching lodes is a poorly mineralised band of hard quartzite. The conditions, therefore, may be thus generalised:—Where the walls are weakest the lodes are narrowest; where the lodes are widest the walls are not present, strong low-grade ground forming the limits of working; and where the lodes are flattest the weak, overhanging schists have a protective covering of hard material, which would not pay to remove, were it wise to do so.

A close study of these conditions has convinced the management that the shape of the ore-bodies is not a deterrent against open stoping.

Characteristics of the Ore.—While the chemical and physical characteristics of the ore itself vary with each particular shoot, there is a feature common to every one of them—viz., the presence of "flaws" or "heads" throughout the ore-mass, seeming to represent interruptions in mineralisation, or temporary alterations in the composition of the solutions that formed the deposits. There are also, in many of the ore-shoots, well-defined faults, carrying a "dig," and revealing in other ways evidence of differential movement, which has destroyed the cohesion of the ground at the point of fracture. Whatever the causes may be, these "heads" are very numerous, and have to be seriously considered in the adoption of any stoping policy.

The "flaws" most numerous are nearly horizontal, have not completely destroyed the cohesion of the ground through which they pass, and have no great continuity laterally. The larger breaks—the faults—are more persistent in length, but are not horizontal, being inclined at such an angle as to allow of flat-back working under proper precautions.

Yet another satisfactory feature is that, where faulting has caused a crushing of the ore-body, so that it is a mass of jointed material resembling "creep" ground, that has happened in the smaller lodes on the footwall.

Strength of Ore.—The ore now being met in the deeper levels of the mine, and that which went to form the large masses from the 625ft. level downwards, may justly be termed strong and compact. Practical experience has shown that even in the largest stopes (and one was worked 350ft. long and 160ft. wide) there never was any tendency for the back to crush with its own weight. The ground is undoubtedly self-supporting, and if it were absolutely homogeneous in structure could be mined almost without precaution. The "heads" and faults, however, tend to make the backs weak, not as a whole, but in regard to certain masses that are unfavourably positioned, or are in proximity to some plane of weakness. Falls of ground, therefore, are to be expected, but by a close study of the conditions can generally be anticipated.

The strength of the ground in the South mine is probably assisted considerably by the schistose and poorly mineralised masses which divide the different shoots from one another, and which, of course, are not removed by stoping.

The pitching tendency of the lodes, which would naturally throw weight partly on to the underlying wall instead of wholly on the filling which rests on the lower back, would assist in the same direction.

The South mine's experience of the system is expressed in the following words:—

"Practical experience on this mine has shown that in flat-back working on ordinary compact ore the new back recently exposed by the miners is not liable to large falls. "Blistering" or "winding" may go on, but will bring off pieces that an ordinary bulking system will secure. The portion of the stope liable to falls is that part ahead of the men, and, as there is no occasion for them to be working under it, it is forbidden ground. An efficient means of blocking it would be by back-filling, but this is not adopted, as the breaking of ore would be considerably hampered, and the side-shooting rendered necessary would play havoc with the bulks. The system, therefore, demands close supervision, in order that the rules framed for safety purposes may be strictly enforced. In addition to the shift boss, who controls a level, and the foreman, who controls a section of the mine, there is yet another foreman who personally examines every open stope every day, superintends the building of all bulks, and in other ways attends to the safe working conditions of such places."

In the discussion on this paper Mr. Fairweather was asked to define more particularly his reason for preferring the flat-back system to the rill stoping, and by means of a diagrammatic sketch on the blackboard he showed clearly that in places where the pitching walls might be parallel to a rill face the danger of heavy falls of ground would be materially increased. In the course of his paper Mr. Fairweather enumerates his objections to the rill system of stoping as follows:—

"(a) Only a small proportion of the total ore can be mined on a true rill system, and, as the back has to be brought up flat previous to square setting and picking up bottoms, this latter work is attended with some risk, as the men are always working under the 'belly' of a previous stope.

"(b) The last 30ft. slice of ore has to swing unsupported by back filling for a much longer time than in the case of flat-back working.

"(c) The carrying of the rill at the correct angle to suit mullock distribution requires close supervision, as the tendency of the men is to flatten it to get more tonnage. If the rill be flattened, mullocking becomes awkward and slow.

"(d) Bulks on a rill of mullock do not remain tight under the back, as in the case of level filling, and therefore cannot be so well relied upon for giving warning.

"(e) In a rill stope the tendency is towards a larger exposure of wall than in the case of the flat-back, and where the wall is weak that condition is bad.

"(f) Loss of ore is unavoidable with the rill system.

"(g) Men fill ore under the 'bellies,' and in 'heady' ground these must become weak as a result of the action of the air in the 'flaws' that are exposed in the rill face."

Later in the discussion it was suggested that it would tend to greater safety if in opening up a level on a wide lode the central area were taken out, timbered, and filled with mullock before the remainder of the sill floor were undercut.

Mr. Fairweather considered this could not be done without the risk of knocking the timbers over. The advantages claimed by him in his paper for taking out the sill in two separate cuts over the method of carrying one stope the full height are:—

"(1) A large ore-body may occupy 6 to 12 months on the sill-floor cut, and during that time a 9ft. back can be more easily examined and kept right than a 16ft. back.

"(2) In the case of a 16ft. back carried in one operation, no gangway timber can be stood until such stope is finished. In the method adopted, timber and filling can closely follow the back-stoping miners.

"(6) In the double operation there is no stoppage of ore breaking, for as soon as men finish the 9ft. stope they are put on the back, and as soon as they finish the 7ft. slice they begin over the timber. In the other case the miners must be withdrawn as soon as they have cut out 16ft. to allow the timber to be erected."

On the question of laying bottoms on 12in. of filling, it was suggested in the discussion that fine ore would be just as suitable and would not mix waste with ore mined when picking up the bottoms. Mr. Fairweather believed that it would be possible to overcome this objection to the fine waste filling, and stated that in any case the local contract system did not readily lend itself to putting fine ore under the bottoms. In the course of his paper he claims the following advantages for laying the bottoms on 12in. of filling:—

"(1) The boards being level, well bedded and buried, are under the best conditions for remaining sound.

"(2) In the subsequent picking up from the stope underneath it will be possible to scrape out the 12in. layer of skimps, boom up the bottoms, and thus secure 'the back' before firing the ground away.

"(3) A reduction in working costs will be effected, and the risk of 'runs' minimised."

The question of fine versus coarse filling was discussed, and it was argued that coarse filling was a better support and did not shrink so much as fine filling. Also, that when a stope came up against an old stope filled with fine material the latter had a great tendency to run out of the filled stope into the new workings. Mr. Fairweather's reply was to the effect that the fine filling was so well wetted down by the jets used for boring that it stood well. He preferred the fine filling. In reply to discussion as to whether the recovery of bulks could not be better effected by building new ones on the new filling, he sketched and more fully explained his method described in the paper as follows:—

"In the construction of each bulk, two 8ft. 10in. x 6in. stringers are used at a height of about 9ft. above the sollar level, and, while the next layer of filling is being distributed, the ends of them are caught up on 10in. x 6in. props, so that the lower portion of the bulk may be removed. Naturally, this work proceeds just in advance of the toe of filling. Instead, therefore, of 9ft. of bulk being buried, only four props are lost, and these only temporarily, as they are afterwards drawn out of the filling by pole and chain. This method has the advantage that the bulks remain in their original position until the mullocking operation is completed. Wherever ground is bad over a bulk, and it is not convenient to take it down, the lower portion of the bulk is allowed to remain, and is buried."

The discussion elicited the fact that it was the intention of the management to have the working regulations quoted above printed.

The necessity for the flat floor of square sets put in previous to closing a flat back stope before mining the arch was questioned. The advantages claimed for this method are stated by Mr. Fairweather as follows:—

"(1) The standing of the sets leaves the back absolutely level, and therefore secures a uniform depth of underhand stopes.

"(2) The sets form an excellent foundation for the timber of the underhand stope."

## Some Features of Mining in the Central Mine.

By R. J. Donaldson.

This paper is a concise statement of the difficulties found in the Central mine, where the lode is very wide and broken, and of the methods of overcoming the difficulties.

A tour through the Central mine brings home forcibly the question of subsidence that is going on. In some of the re-driven crosscuts the tops of the second generation of crosscut legs are seen from one to three feet above the bottom of the present crosscuts. Mr. Donaldson's statement, "An enormous amount of timber is consumed," also received ready confirmation. The discussion on this point as to whether it would be possible to replace some of the timber by coarse mullock walling made it evident that the general consensus of opinion in Broken Hill is that no practical way has been found to eliminate the timber. On this question Mr. E. J. Horwood said, "The use of square sets in bad ground everyone recognised they would like to get rid of, especially owing to the danger from fire. A number of crosscut stopes had been worked in the Proprietary mine, but the system had been abandoned for various reasons. The system did not prove as good, as cheap, or as well ventilated as the square set system. The Proprietary Mine had come back to the square set method, the heavy cost of timber being more than compensated for by its other advantages."

## Underhand Stoping with Square Sets, as Practised in the Broken Hill Proprietary Mine.

By J. C. Coldham.

This describes the latest method put into practice in Broken Hill to meet the requirements for mining broken and badly supported ground. The method of working out the 30ft. of ground described in Mr. Fairweather's paper as being worked after the bottom 70ft. of a 100ft. lift had been worked by open stoping is described in detail by Mr. Coldham. This 30ft. of ground is known as a "bridge" or "arch" and the operation of mining it includes that technically known as "the picking up of bottoms," that is, the flooring laid down under the filling of the level above. The difference between the method described by Mr. Coldham and that practised by Mr. Fairweather in the South mine is that whereas in the latter the stope is levelled off and the flooring of square sets put in and filled. In the Proprietary Mine, on the other hand, the stope is filled to within 5ft. of the back and solidly bulked, leaving a gangway between the bulks to connect chutes carried up through the filling. The stope is then started either from a main winze or from a short square-set rise put up through the bridge. The timbers of these stopes are carried on sills placed on the filling. Stoping is carried out in the same manner as in underhand stoping a block of ore.

Mr. Coldham enumerates the chief advantage of the underhand stoping method as follows:—

"(1) When the ore-body is such that each fresh back must be caught immediately it is opened, the underhand method is superior to any method of back-stoping, as the back must be caught up only on the top floor of the stope, while in overhead stoping each floor presents the difficulties of a fresh back. The importance of this may be seen from the extreme case of running ground, where the contract rate for top sets may amount to as much as 2s. per ton in excess of the rate for the following sets.

"(2) With this method of working in vertical slices much less back is left unsupported by filling than when working with a flat or rill face.

"(3) The filling cost is less when filling deep paddocks than when filling flat, shallow paddocks.

"(4) Should occasion arise it is more convenient to fill close to the face when working out the ground in vertical slices.

In conclusion, it may be said that this method has proved itself more suitable than any other in working out bad ground, and it would seem that it would be difficult to find a method more suitable for the conditions under which it is used at present."

The paper also described the details of winze-sinking and stoping in running ground. Such details will, I am sure, be found very interesting to mining men.

When opening a block of ground for square-set stoping the winze is timbered with square sets as the starting point of the stope timbers. This winze may be taken down in one operation; but in running ground it is probably cheaper to sink a small pilot winze, say 4ft. x 4ft., afterwards stripping this to full size. By this method the amount of dirt to be hauled to the level above is 75 per cent. less than when sinking the winze full size.

The pilot winze is sunk 4ft. x 4ft. in the clear, the timbers consisting of 4ft. gwyndered boards, 10in. x 2½in. in cross section. The ground below the level is shovelled down a few feet, and two or three rings of cribbing placed in position. The loose dirt is shovelled back, and the cribbing packed tightly, using water plentifully to solidify the ground. Sinking is continued ring by ring, using water to make the ground temporarily self-supporting, care being taken to open just sufficient ground for the ring of cribbing.

When the pilot winze is completed it is stripped down 8ft. x 8ft. in the clear, using 8ft.—10in. x 2½in. gwyndered boards to hold back the ground. When this winze has been sunk 8ft., square-set timbers are stood and blocked against the side, bearers are put over this set on the level, and the set timbers suspended from them by 10in. x 2½in. hangers. The winze is sunk in 8ft. lifts, successive sets being stood and suspended from those above. The pilot winze is used as a chute.

In starting a leading set in running ground, the back laths are pitched over the cap of the top floor through the space left between the cap and the back laths of the set behind. The back laths are driven as far as possible through the soft ground, and are given an upward pitch of about 16 deg. One-half of the top breast-board is now cut out, and the laths at this end of the cap driven forward about 2ft., the dirt being scraped away from the points to allow of the laths driving easily. The second half of the top breaster is now taken out, and the laths at this end driven home. To prevent the weight of the ground pushing down the points of the back laths, the butts are "tailed" down against the laths of the set behind.

Since the end back laths must necessarily be pitched inside the struts, a source of danger is presented in the 10in. space left open between the back laths and the sides of the set. To secure this corner the top side laths should be started as soon as possible, the space between the back lath and the side lath being coped over with short boards, as the laths are driven home.

The side laths are pitched upwards at a greater angle than the back laths, and are splayed outwards to allow the use of an 8ft. breast-board. The full-length breast-board is necessary to ensure sufficient space outside the legs to pitch the side laths of the next set.

When the laths have been driven about halfway their points are supported against the increasing pressure by a 10in. x 6in. cap held up in the centre by a 10ft.—10in. x 10in. boom. At this stage not more than about 1ft. of the breast should be open, so that the slope from the points of the back laths to the top of the breast is well under the rilling angle of the loose dirt. By this means, and the liberal use of the water spray, the danger of "runs" is minimised. In bad sets the space open when the laths are driven home will not exceed about 2ft. 6in.

The back laths are now continued slightly in advance of the side laths, until their butts are flush with the cap. The side laths are driven home, and the breast is carefully worked down until sufficient room has been made for the top breast-board, which is then dropped into the joggles of the side laths. Successive rings of breast and side laths are then placed in the same manner as when sinking a winze, until sufficient room has been made for the set timbers. The set is then placed, squared, and blocked, the back laths being supported by a bridge carried on the struts. The boom is now placed to support the top struts, and the successive floors are suspended by means of 10in. x 2½in. hanging boards.

Succeeding floors are worked down by means of rings of breast and side laths. The side laths are placed horizontally, and the set is worked in a similar manner as when sinking a winze. When the sill-floor set has been placed, the boom and hanging boards can be removed.

When mining running ground the two main points to be remembered are—

1. To use water freely to keep the ground damp, and thereby lessen the risk of breaks away.
2. To keep the minimum space open when driving laths, and to keep successive rings of logging close.

This set of papers describing features of Broken Hill mining without doubt will be a valuable addition to the literature of mining methods, and merit the fullest discussion which members of the Institute can give it. It is to be hoped that the opportunity will be taken to contribute written discussions which will appear in due course in the "Transactions of the Institute." The papers form a worthy sequel to the valuable article contributed some years ago by Mr. A. J. Moore to the American technical journal, "Mines and Minerals" on "Broken Hill Mining Methods."

Besides the details of the Broken Hill mining practice described above, the papers contain descriptions of Ore Chutes, which, together with the paper by Mr. J. M. Bridge, "Notes on Steel Ore Passes," form a complete resume of Broken Hill experience in connection with the important subject of chutes.

Mr. Bridge enumerates various chutes as follow:—

"(a) Square cribbed passes or round or square timber, with plain or joggled ends, either built by themselves or immediately inside the legs of square sets and projecting over the caps and struts for additional support and rigidity.

"(b) Square-set passes logged outside, and lined inside with vertical timbers spiked on to each set, or with the cribbing just mentioned.

"(c) Circular stone passes hand-packed, sometimes bonded and strengthened by occasional timbers placed radially.

"(d) Circular wooden passes of radially-shaped timbers placed vertical, the grain of the timber being parallel to the axis of the chute in line with the fall of the ore.

"(e) Circular steel passes."

The chute described in "a" is called by Mr. Donaldson a "logged" or "gwyndered" chute, and is used throughout the Central mine, where, as Mr. Hebbard pointed out in the discussion, twin passes are always built so that when one is so worn as to need repair the other, which was previously used as a travelling way, can then be put into commission. Mr. Fairweather describes the circular wooden type "d."

Mr. Barton describes a method of making the bottoms of the circular steel chutes. The subject of Mr. Bridge's paper as follows:—

"The chutes for the first 18ft. are ordinary gwyndering passes lined with 10in. x 2in. hardwood, 3ft. 8in. square in the clear, which acts as a storage; the steel passes being erected on top of this. The chute bottom has a steel lip at an angle of 60 deg., supported by a 2in. x ⅝in. angle iron, coach-screwed to each leg, and having an angle-iron lug on each side to hold the chute board. The legs are 10in. x 10in. oregon, placed vertically and dove-tailed 1in. into the stringers. At the back of these is placed a steel wearing-plate covering the stringer, extending 18in. down the leg and made of ½in. plate coach-screwed on. The chute bolts are made of 1¼in. iron, in the form of a U. They are about 18in. long, are screwed at each end, and bolted through leg and plate. The only closing used consists of a steel plate, dropped in behind the lugs on the lip, and a bar through the U bolts.''

Mr. Bridge describes his ''Steel Ore-Passes'' as follows:—

The sections as now used are made by cutting the 8ft. x 4ft. plates by means of an ½in. slotting punch, the final cut in every case being made with a round, instead of a rectangular, punch, so as to give a round root to the lugs to prevent tearing. The circular holes for riveting, and for attaching the slings, are punched at the same time, and by the same machine. Provision is made for three lugs on each longitudinal and also on each circumferential seam, the bottom longitudinal lug also serving as an additional circumferential support. After cutting, the plates are bent uniformly in the rolls, until the opposite edges about touch. The various lugs are next put on, in all cases being bent cold by hand, by means of a "dog" made of a 3in. head, having a slot in it 4in. deep by ½in. wide, and provided with a stout iron handle. The lugs of the longitudinal seams are bent out square in one operation, but those for the annular joints are first bent out square to the axis of the tube; then the hold of the "dog" is shortened, and they are bent back parallel to the axis. The edges of the longitudinal seams are then pulled up together and riveted.

The first section of each pass, or the "starter" as it is called, has the same longitudinal joint, but the lugs are replaced by 4in. x 4in. x ½in. angle-iron feet, which rest on the chute timbers, and form the foundation for the pass. Riveting is again avoided by attaching the feet to the tube in the following manner:—

Three pairs of circumferential slots, 2½in. long by ½in wide, are punched, 2in. centres; the 1½in. metal left between is then sheared in the centre, and the two pieces of metal forced back to make two 1½in. x 1¼in. lugs. Over these is placed a 5in. length of 4in. x 4in. x ½in. angle iron slotted to fit the lugs, and these lugs are then hammered back to grip the angle iron. Half, and three-quarter tubes are also used, being made from 8ft. x 2ft., and 8ft. x 3ft. plates, the object being to suit the height of the filling in the stope. The end dimensions of these short tubes are the same as the ordinary ones, but the central longitudinal joint has to be dispensed with, from lack of room on the plate. The different lengths of the slots and lugs on the top and bottom circumferential seams, gives the required taper to each tube. The top of each section has a minimum inside diameter of 2ft. 5in., and the bottom a maximum outside diameter of 2ft. 4¾in., to allow of fitting each tube into the one immediately below it. Three thicknesses of plate are used, ⅜in. for the first 60ft. above the level, 5/16in. from 60ft. to 110ft., and the remainder 3/16in.; the cost complete of each section, from 8ft. x 4ft. plate, being respectively £4, £3 15s., and £3 5s.

In starting from the level, two foundation pieces of 10in. x 10in. oregon of a length to suit the conditions, are first put in, resting on a 2in. projection of the caps of the level sets; an additional hold sometimes being given by spiking a 10in. x 4in. piece on to the legs vertically. Two 7ft. pieces of 10in. x 10in. are next placed transversely to these, blocked 2ft. 5in. apart, and then two 5ft. pieces parallel to the foundation pieces, and likewise blocked 2ft. 5in. apart.

The starting tube is fitted between these, the legs resting on the top of them, and the whole is made rigid by packing with filling. The passes are placed 30ft. apart along the level, and in some cases have been taken up 140ft. above the back of the drive, in stopes averaging 30ft. wide, representing a tonnage handled per pass of about 15,000 tons, without any renewals or repairs.

The advantages of Steel Ore-Passes are enumerated by Mr. Bridge as follows:—

(a) Their moderate first cost and great wearing qualities, which eliminate renewals and repairs.

(b) The small size they can be made, without an undue tendency to hang up, lessening the chance of accident by falling into them.

(c) Their adaptability to stoping conditions, as no special care is needed when firing ground on top of them.

(d) Their impervious nature, which prevents any very rich ore being lost, and also confines sand filling to the stope, which is a matter of great difficulty in very wet mines.

(e) The ease and cheapness of installing each section, as each tube is made so that it fits the previous one.

The result of the use of these passes on the South Blocks mine has proved that for the conditions existing there, the steel pass can do its work quite as well as any form of timber pass, and the question of its adoption is one which depends directly on the relative prices of steel and timber.

In the discussion on this paper, Mr. Pearson (Wallaroo) said they used steel passes at Wallaroo as ore-bins, not as passes. There they had to reinforce the steel with angle iron.

Mr. Gall (B.H. North mine) said that in the North mine steel ore passes were a failure. The ore hung up too frequently. They broke often. About 90 per cent. of them were lost. They had many disadvantages. The North's experience was that they were an utter failure for that mine.

Mr. Wainwright (B.H., South mine) said that the Proprietary used the round metal pass years ago, and it was reintroduced by the late Mr. Diggles on the South Blocks. The South mine had tried the steel pass, first a 2ft. 6in. pass, then a 4ft. pass. These were not a success. So the round timber pass was adopted, and this had proved admirable for the South system of working. The wooden round pass, it was also found, could be recovered after use.

---

# COMMONWEALTH OIL CORPORATION'S AFFAIRS.

## Further Suspension Granted.

(From Our Correspondent.)

Lithgow (N.S.W.), June 7.

A further application for suspension of labour conditions was made by the Commonwealth Oil Corporation, of Newnes, at the Warden's Court, Lithgow, on Thursday, 5th inst.

Mr. S. Northcote McLelland, registered accountant, deposed that over £1,342,147 had been spent at Newnes, which was £67,145 greater than the capital of the company. That amount had been taken out of the revenue. The amount spent in actual mining was £305,586, exclusive of machinery. The sum of £447,915 had been spent on industrial wages and wages on the railway; £325,356 in machinery, £306,587 on mining, £240,000 on the railway from the works to the Great Western line at Newnes Junction, £95,000 prospecting and surveying, and £3000 on maintenance. In 1908, 277 men were employed at the Newnes works, 437 in 1909, 673 in 1910, and 590 in 1911. They need employ only 302 under the leases. Some 20 men had been employed continuously during the last total suspension. During the operations of the Corporation 1252 feet had been sunk, and 54,662 feet had been driven.

Mr. David Fell, receiver appointed by the New South Wales Court, stated that he had been carrying on negotiations with the London receivers. He pointed out the difficulty the corporation was under, and said the actual trouble commenced on March 5th, 1912. Details were given of the various methods of procedure, showing that separate proposals had to be submitted to first debenture-holders, second debenture-holders, preferred (and deferred) shareholders, creditors, loan creditors, and, lastly, to the Court. All this took time, but Mr. Fell was in receipt of cables stating that all parties had agreed to a scheme of reconstruction—the issue of £350,000 prior lien debentures. He also read a communication from London, stating that the receivers were hopeful of securing the necessary money. The only hope of obtaining the money was from the first and second debenture-holders, loan creditors, etc. It was really salvage money, an attempt by the debenture-holders, etc., to save their own property. In the interest of the working man who was looking for employment, the Government, which would benefit by the circulation of money, and of all concerned, he thought the Warden should assist them in every possible way. He and Mr. Simpson had been successful in securing a strong local advisory board, which would assist the London board, which would probably have a representative here. He was of opinion that ~~the board~~ would inspire confidence. The Court had yet to approve of the scheme of reconstruction and issue of the prospectus. He did not know how long operation would take, but was satisfied the receivers felt that the longer it took, the more disastrous it would be for the corporation. Every effort was being made to obtain the money, although he could not definitely say that it would be secured. What would assist those interested most in restarting the works would be a definite pronouncement by the Government that it would impose a reasonable protective tariff on imported oils, etc.

The corporation's officials also applied for a reduction in the number of men employed on the leases from 302 men to 4 for a period of nine months.

Mr. McClelland stated that during all suspensions and exemptions £20,083 had been spent in wages on the leases. Mr. Fell expressed the opinion that the whole of the money spent at Newnes —£1,432,147—had been spent on mining operations. The Warden, however, did not take that view, since the railway had absorbed a very large amount.

Mr. Fell said he believed there had been very little extravagence, and that over a million pounds, at any rate, had been spent on mining operations. If the sanction of the Court to the reconstruction scheme was secured, the money would have to be obtained. The debenture-holders, etc., would not put the money into the corporation as an investment, but as salvage money, in the hope that the thing would turn out all right and they would be able to recoup their losses. Several schemes of reconstruction had been discussed, but nothing had yet been settled. It would be necessarily some time, assuming that the money was obtained, before actual mining operations took place. In all probability, the whole of the works and the method of procedure would be re-cast. He had been connected with several reconstruction schemes, but he had never seen more evidence of desire to put the matter through than in this case. Witness spoke of the money now being put into the business by the directors, and said the loan creditors had put in £100,000, and had consented to lose £50,000 under the reconstruction scheme. The shareholders never had one penny from the company, and £1 shares had been written down at 5s. Without additional capital they would be unable to continue, as the whole of the capital had been exhausted. Should the application be not granted, the corporation would be forced into liquidation and realisation.

The Warden (Mr. A. B. C. Burke) said he would grant a further total suspension of labour conditions for three months. Had it been asked for, he would have been inclined to grant the maximum period of six months. With regard to the application for the reduction of labour employed, he would make his recommendation to the Minister for Mines.

---

# DISCOVERY OF REFINED OIL.

## Oil at Diamond Head.

## Mr. Carne's Report.

The New South Wales Mines Department has furnished the following report by Mr. Carne, who, in company with Mr. F. F. Potts, police magistrate and warden, examined the alleged discovery of natural mineral oil at Diamond Head, on the North Coast, a few miles south of Camden Haven Heads. He has no hesitation in declaring that the slight trace of oil visible at the time of inspection had been surreptitiously introduced.

Diamond Head and the adjacent elevated hills, known as North, South and Middle Brothers, consist of quartz-porphyry, and are evidently connected beneath the low swampy areas extending for several miles north, south and west of Diamond Head. The site of the alleged oil seepage is a small soakage channel draining from the Diamond Head porphyry through a narrow selvage of sandy land to the ocean, the actual site being a few feet on either side of the fenced boundary of portion 36, close to the north-east corner. The sandy rise on the west side of the channel forms a common camping ground; on the east side an old shed has been used by fishermen or other campers, the water of the channel serving for water supply. The owner of portion 36 lives with his family within half a mile of the spot. If the oil seepage in the channel had been genuine, it would long since have been betrayed by an oily scum, odour or taint. The channel is subject to wave action during high tides or storms; sometimes—as at present—being partly filled with rotted seaweed; at others, swept clean. Its banks consist of about six feet of compacted black sand—familiarly known on the North Coast beaches as ''Black Rock.'' The colouration is due to decomposing vegetable matter. Water draining from such formation of swampy origin invariably exposes a surface film of oxide of iron arising from alteration of soluble carbonate of iron and precipitation of insoluble oxide. Doubtless, the iridescent film thus formed attracted recent attention and led to salting. This film—apart from taint and odour—can readily be distinguished from an iridescent oil-film by agitating the water which causes it to break up into disconnected particles; also by the red staining at the bottom of the water caused by precipitated iron oxide. The testimony of reliable witnesses is to the effect that the first announcement referred to the presence of oil floating on the creek water at the fence crossing and to seepage from the banks. At the time of our inspection, there was no sign of either, and the water was being used for drinking. Since the first intending investors visited the site, two small drill holes have been put down in the black sand rock where it slopes to the creek bed—the deepest about 7ft. 6in.—one inside the boundary of portion 36, the other—and deepest—about 30ft. outside. In the latter, water stood about 2ft. 6in. from the surface; on it and in the sand and mud of the drill hole below it, small globules of crude or residual oil could be detected. With the assistance of Mr. Harvey—an oil-boring expert whose services had been secured by Messrs. Deuchar and Smith, of Taree, for testing a block taken up by them to the north—a drill bore was put down 8 feet, within four feet of the one in which oil glimmers were obtainable, without disclosing a sign of oil. If the occurrence had been genuine, then oil would have been visible on the water constantly seeping from the bank in which the drill bores are placed. I might mention that the first sample from the site brought to this Department consisted of sand saturated with refined kerosene.

---

## THE DREDGING INQUIRY.

The mining view of the dredging question, as expressed by Mr. E. C. Dyason, at a meeting of the Buckland Star Dredging Coy. (V.), in Melbourne, shows that there are two sides to the controversy.

"Alluvial mining," Mr Dyason said, "had been carried on in Victoria for over 60 years, and the pollution of the streams was not an incident of sudden development. Alluvial was a gradually dwindling industry. The position, therefore, at present was not worse than it had been, but very much better, especially owing to the protection afforded agriculturists by the Sludge Abatement Board, which did enforce the regulation calling for a minimum quantity of solids in the water. Dredging certainly did in some cases, deteriorate the value of good land, but it also in other cases improved the value of old diggings for agriculture. Many of the dredging leases were on old diggings, consisting largely of stone heaps and holes. This land, after dredging, became level, and fruit and nut trees could be planted, where before it was simply hopeless. If a statement of figures could be prepared and published instead of the dogmatic opinions of biassed minds, they would then be in a better position to judge of the relative areas of good and bad land dredged, especially if it could be known how much had been derived from agriculture on these areas prior to their being dredged, and how much from gold recovered. There was admittedly some good land which should not be dredged, but the dredging industry should not be howled down without the fullest investigation."

Interviewed regarding the case of the Freeburgh (V.) Dredge, Mr. Billson, Minister of Mines, said the statements as to the non-fulfilment of lease covenants had been referred for consideration to the Sludge Abatement Board, who would report in due course. As for the Freeburgh Dredge, it appeared that the company had received permission from the municipal authorities in the very same way that many other companies had received permission to cross public roads when and where they liked. The control of the public roads was in the hands of the municipalities, and it was for them to say what should be done. The Lands department had given permission to the mining company to go through the reserve, and had seen fit to cancel that permission. The Mines Department was in no way concerned with that. The company possessed miners' rights, and as long as it kept within them these were the best possible rights. It had been reported that the Buffalo Star, in the Buckland Valley, was dredging away deep rich land, without attempting resoiling. That statement was made in the face of the fact that sworn evidence was given by the proprietary that the company was resoiling at £50 per acre. The Government had taken up a certain attitude on the whole question of dredging. It said that no further leases were to be issued. If anything was to be done or undone in regard to the dredges, it must be by the Cabinet, and any complaint proved to be justified would be sent on to it for determination.

Commenting on the Ovens and other dredges, the Victorian Sludge Abatement Board, in its half-yearly report, says:—

"Statements have appeared in the press that great devastation has been caused. These complaints are, evidently, largely due to an imperfect knowledge of the facts, of which the following is a concise resume:—Since the inception of dredging in Victoria to date, the area classified as agricultural land dealt with by the dredges is approximately 200 acres, and of pastoral land about 1200 acres, the balance, about 7000 acres being river and creek bed and old worked mining ground.

"The old workings have been much improved, and there can be no doubt that they will in the future be usefully employed in various ways. In their case there was no soil to replace, and, being riddled with old mining shafts, dangerous to stock and giving harbor to vermin, they were a nuisance and worse than useless. No land valued at more than £2 per acre has been leased during the past four years for sluicing or dredging, except in one or two cases where small patches of land included in applications have been valued at £2 10s or £2 15s per acre, and the extent of comparatively good ground that is likely to be turned over by the early lessees is not so great as to give rise to any serious anxiety. Indeed it is questionable whether the improvement to the old mined ground does not fully balance the damage that is done on the few leased areas not subject to resoiling conditions.

"While there has been an improvement in the condition of the streams due largely to the constant efforts of the Mining Department and its officers, there has been less ill-feeling than formerly between farmers and miners, the former mostly realising that, in a State which owes so much to mining, this important industry cannot be wiped out except for very strong and valid reasons, and the latter in most cases showing by their efforts to meet legal requirements, that they are desirous of carrying on their work without injury to their neighbours."

---

## SLUDGE ABATEMENT.

### Everything in Order in Victoria.

In their report for the half-year, just issued, the Sludge Abatement Board (V.) members express themselves as perfectly satisfied with the position of affairs in the State as far as the business which occupies their attention is concerned.

Objection has been taken, the report says, by anglers to the discoloration of the water of the Ovens and other rivers, because they consider that it spoils their amusement, the board remarks cheerfully, but, while it is to be regretted that anyone should suffer inconvenience, however slight, it is scarcely reasonable to ask that an industry returning to the State annually gold worth over £300,000, and employing a large number of men at good wages, should be interfered with merely because it affects the sport of a few individuals. During the year no prosecutions were found necessary. The principal mining companies in the Ballarat district are still doing satisfactory work in stacking their battery sand and other debris clear of the water way. Neither the channel of the Yarrowee nor of the Woady Yalloak is now used as a receptacle for sand or sludge from the mines. In the lower reaches of these streams large volumes of sand are still moving on towards the Barwon River and Lake Corangamite; and this must continue for some years, even though no more battery sand be discharged into either of the rivers first mentioned.

Everything is reported to be quite satisfactory at Bendigo. Gold mining in the vicinity of Castlemaine is largely conducted by means of bucket dredges. There are four of these working in the locality, of which two are in Campbell's Creek, and two in the Loddon River. There are still half-a-dozen pump sluice plants scattered about in various creeks and gullies, but the operations of some of these, and of several small jet elevator plants, were seriously curtailed during the course of the year through lack of water. The settling basin at Strangways, constructed at considerable expense by two of the bucket dredging companies, has been found very useful when properly utilised in improving the conditions of the Loddon River water from Campbell's Creek junction to the Laanecoorie basin. Towards the latter end of the year, however, owing to the somewhat unusual frequency at such season of heavy downfalls of rain, several freshets occurred in Campbell's Creek, with the result that the dam used for diverting the mining water from the creek channel into the race leading to the settling basin was repeatedly breached. This interfered with the continuous use of the settling area, and for some time the river water became more than ordinarily discoloured, and was the cause of serious complaint on the part of land owners and others down stream. Steps, however, have been taken to insist on the proper and continuous use of the settling basin, and there is already noticeable an appreciable improvement in the water which in this district is required in summer for stock, as well as for mining purposes. In a normal summer there is no natural flow in Campbell's Creek, and the Loddon discharge is usually very small, so that without water artificially diverted into Campbell's Creek for mining purposes the stream in the Loddon below Guildford would be, in the summer, much smaller than it is now. In some years there would be no water at all except in shallow holes and in underground flow.

At Beechworth the number of bucket dredges still at work on the Ovens and Buckland Rivers and their tributaries is the same as during the previous year, 38. As most of the plants are operating on flats and terraces and deliver little or no direct effluent into the streams, they do not add much to their pollution. The water diverted by races into these flat and terrace workings, after allowing for evaporation, mostly filters back into the rivers. The water of the Ovens is inevitably discolored, but not to such an extent as to cause any real damage. Fair resoiling results are still being obtained by the use of belt conveyors and other appliances, where the depth of overburden and other conditions are favorable. As, however, probably less than 5 per cent. of the ground dealt with by the dredges is suitable for advance stripping, there is little opportunity for rapid development in this direction.

---

## REPORTS OF COMPANIES AND CORPORATIONS.

### Zinc Corporation (N.S.W.).

The output of the Zinc Corporation for the past two months compare as under:—

| | April. | May. |
|---|---|---|
| Ore milled, tons ... ... ... | 14,236 | 15,554 |
| Tailings treated, tons ... ... | 21,360 | 27,670 |
| Zinc middlings treated, tons | 3,980 | 3,590 |
| Zinc concentrates, tons ... ... | 7,340 | 7,605 |
| Lead, concentrates, tons ... ... | 3,876 | 4,154 |
| Estimated income from all sources (spelter at £23, lead at £15) . ... ... ... ... ... | £46,417 | £51,634 |
| Total working expenditure | *£26,084 | £28,830 |
| Office, estimated expenditure | £400 | £400 |
| Cost per ton on ore mined and milled ... ... ... ... ... ... | 15/9 | 15/5 |
| Cost per ton tailings and middlings treated ... ... ... | 11/9 | 10/10 |
| Cost of redemption of tailings ... ... ... ... ... ... .. | £5,531 | £8,001 |
| Estimated profit over working, including cost tailings ... ... | £14,402 | £14,403 |
| Expenditure on mine development ... ... ... ... ... ... ... | £2,089 | £2,518 |
| New construction work ... .. | £2,117 | £514 |

*Increase in expenditure due to strike troubles.

### Amalgamated Zinc Co. (N.S.W.).

The returns of the Amalgamated Zinc (De Bavay's) Limited for the past two four weeks compare as under:—

| | ended May 1. | ended May 1. |
|---|---|---|
| Tailing treated, tons ... ... | 19,120 | 46,960 |
| Zinc concentrates produced, tons ... ... ... ... ... ... ... ... | 5,221 | 12,603 |
| Assaying— | | |
| Zinc, per cent. ... ... ... | 48.7 | 49.1 |
| Silver, oz. ... ... ... ... ... | 8.1 | 8.4 |
| Lead, per cent. ... ... ... ... | 6.3 | 6.1 |
| Lead concentrates produced, tons ... ... ... ... ... ... ... | 47 | 137 |
| Assaying— | | |
| Lead, per cent. ... ... ... | 51.9 | 53.9 |
| Silver, ozs. ... ... ... ... ... | 35.6 | 36.5 |
| Zinc, per cent. ... ... ... | 17.8 | 17.1 |
| Estimated income (spelter at £22 ton) ... ... ... ... ... | £14,377 | £36,023 |
| Total working expenditure (including cost tailings treated ... ... ... ... ... ... | £8,947 | £17,653 |
| Estimated profit on working account (Spelter at £22) after deducting amount due to Broken Hill South Co., under partnership agreement ... ... ... ... ... ... ... | £3,758 | £12,917 |

### Mararoa G.M. Co. (W.A.).

The Mararoa Co.'s costs for May are as follows:—

| | £ | s. | d. |
|---|---|---|---|
| Mining, 2730 short tons ... ... ... ... | £1223 | 7 | 1 |
| Milling, do. ... ... ... ... ... ... ... ... | 636 | 17 | 5 |
| Realisation of bullion ... ... ...... ... | 35 | 11 | 8 |
| Cyaniding, 1902 short tons sands ... | 295 | 8 | 5 |
| Realisation of bullion ... ... ... ... | 36 | 1 | 9 |
| Cyaniding, 669 short tons slimes ... | 193 | 9 | 0 |
| Realisation of bullion ... ... ... ... ... | 16 | 7 | 9 |
| Cyaniding, 27 short tons concentrates ... ... ... ... ... ... ... ... | 50 | 11 | 0 |
| Realisation of bullion ... ... ... ... ... | 7 | 9 | 7 |
| Waihi slimes ... ... ... ... ... ... ... | 145 | 18 | 2 |
| | £2641 | 1 | 10 |
| Amount spent on development ... ... | 782 | 18 | 9 |
| Amount spent on capital account ... | 201 | 1 | 9 |
| Total expenditure ... ... ... ... | £3625 | 2 | 4 |
| Total value of bullion won for month ... ... ... ... ... ... ... ... | £5057 | 15 | 11 |
| Profit earned for month on ore treatment ... ... ... ... ... ... | £2416 | 14 | 1 |

---

## PUBLICATION RECEIVED.

By a typographical error in our issue of April 3, the address of the publishers of the Universal Electrical Directory was given as Leeds, instead of London. As, however, the address was more particularly given as 4 Ludgate Hill, one would need to be totally ill-informed to be misled.

THE AUSTRALIAN MINING STANDARD.

# ENGINEERING and ELECTRICAL RECORD

Vol. XXVII. MELBOURNE AND SYDNEY, JUNE 19, 1913. No. 760.

THE ENGINEERING AND ELECTRICAL RECORD is published every *Thursday morning. Price Sixpence.*

*All communications should be sent to the Editor, those having reference to business matters should be addressed* CRITCHLEY PARKER.

CASUAL ADVERTISEMENTS *on this page 15s. per inch per insertion.*

THE FAMOUS
"Brimsdown"
"Wirum"
BRITISH MADE Lamps.

The most popular, reliable and economic lamp on the market.

Sole Agents—
THE
LAWRENCE & HANSON
Electrical Co. Ltd.
405 LONSDALE ST., MELBOURNE.
11 YORK ST., SYDNEY
and at WELLINGTON, N.Z.

## ELECTRIFICATION.

### Traction by Tram and Rail.

A very interesting paper on electric traction as applied to rail and tramways was read by Mr. J. H. D. Brearley, at the monthly meeting of the Victorian Institute of Engineers, in the Institute rooms, Melbourne, on Wednesday of last week.

After dealing with the evolution of street tramway systems generally, he said that electricity could be applied to tramways no matter how small the service. At Leonora, in Western Australia, a one-car tramway had been installed by the municipality, the power being taken from the electric light station. The system had given satisfactory results, showing that country towns, situated near mines or other industries employing a large number of hands, could safely establish such a service. On the other hand, there was no limit to the size of an electric tramway system other than that imposed by the carrying capacity of the main trunk lines. The outstanding advantages of an electric tramway system was its elasticity and the ease with which extensions could be made. One form of electric track suffered from the disadvantage of the cable system, viz., the electric conduit system. This was a matter of special interest to Melbourne, because a cable conduit was already laid. There were many reasons why this conduit was useless for conversion. If it were decided to instal the electric conduit system in Melbourne, an entire reconstruction of the conduit would be necessary.

The distribution of traffic in Melbourne was over well-defined trunk lines, and in this respect this city had an advantage over Sydney. Electric cars could be run here at intervals of 10 to 20 seconds, but the real limiting feature was the speed at which they could be worked across the intersections, of which there were five of importance in the city. Electric tramways were poor dividend earners as far as private capital was concerned. Of 139 companies, having an aggregate capital of £150,370,000, the latest statistics showed that £20,400,000 earned no dividend or interest, £84,370,000 under 5 per cent., and £45,600,000 over 5 per cent. The most successful companies in Australasia were at Auckland and Brisbane, where the dividends ranged from 6 to 8 per cent. As far as Australasia was concerned, private enterprise would find very little further scope in tramways for cities or towns, because of the continual increase in wages and the increasing tendency to reserve public utilities for the administration of municipal or public bodies, and the greater ease with which such bodies could finance the propositions.

Continuing, Mr. Brearley dealt with the expansion of street tramways under electric traction. Improved travelling facilities, he said, tended to induce people to settle further away from city centres. In Sydney in 1899 there was only 8¼ miles of electric route, 41¾ miles being steam, and 3¾ miles cable, while the passengers carried numbered 52,810,000. In 1912, the electric route mileage was increased to 131¼ miles, and the passengers carried numbered 266,789,000. Electric cars could run 120 miles a day without undue wear and tear, and at an average speed of 10 miles an hour a car should earn 1s. to 1s. 3d. per mile, or £6 a day on an average. From the returns available the revenue per car mile in Adelaide was 1s. 2.8d.; Auckland, 1s. 6d.; Christchurch, 1s. 3d.; Fremantle, 1s. 1d.; Perth, 1s. 3d.; and Prahran and Malvern, 1s. 1.2d. As far as the electrification of the Melbourne tramways was concerned, a question of great importance would be whether power was taken from a large central station or generated at a station connected with and controlled by the tramways authority. Statistics had shown that power absorbed between 15 and 20 per cent. of the capital cost of running a system, so it would be seen that a saving of ¼ per cent. would be no mean item. The Prahran-Malvern Trust purchased its power from a central station, while the Adelaide system was self-contained and generated its own power. The latest figures showed that the former obtained its power at a cheaper rate than the Adelaide trust. This was an indication that when the Melbourne trams were electrified thoughtful consideration would have to be given to the power question, for possibly it could be obtained cheaper from the railways power station to be erected at Yarraville than from a separate plant connected with the tramways.

## N.S.W. TELEPHONES.

Great indignation is being expressed on behalf of the 250 Sydney firms involved in the resumption of the "purchased telephones" by the Federal Postal Department. The first telephone line used in Sydney was erected in 1880, between Darling Harbour and the Royal Exchange. Other connections were made to wharves and stores, until the number of subscribers reached 300, when the N.S.W. Government took the system over, and it became the basis of the present system. The original lines were constructed at the expense of the users, and many of them still hold the right, granted in perpetuity by the State Government, to retain the lines on payment of a £5 annual fee. For many years the Government has refused to remove such lines and instruments from one office to another, to attach additional switches or allow the users to make alterations.

A Federal bill, passed in 1911, empowers the Government to resume the lines by giving three months' notice. It also provides that "the compensation, if the amount cannot be agreed upon, shall be settled by arbitration, in accordance with the laws relating to arbitration of the State in which the line is situated. Notices of resumption have been issued, and absurd sums have been offered by way of compensation—for example, 13s. for a line that cost £20."

It is argued that there is a reasonable ground for compensation also on the fact that the early numbers of old-established firms are worth a good deal to the holders, seeing that the figures to be granted in exchange are likely to be somewhere in the region of 10,000.

## THE BRIGHTON LINE.

From July 1 the management of the St. Kilda-Brighton (V.) electric trams will be transferred from the telegraph superintendent to the transportation branch of the Railway department, and from that date several reforms are promised. Three new cars, built in Adelaide, have been delivered, and will, it is stated, be placed on the line at the beginning of next month. Other cars for use on the line are now under construction. The new cars are of the sliding door type and are much more comfortable to travel in during winter weather than those now running on the line. Each car has seating accommodation for 50 passengers.

At present there is no proper system of connection between trams and trains, and the committee has given much attention to this question. It is understood that from July 1 a five-minutes' connection will be maintained between Brighton and St. Kilda during the busy traffic of the morning and afternoon.

## N.S.W. ENGINEERING ACHIEVEMENT.

### The Lapstone Tunnel Obviated.

By the completion of that very fine piece of railway engineering work—the new "down" line at Lapstone-Glenbrook (N.S.W.)—transit by rail to the far-west and numerous branch lines has been considerably eased. This work, which is regarded as one of the greatest engineering feats of the southern hemisphere, was commenced in March, 1911. The formation has been taken out for a double line, and the second road—the "up"—will be ready for traffic about the end of the present month. The existing road—that through the renowned Lapstone Tunnel—is to be retained as a relief road, but it will only be used for trains journeying towards Sydney—as it is a down grade in that direction—and not on the journey to the mountains and the west. The new road will make little or no difference in the time taken, but, besides relieving congestion, it will avoid the Glenbrook (or Lapstone) tunnel, and give an easier grade and a more picturesque route. The whole of the work has been carried out on the day labour system by the Department of the N.S.W. Engineer-in-Chief for Existing Lines.

The railway officers concerned are very proud of their achievement. The greatest number of men employed on the work at any one time was 1400, and at that period their fortnightly pay averaged over £6000. Every advantage was taken of modern appliances in carrying out the work. A power-house, capable of generating a 2200-volt current, erected at Glenbrook, carried electricity over the works to the faces of the sandstone cliffs, and so supplied power for working compressed air-drills, which bored their way through the mountains of rock. Portions of the old Eastern Zigzag were used for running materials along; in other places, temporary, but sturdy, lines had to be erected. At the "Bluff," when the short tunnel was in course of excavation, the work was carried out from a shelf cut into the wall of the rock. To get the materials down, what was known as a funicular railway had to be built. Part of it had a drop of 1 in 12. The tunnel itself was lit up with electricity, and huge electrically-driven fans kept the air pure.

On this deviation the steam navvy was first tried on the N.S.W. State railway works, and proved a great success. Its great scoop or shovel seized earth and rock and tossed them aside with amazing ease, accounting for about 2¾ tons at each ponderous movement. Steam derrick locomotive cranes tossed huge boulders about like pebbles; elsewhere steam travelling gantries did their Herculean work with equal facility.

A year ago an estimate of the probable cost of the deviation was given at £200,000. Particulars of actual cost, however, are not yet available. Much of the plant purchased for the work will be transferred to other works, and so adjustments must be made. When the proposal was first submitted to the Public Works Committee, it provided for a single track, but in view of the nature of the work and the difficulty that would have followed the building of a double track later on, it was decided to make the line a double one at once. This, of course, added greatly to the cost. Then, again, the increases granted to the men employed and the extra prices of materials, etc., brought the cost of the work to a much higher figure than was at first contemplated.

## BRITISH AND EUROPEAN DEVELOPMENTS.

(From Our Correspondent.)

London, May 9.

The water diviner, or "dowser," like the poor, is always with us, or it seems so, for periodically we are treated to controversy respecting the abilities of these gentlemen. Recently the matter has been brought forward in a little more satisfactory way, considered from the engineering point of view. The "Sanitary Record" Committee of Scientists has reported on demonstrations of water divining, or dowsing, the demonstrations being arranged as a result of long correspondence running over many months, in the course of which claims were made on behalf of diviners. The general conclusions of the committee, on comparing the state of facts known to exist, with the indications given by the diviners, are that whatever sensitiveness to underground water may exist in certain persons, of which some evidence has been given, it is not sufficiently definite and trustworthy to be of much practical value. Moreover, the lack of agreement with each other shows that it is more a matter of personal mentality than any direct influence of the water. The diviners, as a rule, confine their attention to small streams of water, and as there are few places where these cannot be found, they may well show a large percentage of success.

The new "B. and K." electric restaurant, which was opened in connection with the heating and cooking boosting policy of the Brompton and Kensington Electric Supply Co., will accommodate from 90 to 95 persons, and every part of the service rendered is done electrically. The building is lighted electrically, ventilated, and heated by the same means, while the cooking, bread-making, water-heating, refrigerating, cleaning, signalling, and time service are all electric. The main kitchen is part and parcel of the restaurant on the first floor, just separated by a plate-glass door, but the visitor or customer may enter and see things at any time. An interesting feature is the supply of current on every table, so that the visitor may, if desirous of so doing, do small cooking operations with toasters, chafing dishes, etc. One or two bell pushes are also on each table, and when these are pressed, a signal lamp corresponding with the particular table is lighted up in the service room, and it remains alight until the table has been attended to. The equipment of the restaurant has been furnished by various electrical firms to the design of the B. and K. Accessories Co. Ltd. It will be remembered that those interested in the present undertaking were associated with the electric restaurant which ran through last summer season at Earl's Court Exhibition, and, of course, valuable experience was gained then which is being availed of now. The equipment of the main kitchen consists of one large cooking suite, with a load of 70kw., controlled by 58 switches. There are nine ovens in the lower part, of various sizes and loadings for different cooking operations. At the extreme right there are two steamers for vegetables, fish, puddings, etc., and immediately adjoining are ovens for baking all varieties of bread and rolls for consumption by customers. At the left hand side, there is a large fish fryer, adjoining which is a grill and toaster. On the main hob are fitted twelve boiling plates of various sizes and loadings. Running along the top of the suite are switch indicator lamps, and immediately underneath are hot cupboards for silver. The main kitchen equipment also includes an electrically-heated coffee roaster, an electrically-driven meat chopper, and a coffee grinder, bain marie, fish kettle, stock pot, egg boilers, etc. Hot water supply to the kitchen and scullery is on this floor, it being supplied by a Cooper water-heater. In the main restaurant there is a large double griller, a carving table, and hot cupboards. Hot plates are fitted throughout the establishment, so that meals may be really served up hot and not merely warm. In the servery at the back of the main restaurant, electrically-heated urns are in readiness to supply tea, coffee, etc. The total loading of the electrical equipment is equal to 140 kw. In one part of the basement of the several buildings, taken in Earl's Court-road, there is a mess-room for the eighteen members of the restaurant staff; here the installation will be shown to visitors under ordinary working conditions. On the first floor also there is a small model kitchen, fitted with an electric stove. In another part of the basement there is a refrigerating plant for supplying the cold chamber and making ice, and a 100gal. Cooper water-heater; and there is also a workshop for dealing with cooking and heating business, and for charging electric vehicles.

In bringing before the Iron and Steel Institute his new form of electrically-driven two-high continuous running reversing mill, Mr. Andrew Lamberton paid a tribute to pioneers who had displayed ingenuity in the application of electricity to the problem of the economical driving of rolling mills, but he said that it could not yet be claimed that by the universal adoption of electricity as the motive-power for such purpose, the highest economy in running costs could be attained. Each case must be considered and decided upon its own true merits. The greatest difficulty was met in dealing with reversing mills of the two-high type, where the rolls had to be reversed at each pass, and when these mills were of large size the electrical plant was extremely costly, the reversing mill motors necessary being from 10,000 to 15,000 brake horse-power, due to their having to start from rest under full load at each reversal. The author said that the higher initial cost of the Ilgner system seemed to militate against its general adoption in England, as British steelmakers seemed very slow to adopt it. Two of the most recently erected English steelworks, in both of which blast furnaces and coke-ovens existed, and an ample supply of free gas was thereby available, although using electricity for every possible purpose, had not adopted it for driving their reversing mills. All engineers might be said to be in agreement that where rolling mills could be driven by a constant running motor associated with a heavy flywheel to take the peak loads of rolling, electrical driving was to be preferred, provided the cost of current was low enough. For small mills rolling light sections and bars, which can be fed to the mills by hand, the three-high continuous-running mill is practically universally adopted, and in such cases the driving of these mills by a continuous-running electric motor leaves nothing to be desired. For larger mills rolling bars and sections of heavier type, which cannot be fed by hand, and where live roller feeding-tables and mechanical manipulators are therefore necessary, the three-high type of mill is not so popular in England, although in America and on the continent it is commonly used even for heavy sections. The main objections, however, says Mr. Lamberton, are the complicated live roller tables which require to rise and fall at each pass, and the increased difficulty of manipulating the bars on these rising and falling tables. There is also the further difficulty of the exact setting of three rolls to give accurate sections, together with the multiplication of the guides and guards required in this system. These considerations have caused English steel-makers to prefer the two-high type of reversing mill for such heavy bars and sections, even although the driving of such mills by reversing steam engines is less economical. This being so, it occurred to Mr. Lamberton that if two-high section rolling mills could be designed so as to be capable of being driven by a continuous-running electric motor, and at the same time give the necessary reversals to the bar at each pass, this would go a long way to meet the difficulties referred to, as the ease of setting the rolls in the two-high mill, and the simplicity of the roller tables being fixed instead of moving, would be conserved, and the large and very costly reversing motor rendered unnecessary. In the method by which the author had accomplished this, the root idea was that if in a mill with two rolls, arrangements could be made to make the bottom roll the top roll, and vice versa, then at each reversal of the position of these rolls there would be a pass in the opposite direction. If then a pair of rolls be mounted in circular gables, which are free to rotate in fixed frames or housings, this will afford a continuous running two-high mill, which gives reversals at each pass, on the gables being rotated through an angle of 180deg.—half a revolution. Mr. Lamberton said that by the employment of a high-speed continuous-running motor the size and cost of such motor was reduced to a minimum, and as the flywheel takes the peaks of the rolling loads, the highest economy in operation results. In one of a series of plates accompanying this paper, there was shown the general lay-out of a rail-rolling mill plant on the new system, capable of an output of 5000 tons per week. Three distinct mills were shown—(1) a cogging mill taking the ingot and reducing it to a bloom; (2) a roughing mill to reduce this bloom to a roughly formed rail; (3) a finishing mill to finish the rail to the required section. These mills are all of the same continuous-running reversing type, the rolls having fixed drafts, so that there is no screwing down gear required. The live rollers are all fixed tables of the simplest form, and the manipulation of the ingots at the cogging mill, the blooms at the roughing mill, and the rails at the finishing mill, is of the simplest character. High-speed continuous-running electric motors with suitable flywheels are used to drive each of these mills, and these motors are all of the most reliable type and efficiency. Mr. Lamberton thought that in such an installation a very high efficiency would be obtained with the minimum initial cost. The first mill of this type is now in course of construction, and will be put to work in a large steelworks in England in a month or two.

Three manufacturing companies have held their meetings in London this week —Callender's Cable and Construction Co. and the British Westinghouse Co., to whose reports reference was made here a week ago, and Willans and Robinson Ltd. The last-named has lately passed through the process of reconstruction, and the first report under the new articles shows a profit of £150 for the half-year, which the chairman described as an encouraging indication for the future, though not in itself a matter for congratulation. During 1912 the works were more fully employed than previously, and the progress made since January 1st, 1913, pointed to a continuation of the improvement in business and in the accounts. The Diesel engine business of the company is satisfactorily extending; especially since the opening of this year has extension been apparent. The carrying through of the reconstruction had enabled them to secure two important contracts, valued £50,000, which they could not possibly have obtained without it. It is stated that steam turbine plants for power production on a large scale will remain the company's principal product, but the Diesel engine business is steadily growing for land service, and when the conditions warrant such a departure the building of certain marine types would be undertaken. The British Westinghouse Electric meeting had placed before it a long statement, showing improved and encouraging results with which the reader has already been acquainted. The prospect for the present year is also said to be good, orders booked to date being better than those received in the corresponding period of last year. The Underground Railways turbine arbitration is, however, not yet concluded, and there is also in the mind of the board the view that it will be wise to reduce the capital further. Such reduction, it is hinted, will not affect the preference capital. Callender's Cable Co. is, of course, a very different kind of undertaking, for it is in a highly prosperous condition, as we showed last week, giving a big distribution to its ordinary shareholders. The meeting was held yesterday, and Sir Fortescue Flannery, the chairman, had a completely satisfactory statement to make, for, notwithstanding all the labour troubles of 1912, which were most embarrassing to Thameside works, they turned out more work than in any preceding year. On some of the business done there was little or no profit, owing to competition. The manufacture of telephone cables had to be transferred to Erith, owing to lack of room in Lancashire, and the Lancashire works were enlarged to meet the expanding trade. The large sum of £91,745 is being carried forward, instead of being put to reserve, so that it may be easily available to assist in handling the larger business. Mr. T. Callender, the managing director, went to India on the company's business during 1912, and in the course of a brief speech to the shareholders yesterday, he was able to show how well the concern is doing with its business in the colonies and abroad. Especially gratifying is the progress being made by it on the Continent, where it has just supplied cables even to Switzerland (no British firm had ever got in there before, he said), in Germany also Callender's are doing well. Mr. Callender said that the company was now full up with as much work as it could do.

The press has devoted a good deal of space this week to the report of the Technical Sub-Committee on wireless telegraph systems. The Parliamentary Committee took very full evidence from Mr. Marconi personally on Wednesday, and then adjourned for three weeks. On that very day the newspapers gave a great deal of prominence to an agreement that was being made between the Canadian Government and the Universal Radio Syndicate, under which the Poulsen system will be adopted for service between Canada and England, a day and night service of 80 words per minute to be available by August next, over 2000 miles. Discussion of the indiscretion of Ministers in dealing in American Marconi shares continues in some of the leading morning and evening papers, and there is a prospect of a lively debate on the subject on the floor of the House in the course of a few weeks. May be the reader has been wondering what has happened to Mr. Maxse, the editor who told the committee he wouldn't and didn't, and was reported to the House of Commons in consequence. We suggested that it would not be found politic for the House to do anything. Now, seeing that the committee proceedings appeared to be drawing to a close, Mr. Maxse has written asking to be called again. But the committee has refused to be honoured by his re-appearance before it. If we mistake not, there were more admirers of the attitude of this independent journalist than there were others, whether we speak merely of the newspaper world or of the country as a whole.

The London County Council is about to place the contract for the two 8000kw. turbo-generating sets, to replace engine sets at the Greenwich power stations, with the British Westinghouse Co., at £50,532. Their price was £2500 higher than quoted by Escher Wyss and Co., of Zurich, with Siemens generators, but the matter was referred to Sir Alexander Kennedy, and the Westinghouse tender is recommended, owing to their steam economy (12.44 lb. per kw. hour at full load) as compared with 12.82 lb. per kw. hour (subject to an allowance of 3 per cent. either more or less) offered by the other firm mentioned. The highest tender was £70,770.

## WYALONG—LAKE CUDGELLICO RAILWAY.

The first sod of the Wyalong-Lake Cudgellico railway (N.S.W.) was turned by the Premier Mr. McGowan, last week. Within the influence of the line is a total area of 2,037,500 acres, including 9,407,200 acres of leased lands, 121,900 acres of reserves, 174,500 acres of Crown lands, and 867,400 acres alienated land. The average rainfall varies from 19¼in. at Wyalong to about 17¾in. at Lake Cudgellico. A strong point was made in the Parliamentary Committee's report of the fact that, apart from the impetus the construction of the line will give to wheat cultivation, splendid results are anticipated from the facilities likely to be afforded for the despatch of fat lambs in small lots to markets of the State. The cost of the line, which is 70 miles in length, is estimated at £232,943, or £3,300 per mile. The annual revenue is estimated at £13,000, and the expenditure at £14,241, but the expenditure included £8000 interest on cost of construction.

Speaking later in the day at the luncheon tendered to the visitors, the Premier said it was wonderful the development that had taken place in railway construction in New South Wales during the last 10 years. At the time when the cost of our railways stood at about £42,000,000, and the earnings at £4,500,000 a year, they only paid something like 3.8 per cent.; now, when over £90,000,000 had been spent on them they were returning them £[illegible] annually and more than 4½ per cent. The Government fully realised its responsibilities in regard to railway construction and for the year 1912-13 up to May 31 it had given the Chief Railway Commissioner £877,762 for the requests he made for rolling stock and £1,789,485 for duplication and deviations, making for the 11 months the sum of £2,667,247. It was money well spent. There was the testimony of the chairman of the Royal Dominions Commission (Sir Edgar Vincent), now that he had seen the State of New South Wales that they have not borrowed as much as they might have borrowed, and that they ought to borrow more before they could develop the resources of the country as they should be developed. He believed the general opinion was growing every day that they must have double the development.

Mr. G. S. Beeby, who followed, said:—"Roughly speaking, he thought they wanted £10,000,000 to put the existing lines in order, and to complete lines at present under construction, and if they placed before the money market of the world definite proposals for £10,000,000 of money for investment to put into enterprises like these railways, he believed it could be got, and the work done. They had to face the future, not in piecemeal fashion, but with a progressive scheme."

## PYRMONT POWER HOUSE.

Much activity has been demanded of the Sydney City Council in its endeavours to meet the rapidly increasing demand for electric light in Sydney and its environs. The development of the power house in Pyrmont-street, Pyrmont, has been going on steadily, and many additions have been made since the building was first erected. To the construction of the third huge chimney stack, which was taken over from the contractors at the beginning of April, a deal of significance was attached. This foretold of the further improvements which have been effected in the working plant of the establishment. The stack was erected for the purpose of drawing off the smoke from a number of Babcock and Wilcox boilers of the very largest size, which are at present being installed. The contractors have completed the installation of the first two of these boilers, and they are now at the disposal of the council. No time was lost by the latter in getting them ready for work. Early in the week fires were lit and burned for a couple of days prior to getting up steam. Smoke has been issuing from the big stack since then, and everything is now in readiness for the extra power generated by the two boilers, to be utilised in keeping pace with the requirements, as far as electricity is concerned. Each of the new boilers is equal to about 1500 horse-power. Simultaneous with this work four other boilers of the same capacity are being built in by the contractors, and these will be ready for service in three weeks or a month's time. This will not be the total capacity of the new chimney. It will eventually take four more boilers of the same, or possibly a larger size, than those now being fitted. These will give a total of ten for the stack.

The installation of the six boilers brings the total number in the lighting station up to 21. By having this number at their disposal the authorities hope that it will be unnecessary for them to purchase any additional boilers for another three years. If the twenty-one boilers were worked together they would make steam enough to produce 30,000 horse-power of electricity. The general rule, however, is to have one boiler out of six, or even one out of five, out of use for cleaning or overhauling purposes. The capacity of the generating plant at present at the station is equivalent to 22,000 horse-power. There is on order an additional turbine and alternator of a capacity of about 6700 horse-power. It is expected that this will be installed by the beginning of next winter. When this extra plant is available, the council's boiler capacity for supplying electricity will be equal to 25,000h.p., and the turbine capacity 28,000h.p. It is estimated that 21,000h.p. of electricity will be drawn from the Pyrmont-street station this winter, and, judging by the manner in which the power is gaining in popularity, it is expected that 26,000h.p. will be required next winter.

## MISCELLANEOUS.

The annual meeting of the Associated Chambers of Commerce of the Commonwealth was opened in Sydney on Tuesday last, when the chairman, Mr. H. V. Braddon, delivered his presidential address. Delegates are in attendance from the Sydney, Melbourne, Brisbane, Adelaide, Hobart, Perth, Fremantle, Newcastle, Geelong, Townsville, Toowoomba, Charters Towers, Rockhampton, Launceston, Ipswich, and Mackay Chambers of Commerce; and, in addition, the secretaries of the Melbourne, Adelaide, Brisbane, and Geelong chambers. Mr. C. U. B. Gurnett is acting as hon. secretary of the conference. Matters to be dealt with are the Bankruptcy Bill (Federal), uniformity of company law, trade reciprocity, cable reductions, the Vancouver service, Customs-house congestion, sub-agents' licenses, uniform food and drug standards, immunity of the Crown from garnishee proceedings, the postal, telegraphic, and telephone services, uniformity of railway gauge, pillage of cargo, control of pilots, wireless telegraphy, uniform State timber royalties, and a Federal tender board.

• • •

Three of the new cars built in Adelaide for the Brighton electric tramway have been delivered, and it is intended to place them in running on 1st July. The cars are of the sliding door type, and are said to afford greater comfort, especially during the winter months, than the vehicles now in use. The new cars will accommodate 50 passengers.

• • •

Factory statistics published last week by the New South Wales Government Statistician show that industrially 1912 was a prosperous year for that State. During the period the number of factories in New South Wales increased from 5039 to 5159. The amount paid in salaries and wages was £11,596,204, or £1,545,043 more than in 1911, the increase being more than 15 per cent. The total number of persons employed was 115,547, including 27,327 females. The increase in each group over 1911 was 6097 and 786 respectively, the total increase being 6883, or over 6 per cent. The females did not increase proportionately, the number in 1011 exceeding 1910 by 2214. The largest number of females was employed in the clothing and textile factories, where 19,221, or over 70 per cent. of the total, were engaged. The value of plant and machinery used was £13,773,943, or £1,263,349 more than in 1911. The land and buildings used in connection with the factories were valued at £8,842,489, an increase of £716,002 as compared with 1911.

• • •

The firm of Colin E. Begg, Limited, has been registered in Sydney with a capital of £20,000, in 10,000 preference shares and 10,000 ordinary shares of £1 each, to acquire the business carried on at Macquarie-place by Colin E. Begg, under the style of Colin E. Begg and Company, and to carry on the business of electricians, mechanical engineers, etc. The signatures to the registration are those of C. E. Begg, R. Morgan, J. E. Begg, H. Joseph, G. Morgan, W. S. Morgan, and G. R. Morgan. The first directors are Colin Erle Begg (managing), George Morgan, John Elly Begg, and Roy Morgan. Registered office, Sydney.

* * *

The Water and Sewerage Board has decided to extend the sewerage system in the vicinity of the North Sydney suspension bridge, and to lay a sub-main at an estimated cost of £1250, and to make extensions at Canterbury, estimated to cost £3230.

* * *

The New South Wales railways are about to instal electric lighting on some of the lines. A movement is afoot to have the Sydney-Parramatta suburban service included.

* * *

Taree Municipal Council (N.S.W.) has decided to obtain an opinion from a consulting engineer regarding a proposal to instal an electric lighting plant. The ratepayers are apathetic towards the project.

* * *

The Federal Postmaster-General has decided to erect additional lines of telephone to places in the Parramatta district (N.S.W.), and also between Parramatta and Dural.

* * *

The directors of the Electric Light and Power Supply Corporation Ltd., Sydney, have issued their tenth report, which, owing to the ordinary shares ranking with the preference shares after the 29th April last, covers only four months. The shares now being all of one class the directors contemplate calling in all scrip and issuing in lieu thereof fresh scrip in accordance with the altered conditions. The number of consumers supplied at 30th April was 1483, being an increase of 280 during the four months. The profit for the period was £4468, and after deducting interest on debentures and temporary loans £2225, dividend at 7 per cent. per annum £1003, and preliminary expenses £400, there remains £840, which is carried to reserve for depreciation of assets. The company has now 14 sub-stations, and the new 2000h.p. turbine is completed with the exception of the condensing plant. Further extensions are needed, and most of the capital has so far been provided by temporary loans. More capital is called for, and the directors are negotiating in London for a large debenture loan. The capital as now provided consists of £50,000 in shares, £71,100 in debentures, £11,200 in loans from shareholders, and £13,930 advanced by bankers, and it is quite evident that apart from further extensions the capital account needs to be placed upon a more permanent basis. Owing to the death of Sir James Graham, Mr. C. N. J. Oliver, C.M.G., late Chief Commissioner for Railways, has been elected a director.

* * *

A further advance in the application of electricity to everyday purposes is being made by the Sydney City Council, which is obtaining three machines operated by electricity for cleaning the streets. These machines are used throughout Germany and the Continent, and, up to the present, have proved successful. They consist of a double water spreader in front and a rotary squeegee at the rear, thus doing the work of water cart and broom in one operation. They are fitted with a Tudor or lead battery, which should be in duplicate, and they have a working radius of 24 miles. The late Mr. Webb, of the fire brigade, spoke well of the battery and its life, having had one fitted to an escape ladder. The working of these machines will necessitate a garage in a central position, and will entail a considerable first outlay, for without it they are useless.

* * *

Some time ago Mr. Peters and Mr. Lewis, of the Colliery Employees' Federation, waited upon Mr. Edden, Minister for Mines (N.S.W.), in order to point out to him the danger of explosion that was created by the use of electricity in coal mines. Short circuits and "blow-outs" at collieries where electric machinery was used were the chief sources of risk. At the request of the Minister, Mr. Atkinson (chief inspector) and Mr. Hutton (inspector) have investigated the subject, and in their report, which was available yesterday, they make the important recommendation that "we do not consider from the point of view of safety that it is necessary or advisable to at present recommend any change in reference to the use of safety lamps or electrical coal-cutting machines." The report points out that no information was given as to where blow-outs had occurred, but the inspectors assumed that it was at Hebburn, the only colliery in the northern district worked by electrically-driven coal-cutting machines and safety lamps. The only other colliery was the

**P & O. COMPANY'S ROYAL MAIL STEAMERS**
FOR MARSEILLES, PLYMOUTH, AND LONDON.

Leave Sydney on the subjoined dates, calling at usual ports.

FIRST AND SECOND SALOON ONLY.

| Steamer. | Tons. | Commander. | Noon. | Melb., 3 p.m. |
|---|---|---|---|---|
| MEDINA | 12,500 | Notley | June 28 | July 1 |
| MOLDAVIA | 10,000 | Gordon | July 12 | July 15 |
| MALOJA | 12,500 | Weston | July 26 | July 29 |

PASSAGE MONEY TO LONDON—
Single, £41 16s to £82 10s.
Return, £69 6s. and £123 4s.

Return Tickets between Inter-State Ports are available for return by Orient, Messageries Maritimes, and N.D.L. steamers having room.

SPECIAL HOLIDAY RETURN TICKETS to COLOMBO are now issued, available for two months. Fares from Sydney, £45 2s. first saloon, and £31 18s. second saloon.

A. GORDON WESCHE, Superintendent IN AUSTRALIA, 63 Pitt-street, Sydney.

**The COLONIAL MUTUAL FIRE Insurance Company Limited.**

Principal Office: 60 MARKET-ST., MELBOURNE

Branches in all the States.
Transacts Fire, Guarantee, Employers' Liability, Marine Burglary, and Plate Glass, Accident, Workers' Compensation and Live Stock Insurances.
Send for Prospectus.
W. TUCKER, General Manager

**Harringtons LTD**

**ANALYTICAL & METALLURGICAL DEPT.**

Lowest fees for all kinds of Assay, Analytical, and Metallurgical work.

Expert Advice on Ore Treatment, Bullion Refining, Smelting, etc., etc. Directed by a qualified Analyst from Messrs. Johnson and Sons, London; Assayers to Bank of England; H.M. Mint, The Council of India, etc.

**HARRINGTONS LTD.**
**336 George Street, Sydney.**

Stockholm Borehole, where work ceased two or three months ago in consequence of an industrial dispute. At the Hebburn colliery the manager, Mr. Harle, informed Mr. Atkinson that all employees were encouraged to report to the officials any electrical defects, and these were entered into a report book. An analysis of the "blow-outs" showed that from the beginning of last year to the 5th inst., only 16 had occurred, and Mr. Atkinson observed that all these were preventible by the exercise of care on the part of the machine men or wheelers. Trailing cables were the weakest portion of the coal-cutting machinery, and care in the use of these was being constantly impressed upon the men, though with a view to their protection the cables had recently been encased in hose pipes.

* * *

Sydney holds the unenviable reputation of being the only city of its size in the world where steel buildings are not allowed to be constructed. Mr. J. Burcham Clamp, a Sydney architect, who has just returned from an extensive tour, states that even in Colombo steel construction was permitted, and it is hard to understand why Sydney should prohibit it. He pointed out that the mammoth Woolworth building in New York, which was of 55 stories, 780ft. in height, was a fine example of steel construction, a great advantage of which was the smaller wall spaces required. This meant an enormous saving not only in material, but in frontages. The walls of the Woolworth were only 30in. in thickness, but if a building of the same size were put up in Sydney, the authorities would require wall thicknesses of 8ft. or 9ft., which would be a very big item in the heart of Sydney, where land was so valuable. Besides the saving on the outward wall, big savings were effected on the inside also. "I went away from Sydney," Mr. Clamp went on, "with the idea that skyscrapers would be rather offensive to the eye in a place like Sydney, but I have come back with a different opinion. I was pleased rather than displeased with the great buildings in New York, and I think that sooner or later we will have to fall into line. I see no objection to the erection of taller buildings than are permitted under our regulations in the wider streets, and at street corners, provided that they are made fireproof and have ample fire escapes."

# *Tenders Invited and Accepted*

It is particularly requested that the information regarding contracts open, and the successful tenderers, be forwarded to The Editor not later than Monday of each week.

The following contractions are used throughout:—S—supply; D—delivery; M—manufacture; C—construction; E—erection; P—purchase; I—installation; R—removal. Where no contractions appear, supply and delivery is understood. The date at the beginning of each paragraph refers to the closing of tenders.

## INVITED.

### Commonwealth.

Specifications, tender-forms, etc., for tenders invited for the Postmaster-General's Department of the various States under this heading may be had as follows:—Victoria—Various State G.P.O.'s. New South Wales—Departmental Stores, Sydney, and various G.P.O.'s in other States. South Australia—Adelaide, Melbourne, Sydney and Brisbane G.P.O.'s. Western Australia—Departmental Stores, Perth, and various G.P.O.'s in other States. Queensland—Various State G.P.O.'s. All States—Various G.P.O.'s. If the Specifications, etc., may be had elsewhere in addition the places will be given in parentheses.

POSTMASTER-GENERAL'S DEPARTMENT, Melbourne.—24th June.—Telephone parts, as per schedule No. 867.

24th June.—Telephones, as per schedule No. 864.

24th June. — Hard-drawn copper wire, etc., as per schedule No. 855.

24th June.—Hard-drawn copper wire, as per schedule No. 854.

24th June.—15,000gal. of benzine, from the 1st July, 1913, to the 30th June, 1914, as per schedule No. 933.

1st July.—S. and D. of 30 nautical miles of submarine cable, as per schedule No. 858.

1st July.—S. and D. of telephone instruments, as per schedule No. 865.

1st July.—S. and D. of insulators, as per schedule Nos. 874 and 875.

1st July.—Switchboard parts, as per schedule No. 879.

1st July.—175 cable boxes, as per schedule No. 876.

1st July.—S. and D. of packing boxes, for a period of two years, from the 1st July, 1913, to the 30th June, 1915, as per Schedule No. 915.

8th July.—Instruments, telephone parts, as per schedule No. 866.

8th July.—India-rubber covered wire, as per schedule No. 873.

8th July.—Cast-iron pipes, as per schedule No. 885.

8th July. — Measuring instruments, as per schedule No. 871.

8th July.—Wire, I.R. covered, as per schedule No. 872.

8th July.—Batteries and battery material, as per schedule No. 880.

8th July.—Galvanised-iron piping, as per schedule No. 887.

8th July.—Switchboards, telephone, various, as per schedule No. 895.

8th July.—Measuring instruments, various, as per schedule No. 870.

8th July.—S., D., and E. of a common battery switchboard at Windsor, as per schedule No. 805.

15th July.—Telegraph and telephone material (switchboard parts), as per schedule No. 878.

15th July.—Galvanised-iron piping and fittings, as per schedule No. 886.

22nd July.—Batteries and battery material, as per schedule No. 881.

22nd July.—Wire (silk covered), schedule No. 884.

22nd July.—45 lb. wire (silk covered), as per schedule No. 883.

22nd July.—10,000 porous pots, as per schedule No. 882.

22nd July.—Ironwork, as per schedule No. 891.

22nd July.—Telephone switchboards, as per schedule No. 899.

22nd July.—Telephone switchboard cable, as per schedule No. 856.

22nd July.—Telephone switchboard cable, as per schedule No. 857.

22nd July.—Sundries, as per schedule No. 892.

29th July.—Detectors, keys, staples, tongs and rosettes for table telephones, as per schedule No. 901.

29th July.—Sundries, as per schedule No. 893.

29th July.—Coach screws and spikes, as per schedule No. 904.

19th August.—105 miles of paper-insulated, lead-covered cable, as per schedule No. 906.

26th August. — 460 coin-collecting devices, electrically controlled, as per schedule No. 916.

16th September.—S., D., E., and I., at the Telephone Exchange, Collingwood, Victoria, of a common battery switchboard, as per schedule No. 860, or an automatic, or semi-automatic, switchboard, as per schedule No. 859.

POSTMASTER-GENERAL'S DEPARTMENT, Sydney.—25th June (extended from 11th June). —Switchboard cable, to stores schedule N.S.W., 290; copper wire, etc., to stores schedule N.S.W., No. 291; wire, india-rubber covered, to stores schedule N.S.W., No. 292; wire, cotton, silk, or wool covered, etc., to schedule N.S.W., No. 293.

25th June. — (1) Battery material, as per stores schedule N.S.W. No. 298; (2) instrument ink, etc., as per stores schedule N.S.W. No. 299; (3) coal tar composition, etc., as per stores schedule N.S.W. No. 300.

2nd July.—2450 backboards for automatic wall sets, as per stores schedule N.S.W. No. 312.

2nd July.—150 brass office seals; 1800 hardened loose type; as per stores schedule N.S.W. No. 318.

9th July.—30 Morse registers, as per stores schedule N.S.W. No. 310.

9th July.—2350 relays and 88 mounting plates, as per stores schedule N.S.W. No. 311.

9th July.—Eight multiple magneto incoming junction line switchboards, with associated equipment, as per schedule No. 205.

9th July.—Wire, galvanised iron, etc., stores schedule, N.S.W., No. 295; bridle rings, etc., stores schedule, N.S.W., No. 297.

9th July.—240 steel date stamps to stores schedule N.S.W. No. 319; and engraving on date stamps to stores schedule N.S.W. No. 320.

16th July.—60 letter and newspaper boxes combined, and 80 letter boxes, as per stores schedule N.S.W. No. 316.

16th July.—100,000 tin slides and 100,000 seal cups, as per stores schedule N.S.W. No. 317.

27th August.—(1) Telephones to stores schedule N.S.W. No. 301; (2) switchboards to stores schedule N.S.W. No. 302; (3) lamps, electric, incandescent, to stores schedule N.S.W., No. 304.

POSTMASTER-GENERAL'S DEPARTMENT, Perth.—25th June.—20 miles of wire (cotton, silk, or wool-covered), to W.A. schedule No. 292.

25th June.—Conduits, to W.A. schedule No. 290.

9th July.—S. and D. of wire, india rubber covered, and cotton, silk, or wool covered, to W.A. schedules Nos. 265 and 266.

9th July.—Insulators to W.A., schedule No. 277.

9th July.—Ironwork generally to W.A. stores schedule No. 293.

16th July.—S. and D. of wire, bronze and copper, to W.A. schedule Nos. 260, 267, and 273.

23rd July.—S. and D. of switchboards and parts, telegraph and telephone instruments, to W.A. schedules Nos. 254, 255, and 256.

30th July.—S. and D. of switchboard cable, to W.A. schedule No. 275.

30th July.—S. and D. of steel towers, battery material, wire and iron work generally, to

**Osborn's Truck Wheels & Axles**

**Osborn's Mushet High Speed Steel, Twist Drills, Mining Steels, Crusher Jaws and all classes of Castings.**

Samuel Osborn & Co. Ltd., Sheffield, are Standard Makers.

**Gibson, Battle & Co. Ltd.**

**535 Kent St., Sydney.** **436 Collins St., Melbourne.**
S.A. Agent: C. C. Deland, Victoria Square, Adelaide.

W A. schedules, Nos. 259, 262, 263, 268, and 269.

6th August.—S. and D. of insulators, telegraph and telephone material, and iron poles, to W A. schedules, Nos. 258, 261, and 264.

POSTMASTER-GENERAL'S DEPARTMENT, Brisbane.—25th June.—S. and D. of letter-box fronts as per stores schedule No. 249.

25th June.—Parcel receptacles, as per stores schedule No. 271.

27th August.—S., D., and E. at the Telephone Exchange Brisbane, of five sections of switchboard, common battery, multiple, and other equipment to schedule No. 243, specification No. 458.

10th September.—Telephone Exchange, Brisbane, nine sections of a trunk line switchboard to schedule No. 244, specification No. 461, and the general conditions, drawings, etc., attached thereto.

POSTMASTER-GENERAL'S DEPARTMENT, Adelaide.—25th June.—1000 letter box fronts, as per schedule No. 288.

9th July.—17,000 cast-iron brackets and 8500 steel spindles as per schedule No. 298.

16th July.—Telegraph and telephone material, schedules Nos. 277 to 286.

13th August.—Telephone parts, as per schedule No. 292, and switchboards, as per schedule No. 293.

DEPARTMENT OF HOME AFFAIRS (Works Director, Victoria). — 7th July.—Cold storage installation at Naval College, Jervis Bay.

21st July.—S. of laundry plant to Captains' Point for the Naval College, Jervis Bay, N.S.W.

DEPARTMENT OF HOME AFFAIRS.—Federal Capital Power Plant.—1st September.—S. of set 1, main power-house switchgear; set 2, switchgear for Diesel engine plant.

DEPARTMENT OF HOME AFFAIRS. Kalgoorlie-Port Augusta Railway.—2nd September.—M., S. and D. of 80 lb. steel rails and fishplates. M., S. and D. of iron dog spikes and steel fishbolts and nuts for 80 lb. rails.

DEPARTMENT OF EXTERNAL AFFAIRS.—Port Augusta to Oodnadatta Railway.—24th June.—M., S. and D. of bogie goods waggons, 3ft. 6in. gauge, and water tank waggons, 3ft. 6in. gauge.

22nd July.—M., S. and D. of 4 wheel brake vans (3ft. 6in. gauge). (See advertising columns.)

DEPARTMENT OF TRADE AND CUSTOMS.—1st July.—M., S. and D. (at Melbourne) of an automatic flashing light for Emery Point, Port Darwin, and also of an automatic flashing post light for Fort Point, Port Darwin.

26th August.—S. and D. of eight (8) automatic flashing lights.

DEPARTMENT OF DEFENCE.—Royal Australian Navy.—21st June.—P. of a 5in. foot treadle lathe from R.A.N. Depot, Williamstown.

24th June.—Engineering equipment and stores for the Government Small Arms Factory, Lithgow, New South Wales.—Electric motors, tools, pulleys, castings, grinding wheels, saws (band and circular), steel, die blocks, drill rods, shafting and rubber tyres. (See advertising columns.)

## Victoria.

VICTORIAN RAILWAYS.—19th June.—Rolled steel posts, Oregon timber.

24th June.—Octagon steel, galvanised corrugated iron, stringy bark weatherboards, Manila ticket boards.

23rd June.—M. and S. of 50 sets of fittings for station gates.

27th June.—M., S., and D. of 200 retention valves.

25th June.—50 tons of good machinery cast iron scrap.

[illegible] for gas making as ordered, during period ending 30th June, 1914.

2nd July.—Copper plates.

2nd July.—M., S. and D. of mild steel girders, etc., for bridge over Hopkins-street, Footscray.

9th July.—M., S. and D. of wrought-iron forgings.

Tenders giving full particulars and place of inspection, are invited by the Superintending Engineer, Flinders-street station, from persons wishing to sell or hire a derrick or spar, not less than [illegible] long, and capable of lifting loads up to 17 tons.

23rd July.—M., S. and D. of one hydraulic forging press.

30th July.—Balls and ball races for 70ft. turntables.

4th August.—Electrification of the Melbourne suburban railways—(a) circulating water and sump pumps, with motors; (b) air and water extraction pumps and motors; (c) surface condensers, hot wells, piping, and sundries.

6th August.—Steel channel bars.

13th August.—Best steel boiler plates for steel cranes, boilers, etc.

13th August.—30,000 lineal feet of wrought-iron steam pipe, 1in. diameter.

20th August.—M., S. and D. of (a) lathe, (b) sawing machine, (c) chisel mortiser, (d) cut-off machine, (e) moulding machine.

27th August.—Hollow chisels and bits.

3rd September.—S. of three petrol engines and pumps for use at Newport Workshops. (Fresh tenders.)

3rd September.—Steel faced machine knives.

10th September.—Neutral track relays.

VICTORIAN RAILWAYS COMMISSIONERS.—State Coal Mines.—23rd June.—S. of cast steel haulage pulleys, incandescent lamps for electric street lighting, incandescent drawn wire lamps.

23rd June.—Rubber, glass, mild steel plates, and hoop iron.

23rd June.—Mine timber.

25th June.—S. of 2 10h.p. portable oil engines, and boring plants and equipment.

25th June.—S. of one 140 h.p. induction motor; and flexible belt and jointing material for band conveyor.

13th August (extended from 25th June). — S. of electrical equipment.

PUBLIC WORKS DEPARTMENT. — 26th June. — Refrigerating machinery and other plant, new cool stores Victoria Dock; contract No. 5; copper cooking vessels, Hospital for Insane, Ararat.

## New South Wales.

PUBLIC WORKS DEPARTMENT. — 24th June.—1. of electric light, post office, Cessnock. (Fresh tenders.)

24th June.—Conversion of lift, P.W. Department, from hydraulic to electric working.

11th August. — Steel bridge for Macleay River, Wauchope, to Kempsey section, North Coast railway.

11th August. — Steel bridges for Hastings River and flood channel, Wauchope to Kempsey section, North Coast railway.

3rd September.—Efficient steam tugs for use at Bellinger River and Cape Hawke, from 1st November, 1913.

RAILWAY DEPARTMENT.—6th August.—S. of one live steam feed water-heater for Ultimo power-house. (See advertising columns.)

20th August.—S. of a pneumatic ash handling plant for White Bay power-house. (See advertising columns.)

METROPOLITAN WATER AND SEWERAGE BOARD. — 30th June.—Construction of 1292 lineal feet stoneware and cast-iron pipe sewers in the municipality of Leichhardt.

3rd September.—S. and D. of efficient tugs for use at Bellinger River and Cape Hawke from 1st November, 1913.

## South Australia.

SUPPLY AND TENDER BOARD. — 24th June.—S. and D. of 27,000 wrought iron standards; 27,000 cast iron sockets.

24th June.—M., in South Australia, S., and D., at the Waterworks yard, Kent Town, of 12 turbine water meters, 2in.; 12 turbine water meters, 3in.

24th June.—S. and D. of four railway weighbridges.

15th July.—S. and D. of best mild steel.

15th July.—S. and D. of 500 bars bright drawn hexagon steel.

15th July.—S. and D. of cold-reeled mild steel bars.

15th July.—S. and D. of solid drawn copper tubes.

22nd July.—S. and D. of chain iron.

RAILWAYS.—24th June.—P. of old steel tyres, scrap steel springs, scrap spring steel, scrap steel boiler plate, cuttings, etc., scrap steel and iron mixed (thin).

15th July.—C. of 8 bogie passenger brakevans, 5ft. 3in. gauge.

15th July.—C. of 17 bogie goods brakevans, 5ft. 3in. gauge.

15th July.—C. of 30 sheep vans, 3ft. 6in. gauge.

15th July.—C. of 30 sheep vans, 5ft. 3in. gauge.

15th July.—C. of 15 cattle vans, 3ft. 6in. gauge.

22nd July.—C. of 30 or 50 bogie waggons, 5ft. 3in. gauge.

## Western Australia.

GOVERNMENT TENDER BOARD.—19th June.—Four overhead electric travelling cranes, as per schedule No. 101a, 1913.

19th June.—Engine tyres for Railway Department, as per schedule No. 98a, 1913.

3rd July.—Tubular iron poles, for Railway Department, as per schedule No. 118A, 1913.

31st July.—3520 pairs of fishplates for 46½ lb. material.

RAILWAYS DEPARTMENT.—26th June.—P. of, approximately, 1000 tons of mixed scrap, mostly mild steel, suitable for a rolling mill, lying at Midland Junction.

## Queensland.

RAILWAYS DEPARTMENT.—24th June.—S. of 5000 spiral bearing springs, to code drawing No. 9.

NORD DEUTSCHER LLOYD
REGULAR SERVICE TO EUROPE.
REDUCED FARES TO LONDON.
TO MANILA, CHINA AND JAPAN.
Via New Guinea and Yap.
Fares to Hong Kong, £40; II., £26.
Full particulars will be sent on application to—
LOHMANN AND CO., General Agents,
7-9 Bridge-street, Sydney.
Ostermeyer, Van Rompaey and Co., Melbourne, H. Muecke and Co., Adelaide; L. Ratazzi and Co., Fremantle; Thos. Brown and Sons Ltd., Brisbane.

The Mount Lyell Mining & Railway
CO. LIMITED.
Purchasers of Ores containing Copper, Gold and Silver. Rates obtainable on application to the Secretary
Manufacturers of Coke for Smelting and Foundry Purposes, Acids, Etc.
HEAD OFFICE—
39 QUEEN-STREET, MELBOURNE.
D. G. LUMSDEN,
Secretary.

We helped them,
We can help YOU!

We refer to the hundreds of Mine Owners who have adopted "Atlas Diesel" Engines. This efficient and economical source of power has been brought to a wonderful state of perfection.

It is giving solid satisfaction in hundreds of Mines to-day, working under all conditions.

Naturally, the "Atlas" Engine possesses many unique features that enable it to give such satisfaction. It runs on the very cheapest fuel petroleum residue, etc., and this, combined with its high efficiency, means extremely low running cost. It requires no device for ignition, and starts at the first injection of the fuel oil.

The Governors of "Atlas" Engines are absolutely sure in their action, and perfectly reliable.

We are Specialists in Mining Machinery. Let us solve your power problems. Write to-day or call and see the "Atlas" Engine running.

STAWN LTD.,
Engineers,
313 KENT STREET, SYDNEY.

Dunlop Mining Goods
Send for Illustrated Catalogue
The Dunlop Rubber Co. Aus. Ltd
108 Flinders St., Melbourne.
& all States
Dunlop Rubber Belting
Is more efficient than Leather belting for Outdoor & Wet Work.
Sample & Price on application

"FIBRO-CEMENT" Fireproofing
Everyone about to build should obtain full particulars of this cool, acid-proof, ant-proof and fire-resisting material. The slates for roofs and the sheets for walls and ceilings are specially suited for the Australian climate. Used by the Federal and State Governments and by all the leading Architects and Builders.
ECONOMICAL AND EVERLASTING.
Full particulars, etc., from Sole Agents and Importers—
JAMES HARDIE & CO. Melbourne & Sydney

**Exclusive Jewellery**

*Fine Diamonds, set in platinum, £8/8/-*

*Fine Diamonds, set in platinum, £10/10/-*

**We are showing in Large Quantities.**

Our Managing Director has lately returned from Europe and has secured the very last word in these exquisite refined jewellery productions that captivate the exclusive sets of the Old World, Platinum worked like a spiders' web or a piece of exquisite lace. It is interesting just now to wander through our Showrooms, and see the latest productions, and visitors are cordially invited.

FAIRFAX AND ROBERTS LIMITED,

The Oldest Jewellery House in Sydney. 23 and 25 Hunter Street.

15th July.—M. and S. of steel super-structure bridge over Pioneer River.

15th July.—S. of one 120ft. steel super-structure (one span), Caboolture River bridge.

29th July.—S. of steel superstructure for three 149ft. 6in. spans for widening Bremer River bridge.

PUBLIC WORKS DEPARTMENT. — 20th June.—Assay laboratory, Technical College, Mt. Morgan.

18th July. — Steel superstructure of two spans of 120ft each on one cast-iron pier, and concrete abutments, for new bridge over McIntyre River, Goondiwindi.

TREASURY DEPARTMENT.—24th June.—S. of kerosene oil, for the use of the Marine Department, for a term of twelve months, from July 1 next at the following places, viz.:—Brisbane, 30,000gal.; Rockhampton, 6000gal.

## General.

CITY OF MELBOURNE. — 20th June.—S. and D. of 31 waterproof coats.

4th July.—S. and D. of one 15-ton pulley block.

15th July.—S., D., and E. of a steam or suction gas plant, for the City Council's quarries, Clifton Hill.

MUNICIPAL COUNCIL OF SYDNEY.—23rd June.—Three metal bodies for motor waggons. (See advertising columns.)

7th July.—Arc lamp carbons.

CITY OF TOOWOOMBA (Q.) (extended indefinitely from 1st March).—Following plant:—(1) S. and E. of pumping plant of 25,000 gallons per hour capacity; (2) 10in. cast iron water pipes; (3) valves, special castings, etc. Tenders must be in accordance with specifications and conditions of tenders, copies of which may be seen, and tender forms obtained, at the offices of the town clerk, Sydney, Melbourne, Brisbane, and Toowoomba.

TOWN OF NORTHCOTE (V.) (W. G. Swift, Town Clerk).—7th July.—S., D., and laying of underground electric cables.

TOWN OF PORT MELBOURNE (V.). (A. V. Heath, Town Clerk).—8th July.—S. and D. of a 10-ton steam roller, fitted with scarifier, under terms and conditions to be seen at the council offices, Town Hall, Port Melbourne.

SHIRE OF DUNDAS (V.) (C. H. Smith, Secretary, Hamilton, V.).—2nd July.—Road-making plant.

SHIRE OF WYCHEPROOF (V.)—Electric Supply Undertaking, Township of Sea Lake (G. B. Lincolne and J. K. MacDougall, 430 Little Collins-street, Melbourne).—5th July.—S., D., and E. of one suction gas engine and gas plant complete; S. and D. of electrical plant and equipment; E. of electrical plant and equipment; S. and D. of wires and cables; S. and D. of wood poles.

SHIRE OF WYCHEPROOF (V.).—Electric Supply Undertaking, Township of Wycheproof (G. B. Lincolne and J. K. MacDougall, 430 Little Collins-street, Melbourne).—5th July.—S., D., and E. of one suction gas engine and gas plant complete; S. and D. of electrical plant and equipment; E. of electrical plant and equipment; S. and D. of wires and cables; S. and D. of wood poles.

MARINE BOARD OF HOBART (J. Adams, Secretary).—24th June.—S. of oregon and deal timber and galvanised iron, etc.

CAIRNS HARBOUR BOARD (Q.) (T. R. Hall, Secretary).—26th June.—S. of a quantity of mild steel round bars.

MELBOURNE HARBOUR TRUST COMMISSIONERS (R. Rudd, Secretary). — 24th June.—S. of a motor launch.

MELBOURNE AND METROPOLITAN BOARD OF WORKS (Geo. A. Gibbs, Secretary).—27th June.—S. and D. of 10 tons of 3in. and 20 tons of 5in. C.I. pipes of Australian manufacture.

27th June.—S. and D. of 20 24in. C.I. hatch boxes, of Australian manufacture.

29th July.—S. and D., at the Metropolitan Farm, Werribee, of two steel wire plough ropes.

METROPOLITAN WATER AND SEWERAGE BOARD, Brisbane (Q.) (Geo. Johnston, Secretary). — 26th June.—S. and D. of 5000 water meters.

3rd July.—S. and D. of 50 tons of best soft pig lead, with the right to purchase an additional 50 tons.

31st July.—41,000 casks Portland cement, under contract No. 10, 1913; and 41,000 casks Portland cement, under contract No. 11, 1913.

MUNICIPAL TRAMWAYS TRUST, Adelaide (W. G. T. Goodman, Chief Engineer and General Manager.—1st July.—S. and D. of wooden poles. (See advertising columns.)

15th July.—M., S., and D. of steel rails.

29th July.—S. and D. of bonding material.

19th August.—M., S., and D. of steel poles. (See advertising columns.)

Specifications relating to the S. and D. of copper cable and wire may be obtained on application to W. G. T. Goodman, Engineer and Manager. Tenders will be invited at 48 hours' notice, at a later date, and specifications are now issued to facilitate prospective tenderers obtaining quotations. (See advertising columns.)

THE BROKEN HILL SOUTH S.M. CO. N.L. (F. C. Howard, Managing Director). — 27th June.—S. and D. of stores and mining requisites for the 12 months ending 31st July, 1914.

CHILLAGOE LTD. (C. L. Hewitt, Secretary, 39 Queen-street, Melbourne).—23rd June.—S. of stores required for the 12 months ending 31st July, 1914.

O.K. COPPER CO. N.L. (in liquidation) (Sidney Cornish, 23 Brookman's Building, Adelaide, S.A.)—21st July.—P. of large traction plant; also smelting, converter and mining plants, buildings, stores, etc., estimated to have cost £75,000, comprising engineering plants, 30-ton weighbridge, 4 Babcock boilers, also number of engines of mines, smelter and converter plants, air compressor, pumps of various descriptions; also 9 traction engines, number of trailers, together or separately; also large quantity of stores and sundries. The whole mine and plant as a going concern, or the mine, including all leases; the whole of the plant, in one lot; any article of machinery and plant separately. (See advertising columns.)

BENDIGONIA UNITED G.M. CO. N.L. (G. A. Petrie, Bendigo).—19th June.—P. of winding plant and accessories, complete.

AJAX NORTH CO. N.L. (W. M. Williams, Manager, London Bank Chambers, Ballarat).—23rd June.—S. of new or second-hand 10-head battery, complete, stamps not less than 1000 lb., suction gas plant, or steam engine, for battery, 2 Wilfley tables, rock-breaker, and two classifiers.

SWISS MOUNT QUARTZ MINING CO. N.L. (V.) (Wm. Lascelles, Manager, 90 William-street, Melbourne). — 25th June.—P. of the above mine, as a going concern, including all machinery, which comprises complete winding plant, and mining equipment, consising of horizontal engine, 18in. cylinder, 3ft. stroke, double drums, wire ropes; large Cornish galloway tube boiler, 26ft. x 6ft. 6in., poppet heads, smith's shop, tools, cages, tanks, trucks, etc.

SYDNEY MECHANICS' SCHOOL OF ARTS (N.S.W.) (W. M. Fairland, Secretary, 275a Pitt-street, Sydney).—30th June.—I. of electric light.

# ACCEPTED.

## Commonwealth.

POSTMASTER-GENERAL'S DEPARTMENT. Melbourne.—100 cords, 3 conductors, £5; 300 howlers, £180; 500 receivers, watch pattern, £77 1s. 8d.; 150 telephones, magneto, table pattern, £371 5s.—Western Electric Co. (Aust.) Ltd., Sydney.

200 common battery switchboards, cordless, for private branch exchanges, four lines, £1500; 75 common battery switchboards, cordless, six lines, £722 16s. 3d.; 25 common battery switchboards, cordless, ten lines, £365 12s. 6d. — J. Bartram and Son Pty. Ltd., Melbourne.

POSTMASTER-GENERAL'S DEPARTMENT, Brisbane.—50 balances, Salter's Family, No. 45, 7s. 11d. each—Edwards, Dunlop and Co., Brisbane.

200 pairs blocks, brass, 3½in., in pairs, 10s. 6d. each—The Forster Engineering Works, Brisbane.

72 boxes, cash, 10in. x 5¾in. x 3½in., 8s. 6d. each; 36 boxes, cash, 12in. x 6½in. x 3½in., 11s. each; 432 log-lines, Sinnet plaited, 1in., 12 fathoms long, 3s. 6d. each—Smellie and Co., Brisbane.

288 brushes, brass wire, for battery cleaning, 2s. each—C. Gordon and Co., Brisbane.

144 bush hooks, Collins and Co.'s, 3s. 11½d. each; 288 tomahawks, Collins and Co.'s, No. 1, Hunters' hatchets, 1s. 10¾d. each—Webster and Co., Brisbane.

72 pads, red rubber, 18in. x 12in. x 5-8in., 17s. each—The Dunlop Rubber Co., Brisbane.

200 draw tongs, 5s. 5d. each; 144 hand vices, 5½in., 1s. 8d. each—W. G. Watson and Co., Sydney.

6000 copper binders, for use with 100 lb. wire, £1 13s. 9d. per 1000; 22,000 copper binders, for use with 70 lb. wire, 19s. 6d. per 1000—The Lawrence and Hanson Electrical Co. Ltd., Sydney.

3000 jointing sleeves, for use with H.D. copper wire 138 mils in diameter, £4 4s. per 1000; 5000 jointing sleeves, for use with H.D. copper wire 113 mils. in diameter, £3 16s. per 1000—Brabant and Co., Brisbane.

12,000 copper tapes, for use with 200 lb. wire, £11 (lump sum); 6000 copper tapes, for use with 100 lb. wire, £2 9s. 3d. (lump sum); 22,000 copper tapes, for use with 70 lb. wire, £9 0s. 9d. (lump sum)—The Australian Metal Co. Ltd., Melbourne.

160 waterproofs, with capes, £1 16s. each—Thos. Brown and Sons Ltd., Brisbane.

DEFENCE DEPARTMENT. — Military Forces of the Commonwealth.—Contracts for the supply of medical equipment. — 340 bottles, water, copper, tinned (for medical companions and surgical haversacks), complete, 9s. each—A. G. Way, Melbourne.

20 boxes, field fracture, complete with contents, with lock and two keys, £14 each; 39 boxes, reserve dressing, complete with contents, £3 16s. 6d. each—Elliott Bros. Ltd., Sydney.

41 cases, water analysis, complete with contents, with lock and two keys, but without the two detachable supporting straps, £3 6s. 10d. each—Burroughs, Wellcome and Co., 481 Kent-street, Sydney.

81 companions, medical, complete with contents, £6 5s. each; 254 haversacks, surgical, complete with contents, £2 8s. 6d. each; 84 pairs panniers, field, medical, Nos. 1 and 2, complete with contents, with padlock and two keys, £38 per pair; 33 pairs panniers, field, surgical, Nos. 1 and 2, complete with contents, with padlock and two keys, £52 per pair—Elliott Bros. Ltd., O'Connell-street, Sydney.

## Victoria.

VICTORIAN RAILWAYS.—P. of a quantity of Bamber zincs, £169 6s. 8d.—Eyre Smelting Co.

P. of a quantity of "Duval's" metallic packing, £63 15s.—David Nield.

PUBLIC WORKS DEPARTMENT.—Electric tram car trolley, wire brackets, insulators, bends, etc., to the Sanatorium, Cheltenham, £7 17s. 2d.—Weymouth and Co. Pty. Ltd.

Piles in connection with the establishment of ship-building yards, Williamstown, £331—Melbourne Harbour Trust.

Mild steel girders, etc., for bridges at Dandenong-road and Smith-street, Caulfield (Caulfield line duplication), £7986—Johns and Waygood Ltd.

Brake reservoirs for "A2" and "DD" classes of engines—Item No. 1, brake reservoirs, "A2" class, finished, at £6 12s. 8d. each, complete to drawing; item No. 2, brake reservoirs, "DD" class, finished, at £6 17s. 6d. each, complete to drawing—The Austral Otis Engineering Co. Ltd.

Forgings for 250 "I" class trucks—Shunting hooks, at 3s. 11½d. each; door hinges, short, new pattern, at 2s. 11½d. each—Trembath and Co.

Greyish-white arsenic, at £13 18s. 6d. per ton—Robert Bryce and Co. Pty. Ltd.

MINES DEPARTMENT. — 4000ft. of solid drawn steel tubes, 2⅞in. outside diameter, 2⅛in. inside diameter, in 16ft. lengths, not screwed, 2s. 2d. per foot—The Goldfields Diamond Drilling Co. Ltd.

## South Australia.

SUPPLY AND TENDER BOARD. — 65 tons arsenic, 85 per cent. pure, £9 15s. per ton—Gibbs, Bright and Co. (for Messrs. Edwards and Co.).

200 nests spiral bearing springs (drawing 9501), 9s. 3d. each—The Federal Spring Works.

48,000gal. castor oil, 3s. 2⅝d. per gallon—Geo. Wills and Co.

60,000gal. axle oil, 1s. 4¼d. per gallon — Vacuum Oil Co. Pty. Ltd.

44,000gal. cylinder oil, 1s. 8 6-10d. per gallon —Charles Atkins and Co. Ltd.

1800 flat brackets, £3 6s. 8d. per 100—Samuel Perry.

1800 G.I. insulator pins, £2 5s. 3¾d. per 100—A. Simpson and Son.

200 tons 1in. metal, 8s. 6d. per ton — John Dunstan and Sons Ltd.

(Continued on page 524.)

## Commonwealth of Australia.

### SWITCHGEAR FOR POWER HOUSE, CANBERRA, FEDERAL TERRITORY.

**TENDERS** are invited, returnable on Monday, 1st September, 1913, for the supply of the above, as follows.—

Section 1.—Main Power House Switchgear.
Section 2.—Switchgear for Diesel Engine Plant.

Tenders are to be addressed to "The Secretary, Department of Home Affairs, Russell-street, Melbourne," and endorsed, "Tender for Switchgear for Power House, Canberra."

Specifications, conditions and tender forms may be obtained at the following offices:—(1) The Works Director for New South Wales, Customs House, Sydney; and (2) The Works Director for Victoria, 151 Collins-street, Melbourne.

No tender will necessarily be accepted.

KING O'MALLEY,
Minister of State for Home Affairs.

---

### PORT AUGUSTA TO OODNADATTA RAILWAY.

TENDERS, addressed to the Secretary, Department of External Affairs, Melbourne, will be received up to 11 a.m. on Tuesday, 22nd July, 1913, for the Manufacture, Supply and Delivery of 4 Wheel Brake Vans (3ft. 6in. gauge).

Drawings, specifications, etc., will be on view on and after 24th June, 1913, at the undermentioned offices:—

Commonwealth Railways, 84 William street, Melbourne.
Commonwealth Works Director, Customs House, Sydney, and
Commonwealth Works Registrars, Brisbane, Adelaide, Perth, and Hobart.

The charge for each copy of specification will be £1 1s., and for each plan 5s., which must be paid before the documents can be issued.

Tenders are to be endorsed "Tender for 4 Wheel Brake Vans," and are to be accompanied by the deposit mentioned in the Form of Tender.

JOSIAH THOMAS,
Minister of State for External Affairs.

---

### ROYAL AUSTRALIAN NAVY.

TENDERS are invited for the PURCHASE of a 5in FOOT TREADLE LATHE, from the R.A.N. Depot, Williamstown.

The Lathe may be inspected, and further particulars obtained on application to the Naval Store Officer.

Tenders will be received until noon, the 21st June, 1913, and are to be addressed to the Naval Store Officer, Naval Depot, Williamstown.

WILLIAM BURROWS,
Commander.

---

Department of Defence,
Melbourne, June 17, 1913.

### MILITARY FORCES OF THE COMMONWEALTH.

TENDERS are invited for the undermentioned supplies:—

On TUESDAY, JUNE 24, 1913.

Engineering Equipment and Stores for the Government Small Arms Factory, Lithgow, New South Wales. (Electric Motors, Tools, Pulleys, Castings, Grinding Wheels, Saws, Band and Circular, Steel, Die Blocks, Drill Rods, **Shafting and Rubber Tyres.**)

On FRIDAY, JUNE 27, 1913.

Chemicals for the Commonwealth Cordite Factory. (Acids Sulphuric, Acetone, Nitrate of Soda, Soda Ash and Glycerine.)

Tenders will be received until 3 o'clock p.m. on the date shown, at the office of—

The Superintendent of Contracts, Department of Defence, Victoria Barracks, Melbourne;
The Senior Ordnance Officer, Ordnance Stores, Circular Quay, Sydney;
The Senior Ordnance Officer, Ordnance Stores, Petrie Terrace, Brisbane;
The Senior Ordnance Officer, Ordnance Stores, Adelaide;
The Senior Ordnance Officer, Ordnance Stores, Perth;
The Senior Ordnance Officer, Ordnance Stores, Hobart.

Tender forms, specifications, and all information may be obtained at the offices of the above-mentioned Senior Ordnance Officers, and at the office of the Senior Ordnance Officer, Victoria Barracks, Melbourne.

The lowest or any tender will not necessarily be accepted.

G. F. PEARCE,
Minister of State for Defence.

---

## Government Notices (V.).

### VICTORIAN RAILWAYS.

### ELECTRIFICATION OF MELBOURNE SUBURBAN RAILWAYS.

SEPARATE TENDERS are invited for the following plant in connection with the Electrification of the Suburban Railways:—(a) Circulating Water and Sump Pumps with Motors; (b) Air and Water Extraction Pumps, and Motors; (c) Surface Condensers, Hot-wells, Piping and Sundries. Specifications and forms of tender for each section can be obtained at the Contractors' Room, Railway Offices, Spencer-street, Melbourne, and at the Office of the Agent-General for Victoria in London (where tenders will also be received).

For any further information, application should be made to the Consulting Engineers, Messrs. Merz and McLellan, 32 Victoria-street, Westminster, London, S.W., or the Acting-Secretary for Railways, Melbourne. Tenders may be submitted for any or all of the above sections.

The charge for each specification is £5 5s. for the first copy, and £2 2s. for each further copy; and the sums paid will be refunded on receipt of bona fide tenders.

Tenders, endorsed "Tender for Electrification of Melbourne Suburban Railways," must be lodged in the Tender Box, Railway Offices, Melbourne, or at the Office of the Agent-General for Victoria, in London, at or before 11 a.m., on Monday, 4th August, 1913.

No tender will necessarily be accepted, and ample security will be required from the successful tenderers.

E. B. JONES,
Acting-Secretary for Railways.

---

### VICTORIAN RAILWAYS COMMISSIONERS.

### STATE COAL MINES.

### MOTORS, ETC.

**Tenders (endorsed "Tender for Motors"), to be addressed to the General Manager, State Coal Mines, Wonthaggi, and delivered at his office at** Wonthaggi, not later than 12 noon of 2nd JULY, **are invited for the Supply of Two (2) 75h.p. D.C. Motors, etc., P.D., £5. Particulars and forms of tender, at the Melbourne office of the State Coal Mines, Robb's Buildings, Collins-street, and** at the office of the General Manager, Wonthaggi.

### ELECTRICAL EQUIPMENT.

**Tenders (endorsed "Tender for Electrical Equipment")**, to be addressed to the General Manager, State Coal Mines, Wonthaggi, and delivered at his office at Wonthaggi, not later than 12 noon of 13th AUGUST, are invited for the Supply of **Electrical Equipment for McBride Tunnel; P.D., £50. Particulars and forms of tender, at the** Melbourne office of the State Coal Mines, Robb's Buildings, Collins-street, and at the office of the General Manager, Wonthaggi.

**No tender will necessarily be accepted.**

G. H. BROOME,
General Manager.

---

### EXAMINATION OF MINING MANAGERS AND OTHERS.

An examination of persons desirous of obtaining certificates as Mining Managers or Under Managers of Coal Mines, Mining Managers (first or second class) of Metalliferous Mines, Underground Foremen, Battery Managers, Cyanide Works Managers, or Chlorination Works Managers will be held in Melbourne in August next.

Applications should be lodged at this office before the 4th July. Forms of application and copies of the regulations may be obtained at this office.

R. U. BIRRELL,
Secretary to the Board of Examiners.

Office of Mines,
Melbourne, June 16, 1913.

---

## MUNICIPAL COUNCIL OF SYDNEY.

### TO CONTRACTORS.

SEALED and ENDORSED TENDERS will be received by the undersigned until 3 o'clock p.m. on MONDAY, the 23rd JUNE, 1913, for the SUPPLY and DELIVERY of THREE METAL BODIES for MOTOR WAGGONS.

Copies of specifications, etc., may be seen or obtained upon application at the Office of the Chief Inspector of City Cleansing, Town Hall, Sydney.

The lowest or any tender not necessarily accepted.

TENDERERS, please note that they must pay their CASH DEPOSITS direct into the City Treasury, and NOT enclose same with their tenders otherwise their tenders will be rejected as INFORMAL.

THOMAS H. NESBITT,
Town Clerk.

Town Hall, Sydney,
13th June, 1913.

---

## MUNICIPALITY OF ALBURY.

### LOAN FOR ELECTRICITY WORKS.
Under LOCAL GOVERNMENT ACT 1906-7-8.

£10,500, at 4½ PER CENT. PER ANNUM, in £50 DEBENTURES.

TENDERS will be received at the Town Hall, Albury, for the whole or any portion of the above Loan, up to 4 p.m. on 1st July, 1913.

No tender below par will be entertained.

Prospectus, stating conditions of retirement of debentures, etc., and tender forms may be obtained on application.

A. R. DORE, Town Clerk.

Town Hall, Albury, June 6, 1913.

---

## MUNICIPALITY OF CORAKI.

### TENDERS FOR LOAN.

TENDERS are invited for a Loan of £3000 for Electric Lighting Purposes.

Full particulars on application to the Town Clerk, Council Chambers, Coraki.

C. E. HAWTIN, Town Clerk.

---

## CITY OF ROCKHAMPTON.

Applications are invited from Qualified Engineers for the position of City Engineer to the Council of the City of Rockhampton, at a Salary of £1000 per annum.

Each applicant is to state his age, and supply full particulars as to his qualifications and experience, and to furnish certified copies of his certificates and testimonials, also when he will be prepared to enter upon his duties.

It is the intention of the Council to make application to the Government for a loan of £125,000 to £150,000, for the purpose of a new water supply scheme for the city, and if such application be granted, the City Engineer will, in addition to the general duties of his office, be required to prepare the necessary drawings, specifications and estimates for the intended scheme, and to superintend the same during its execution.

Applications to be forwarded to the undersigned on or before 16th July, 1913, and endorsed "Applications for Position of City Engineer." A copy of the proposed agreement to be entered into may be had on application to the Town Clerk.

Dated this seventh day of June, 1913.

W. T. DEAN,
Town Clerk.

---

## FOR SALE BY TENDER.

LARGE TRACTION PLANT, also SMELTING, CONVERTER and MINING PLANTS, BUILDINGS, STORES, etc., estimated to have cost £75,000, comprising:—Engineering Plants, 30-ton Weighbridge, 4 Babcocks Boilers, also number of Engines of Mines, Smelter and Converter Plants; Air Compressor, Pumps of various descriptions; also 9 Traction Engines, number of Trailers, together or separately. Also large quantity of Stores and Sundries. Full schedule obtainable from BURNS, PHILP and CO., Sydney, Brisbane, Townsville, Cairns, or Charters Towers, or from the undersigned.

Also the whole of the BUILDINGS and MINERAL LEASES of the O.K. Copper Co. N.L. (in liquidation), situated at O.K., North Queensland.

Tenders are invited for:—(1) The whole Mine and Plant as a going concern; or (2) the Mine, including all Leases; (3) the whole of the Plant in one lot; (4) any Article of Machinery and Plant separately.

Tenders close 4 o'clock, July 21st, 1913. No tender necessarily accepted.

SIDNEY CORNISH (for Liquidators).
23 Brookman's Building, Adelaide.

## SHIRE OF WYCHEPROOF.

### ELECTRIC SUPPLY UNDERTAKING.

### TOWNSHIP OF SEA LAKE.

TENDERS are hereby invited for the undermentioned WORKS:—(G) Supply, Delivery, and Erection of One Suction Gas Engine and Gas Plant, complete; (H) Supply and Delivery of Electrical Plant and Equipment; (J) Erection of Electrical Plant and Equipment; (K) Supply and Delivery of Wires and Cables; (L) Supply and Delivery of Wood Poles.

Specifications on view at the office of the consulting engineers, Messrs. G. B. Lincolne and J. K. Macdougall, 430 Little Collins-street, Melbourne, from whom copies may be obtained on payment of 10s. 6d. per set, returnable on receipt of a bona fide tender. Specifications also on view at the office of the undersigned, to whom tenders are returnable not later than midday, Saturday, 5th July, 1913.

A. E. STEWART,
Shire Hall, Wycheproof. Shire Secretary.

## SHIRE OF WYCHEPROOF.

### ELECTRIC SUPPLY UNDERTAKING.

### TOWNSHIP OF WYCHEPROOF.

TENDERS are hereby invited for the undermentioned WORKS: (A and B) Supply, Delivery and Erection of One Suction Gas Engine and Gas Plant, complete; (C) Supply and Delivery of Electrical Plant and Equipment; (D) Erection of Electrical Plant and Equipment; (E) Supply and Delivery of Wires and Cables; (F) Supply and Delivery of Wood Poles.

Specifications on view at the office of the consulting engineers, Messrs. G. B. Lincolne and J. K. Macdougall, 430 Little Collins-street, Melbourne, from whom copies may be obtained on payment of 10s. 6d. per set, returnable on receipt of a bona fide tender. Specifications also on view at the office of the undersigned, to whom tenders are returnable not later than midday, Saturday, 5th July, 1913.

A. E. STEWART,
**Shire Hall, Wycheproof.** **Shire Secretary.**

## TOWN OF PORT MELBOURNE.

**TENDERS are invited until 4 p.m. on Tuesday,** July 8, 1913, for SUPPLY and DELIVERY of a 10-TON STEAM ROLLER, fitted with scarifier, under terms and conditions to be seen at the Council **Offices, Town Hall, Port Melbourne.**

Preliminary deposit to accompany tender, 1 per **cent. The lowest or any tender not necessarily accepted. Tenders to be addressed to the mayor, endorsed on the cover "Tender for Steam Roller** and Scarifier."

A. V. HEATH, Town Clerk.

## JUNCTION NORTH BROKEN HILL MINE, NO LIABILITY.

**TENDERS are hereby invited for the Supply of Mining Stores for twelve months, commencing 1st August next.** Schedules are obtainable from the Company's offices at Sydney, Melbourne, or Broken **Hill, and should be received by the Broken Hill office not later than 12th July, 1913.**

T. H. PALMER,
General Manager.

## LETTERS PATENT.

FURTHER NOTICE IS HEREBY GIVEN that **the Patentees of Australian Letters Patent No. 16585/09, dated Dec. 13, 1909, for "Improvements** relating to the separation of substances by the wet magnetic process," are prepared to satisfy any **demands and all requirements of the public respecting the said invention. Applications will also be received for the issuance of licenses. Further** information and particulars, including drawings and specifications, are obtainable from EDWARD WATERS & SONS, Patent Attorneys, 414-418 Col**lins-st., Melbourne, and 7 Moore-st., Sydney.**

**TENDERS are invited for the PURCHASE or** WORKING on ROYALTY of the Trumble Refining Co.'s "PROCESS and APPARATUS for the EVAPORATION of LIQUIDS," covered by Commonwealth **Letters Patent No. 1788, of 12th July, 1911. The company will dispose of their whole or part interest in the patent, or will grant licenses to work the same to fulfil the full requirements of the public.**

Address, c/o Phillips, Ormonde & Co., Patent Attorneys, Lombard Bldgs., 17 Queen-st., Melb.

## ALFRED RONALDS.

**Will the relatives and friends of the late Alfred Ronalds (author of Ronalds' "Fly-Fisher's Entomology") please** communicate with—

Critchley Parker,
"Mining Standard,"
Melbourne or Sydney.

## BOURKE'S HILL TIN SLUICING Co., No Liability, Emmaville (N.S.W.).

A DIVIDEND (the 11th) of Sixpence per share has been declared in the above Company, PAYABLE at the registered office, 125 Queen-street, Melbourne, on Tuesday, 24th June, 1913. Share Register will be closed from 18th to 24th June.

**JAMES MACKAY, Manager.**

## TONGKAH COMPOUND, N.L.

Puket, Siam.

Notice is hereby given that the Half-yearly Ordinary General Meeting of shareholders in the above Company will be held at the registered office **of the Company, National Mutual Bldgs., 395 Col**lins-st., Melbourne, on Monday, June 23, 1913, at 2.30 p.m. Business: To receive and adopt balance-sheet and reports; to transact any other general business. By order of the Board,

E. J. KENNEDY, Manager.

## THE PRIMROSE MINING CO., No Liability.

### NOTICE OF EXTRAORDINARY MEETING.

I HEREBY GIVE NOTICE that an Extraor**dinary Meeting of the Shareholders in the above**-named Company will be held at the Stock Exchange, Cameron-street, Launceston, on WEDNESDAY, the 25th day of June, 1913, at 8 o'clock p.m., to consider, and if deemed desirable, to pass, all or any of the following resolutions, **with or without modification:—**

1. That the action of the Directors in giving Mr. E. A. Weinberg an option to purchase the Mine and Plant of the Company upon the terms contained in Telegrams between **this Company, the Hercules Company, and** Mr. Weinberg, dated 10th May, 13th May, 14th May, 16th May, and 23rd May, 1913 (copies of which can be seen at the office of the Company), be and the same is hereby confirmed.
2. That the Directors be and are hereby authorised to modify the terms of the abovementioned option in any way that they may think fit in the interests of the Company.
3. **That the Minutes of the Meeting be and the same are hereby confirmed.**

Dated this 5th day of June, 1913.

AUG. SIMSON,
Manager.

## THE HERCULES GOLD AND SILVER MINING CO., NO LIABILITY.

### NOTICE OF SPECIAL MEETING.

I HEREBY GIVE NOTICE that a Special **Meeting of the Shareholders in the above-named** Company will be held at the Stock Exchange, Cameron-street, Launceston, on TUESDAY, the **24th day of June, 1913, at 8 o'clock p.m., to consider, and, if deemed desirable, pass all or any of the following resolutions with or without modi**fication:—

1. That the action of the Directors in giving **Mr. E. A. Weinberg an option to purchase** the mine property and effects of the Com**pany, subject to the debts and liabilities of** the Company (if any) upon the terms contained in telegrams between the Company **and Mr. Weinberg, dated 10th May, 14th** May, 16th May, and 23rd May, 1913 **(copies of which can be seen at the office** of the Company) be and the same is hereby **confirmed.**
2. **That the Directors be and are hereby authorised to modify the terms of the option in any way they may think fit in the interests of the Company.**
3. That the Minutes of the Meeting be and **the same are hereby confirmed.**

**Dated this fifth day of June, 1913.**

W. CHISHOLM INGLIS,
**Manager.**

## BANK CLEARINGS.

**The Melbourne Clearing House reports as follows for the week ended June 16:—**

| | | |
|---|---|---|
| Total clearance | | £5,590,219 |
| **Settled by certificates** | **£539,500** | |
| **Settled in coin** | **167,191** | |
| | | £706,691 |
| **Total clearance for the corresponding** week of 1912 | | £5,908,857 |

**The St. Kilda (V.) Council has notified the** Brighton Council **that arrangements have been made for the two Councils to confer this week on the** proposal **to approach the Railways Com**missioners with a view to the Brighton-St. Kilda **electric railway being handed over to the municipalities.**

(Continued from page 522.)

200 tons 1½in. metal, 8s. 6d. per ton—John Dunstan and Sons Ltd.

### Western Australia.

RAILWAY DEPARTMENT. — Brass boiler tubes, £84 3s. 6d. per ton—Wm. Adams and Co. Ltd.

WATER SUPPLY DEPARTMENT. — C.I. meter covers, item 767, 7s. 6d. each—G. Kent Ltd.

### General.

TOWN OF GAWLER (S.A.).—Contract No. 9—Transformers and lightning arresters, £85 16s.—Australian Metal Co. Ltd.

Switchboard panel, complete, with instruments, £61 12s.—H. Rowe and Co.

Time switch, consumers' meters, insulators and street brackets, £142 2s.—Wm. McLean and Co.

Service cut-outs and links, £13 15s. 10d.—W. T. Henley's Telegraph Works Co. Ltd.

Contract No. 10—Aluminium cable, £142 6s. 3d.—Todd and Samuel (agents for British Insulated Helsby Cables Ltd.).

Contract No. 12—Erection of electrical equipment, £281 17s.—Wm. McLean and Co.

Contract No. 11—For supply of poles, held over for further consideration.

METROPOLITAN FIRE BRIGADE BOARD, MELBOURNE (V.). (F. J. Gomm, Secretary).—100 fire alarms and telephones, in boxes, complete, at rates—Davies, Shephard and Co.

## DIVIDENDS OF MINING COMPANIES.

The following dividends and bonuses of mining companies in Australia have been declared and are payable on the dates mentioned:—

### June.

19th.—South New Moon, 1s., £1600.
19th.—Great Southern, 6d., £900.
19th.—Carlisle, 6d., £900.
24th.—Bourke's Hill, 6d., £1125.
24th.—Burnt Creek, 6d., £900.
24th.—Sons of Gwalia, 1s. (less I.T.), £17,500.
24th.—Great Boulder, 9d., £56,250.
25th. — Broken Hill Block 10, 1s. and 1s. bonus, £10,000.
26th.—Zinc Corporation, 1s. 6d. (ord. and pref.), £89,882.
26th.—North Broken Hill, 2s., £60,000.
27th.—Broken Hill South, 6s., £60,000.

### July.

2nd.—Ajax Central, 1s., £1500.
2nd.—Sulphide Corporation, 1s. 6d. ordy. and 2s. pref. (less British I.T.), £96,250.
4th.—Broken Hill Water, 1s. 6d., £15,000.
5th.—Kalgurli, 4s. (less British I.T.).
18th.—Williams' Fancy, 1s., £1200.
McGregor-Cloucurry (final £18 18s. 4d. per 100 shares).

## PAPUAN OIL.

Speaking as to oil prospects in Papua, Mr. S. G. McDonnel, who is a trader at Orkolo, some twenty miles from the bore on the Vailala River, states that "those who have to do with the boring are keeping very quiet as to results," he said, "though why there should be any secrecy goodness only knows. We know that oil has been struck all right, for Mr. Staniforth Smith has been showing samples of it at Port Moresby, and we understand that the flow is a good one. They came upon the oil before reservoirs had been constructed to hold it. If things turn out the way we all hope and believe, there should be great activity presently. We know for certain that the oil fields extend from the Vailala to the Purari River, a stretch of about 20 miles, and it is said that there are strong indications of oil at Kerema, which is 50 miles distant from the Purari. There should therefore be a great many bores put down, and this will mean a big accession to our white population. The climate, however, is not too good. It is an awful place for mosquitoes, and there is a lot of blackwater fever about, as well as malaria. There will, I am afraid, be a pretty rough time ahead of those who go there till the swamps get drained and the country cleared. The climate is very humid; though the locality in which they are boring at present is fairly healthy. The natives were increasing in numbers. Though there would never be any great anxiety on the part of the Papuan to hire himself out to white employers, he thought the labour problem would work out all right in time. The natives did not mind working for two or three days, but they had not got accustomed yet to sustained work."

## THE NAVAL DOCKYARDS.

Garden Island, Sydney, which has long been dedicated to the use of the Imperial Naval authorities on condition that Sydney was to be the head naval station in Australasia, is being vacated by the Imperial authorities at the end of this month, and the site, therefore, reverts to the State. Cockatoo Island has already been transferred to the Commonwealth.

Arrangements have been completed for the transfer from the State to the Commonwealth of Garden Island, Admiralty House, the Naval Victualling Stores, Spectacle Island, and "Tresco," Elizabeth Bay. The value agreed upon is £613,000. These properties will become a portion of the "transferred properties," on which the Commonwealth will pay interest at 3½ per cent from July 1 next.

In fixing the value of Fitzroy Dock, Mr. Davis and Colonel Miller assessed the property at £867,716, so that the State will receive in future something over £50,000 a year from the Commonwealth. Besides this, the naval authorities have agreed to pay to the New South Wales Government a sum of £67,000 in cash, as representing the value of the labour and material put into the warships up to the date of the taking over of Fitzroy Dock by the Commonwealth, and stores also taken over by the Federal authorities.

Mr. Griffith, N.S.W. Minister for Works, expressed himself as highly pleased with the fair and reasonable attitude adopted by the representatives of the Commonwealth during these transactions, and still more so at the fact that this arrangement fixes the principal naval workshops for the Commonwealth for all time in Sydney.

Last week the sale at Garden Island had a special significance, being the last that will be held under instructions from the Imperial authorities. The auctioneer submitted a variety of articles, including scrap iron, surgical instruments, boats, cutters, gigs, whalers, brass, copper, iron, shovels, carpets, matting, electric cables and fittings, engineering tools, furniture, and hundreds of other articles, valued at several thousands of pounds. Everything was carried out in accordance with the rules of the navy. The Customs authorities also took a hand. Garden Island is at the present time outside the Commonwealth, and consequently purchasers of goods were called upon to pay from 5 to 10 per cent. duty on dutiable goods before they were allowed to land them in Sydney.

## N.S.W. PIPE CONTRACT.

The three-cornered squabble between the N.S.W. Minister for Works, the N.S.W. Water and Sewerage Board, and G. and C. Hoskins Ltd., which threatened to have a very detrimental bearing on the operations of the board, has now been ended by the Minister approving of the board's acceptance of the firm's tender for the supply of cast-iron pipes, and special castings, for a period of four years, at the schedule of prices submitted; chargeable to "Expenditure Suspense Account for General Reticulation, etc., Mains." When the Minister's approval was made known, the members of the board expressed their approval by a succession of "Hear, hears," Mr. Barlow remarking "No water famine now."

The following maximum quantities of pipes and special castings will be required per annum during the currency of the contract:—3in. spigot and socket pipes, 50 tons per annum; 4in., 2600 tons; 6in., 2020 tons; 8in., 670 tons; 9in., 120 tons; 10in., 920 tons; 12in., 1200 tons; 15in., 391 tons; 18in., 451 tons; 20in., 4400 tons; 22in., 1512 tons; 24in., 3608 tons: 30in., 3457 tons; 36in., 5179 tons; 42in., 330 tons; 48in., 2200 tons. The contract provides that the whole of the pipes and special castings shall be cast and completed at the works of the contractor, which shall be situated in New South Wales. Messrs. G. and C. Hoskins Ltd. are now re-starting their Rhodes works.

## DAYLIGHT CINEMA.

There has been on exhibition during the week at the Glaciarium, Melbourne, a remarkable invention which is likely to revolutionise the cinematograph business. It is in the shape of a patent screen which allows of picture shows to be given in daylight, in a hall or in the open air. The darkness hitherto associated with cinematograph exhibitions may now be dispelled, and patrons may, with the lights full on, enjoy the latest creation under comfortable conditions, and in a healthy atmosphere. The association of darkness and crowded audiences is not quite a sanitary arrangement. The new screen, which comes from Germany, has been introduced to Australia by Messrs. Melde, Smith, and Co., 99 Queen-street, Melbourne, and is a simple arrangement which can be used with existing lanterns, the only difference being that the picture is projected from behind. Although the exhibition was seen under crude conditions, the pictures shown were remarkably clear, and gave a pleasing impression of action in sunlight, the scenes conveying to the eye a graphic idea of the living reality. A feature of the patent is that, by a simple stage manipulation, a "ghost" illusion can be introduced, the figures being shown as if performing on the stage, no screen being in evidence. This illusion can be heightened by the introduction of living artists who can speak and walk about among the cinematograph "ghosts."

As an advertising medium the screen should have an extensive role, while its uses for educational purposes, in schools and lecture rooms, are obvious. It is already largely used on the Continent, and no doubt will, when introduced to the Commonwealth public, be very popular. It should be added that the screen is weather and fire-proof.

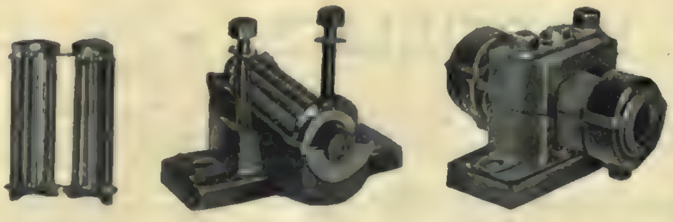
We know

THAT YOUR REQUIREMENTS DEMAND GOOD QUALITY, EFFICIENCY, AND ECONOMY.

"EDISWAN" SUPPLIES

ARE DESIGNED WITH EXPERT KNOWLEDGE, BEST MATERIAL AND WORKMANSHIP

THE
EDISON & SWAN
UNITED ELECTRIC LIGHT CO. LTD.,
SYDNEY. MELBOURNE. BRISBANE.



Be up-to-date

AND REMEMBER THAT THE INITIAL EXPENSE IS QUICKLY REPAID BY THE SAVING EFFECTED BY USING

KYNOCH
Roller Bearings,

THE BEARINGS THAT WILL GIVE YOU COMPLETE SATISFACTION.

LUBRICATION IS ENTIRELY AUTOMATIC.

Catalogues and Full Particulars from

KYNOCH LIMITED,

Manufacturers of Gas Engines, Suction Gas Plants, Explosives and Ammunition.

90 William Street,
MELBOURNE.

277 Clarence Street,
SYDNEY.

LIQUID FUEL for Diesel & all Crude Oil Engines.

"SHELL" SPIRIT, "SHELL" BENZINE, LUBRICATING OILS AND GREASES.

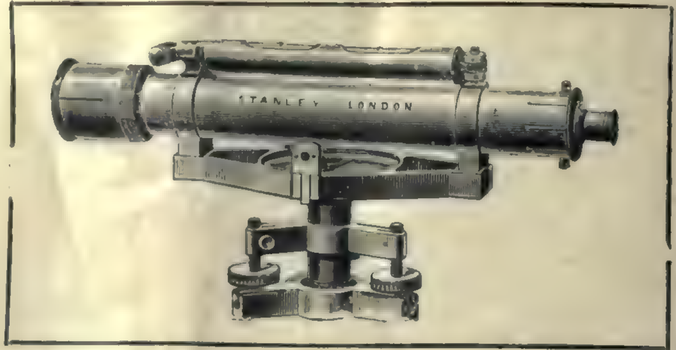
Prices and particulars on application to

THE BRITISH IMPERIAL OIL CO. LTD. Adelaide, Brisbane, Fremantle, Melbourne, Sydney and New Zealand

TRADE **STANLEY** MARK

Largest Manufacturers of Surveying and Drawing Instruments in the World.

Please send for our K.28 Catalogue. Postage Free, and Compare our Prices with those of other "first-class" makers.



**W. F. Stanley & Co.,**
—LIMITED.—
286 High Holborn, London, W.C.

SYMONS

PATENT DISC CRUSHER

SOLE MAKERS,

**HADFIELD'S - - LIMITED - - SHEFFIELD.**

1. IT IS THE ONLY CRUSHER that will take rejections (screened or unscreened) from standard crushers and reduce same rapidly at **one operation** to ¾-inch size and less.
2. IT IS THE ONLY CRUSHER that successfully reduces **wet or dry** gravel boulders mixed with sand to smaller product.
3. IT IS THE ONLY CRUSHER that can be quickly adjusted to make any standard size of product desired.
4. IT IS THE ONLY CRUSHER that **spreads** the stone while crushing it from a central feed opening, thereby avoiding congestion and choking.
5. IT IS THE ONLY CRUSHER that lubricates its own horizontal shaft bearings **in a bath of oil** without wasting it.
6. IT IS THE ONLY CRUSHER that reduces to small sizes without any grinding movement or undue wear.
7. IT IS **THE** CRUSHER that excels in output, in economy of power, in uniformity of product, and in low cost of maintenance.
8. All these important advantages are secured as the result of **a new crushing principle**, which is embodied in the Symons Disc Crusher.

**Fullest Information and Testimonials sent on Application to HADFIELD'S SOLE AGENTS, as under:—**

**Horrocks, Roxburgh Pty. Ltd.**
"Sheffield House," MELBOURNE.
Sole Agents for:—Victoria, South Australia, and Tasmania.

**J. B. Wallis & Co.**
Challis House, SYDNEY.
Agents for: New South Wales and Queensland.

**John J. Horrocks & Co. Ltd.**
Princes Building, PERTH.
Agents for:—Western Australia.

(Melbourne Address at 519 *Little Collins Street, corner of Church Lane, between King and William Streets.*)

ALWAYS RUNNING!

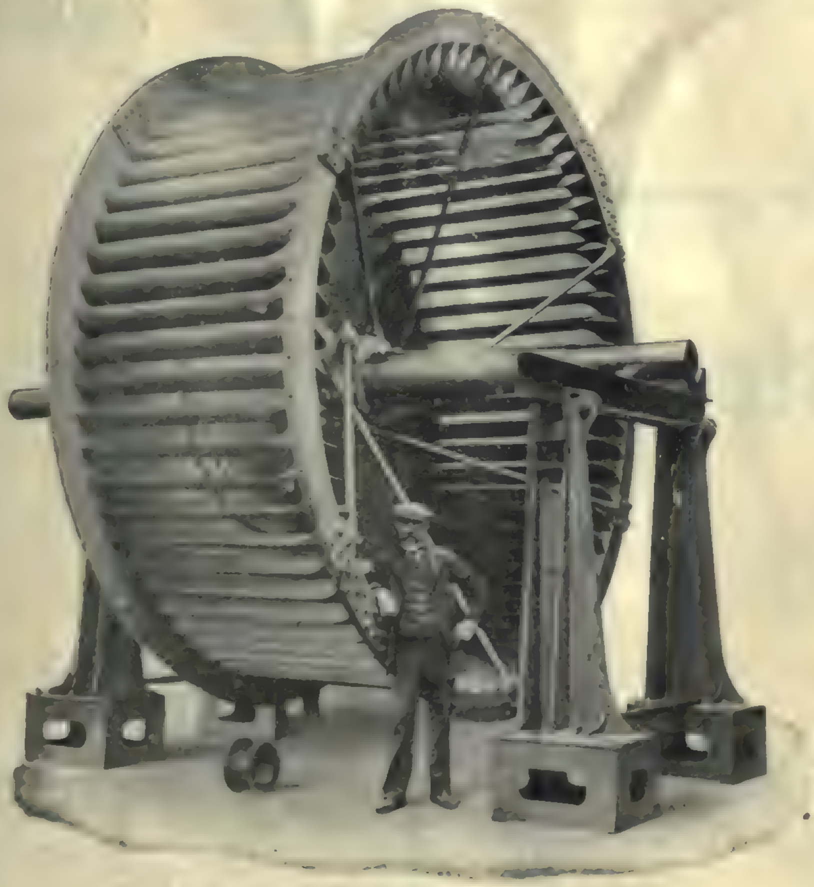
SMITH'S RED THREAD ROPES run night and day in Mines, Collieries, Aerial and Underground Cable Tramway systems., etc., all over the world. Owing to superiority in material and construction they

**Always "Finish" Last!**

Representative:—
B. K. MORTON PTY. LTD.,

Thos. and Wm. Smith, Ltd.,
Newcastle-on-Tyne, England.

512 Little Collins Street, Melbourne.
127 York Street, Sydney.



15 ft. Diameter Single Inlet Sirocco Mine Fan.

TRADE "Sirocco" MARK

MINE FANS

. . . ARE RELIABLE. . . .

Because they are liberally designed and substantially constructed of first-class material.

Our special Mine Fan Bearings have large Bearing Surfaces and Automatic Lubrication, thus ensuring satisfactory running for long periods without attention.

Write to the Sole Agents for Publication No. 1005.
"A Mine Fan in the Making."
It will interest you.
Posted on Request.

DAVIDSON and CO. LTD.
BELFAST, IRELAND.

SOLE AGENTS—

**Sydney:** Ferrier & Dickinson, 12 Spring Street.
**Perth:** Saunders & Stuart.
**New Zealand:** John Chambers & Son Ltd., Wellington.
**Adelaide:** Unbehaun & Johnstone, 100 Currie Street.
**Brisbane:** Engineering Supply Co. of Aust. Ltd.
**Melbourne:** Fyvie & Stewart, 362 Collins Street.

Everything for Mining

SUPPLIED BY US.

CANDLES,
EXPLOSIVES,
CHERSEN ROCK DRILLS,
WINDING ENGINES,
STONE CRUSHERS,
ROAD MAKING PLANT.

CARD CONCENTRATOR, Sole Manufacturers
DORR THICKENER,
DORR CLASSIFIER,
B and M TANKS,
TILGHMAN'S AIR COMPRESSORS.

QUARRY BARS.
WELL BORING PLANTS. BLOW OFF VALVES, ETC.

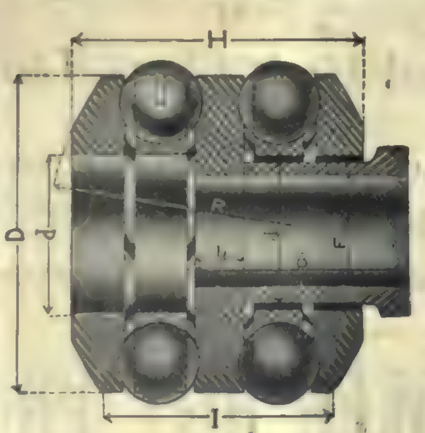
Agents in all CAPITAL CITIES of Commonwealth and NEW ZEALAND

N. GUTHRIDGE LTD.

Offices and Stores—SYDNEY and MELBOURNE.

S. K. F. BALL BEARINGS. .

A new system, being adopted by many factories and engineers for shafting, machines, fans, pumps, etc.



Saves up to 70 per cent. power, and use practically no lubricant.

Radial, Thrust, Double Thrust.

S.K.F. are self-aligning, thus overcoming the worst features of other bearings.

Swedish Diesel "Polar" Motors — the coming power.

General Electric Mfg. Co. of Sweden: Power Plants.

Motors, Dynamos, Transformers, Etc.

Dissolved Compressed Acetylene for Welding, Light, Etc.

Rewinding and all Electrical Repairs a speciality.

Jungner Indestructable Accumulators.

GARDNER, WAERN & CO.,
57 Queen Street, MELBOURNE.
334 Kent Street, SYDNEY.
*Stores and Showroom, 369 Flinders Street, Melbourne.*

"Allen's"

IMPERIAL

Manganese Steel

FOR

Dredging Pins and Bushes, and all Wearing Parts of
Rock-Crushing Machinery, Points, Crossings, Etc.

SOLE MAKERS OF

THE "STAG" TUBE MILL

For Grinding Grit, or Tailings, and Granular Materials,
to any degree of Fineness.

THE "STAG" BRAND OCTAGON MINING DRILL STEEL

EDGAR ALLEN & CO., LTD.,
Imperial Steel Works, SHEFFIELD.

Stocks on Hand
of
Mining and High Class Tool Steels.

AUSTRALIAN REPRESENTATIVES:
P. T. Taylor Ltd., 141 York Street, Sydney.

Established 1860.

Bondholders' Register

Publishes the Actual Numbers of all
Drawn Bonds Throughout the World.

PUBLISHED FORTNIGHTLY.

10s. PER ANNUM

73 Farrington St., LONDON, E.C.

Australian Offices,
376 Flinders Lane, MELBOURNE.

It is announced that the Verein fur die Bergbaulichen Interessen, im Oberbergsamtsbezirk, Dortmund, are offering a prize of £1250 for a miner's electric safety lamp possessing the following characteristics:—Explosion proof, even after having received a blow or damage; useable for 12 hours uninterruptedly; portable, strong, simple to control, economical; furnished with a gas indicator like the ordinary oil or benzine lamp; and giving a candle power of 1 c.p. after 12 hours' burning. Lamps must be sent in, with drawings and explanations in German, before October 1, 1915.

* * *

The "Electrical World" gives an account of a run of 310 miles from New York to Boston over the Hudson River and Boston and Albany routes which was successfully made on March 6 by a new Beach-Edison storage battery car. The trip was particularly interesting in that it demonstrated to representatives of steam railways, for which the run was made, that this type of self-propelled car can maintain high average speeds for distances considerably in excess of 100 miles. The car used was 50ft. long overall, 12ft. 6in. high and 8ft. 11in. wide, and weighed complete, with load, 34.6 tons. Seats were provided for 50 passengers, although on the trial run the car carried a combined load equivalent to 84 passengers. The electrical equipment of the car includes four 20 h.p. 220-volt motors and two sets of 230 cells, each of Edison A-8-H storage battery type and capable of delivering energy to the motors at approximately 240 volts. The route followed provided a variety of track conditions, including a long run on the level, several climbs and considerable curved track. The batteries were fully charged when the car left New York at 9 a.m., and the run of 114 miles to Hudson was made at an average schedule speed of 35 miles per hour. On arrival at Hudson the car climbed 1½ miles of 2 per cent. gradient before re-charging. The energy consumption for the level run of 114 miles was 37½ watt-hours per ton-mile. The car arrived at Springfield, Mass., 98 miles distant from Hudson, with about one-third of the charge left in the batteries, and this after having climbed the Berkshire Hills to an elevation of 1450ft. and negotiating many hills, including one continuous up-gradient of 1 per cent. for 8 miles. At Springfield the battery received a short boosting charge while the party had dinner. The remainder of the run, 98 miles, to Boston was covered without incident.

THE BROKEN HILL PROPRIETARY COMPANY LTD.

Smelters and Refiners.

TARIFF ON APPLICATION.

MANUFACTURERS OF:
SOFT PIG LEAD, FINE SILVER, ANTIMONIAL LEAD, COKE, SPELTER,
BLUEPOWDER (ZINC DUST), and SULPHURIC ACID.

Branch Offices—
LONDON, 3 Great Winchester-st., E.C.; ADELAIDE, Alfred Chbrs., Currie-st.; SYDNEY, Imperial Chbrs., O'Connell-st.

HEAD OFFICE.
Equitable Building, Collins Street, MELBOURNE.

## CONTENTS.

### JUNE 26.

EDITORIAL—
  The Marconi Scandals .. .. .. .. 525
  Uniform Gauge .. .. .. .. .. .. 526
Leaderettes .. .. .. .. .. .. .. 526
News and Notes .. .. .. .. .. .. 527
Personal .. .. .. .. .. .. .. .. 527
Victorian Dredging Inquiry .. .. .. 527
Metal Quotations .. .. .. .. .. .. 527
Mining in Queensland .. .. .. .. 527
Investor's Column—
  North Nuggety Ajax (V.) .. .. .. 528
  Golden Age (V.) .. .. .. .. .. 528
Our Big Mines .. .. .. .. .. .. 529
Mining in New South Wales .. .. .. 530
Victorian Mining Activities .. .. .. 531
Tasmanian Mining .. .. .. .. .. 532
Some Prominent Bendigo Mines (V.) 533
A Silver Find .. .. .. .. .. .. 534
Broken Hill Treatment Methods .. .. 534
Tailings Pumps and Wheels .. .. .. 535
Hope for Ballarat .. .. .. .. .. 535
Papuan Affairs .. .. .. .. .. .. 536
Mining in Western Australia .. .. .. 536
The Coal Mining Industry .. .. .. 536
Reports of Companies .. .. .. .. 536
The Vacant North .. .. .. .. .. 536
Tenders Invited and Accepted .. .. .. 540
Mineral Separation .. .. .. .. .. 544
Victorian Geology .. .. .. .. .. 545

### Engineering and Electrical Record.

Sydney City Council .. .. .. .. .. 537
Lithgow (N.S.W.) Industries .. .. .. 537
Cheaper Cable Rates .. .. .. .. .. 537
British and European Developments 538
Correspondence .. .. .. .. .. .. 539
Uniform Company Law .. .. .. .. 539
Miscellaneous .. .. .. .. .. .. 539

WELSBACH
WIRE LAMPS,
BRITISH MANUFACTURE.
SEND FOR CATALOGUE.
Welsbach Light Co. of Aust. Ltd.
302 Pitt Street, SYDNEY.
380 Lonsdale Street, MELBOURNE.
Creek Street, BRISBANE.
102 Victoria Street, WELLINGTON, N.Z.

FIRE. . BRICK
Our Products have proved their superiority.
FIRE CLAY GOODS For Every Purpose.
Darley Fire Bricks will withstand the most intense heat, and will not shrink. Our bricks are made near Bacchus Marsh, Victoria, and we supply all the States.
Specialities
High-Grade Firebricks & Retorts.
Prompt Delivery. For Prices, etc., write to—
DARLEY F. B. Co.,
Oliver's Lane, Flinders St. Melbourne

COKE!
NORTH BULLI COLLIERY
Limited
Supplies best quality hard
SOUTHERN
SMELTING COKE.
(Weekly output 1250 tons.)
H. G Hyde, Secretary
Royal Insurance Building, 10 Spring-street,
SYDNEY.

AUSTRALIAN MINING STANDARD.
Forwarded Post Free to any Address.
Australasia .. .. .. .. .. .. .. .. .. .. 26/- per
Abroad .. .. .. .. .. .. .. .. .. .. .. 30/- Annum.
Payable half-yearly or yearly, in advance.
All amounts should be made payable to order of "CRITCHLEY PARKER, Bank of Australasia."
12 O'Connell-street, Sydney. Tel. Central 2703.
376 Flinders-lane, Mebourne. Central 7931 & 1838.

**BACK NUMBERS OF THE "MINING STANDARD."**

The following is the rate for back copies more than a month old. Applications by post must be accompanied with cash and postage added. In no case can we guarantee to supply copies, as our storage accommodation is limited.

A postcard will be sent if the number required is out of print.

For copies three months old, ninepence; six month, one shilling; and beyond that period, one penny per month per copy.

As there is a regular demand for back copies of the "Mining Standard," newsagents are requested to send back all returns uncut and in good condition, otherwise they will not be accepted.

All Returns from Newsagents must reach us by the end of each month (the whole paper must be sent). No credit will be allowed beyond this term

Postage — British, 1d.; Foreign, 1½d.; Australasia, ½d. per copy.

Stamps will be accepted as pre-payment.

Address communications: Publishing Department, "Mining Standard."

**ALTERATION TO ADVERTISEMENTS.**

As our publishing arrangements necessitate the "Mining Standard" being issued simultaneously in Sydney, Melbourne and Adelaide on the same day each week, advertisers wishing to change their advertising matter must supply same ten days in advance of publication.

**CASUAL ADVERTISEMENTS.**

The rate for this class of advertisement is governed by the position it occupies.

If it appears on leader page or amongst or next to reading matter, the rate is 15s. per inch (nonpariel) per insertion.

Towards end of reading section, set in brevier, 16 ems width, 6s per inch per insertion.

If set in nonpariel the rate is 4s. per half inch.

**ADVERTISEMENT PROOFS.**

Proofs are submitted to advertisers in order to give them an opportunity of going over the advertisements before printing. Any alterations from the original copy will be charged for. Advertisers are specially requested to instruct their publicity departments, advertisement writers, etc., to give clear and definite instructions respecting changes of matter or new copy, to avoid incurring extra charges.

Advertising Copy must be typed and so arranged as to clearly indicate the display required for the more important features of the advertisement.

THE AUSTRALIAN MINING STANDARD.
ESTABLISHED 1888.
It is requested that all business communications be Addressed to Critchley Parker.
THURSDAY, JUNE 26, 1913.

## THE MARCONI SCANDALS.

The report of the Marconi Committee of the British Parliament was just what might have been expected. The findings of both the majority and the minority should carry little weight, because it is evident that in both cases the views enunciated were purely party views. The Liberal majority was very obviously determined to whitewash and to exonerate at all costs. The Unionist minority was equally obviously bent upon making the most of Ministerial indiscretions. The Chairman, Sir Albert Spicer, made a feeble attempt to be impartial, and stepped so far aside from the attitude of his Liberal colleagues as to put forward a report blaming Sir Rufus Isaacs for trafficking in the shares of the American Marconi Company, and also commenting unfavourably upon the reluctance shown by Ministers to make known the facts of their dealings. That is getting much nearer to an honest criticism of the position, than the finding of the majority which, apparently, the Chairman ultimately, for party reasons, signed; yet his original finding did not go a step further than what was called for. In fact, had he put party considerations aside, he would probably have spoken in much stronger terms than he did. It is satisfactory in this connection to note that the "Nation," the principal Liberal weekly of Great Britain, so far abandoned its ordinary party view as to acknowledge the mistake into which Ministers fell in trafficking in these shares, to express a hope that they would admit their fault, and to call upon Sir Rufus Isaacs "to shoulder the full burden of his error." Indeed, though the view put forward in the minority report was, as has been said, as much a party finding as that of the majority, it came very much closer to the truth. When the minority found that the Attorney-General "acted with grave impropriety in making an advantageous purchase upon advice which was not available to the public," that the Chancellor of the Exchequer and Lord Murray of Elibank were open to similar censure, and that the wireless agreement was "an essential factor of the whole structure of the Marconi Company's finance," it was stating a view that would seem right to every person who is not a partisan.

There are various considerations that make one regard with the gravest suspicion the conduct of one or two of the Ministers concerned. One is the fact that they never made a clean breast of their transactions until a confession was forced from them. The excuse put forward, that they held the American Marconi Company to have nothing whatever to do with the English Marconi Company, is too weak to be taken seriously; and our wonder is not that the Unionist press made so much of the peculiar circumstances as that it made so little. It was almost as eager as the Liberal press to declare that there had been no hint of corruption in the action taken by the Ministers concerned, and the finding of the Committee was hailed by the press on the Liberal side as a complete vindication of their party leaders. It may well be doubted if they thought so in their hearts. It was not so very many years ago that it was not considered a wonderful compliment to declare a British Minister of the Crown to be free from corruption; he was expected to be so. To laud him for not accepting open bribes is about as foolish as it would be to congratulate a business man on not being a burglar. It is to be feared that the attitude of the vindicators of Mr. Lloyd George and Sir Rufus Isaacs is a quite sufficient indication that a much lower standard of perfection is now required for British Ministers than used to be required only a few short years ago.

A second very unpleasant feature of the enquiry was the unreadiness shown by all those whose regrettable actions had practically placed them upon their trial to admit that they had in any way done wrong. Had Mr. Lloyd George, for example, made a frank admission that he had acted without due consideration, his explanation would probably have been accepted, and he would have left the inquiry "without a stain on his character." Instead of that, he sought to bluff his critics off with what was an obviously absurd explanation of his conduct. He had the almost appalling effrontery to declare that he regarded his transaction in American Marconis as an investment, and this in face of the fact that he held portion of the stock only three days, selling out at a handsome profit, and that the purchase was not made with his own money, but with money which was advanced to him for the purpose by his broker. Any plain-minded person acquainted with Stock Exchange dealings would say that Mr. Lloyd George was simply speculating on a rise; but Mr. Lloyd George is evidently not a plain-minded person, and regards this transaction as a three days' investment (of another man's money). It is unbecoming in a Chancellor of the Exchequer, above all other men, to speculate on the Stock Exchange; especially is it improper for him to speculate in a stock which is in any way whatever likely to be affected by the actions of the Government of which he is a member; and there can be no question whatever that, at the time when Sir Rufus Isaacs and Mr. Lloyd George got into the American Marconi Company on very favourable terms, the English Marconi Company, which is very closely associated with the American Company, was negotiating for a contract with the Government of which Sir Rufus Isaacs is the chief legal adviser, and for which Mr. Lloyd George holds the purse-strings. Sir Rufus Isaacs, whose brother is the managing director and controller of the English Marconi Company, purchased from that brother, through the medium of another brother, 10,000 Marconi shares for £20,000. Two days later those shares were quoted at £4 per share, and the Attorney-General had thus been put in a position to make a very rapid profit of £20,000. Sir Rufus Isaacs was not selfish; he gave Mr. Lloyd George a chance to take up a thousand shares at what had been cost price to him. In other words, he made the Chancellor of the Exchequer a present of the opportunity of making, within 48 hours, a profit of £2000. It is explained that this action was due to friendship. It may have been. It is also explained that both the speculators (or should we say, "investors") failed to make money on the entire transaction. That does not alter the fact that they might, had they chosen, have done very well indeed out of it. There are thousands of speculators who knew when to buy without knowing when to sell; and it is rather much to assume that, if a portion of these shares remained unsold, it was due to principle.

There is one other consideration demanding attention. It is only 10 or 12 years ago since Mr. Lloyd George taking up the highly moral attitude which is characteristic of him, claimed, when assailing another eminent British statesman, that every member of the Government should be, like Cæsar's wife, above suspicion. It is a pity, a great pity, for the sake of the reputation of British statesmen, that he did not set up for himself the same high standard of conduct that he demanded in others. Instead of that, he took up, when before the Committee, the disreputable line of insinuating that if mention was made of his conduct on that occasion, he would make revelations that would bring down certain reputations. A threat such as that was not calculated to increase one's confidence in his integrity. But, apart altogether from that, it may be said that it is not enough for a Chancellor of the Exchequer not to be corrupt; he must stand indubitably free from every suspicion of even the faintest connection with the things that are corrupt.

Following on the report of the Committee, there has been a debate in the House of Commons, with a result which will scarcely add to the esteem in which that once great institution is held. A motion regretting the transactions of "certain Cabinet Ministers" in American Marconi shares and the want of frankness they had displayed, was withdrawn in favour of one which would not, in the words of their colleague, Sir Edward Gray, entail their resignations and close their political careers. The frankness that Sir Rufus Isaacs and Mr. Lloyd George had so singularly failed to display at the right time was duly forthcoming on this occasion, and Mr. Lloyd George also gave further evidence of his power of facile emotionalism. One can read between the lines of the speeches made that these expressions of a tardy regret were not taken altogether seriously, but were looked upon as a mere piece of political opportunism; but not even the party opponents of the Ministers concerned wished to go to extremes, and so the House passed a non-committal, white-washing motion, which is sufficient proof that the old high moral standard of the House of Commons is a thing of yesterday. The careers of Mr. Lloyd George and Sir Rufus Isaacs will not be closed; but the question arises, can the Government, after the revelations that have been made, afford to allow the former to retain the pre-eminent position of Ministerial trust?

## UNIFORM GAUGE.

At a conference of the Chambers of Commerce, held in Sydney last Thursday, a motion was carried, urging on the Commonwealth and State Governments the necessity of establishing uniformity of gauge on the railways between Sydney and Melbourne, with the object of increasing the speed and the comfort with which passengers can get from the one capital to the other. The speeches made were, in the main, the speeches of sensible business men. It is true that the question was raised whether the 5ft. 3in. gauge, or the 4ft. 8½in. gauge, was better suited to the requirements; but most of the speakers were content to keep away from such contentious questions, and to recognise that the New South Wales gauge was the one that had been decided upon by those who had to settle the question. Of much more practical utility was a discussion as to where a commencement should be made. The view put forward that the Sydney-Melbourne line should be the first to be dealt with is a sound one, because this is the stretch of railway which is undoubtedly the most important in the Commonwealth. Important too was the suggestion of Mr. Norton Grimwade of Melbourne that the work of making the gauges uniform should be undertaken at once, because, the longer the delay, the greater would be the cost. Mr. Grimwade pointed out that in the past 16 years the cost of conversion of the Victorian and South Australian 5ft. 3in. gauge railways to 4ft. 8½in. had increased from £2,360,500 to £7,295,000, while in the same period the cost of conversion of the 4ft. 8½in. gauge lines in New South Wales to the 5ft. 3in. standard had, including alterations to rolling stock, increased from £2,460,000 to £19,319,000. Another sensible suggestion, though by no means a novel one, was that put forward by Alderman Cocks, Lord Mayor of Sydney, who advocated the overcoming of the difficulty by the laying of a third rail. That could probably be done at very little cost and with not much difficulty, on the line between Sydney and Melbourne; and, if so, it seems to us that it should be done, affording, as it does, a very agreeable way out of the difficulty; but it is to be feared that on many other lines this compromise course may be difficult of execution. There must be many cases where it would necessitate much of that extra expense which is the main objection to the wider gauge. However, whether the proposal for a third rail in the case of the Sydney-Melbourne line be adopted or not, it is to be hoped that action will not be delayed. It is high time that Victoria and South Australia recognise that what has been done will not be undone, and that the decision to take the 4ft. 8½in. gauge as the standard gauge for the Commonwealth railways will not be altered, and, throwing selfish considerations aside, to act with the Governments of the Commonwealth and New South Wales to secure uniformity of gauge as early as possible.

---

The Maryborough (Q.) firm of Walkers Limited recently entered into a contract to supply the Victorian Railways Department with 20 engines, and its experiences raise two interesting questions—firstly, as to the freight rates charged by Australasian shipping companies, and secondly, as to the extent to which the autocrat who has control of the railways of New South Wales is considering the interests of his State and of the Commonwealth. The firm thought at first of utilising the very cheap freight rates charged on the Queensland State railways, forwarding the material for their 20 engines to Wallangarra, a station on the New South Wales border, and despatching them thence to Albury, there to have them put together and handed over to the Victorian railway authorities on the State's own lines, but the company reckoned without its host in the shape of the New South Wales Chief Commissioner for Railways, who informed the firm that there were no facilities at Wallangarra for dealing with this class of freight. As there is a 10-ton crane at the border town in question the excuse does not seem to be a valid one; and one is inclined to ask what is the use of State railways under such circumstances. A freight train runs only once a week from the Queensland border to the Victorian border, and it is not amazing that so poor a service should be quite sufficient for the requirements of local industries if they meet with no more encouragement than was given to Walkers Limited in this matter. Mr. Johnson's action not only deprived the New South Wales railways of a good freightage, but also lost the State the commercial benefit that would have arisen from having the work done in a New South Wales town. The Company, thus turned down by Mr. Johnson, had to arrange for sea carriage, and it found that this cost it £5 a ton, although the freight on a recent consignment of Beyer Peacock engines from the Old World amounted to only £2 per ton. Of course the shipping authorities will say, quite reasonably, that the extra charges for labour are responsible for a considerable increase in freight charges on the Australian coast; but, while this is undoubtedly true, it is no use telling us that this is quite sufficient explanation of the difference between £5 a ton and £2 a ton to which we have directed attention.

* * *

Mr. J. D. Henry, who recently arrived in Wellington (N.Z.) to be present at the opening of the large new refinery of the Taranaki Oil Wells Ltd. at New Plymouth, and who is also to report on the year's working, is reported in New Zealand papers as stating that it is now known that the oil-bearing areas of the Dominion are extensive, and that he will go so far as to say that there is no other part of the British Empire of the same size as the North Island of New Zealand in which there is so large a proportion of supposed oil-bearing territory. Mr. Henry admits that the geological evidence of the existence of oil is apparently thin at the present time, and that the official reports are not comparable with those of the Geological Survey Department of Russia and the United States of America; but, with the present interest in the industry, it should not be long before New Zealand will have a multiplicity of proofs of the existence of oil in commercial quantities at numerous points. If Mr. Henry be correctly reported, he must be an expert gifted with a quite remarkable capacity for vague generalities; but, even from his own admissions, it is obvious that the great oil reserves of the country have not been proved to exist, and probably exist only in the imagination of himself and of those who have sunk their money in the operations of the Taranaki Oil Wells Ltd.

* * *

Quite a little comedy, but a costly one, has been going on at the Melbourne docks for over a year, the cause of contention being the non-payment of extra rates to the wharf labourers. It seems that the labourers are more loyal than the Government, and that, when the latter abolished the annual holiday in honour of the birthday of the Prince of Wales, the former did not fall in with the arrangement—probably because it has been the custom at the docks to pay time and a half on all public holidays. The birthday of 1912 fell on a Sunday, but no extra pay was given to the men who worked on the following Monday, although they contended that the holiday conditions should have been observed upon that day. The employers refused to admit the claim, and since then the wharfers have downed tools on every public holiday, and declare that they will continue to do so until they receive their "back pay." Both sides are obdurate, the lumpers refusing to fall in line with the stevedores, who accepted the decision of an arbiter that the employers were right in refusing to pay. The stevedores were willing to work, but, as they cannot do so without the co-operation of the wharfers—the former being engaged handling cargo on the steamers and the latter dealing with it on the quay—there has been a "hold-up" on every holiday since—all over half a day's pay, to which, it is admitted by one-half of the unionists, they are not entitled. The stevedores want to work, but they must abide by the "rules," and support their brethren of the wharf. Meantime shippers and ship-owners are, on each holiday, suffering a great loss, amounting in some cases to as much as £100 for every day over her time that a vessel is delayed in port. Still the comedy goes on, so that the "principles" of trade unionism may prevail. The foolishness of the contention is shown by the fact that every time the men remain idle they lose nearly £500 in wages. Monday last was the Prince's birthday, and the farce was in full swing.

• • •

There have been some notable events in the world of labour within recent times, but the decision come to by workmen of Broken Hill this week will rank high among them. The Arbitration Court had at great length been considering the engine drivers' and firemen's plea that rates of pay and hours of work should be fixed for all the States, with the exception of Western Australia. Recently the Mount Bischoff men withdrew, saying they were satisfied with things as they were, and this remarkable admission on the part of a section of unionists has now been capped by the Silver City men, who say they are willing to abide by the word given by them in 1911. The employers, they say, have acted up to the terms of that agreement, and they also have discovered, at this late stage in the proceedings, that it is incumbent upon them to do likewise. It looks like the millennium. Mr. Justice Higgins congratulated the men upon "the highly honourable" attitude they had taken up, and added that it reassured him considerably in dealing with unions.

## NEWS AND NOTES.

In connection with the Austral Malay Tin Ltd., Mr. A. W. Freeman has cabled that the Kampong property at Taiping, F.M.S., has been favourably reported upon for bucket dredging by Mr. M. T. N. Black, general manager of the Tongkah Harbour Tin-dredging Company, and that up to June 14 324 acres had been bored by Messrs. Horton, Nash, and Bethune for an average of 19 oz. tin oxide per cubic yard. A total of 324 bores have been put down, the average depth being 30ft. The area contains 18,000,000 cubic yards of tin-bearing material, and it is estimated by Messrs. Freeman and Black that the 324 acres will produce a net profit of £750,000 with two dredges in ten years.

Satisfactory progress is being made with the testing of the new gold amalgamating machine at the Long Beach Company's claim at Chaselands, South Island of New Zealand. Mr. C. E. Woolf, consulting engineer, reports that the concentrates in the neighbourhood contain a large quantity of very fine gold in heavy black sand, making it very difficult to recover more than a fraction of the gold by the older methods. There is, however, no difficulty in obtaining practically all by the aid of the amalgamator, and the prospects appear most promising and point to the possibility of making a success of otherwise unworkable beaches. A feature which commends itself generally is that the concentrates can be fed straight from the boxes on to the table of the machine, and no extra labour is required, as the action is quite automatic.

The Mount Toppers Tin Mine, No Liability, was registered in Sydney on June 18th, with a capital of £20,000, in £1 shares, to operate near Tingha, New South Wales. The signatures to the registration are those of E. H. Callan, H. W. Clark, O. I. Hagen, H. V. Kiss, P. Wilson, B. Poole, and H. M. MacKenzie. The first directors are Arthur R. Powell, Edward H. Callan, Francis J. M'Donald, and Robert I. Browning. Registered office, Australasia Chambers, Martin Place.

The Melbourne and Metropolitan Board of Works are calling tenders for a loan of £300,000 at 4 per cent. for 40 years. The tenders close at the offices of the board on 7th July, 1913. For further particulars see our advertising columns.

The Sydney Wharf Labourers' Union has decided to enter the Transport Workers' Federation with a view to linking up the unions connected wtih the shipping trade. A similar body to the proposed federation existed some time ago, but was practically inoperative. The merchant service has accepted the present constitution, but the engineers have "turned it down." The object is to prevent strikes being entered upon without the consent of all unions affected.

The route of the proposed railway from Moama (N.S.W.) to Moulamein was last week inspected by the N.S.W. Minister for Public Works, Mr. Griffith. There were also present representatives of the Federal and Victorian Governments.

Newcastle (N.S.W.) Council is organising a deputation to the Federal Government to ask for more effective protection of the Australian oil industry.

A conference has been held between representatives of the Chamber of Mines of Western Australia, friendly societies, and various mining employees' unions, and Mr. J. Dodd, honorary Minister, for the purpose of discussing an insurance scheme for the relief of sufferers from miners' complaint. Various alternative schemes were submitted by the representatives, but the one most favoured was a general insurance scheme, as opposed to any sectional measure of erlief. The Minister promised to submit any measure framed to the bodies interested for their suggestions before Parliament finally ratified it.

The latest addition to the list of Victorian dividend paying mines is that of the New Specimen Hill Company, Daylesford. After providing for the payment of 6d. per share, which absorbs £1000, the company will leave a similar sum to credit.

At a meeting of the Rosedale (V.) shire council, Cr. Henderson brought before councillors a proposal of the Toongabbie Progress Association to raise funds for the erection of a memorial to mark the last resting place of Stringer, the discoverer of the Walhalla goldfield. The pioneer is buried in Toongabbie Cemetery, and it is considered that those who so largely benefited by his discovery should contribute sufficient funds to erect a suitable monument over the grave of the man from whom Stringer's Creek takes its name. There is a local marble deposit in the hills a little distance from Toongabbie, and it was suggested that this stone should be used for the memorial. Councillors expressed themselves in sympathy with the movement, and Cr. Henderson stated that the Walhalla council would also be communicated with.

The Dredging Inquiry Board (V.) will hear expert evidence at the Chief Secretary's office at 10 a.m. on Friday ~~and Satur~~day. Witnesses will be called by the Dredge Owners' and Anti-Dredging associations.

The Federated Executive of the Mining Employees' Association (V.) has decided to make a levy of 10s. per member to provide funds to enforce the unionist policy. Hole-in-a-corner meetings are being held in Bendigo, but, as far as can be gathered, there are still a good many independents on the field, notwithstanding the declaration of the officials that they only number nine. At one mine, it is stated, out of eleven men employed, nine are outside the association.

## PERSONAL.

Mr. W. G. Watson, managing director of W. G. Watson and Co. Ltd., Clarence and Kent Streets, Sydney, is leaving by the Otway on a trip round the world.

Among the contributers to a volume "The Coal Resources of the World," which is being prepared in connection with the International Geological Congress to be held in Toronto, Canada, in August, is Mr. E. F. Pittman, Government Geologist, N.S.W.

Mr. Alexander Kennedy, a well-known mining engineer of Bendigo, died last week, aged 83 years. He came from Scotland to Victoria in 1854.

## VICTORIAN DREDGING INQUIRY.

In reply to his protest against the altered attitude of the Victorian Cabinet regarding the issue of a mining right over a local reserve to the Freeburgh dredge, Mr. Thos. Graham, president of the Anti-Dredging Association, last week received the following telegram from the Acting Premier:—

"Government arrived at decision Freeburgh dredge after careful consideration all facts and in view of no danger pollution from working.—Murray."

At a large meeting of Freeburgh residents to discuss the closing down of the Tewksbury Amalgamated Co.'s dredge, the following resolutions were unanimously carried:—(1) That this meeting of residents of Freeburgh, being conversant with the true facts of the case, emphatically protests against the untruthful and misleading statements made by a portion of the metropolitan press in regard to the Tewksbury No. 3 dredge going through a corner of the Freeburgh recreation reserve. (2) That this meeting is of opinion that a mining lease, as surveyed, should be granted to the Tewksbury Co., and that a petition be prepared and signed by residents of Freeburgh, and sent to the Minister of Mines, praying him to grant the lease in question. (3) That a deputation of three be appointed to present to the Minister of Mines the petition and resolutions of this meeting.

During last week the Dredging Inquiry Board heard evidence and inspected the dredging areas in the Wangaratta district and elsewhere.

## METAL QUOTATIONS.

### By Cable.

(From Our Correspondent.)

London, Tuesday.

A severe slump has been experienced in the metal market this week, the sufferers being copper and tin. There were indications of this last week when standard copper finished at £66 2s. 6d., and since then the values have fallen by an additional £3. Tin showed a disposition to maintain its position, but over the week end there was a collapse, and the spot position lost £5, the metal being quoted at £199 15s. for spot, and £200 for forward, a drop in the fortnight of £10. Lead remained firm, and was quoted up to £21 10s. Quotations were:—

COPPER.—Standard spot, £66, £65 5s., £65 2s. 6d., £65 and £63; three months, £66 5s., £65 2s. 6d. and £63 7s. 6d.

Electrolytic, £69 10s. and, to-day, £67 10s.

TIN.—Spot, £207 10s., £204 5s., £204 10s. and £199 15s.; three months, £207 15s., £204 10s. and £200.

LEAD.—£20 10s., £20 15s. and £21 10s.

SPELTER.—£22 5s.

SILVER.—27 5/16d., 27¼d. and 26 7/8d.

ANTIMONY.—"Star" brand, £31; 50 per cent. ore, £8 10s.

WOLFRAM (70 per cent. ore).—33s. 6d. per unit, or £117 5s. per ton; no change.

MOLYBDENITE.—Unchanged at 2s. 9d. per lb., or £308 per ton.

MANGANESE.—(50 per cent. ore) 9½d. per unit, or 39s. 7d. per ton, an increase of 2s. 1d.

## MINING IN QUEENSLAND.

### North Queensland Fields.

(From Our Correspondent.)

Mareeba, June 13.

Tin mining is very brisk again, and the declaration of dividends by the Prince Alfred Tin Mines, 10s. per share, and the Tommy Burns Tin Mines 6d. per share, has caused a good demand for shares in both the above companies. The Prince Alfred has in a little over 12 months returned to shareholders 30s. per share. This is at the rate of 30 per cent. on the par value of shares. There is every prospect of their operations showing even a larger profit. The company, after payment of dividend, has £2555 on hand and a good tonnage of ore at grass. The stopes are looking well, and the sinking of the main shaft is being rapidly pushed on.

The Tommy Burns mine is opening up better than ever, and there will be no shortage of ore from this mine for a long time to come.

Sunnymount, on the Mt. Garnet Railway line, where these mines are situated, is becoming a place of some importance, as several other good shows, such as the Cyclone, are being opened up. These developments show how good things were missed by the early prospectors. Every day fresh finds are being made in North Queensland, showing that this district is still in the prospecting stage.

Some good finds of bismuth associated with tin are reported from the Cardross (Chillagoe) district.

The new find is about 10 miles west of Cardross, where the Mammoth copper mines are being worked.

Price and Irvine at the Meteor have a seam averaging about 6 inches, worth 30 per cent. bismuth and 27 per cent. tin.

Bradshaw and Whitehead are working a 6in. seam, worth 40 per cent. bismuth.

The Mammoth copper mines furnace is again in full blast, and turns out a 33 per cent. matte. From the 21st to 31st May 535 tons of ore produced 140 tons of 33 per cent. matte, which was sent to the Chillagoe Company's converters. The mines are looking well, especially the Chieftain, in which development work is confined at present, owing to shortage of labour. The reserves of ore on surface at 31st May were as follows:—450 tons, assaying 7 per cent. copper, 457 tons assaying 10.6 per cent. copper, and 238 tons assaying 13 per cent. copper. Sufficient faces are now available to maintain a daily output of 80 tons of high grade ore.

It is expected that Torpy's Crooked Creek concentrating mill will be in commission again on 1st July. During May 360 tons of silver-lead ore were raised, and 160 tons averaging 28 per cent. lead and 22 oz. silver per ton were railed to the Chillagoe smelters.

The Mungana mines continue to send fairly large shipments of ore to the Chillagoe smelters.

At Irvinebank, the Vulcan tin mine has given its supporters fresh heart, by the developments at the 900ft. level. This is one of the most important developments that has taken place for some time past. This company is installing an aerial ropeway from the mine to the battery. When this is completed many thousands of tons of stone from the dumps will be treated.

The difference in cartage costs on the ore mined and milled will put the old Vulcan again on the dividend list.

The aerial ropeway, from the Governor Norman mine (Irvinebank Co.) to the company's London mill, a distance of 2½ miles, is now in commission, and working very satisfactorily, and has reduced costs from 6s. to 9d. per ton. The Governor Norman mine shortened hands a fortnight ago. The ore body decreased in value, but a satisfactory improvement has since been made. P. Tranley, at the Southern mine (Irvinebank), has been sending in large parcels of high-grade ore to the mill, and during the past six months he has been the largest individual producer.

At Stannary Hills not much is being done with the Stannary Hills Co.'s mines, the bright star of this district being the ''Lass of Gowrie.''

During the month of May 195 tons of ore were treated from this mine for a return of 14 tons 5 cwt. 2 qrs. 15 lbs. of firsts, and 12 cwt. of seconds. This is an exceptionally rich return and is on a par with previous ones. The lode, which is a true fissure, is maintaining its size and values as it is being driven on.

At Herberton the tin mine par excellence is the Rainbow. For some months the owners have been driving a tunnel into the hill to connect with the old workings. This is now completed, and work has been resumed on the ore-body. Last month the owners crushed 42 tons of stone for 4 tons 14¾ cwt. of tin, valued at £664. This is a very valuable proposition, and the owners have refused big offers for it.

In gold mining the mine attracting greatest attention is the New Minnie Moxham Gold Mine N.L., at Northcote. The first meeting of shareholders of the company was held last Monday, when Messrs. C. A. Jenkinson, Geo. Bray (Bray and Oakes, Charters Towers), A. Sheppard, C. F. A. Couper and F. H. Barnes were elected a board of directors. All the shares were applied for, and work at the mine is in full swing. Two shifts are busy in the shaft sinking from 140ft. to 210ft., where it is anticipated the reef will be met with. This work will be completed in a little over two months. Meanwhile, the easterly level from the 140 crosscut is being driven, and good values have been disclosed over the length driven, about 38ft. The reef has maintained an average width of 3ft. The mine has recently been visited by a number of mine managers, and they all speak in high terms of it. Great interest is now being taken in the Northcote field, and several other properties are now being worked.

At the Mareeba Goldfield work is being started on the Amalgamated leases. A syndicate of 40 shares of £10 each is doing the preliminary work. There is every prospect of this venture being successful now that the ownership of the disputed ground has been decided.

## THE INVESTOR'S COLUMN.

### Some Companies Attracting Attention To-day.

(By Our Ex change Reporter.)

### North Nuggety Ajax (V.).

For several weeks the transactions in the shares of this company have attracted considerable attention among the members of the Exchange, not for their diversity, but on account of the uniformity of their pattern. From about 12s. 6d. to 19s. one buyer has taken or been prepared to take practically every share that has been offered. As the returns, although showing a fair profit, have certainly not been of a sensational character, and as the mine has been regarded as rather under a cloud, it is not surprising that large numbers of shares have changed hands. Various reasons for such persistent support have been put forward, but it seems strange that a very obvious one has been overlooked, and the history of the company is another illustration of how public opinion goes from one extreme to another, and how hard it is to rehabilitate a stock after its good name has been tarnished. The shares in this well-placed concern on the Ajax line of reefs had as the result of dividends to the extent of 30s. in about twelve months gradually risen to 87s., but on the cutting out of the chute of gold on a great flat make of stone, fell to 10s., that is, one-eighth of their former value. When the unusual character of the auriferous deposits of the Ajax group is remembered, namely, that not only one, but several lines of reef traverse the leases, and that with them are often associated flat formations or wings of stone, most of the reefs and flat makes being gold bearing, it will seem strange that the setback in price should have been so severe. The financial position at the commencement of the half-year was decidedly good, there being £4338 in hand; there was also a large quantity of fairly payable stone in sight, and the mine equipment was good; under these circumstances it should have been apparent that the shares were not a bad speculation at ten or twelve shillings. It was not, however, owing to any of these facts that the quotations have so materially improved, but really to the excellent developments in the Ajax Central, the adjoining mine. This company is working on two payable vertical reefs, both of which are well opened up at three or four different levels. These reefs are dipping coming south, that is, towards the North Nuggety Ajax lease, to which they have got so close that it seems improbable that they will not continue into the latter company's mine. One of these reefs, the Ajax or Eastern reef, has been driven on right up to the boundary, and the North Nuggety Company has obtained permission to continue the drive into its own ground. A crosscut at another point further south was also put out to meet the extension of this reef, and a mullocky formation was cut at 89 feet and driven on to the northern boundary. This reef was not payable, and it is now practically certain that the Ajax Central lode got split up near the boundary—the eastern portion of it not rising as high as the No. 6 level of the North Nuggety Ajax, which is 30ft. higher than that of the ''Central's.'' The western branch of the lode has just been picked up by means of a short crosscut from the end of the northern drive, there being nine inches of gold bearing quartz. As the dip of the reef is south, it is reasonable to assume that it has gone underfoot, and will be met with at a lower level. As the shaft is already sunk the required depth, that is 80ft. below the No. 7, crosscutting is being started at the No. 8 level in order to intersect the downward continuation of the lode, and as the underly is westerly, that is towards the shaft, the reef should be met with much sooner than at the No. 6, which, as already mentioned, was at about 90ft. It is hardly necessary to state that if the reef at this point proves to be of good quality, that the mine will enter upon a new era of prosperity. There will be a long chute of stone to work between this point and the northern boundary. The western vertical reef, which was originally discovered in the lease of the Ajax company, has been proved to exist at three or four different levels in the Ajax Central mine, and the possibilities of its living into the North Nuggety mine are very similar to those with regard to the eastern reef, as the stone which was first opened up at No. 4 has since been followed down to the No. 7, and is dipping as it continues on its southerly course. A crosscut was put out from the end of the north drive in the North Nuggety, at the No. 6 level, to meet this lode track, which it was expected would be at about 100ft.; but this was not the case, and similar want of success attended another 50ft. of crosscutting. It is probable that this reef has also gone underfoot, and this is the general opinion, but it may be that it is still further west.

From the No. 6 level a rise put up from the northern end has located the flat make (which has been worked at the No. 4 in the Ajax Central), and subsequent work has proved the continuance of this formation for a distance of 400ft. into the mine, and it may continue to the southern boundary, its course in this direction having been proved by a rise put up from the No. 7 level.

The persistence of this flat make, with its southerly dip from the Ajax Central for so long a distance into the North Nuggety Ajax, appears to be a promising augury for the continuance also of the reefs, for it shows the continuity of the formations. The above flat make has been of a very fair quality and size, and is expected to provide a large amount of crushing dirt for the coming operations. During the half year just closed 8524 tons were crushed for a yield of 3572 oz., that is at the rate of a little over 8 dwts. per ton. As the company has its own 15 head battery, and there is a fair amount of payable stone in sight, it may be said that, although the shares are perhaps not worth more than ten or twelve shillings on the present show in the mine, yet their prospects are sufficiently solid to account for the higher market quotation. The position is not unlike that of the Ajax Central company when the western vertical was first discovered in the Ajax lease close to the boundary between the two properties. It will be remembered that the ''Central'' company was allowed by its neighbour to continue a drive on this reef south into its property, and after very payable stone had been opened up for a distance of 50 or 60ft., the reef deteriorated both in size and quality. This was at the No. 4 level, and the prospects at one time looked so unfavourable that the shares fell to less than one-half their previous price. Since then this particular reef has been discovered at lower levels, and opened up with most satisfactory results. In several respects similar developments have occurred in connection with the Ajax or Eastern reef. The financial position of the company is sound, the credit balance being about £2500, in addition to which there are on hand stocks of fuel, etc., amounting to £615, and sundry debtors owe the company £259. During the half year three dividends of 1/- were paid, the total disbursements in this respect now amounting to £46,500.

### Golden Age (V.).

Despite the attention to Daylesford and Ararat ventures which has been a prominent feature of the mining market for a considerable time, they have not by any means monopolised the attention of investors, for the excellent returns obtained from some of the Bendigo mines continue to bear testimony to resources of that remarkable field. It is seldom that the dividend list fails to show that the district is making a disbursement to its supporters. Central Red, White and Blue, on the Sheepshead line, and Golden Pykes, amidst the Johnson's group, have not only rewarded their own shareholders handsomely, but have also put heart into those in neighbouring companies. Golden Ages are an example in the latter respect, and the recent quotations indicate a belief that a period of profit-making and dividend disbursement in the near future may not unreasonably be expected. The financial position is fairly good, and although an expense of a little under £600 has been incurred on account of machinery and shaft equipment, this is practically provided for by money in hand and calls receivable. The working expenses have averaged about £350 to £400 per fortnight, and a lot of development work has been pushed on, while no returns have been received. The company is, however, now in a position to start work on the continuation of the Golden Pyke reef, a connection having been made with the Dagmar workings in the south end at 853 feet. Sufficient stone of payable quality should be obtainable from here to pay for all expenses. In about a fortnight or three weeks the new machinery should be erected on the northern shaft, which is about 200 feet south of the Golden Pyke boundary. The Johnson's Reef Extended sunk this shaft many years ago, and put out a crosscut at 650 feet to intersect the reef. A rise was then put up to 50 feet, and payable stone obtained and crushed; a level was also put in south on the course of the reef, but the stone contracted and the drive was stopped. Such contractions are not unusual or necessarily permanent on this line of reef, but this fact was not so generally known at that time. It is believed that this old shaft, and also the drive, will be found in good repair, and that work on the reef can be resumed without delay. It will be gathered from this brief statement of the position that the company should soon be on payable stone at two different points, and it is not improbable that the shares may go better.

# OUR BIG MINES.

## Examinations of their Yearly and Half-Yearly Reports.

(By a Mining Accountant.)

### British Broken Hill.

The report of British Broken Hill Pty. Co. Ltd., for the half-year ended December 31, 1912, discloses the urgent necessity of the long promised improvements, both in the mining of the ore and the treatment at the mills. And incidentally, it may be remarked that the report itself is capable of a great deal of improvement. The leading features in this present production, which is a most leisurely affair, are a record output of ore, a reduced profit, and a dividend distribution in excess of earnings. The paper profit was £61,837, but this half-year the sum of £12,822, expended on mine development, was charged to capital account, thus relieving profit and loss account considerably, making it appear to undue advantage when compared with previous accounts, which in the past have had to bear the burden of mine development. Whether any development charge was made to profit and loss is not clear: this is one of the poor characteristics of the British report. But it is only one of many. If there has not been a deal of unnecessary carelessness in the framing of this particular report, there has been a desire to confuse, which is even worse. An early start is made on the outside of the cover, where it is to be found that the directors' report, accounts, etc., from June 30 to December 31, 1912, are to be presented, together with the half-year's report to June 30 (!), 1912, at the 33rd ordinary general meeting at London May 21, 1913. A few days later, and it might easily have been possible to deal with the report of the current half-year ending June 30, 1913, in addition to the half-year ended December 31, 1912. Inside the cover there are worse examples, which will be dealt with as the examination proceeds. Meanwhile, there is another leading feature to briefly comment upon, and that is the highly satisfactory results obtained from exploration and development. The British mine is proving its right to rank with the South, North, and Central, and its promise is bright.

Reference has been made to the dividend distribution in excess of earnings. The profit was just sufficient to cover the distribution made last December, amounting to £60,000 dividend on 300,000 shares, and £1832 as dividend at the same rate (20 per cent. per annum) on the instalments of capital paid in respect of the new shares issued in September last. This amount, £61,832, appears as the dividend in the balance-sheet. But since the date of this, the directors recommended the payment on June 13, of a final dividend for the year of 1s. per share (free of income tax), and a dividend at the same rate (15 per cent. per annum) calculated to December 31 last, on the instalments of capital paid in respect of the new shares. These payments absorbed £16,371. Hence the total dividend of £78,203, exceeded the amount earned by £16,366. The disbursement may, perhaps, be defended on the ground of the greatly improved financial position of the company, owing to the success of the recent share issue at a premium of £1 10s. per share. 100,000 ordinary shares of £1 each were issued at £2 10s.; the balance-sheet, as at December 31, 1912, shows that £33,744 was received on account of capital, and £50,615 on account of premium. The net result of the dividend distribution is that the balance at credit of profit and loss has shrunk from £81,324 at June 30, 1912, to £34,955.

The general manager (C. J. Emery), reporting on the operations for the half-year, states that the greater portion of the development work was carried out around Thompson's shaft, exploring and developing the main ore bodies. The detailed information is not as complete as is warranted by the importance of the work. A later report is issued by G. C. Klug, the managing engineer of Bewick, Moreing and Co. The general testimony is to the very satisfactory development of the mine, auguring well for the realisation of anticipations regarding the continuity of ore lenses north of Thompson's shaft. The southern portion of the western lens is merging into a large body of rhodonitic low-grade sulphide ore, but the lens itself is continuing with depth, on a fairly flat angle of pitch. The eastern lode channel is proving itself consistent, and several lenses of milling ore are being developed. At the No. 10 level, the lowest in the mine, the crosscut had intersected the southern portion of the main western ore body. As in the upper levels, this ore body was of a rhodonitic nature. The crosscut also passed through a lens of good ore in the east lode channel. From the evidence revealed at this moment, it is apparent that the western and eastern ore bodies are maintaining each other in depth.

The development of the northern portion of the mine is of great importance. A satisfactory arrangement has been made with the Junction Company, to enable this work to be started from Browne's shaft, at the No. 6 level. It is stated that the ore bodies, below No. 6 level at Thompson's shaft, are now assuming a direction which makes their trend consistent with that determined on the boundary of the Junction Company. There is an enormous amount of work to be done before the full extent of the ore lenses can be proved, and, in this connection, it is stated that a programme has been mapped out for exploring the ore bodies and for giving increased facilities for economic mining. These facilities are much needed. The mine is developng encouragingly south of Thompson's shaft, on the Nos. 2, 3, and 5 levels, and the south end of Blackwood section on the No. 2 level, where what appears to be another lens of sulphide ore has been discovered in the eastern lode channel.

The managing engineer does not recommend sinking a new shaft, as he considers Thompson's shaft is in a convenient and satisfactory position for working the ore bodies in this vicinity. Later on it may be necessary to strip Thompson's shaft in order to increase its capacity. This saves a lot of money. At the date of the report, the shaft was being deepened to the No. 11 level.

Table A—Underground History.

| | | Half-year ended | |
|---|---|---|---|
| | Dec., 1911. | June, 1912. | Dec., 1912. |
| Ore raised . . . . . . . . tons | 81,777 | 102,106 | 103,150 |
| Filling for depleted stopes . . . . . . tons | 20,048 | 28,972 | 36,102 |
| Timber used underground . . . super. feet | 404,271 | 564,970 | 708,166 |
| Footage of development work— | | | |
| Shaft-sinking | 16 | 84 | 66½ |
| Driving and cross-cutting | 756 | 1,799 | 1,533 |
| Winzing and rising | 302 | 375 | 356 |
| Total | 1,074 | 2,258 | 1,955½ |
| Diamond-drilling | 3,740 | 4,895 | 4,288 |
| Ore reserves . . . . tons | 2,000,000 | 2,000,000 | — |

Table B—Lead Concentration.

| | | Half-year ended | |
|---|---|---|---|
| | Dec., 1911. | June, 1912. | Dec., 1912. |
| Crude ore treated . . . . tons | 81,001 | 101,390 | 103,680 |
| Average assay value— | | | |
| Lead . . . . per cent. | 14.4 | 13,9 | 13.2 |
| Silver . . . . oz. | 7.8 | 7.7 | 7.3 |
| Zinc . . . . per cent. | 12.7 | 12.0 | 11.7 |
| Lead concentrate produced . . . . tons | 13,008 | 15,244 | 15,003 |
| Average assay value— | | | |
| Lead | 63.6 | 63.2 | 62.8 |
| Silver | 25.6 | 24.9 | 24.2 |
| Zinc | 7.2 | 6.6 | 6.6 |
| Ratio of ore to concentrate | 6.2 | 6.6 | 6.9 |
| Percentage of recovery— | | | |
| Lead | 70.5 | 68.4 | 68.8 |
| Silver | 52.1 | 48.2 | 47.5 |
| By-products— | | | |
| Quartz-tailing | 10,145 | 14,786 | 16,385 |
| Zinc-tailing | 41,740 | 51,514 | 49,238 |
| Slime | 16,108 | 19,846 | 23,054 |

Table C—Zinc Concentration.

| | | Half-year ended | |
|---|---|---|---|
| | Dec., 1911. | June, 1912. | Dec., 1912. |
| Zinc tailing treated . . . . tons | 41,740 | 51,514 | 49,238 |
| Average assay value— | | | |
| Lead . . . . per cent. | 3.7 | 4.0 | 3.9 |
| Silver . . . . oz. | 3.7 | 3.9 | 3.8 |
| Zinc . . . . per cent. | 15.0 | 14.3 | 14.0 |
| Zinc concentrate produced | 11,801 | 14,651 | 13,386 |
| Average assay value— | | | |
| Lead | 9.9 | 10.9 | 11.7 |
| Silver | 10.6 | 11.0 | 11.4 |
| Zinc | 41.9 | 40.5 | 40.2 |
| Ratio of zinc tailing to concentrate | 3.5 | 3.5 | 3.7 |
| Percentage of recovery— | | | |
| Lead | 75.0 | 75.8 | 80.7 |
| Silver | 79.5 | 78.1 | 80.1 |
| Zinc | 78.6 | 80.2 | 78.0 |

Regarding the metallurgical work, an increased tonnage of ore was treated at the lead mill. The ore was lower in grade all round, as will be seen from Table B. The lead concentrate was slightly lower than before, the percentages of recovery being much the same. The zinc concentration shows a retrograde movement. The zinc tenor of the concentrate was decidedly poor, and the zinc recovery was lower, while the recovery of lead and silver in the zinc concentrate was substantially higher. But the terms of payment for lead and silver in this class of concentrate are far from favourable. The ideal concentration to strive for is the maximum of lead and silver in the lead concentrate, and of zinc only in the zinc concentrate. This will be evident from what follows later. Taken all round, the mill work was not flattering. Steps are being taken to remodel the lead mill and to replace the Elmore zinc concentration plant by a Minerals Separation plant. Tube mills will be introduced, and the number of concentrating tables will be increased, and a wise step is being taken in providing a supply of power in excess of actual requirements. For this purpose advantage is being taken of the modern practice of utilising the exhaust steam from the reciprocating engines. The future mill should have a capacity of 20,000 tons of ore per month. The managing engineer estimates that, on a basis of lead £15, and spelter £23 per ton, the enhanced profit will be £30,000 a year. It is certainly to be hoped for, as the metallurgical work of this company has not, so far, been of a high quality.

The figures in the last column of Tables B and C do not correspond with the table published in the directors' report. But then the table does not agree with the written statements in both the directors' report and that of the general manager. The table referred to gives the information that 103,710 tons of crude ore was treated, as against the 103,680 tons mentioned in other places. The output of lead, silver, and zinc contained in the concentrates differs materially from other statements, both prior and subsequent to the doubtful table.

A further matter that needs explanation is the discrepancy between the statements as to costs and the information to be derived from the accounts. In two places in the report the costs are given as: Mining, 14s. 3.13d.; lead concentration, 5s. 1.2d.; and zinc concentration, 6s. 9.24d. per ton. Per ton of what is not stated; the slipshod character of the report is thus further revealed. Either the costs are on a uniform basis of tonnage raised or treated, or else they are on a basis of tonnage handled in each branch of the operations. The latter is probably what is meant. In neither case, however, does the information agree with that in the accounts. Thus—

Mining 103,510 tons at 14s. 3.13d. = £73,806.
Concentrating 103,680 tons at 5s. 1.2d. = £26,438.
„ 49,238 „ 6s. 9.24d. = £16,669.

The £73,806, top line, corresponds with £72,177 in the accounts; the next two lines give £43,107, corresponding with £44,375 in the accounts. In the previous report similar discrepances were shown, only the stated cost of mining was less than the amount indicated in the accounts, and not greater, as at present. The sum total above does not agree with the corresponding debit in the working account, so the difference is not due to certain minor operations being regarded in one case as belonging to mining, and, in the other, to ore treatment. An example of such would be transported from mine to mill, and preliminary crushing. The above is another example of carelessness or misleading information. It is obvious that the error would be greater if the costs were stated on a uniform basis, either of ore raised or ore treated. In pursuance of this particular type of error, the following table is given. It is instructive, serving, as it also does, to indicate the trend of the costs, whatever their basis.

Table D—Costs as stated in the Report.

| | Half year ended<br>Dec., 1911. | | June, 1912. | | Dec., 1912. | |
|---|---|---|---|---|---|---|
| | s. | d. | s. | d. | s. | d. |
| Mining* | 12 | 4.57 | 13 | 1.25 | 14 | 3.13 |
| Lead concentration† | 4 | 11.97 | 4 | 11.87 | 5 | 1.2 |
| Zinc concentration‡ | 6 | 8.31 | 6 | 6.56 | 6 | 9.24 |

Table E—Costs as Calculated from Published Revenue Accounts, on a uniform basis of Crude Ore Treated.

| | s. | d. | s. | d. | s. | d. |
|---|---|---|---|---|---|---|
| "Mine Work, Ore Raising, etc." | 15 | 2.1 | 16 | 2.8 | 13 | 11.1 |
| "Ore Dressing" | 8 | 9.1 | 8 | 9.4 | 8 | 6.7 |
| "Forwarding" | 0 | 1.1 | 0 | 0.8 | 0 | 1.1 |
| Administration, Head Office, and General | 1 | 7.3 | 1 | 2.3 | 0 | 11.9 |
| Income Tax | 0 | 3.3 | 0 | 8.0 | 0 | 8.4 |
| Depreciation | 0 | 10.1 | 0 | 8.4 | 0 | 8.2 |
| Total†† | 26 | 9.0 | 27 | 7.7 | 24 | 11.4 |

*Per ton of ore raised. Includes timbering, filling, and all charges to delivery at crusher bins.

†Per ton of ore milled. Includes delivery of zinc tailing to Elmore plant.

‡Per ton of zinc tailing treated. Includes royalty.

††Does not include debenture interest.

In the Table E above, the items in inverted commas are as expressed in the accounts. The first of such is clumsy and inefficient; the cost of mine development cannot be distinguished from that of ore extraction; "Ore dressing" comprises at least two entirely distinct and important branches of metallurgical operations—namely, lead concentration and zinc concentration—yet the two are compounded in one, while the insignificant "Forwarding" is given honourable mention by itself. However, that was to be more or less expected. Table E shows a reduced total cost for the last half-year, but the reduction is not so good as it appears, because of the absence of £12,822 that was expended in mine development, but not charged to revenue. No doubt mine development was heavier than before—for that was one of the objects of the recent share issue—but the other periods had to stand heavy charges also, and these were not charged to capital account, as now.

Leaving the subjects of costs, the next matter of interest is that of income. The working account is credited with the following:—

| | |
|---|---|
| By Concentrates Sales— | |
| Lead | £144,406 |
| Zinc | 30,129 |
| | £174,535 |
| By Slime sales | 15,693 |
| " Ore in hand | 333 |
| | £190,561 |

The amount of £658 was debited, or written-off, such sum being the valuation of ore taken into the previous account. Details concerning the sales are conspicuous by their absence. There is no mention of tonnage or of prices realised. How much of the half-year's products was actually sold, and how much was estimated for the purposes of revenue, are left to guess work. Probably most of the production was sold; for, as the report was delayed so long, there should have been time for the complete disposal of the products before the accounts were finally prepared. That, however, is not the most important point. What were the average metal prices, either realised or credited to production? In the report there is a table of monthly averages from November, 1912, to April, 1913, inclusive. But this table does not necessarily tell anything, except that metals were high. The terms of the new contract for the sales of concentrates have not been made public. In the absence of such vitally important information as desired in the question above, the best that can be done is to determine, in an approximate manner, the revenue from the sale of the whole of the half-year's output at the average of the monthly prices quoted, and then to trace the effect of a fall in metal prices. The output for the half-year was:—

| | Lead Concentrate. | Zinc Concentrate. |
|---|---|---|
| Concentrates, tons | 15,003 | 13,386 |
| Containing— | | |
| Lead, tons | 9,423 | 1,566 |
| Silver, oz. | 363,043 | 153,053 |
| Zinc, tons | 993 | 5,386 |

Each company has a separate tariff or contract for the sale of its products, and perhaps no two contracts are identical. But the net results of any two probably would not greatly differ. In the following the lead concentrate is credited with full recoveries for lead and silver (fine), and debited with 85s. smelting charge; the zinc receives no payment. The sale of zinc concentrate is more complex, but, roughly, it may be taken that 95 per cent. of the market price of spelter is allowed, after deducting 8 units of zinc, and allowing only 50 per cent. of the market prices of lead and silver (standard), after deducting 8 and 5 units respectively; a smelting charge is made, varying with the price of spelter, and ranging from £5 to £6 or £6 10s.

The averages of the monthly prices quoted are: Lead, £17 4s. 2d.; silver, 2s. 6.67d.; spelter, £25 11s. 11d. Taking round figures of £17, 2s. 6d., and £25, it will be found that the results are fairly close to the figures in the working account. Thus—

| | Calculated. | Actual. |
|---|---|---|
| Lead concentrate | £141,808 | £144,406 |
| Zinc concentrate | 29,496 | 30,129 |

Thus it is fairly certain that high prices were realised or taken into account. For the ten years ended December, 1911, the average prices were:—Lead, £13 16s. 8d.; spelter, £22 16s. 9d.; fine silver, 2s. 4.2d.; standard silver, 2s. 2.2d. There is plenty of room for a fall to these prices. The difference in profit would be tremendous. Thus: If lead had fallen £4, silver 2½d., spelter £3, the lead concentrate produced last half-year would have realised about £41,000 less than it did, while the reduction in the zinc concentrate would be about £6000. A total difference of £47,000 in a total net profit of £61,837 is a serious matter—and not by any means unlikely. Of this profit, £15,693 was derived from the sale of slimes to the Junction North Company (price and tonnage not stated), so that the two classes of concentrates gave a profit of under £47,000. The meaning of this is that, in terms of the present practice, the British Company could not make a profit if metals fell to average prices. The slimes would bring in nothing, or next to nothing, and the concentrates would just about pay for their production. As a period of low metal prices is not at all unlikely before many months are gone, it is obvious that the company needs to hurry up with its improvements. It cannot go on paying, or partly-paying, dividends out of capital, premium or otherwise. There is a lot of expense ahead. The following table shows the leading features of the financial position during the last three half-years:—

Table E—Financial Progress.

| | Half-year ended<br>Dec., 1911. | June, 1912. | Dec., 1912. |
|---|---|---|---|
| | £ | £ | £ |
| Revenue | 170,817 | 203,093 | 191,043 |
| Expenditure | 105,496* | 137,481 | 126,661 |
| Written-off | 3,423 | 3,545 | 3,545 |
| Net profit | 61,910 | 62,067 | 61,837 |
| Dividends | 30,000 | 46,597 | 108,206 |
| To Reserves | 65,854 | 81,324 | 34,955 |
| Paid capital | 264,000 | 264,000 | 307,744 |
| Capital expenditure | 2,807 | 2,109 | 15,687 |
| Liquid assets | 92,313 | 106,741 | 211,033† |
| Liabilities | 15,933 | 43,516 | 58,288‡ |
| Surplus of liquid assets | 46,379 | 63,226 | 152,745 |

*Includes £3060 Debenture Redemption Fund.

†Increased by £109,359 from share issue; but not allowing for dividend (£46,374) declared since close of period.

‡Outstanding balance of £24,300 debentures (6 per cent.) to be redeemed September 30th, 1913.

# MINING IN NEW SOUTH WALES.

## Broken Hill.

(From Our Correspondent.)

Broken Hill, June 20.

It seems almost impossible this week to say anything fresh about the Broken Hill mines as regards development. The mill work everywhere is good. Steadily the mills improve in their recoveries.

Attention was specially drawn early in the week to a development in the South mine, on No. 8 level. Here, going westward, good ore was met with in a crosscut. A diamond drill bore had failed to locate any ore. This bore was put in only a few feet away from the present crosscut. Still, the development was only about where it should be, and assisted to confirm other work.

The South seems to carry on development work on a greater scale than any other mine, except perhaps the Central. The South is working from the 425ft. downwards. The upper levels are chiefly for connection work, but depth is proving what is wanted at every point. One thing about the South management, it allows the shareholders, through the papers, to know everything that is going on.

Block 10 continues one of the unlucky mines along the line of lode. The upper levels will apparently be the mine's only hope. Word for word I give the general manager's report about the 1465ft. level: — "The intermediate north drive from co-ordinate 220ft. south has been advanced 10ft. to a total distance of 26ft., footwall only exposed; through lode assaying over full width of drive 9.6 oz. silver, 9.3 per cent. lead, and 4.3 per cent. zinc." There is only one word to express one's opinion on this report. It can be found in the dictionary.

Development work as regards Zinc Corporation was last week in the South Blocks confined to the Main Lode. Work proceeded on four levels, and results were generally satisfactory. The combination of the South Blocks and the Zinc Corporation makes good for both — the Lyster plant is helping greatly in results. The Horwood process experimental plant is being slightly rearranged.

Nothing new of importance comes from the Central or Proprietary. The South Extended is dumb as to results. Block 14 has nothing fresh to say, only the regular weekly output. This is being well maintained.

The mine on which special attention is directed right through is the British. Here everything is going along O.K. Big progress is being made with the erection of new plants; and underground the mine is looking splendid. No. 8 level developments are showing good and low-grade ore; No. 9 level is proving good-grade ore, and No. 10 level north drive is in ore. The main crosscut in No. 11 level has been started, in schist.

Is it pertinent to ask here when Bewick, Moreing, and Co. takes over absolute control of the British mine? And when the Junction falls into the hands of the same managers? What one suspects in mining matters can only now and again be indicated.

The Junction North mill, or mills, improves in results. Any analysis of product figures is satisfactory—costs then come into the consideration of those interested. The Junction North figures cannot be compared with any others nowadays on account of the mixture of bought ores and other products. They can only be analysed as good.

The North, which does not want any more at present is, like the South, always getting more. On the 1250ft. level the crosscut in section 6 shows fair grade ore, whilst in section 17 the southern drive shows average grade ore at 34ft.; and the 1400ft. main crosscut is making progress.

Work on the Barrier remains almost confined to the big mines along the line of lode. The little ventures are not regarded; and the big mines show only further "life."

## Bathurst District.

(From Our Correspondent.)

Bathurst, June 20.

A small company has been formed with a capital of £2000 in 200 shares of £10 each to acquire under a working option Potter's Silver Lead Mine at Condobolin. Mr. C. M. Miller is the promoter, and it is understood the whole of the capital has been subscribed. The deepest workings are only some 200ft. A large quantity of exceptionally rich ore has been sent away, and many thousands of tons of seconds are on the dump, which can be turned into money when the necessary treatment plant is erected. There is also a big block of payable ore ready to stope out, but the intention of the present company is to deepen the shaft and open up another level. Strange to say, no crosscut has been put in to prove the existence of other parallel lodes, and this work will be commenced forthwith. The mine is favourably situated, being distant only three miles from Condobolin railway station, so that transit charges amount only to a nominal sum. The mine is to be vigorously exploited, and its future prospects are undoubtedly good. The intention is to form at a later date a larger company with a capital of £75,000 to work the mine on a big scale, and to instal the latest up-to-date machinery. The finding of this mine by Mr. Potter on his own farm was purely accidental. The discovery of Gossan ore in sinking a post hole led to an assay being made, and hence the springing into existence of a mine that might otherwise have remained undiscovered.

Some prospecting is going on for tin, in the Yetholme district. Small quantities of stream tin can be obtained in the dish in several gullies and creeks, but nothing payable so far; search, however, is being made for the lode.

To satisfy a further judgment against the Great Lucknow Consols Napoleon Reef, the whole of the remaining plant and machinery was sold by auction by the warden's bailiff for a merely nominal sum, the purchaser being Mr. W. P. Brook, a local shareholder in the company. What will happen next it is hard to say.

## Lithgow District.

(From Our Correspondent.)

Lithgow, June 20.

A number of authorities to enter private lands have been applied for by several district speculators on the Bruceda1e Estate for hydraulic sluicing purposes. The ground is now being marked out and compensation assessed, though no prospecting can be done until these matters are adjusted. A cursory examination shows an immense body of wash dirt extending down the Clear Creek and Winburndale Creek on their left banks. A number of dishes washed show both fine and coarse gold in payable quantities if handled in a large and systematic way. It is also said that stream tin has been discovered here, but its exact locality has been kept secret until the ground has been legally secured. Taken altogether, there are big possibilities of profitably working a large area of country with the installation of modern machinery. Mr. C. H. Slade, in conjunction with Sydney capitalists, is forming a company to thoroughly test the areas he and his party will hold, and has secured a convenient plant to carry on this preparatory work, with a view to introducing the more modern plant later on should the preliminary venture prove successful.

At Rockley, Mr. C. Wilson has been granted a gold-mining area of 20 acres, and intends to open up the show at once. Mr. J. Edwards has secured a gold-bearing lease of 30 acres near Capertee, and a start to mine will be made with as little delay as possible.

Mr. James E. A. Wurth, manager of the Mudgee Crude Ore and Pigment Company, is in negotiation with the Department for External Affairs in connection with using district marble in the construction of the Commonwealth buildings in London. Mr. C. F. Summers, who was appointed by the Department to inspect the various marble deposits in Australia, recently paid a visit to these deposits, and reported very favourably on the quality of the stone. Mr. Wurth anticipates in the near future shipping large consignments of marble to London, as well as to America.

The Zinc Corporation is hard at it getting the water out of the lower levels of the Old Sunny Corner Mine, over which the company has a working option. There are over 1500ft. of drives in the mine, and, as these have been full of water for nearly 20 years, their appearance will not be anything when baled out. The company is anxious to test whether the ore body continues down. There is already a large body of ore in sight in No. 4 and the higher levels, but not sufficient, it is said, to justify the big expenditure necessary for plant to treat this class of ore. The Sunny Corner ore body is erratic; it varies in thickness from 6ft. to 50ft., and then again in places it runs out quite flat. Whether there are any more such patches the company is endeavouring to find out, and upon the result of this investigation the future of Sunny Corner depends.

At the Nevada Mine, the Sulphide Company's option, the diamond drill is down about 160ft. It is estimated by experts that it will take about six months to test this property.

Machinery for a gold-sluicing plant is now being erected near the old Phoenix Copper Mine at Wiseman's Creek, near Lithgow, by a private company, and there are prospects of the venture turning out a success.

Something more than surprise was manifested at Torbane and Airly when news came to hand that the shale mine and oil retorts at those places were to be closed down in the course of the next two or three weeks. For years there had been persistent rumours that something of the kind was going to happen, without anything actually taking place; so that the residents had come to regard rumour as a lying jade; and, even now, many refuse to believe the report. However, the news appears to be only too true, and operations are already in progress for closing down. This decision on the part of the Commonwealth Oil Corporation will affect about 150 workmen, and will practically result in the extinction of the two townships named. As many of the workers were comfortably established and own their own dwellings, a considerable amount of hardship must result. The fortnightly pay-sheet amounted to nearly £900, so that there must be a greatly diminished circulation of money in the district, and consequent depreciation of property. The cessation of work will undoubtedly prove a great blow to the whole district. The change will not be without effect upon the next State elections, as both townships have always been regarded as great Labor strongholds.

The Big Bygoo Tin Mining Co. Ltd. has entered into arrangements for crushing and concentration of its ore at the Breadalbane treatment works. The first consignment is to be forwarded as soon as trucks are available.

At Mulyan, N.S.W., a discovery has been made on the property of the Dalcoath Prospecting Syndicate. During the course of costeening, a formation was cut in the soft tertiary granite, consisting of quartz strongly impregnated with cassiterite (tin oxide). This quartz lies parallel to, and in conjunction with, a pegmatite vein coursing about north-east and south-west. Those conditions are similar to those prevailing on the Ardlethan field.

---

## VICTORIAN MINING ACTIVITIES.

### Bendigo and District.

(From Our Correspondent.)

The gold production for the week ending June 21, 1913, amounted to 3657 oz. 16 dwt. The principal producers were:—Carlisle, 390 oz. 10 dwt.; Virginia, 326 oz. 8 dwt.; Johnson's Reef, 234 oz. 7 dwt.; Golden Pyke, 225 oz. 2 dwt.; South New Moon, 190 oz.; Spring Gully, 180 oz.; Central Red, White and Blue, 165 oz.; Catherine Reef, 139 oz.; Williams' United, 107 oz. 17 dwt.; Nell Gwynne, 106 oz. 5 dwt.; Ironbark, 93 oz. 13 dwt. Dividends aggregating £3616 6s. 6d. were announced, viz.:—Golden Pyke, 1s., £1372 10s., total to date, £72,567 17s.; Windmill Hill, 6d., £793 16s. 6d., total to date, £68,259 18s.; Great Northern, 6d., £750, total to date, £166,450; Nell Gwynne, 6d., £700, total to date, £4900.

Carlisle showed a further increase in the yield, the higher average of nearly 7 dwt. resulting from the week's milling. Recent improved returns have followed on the extension of the 1140ft. stopes along the course of the top fault, where the main crosscut entered the more productive portion of the massive spurry formation. Having passed through the lower grade spurs above the fault in the main north level and depleted the crushing material along the faulting in the side stopes in this direction, stoping overhead is now more general from where the fault pitched under the north level, taking the crushing material for a width of about 20ft. At 60ft. south, these operations are revealing a very fair sample of gold where the quartz is more consolidated than in the side stopes. The latter are operating on the spurs for a width of 30ft., several colours of gold showing. By rising and the extension of intermediate levels southward above this level, the company will be able to keep in touch with the productive stone in the vicinity of the rising fault. At 140ft. north of the shaft a winze has been sunk to 17ft., passing through the top fault at 12ft. Fair prospects have been disclosed here, close to the Victory east back. The object is to connect with the 1200ft. north intermediate level. The latter is extended to 186ft., opening up a full width of crushing stone, which has shown a few colours of gold during the past month. A rise has been started to connect with the winze from 1140ft., and there is still 35ft. solid ground before holing through. This connection will provide another 150ft. in length of the formation for stoping, and with similar work in progress southward at 1140ft. a steady gold production should be forthcoming for some time. At 1264ft. another main level has just been commenced to facilitate the working of the northerly pitch of the stone. At this depth it will be necessary to drive about 300ft. before reaching the more auriferous zone. The irregular reef allied to an easterly dipping fault above 3430ft. has been temporarily suspended, though more encouraging prospects were discovered just before cleaning up.

New Moon Consol put through 56 tons from the footwall portion of the large fault reef at 1080ft. for the better return of 42 oz. 10 dwt. Driving and stoping is in progress from 135ft. to 275ft. north of the main crosscut. At 245ft. north a connection has been made with the old intermediate above, by sinking a winze from the latter. As this work opened up fair prospects, the output is to be increased. Recent results are the best obtained from this formation, which has been prospected for several years; previous shoots having been very short.

South New Moon 980ft. spurs now being stoped to above the 900ft. level at 450ft. south of the shaft have shown more gold of late. There is still over 300ft. of ground available along the strike of these veins before reaching the Clarence United Company's lease. The latter company are searching for the continuation of these veins by rising above 935ft. and crosscutting from 835ft. Any favourable development at this point would materially enhance the prospects of both companies. At 1060ft. the spurs to the east of the old stopes are revealing gold after each firing. The stone in the 1140ft. south level, at 153ft. from the No. 2 crosscut, is being tested by a trial milling. This formation is allied to a strong fault and an east back, and has shown fair prospects where the break pitched below the level northward. No change of note has been observed in the 440ft. north level. On the Paddy's Gully line the 200ft. west crosscut should reach the reef channel about the end of the month. Up to the present no favourable indications have been disclosed.

Garden Gully abandoned the upper limits of the 1552ft. reef in favour of prospecting the downward extension of the east leg, which showed gold rather freely in driving the north level. In carrying out some understoping prior to sinking a winze below the level, several nice colours of gold have been exposed. Though very favourable prospects were seen in the level, the auriferous shoot was short and did not extend far overhead. It now remains to be shown by the present work whether the gold continues downward to where a fault intersects centre. At 494ft. the north level is uncovering 6in. of mineralised quartz, at about 90ft. under the cap of the smaller formation, with over 150ft. of ground still to open up before reaching the boundary. In the stopes north and south of the rise at 300ft. north of the No. 1 shaft, the reef is 6in. to 8in. thick and payable, but closer to the plat there is less stone and of lower value. Some important work is being carried out at 2039ft., where a level on the upper "South Garden" reef is exposing more stone about the saddle. This level is approaching the portion of the lease between the Nos. 1 and 3 shafts, where the best results have always been obtained and interesting developments are shortly anticipated. Above 2180ft. the company have started driving in the cap of the lower reef, the stone that has yielded so much in the South Garden United mine at 2080ft. On the Paddy's Gully line financial pressure has compelled the relinquishing of shaft sinking.

New Prince of Wales sent in 50 oz. 17 dwt. from 140 tons, and once more show a small credit on the current account, the reserve fund remaining at £400. The crushing was drawn from the 690ft. south intermediate workings, broken principally between the Nos. 1 and 2 winzes. To a depth of 50ft. under the main level a good width of attractive looking stone is showing for a length of about 150ft. at this point, containing a short enrichment. As the higher quality quartz was not stoped to any extent during the week, the return is regarded as satisfactory. In beating out this stone near the connecting rise during the next two or three weeks, returns are likely to show an improvement, and there is just the possibility of a 6d. dividend following. The formation is pitching strongly north, and a level will be started off the 790ft. main crosscut later to follow it. Closer to the South boundary, at 690ft., another intermediate level and stopes are in progress from a depth of 45ft. on 6ft. to 8ft. of quartz. At present the stone is of low value, but at about 10ft. higher up more gold was seen in the winze, and the next stope should reach this shoot during July. At the No. 2, or north shaft, the crosscut off the 870ft. north level is meeting with spurs. The objective is a massive reef of irregular form, traversed for about 60ft. in sinking the shaft below 770ft., where a colour or two of gold were disclosed. This stone should be reached about the end of next month. A level located further east is also going south at this depth, but nothing important has been found.

South Prince of Wales operations at 590ft. and 690ft. are uncovering fair prospects in the southern extension of the New Prince of Wales formation, more quartz than anticipated being disclosed. At the former depth the south intermediate, from the New Prince of Wales' end, shows 1ft. to 3ft. of quartz and a little gold, at 108ft. inside the north boundary. Following are a couple of stopes taking up to 5ft. of crushing material of a highly mineralised character, and also containing gold. Galena predominates at present, which usually precedes an enrichment of the stone. This formation has an unusual strike, cutting the beds diagonally and carrying it well to the west of the old workings above 611ft. This circumstance suggests the possibility of the quartz being found continuous toward the main shaft and assures a greater degree of permanency than anticipated a few weeks ago. Another satisfactory feature is the indications of the gold extending beyond the point where the first shoot appeared to terminate on reaching the main east back. A [illegible] in the top stopes promises to play an important part in future operations. The 690ft. level is extended to 70ft. from the north end of the lease, showing a little gold in 1ft. to 2ft. of quartz. At 20ft. from the face the side stopes to westward disclose more auriferous quartz. At the outset the level traversed stone of better quality, and the reason is shown in the back stopes, which are only a few feet above the timber. Here a strong western side is visible, and along the break the quartz reveals more gold. As at 590ft., the existence of the fault improves the chances of enrichments being found at intervals. At 15ft. from the face a rise is up 10ft. through a full width of crushing stuff, carrying a little gold. After rising 30ft. a connection is expected to be made with the 611ft. winze below the old north level. This winze also reveals gold in a fair width of quartz, but it is yet uncertain whether the stone is identical with that at 690ft. Off the 611ft. main crosscut from the company's shaft, there is a level going south on 2ft. of highly mineralised quartz, associated with what is known as the "5ft." slate. These operations are expected to lead to payable results later.

Williams' United resumed stoping on the eastern spurs of the 2100ft. formation, located between the hanging wall of the Catherine fault and the main east back, the larger yield reflecting the higher quality of these veins. The south level is advanced to 620ft., and is still exposing spurs, varying from 2in. to 12in. thick and containing gold. From the west crosscut at 430ft. south, the company are also driving south on the hanging wall of the fault, opening up a considerable width of consolidated stone, with a little gold. In stoping overhead for a width of 30ft. gold is visible at intervals. The 2000ft. south has uncovered more stone of late in course of extension to 244ft.

This level is along the main back, and the quartz, though showing gold, is of inferior grade as yet. There is close on £1000 to credit. An outlay of several thousand pounds on a milling plant and air compressor is contemplated shortly; but it is probable that a disbursement of profits will be decided upon at an early date and the expenditure on machinery financed by instalments when the work is undertaken.

New Shenandoah were not so successful as generally anticipated in driving the rise on the outer west leg of the 500ft. reef at the Garibaldi shaft, an average of only a trifle more than 5 dwt. per ton being shown. The levels have opened up 5in. to 9in. of laminated quartz of a highly mineralised character for a length of 70ft. Rising has been carried out to a height of 20ft., and some stoping done. The gold is chiefly associated with the minerals. As this work is from 50ft. to 70ft. under the turnover, the results may be regarded as encouraging. In order to ascertain the dimensions of the formation overhead, a crosscut is going out at 450ft. to meet the rise. This crosscut is out only 10ft., and will need to go another 50ft. to connect the rise. A small vein of bedded quartz and a few spurs are showing, and, having to traverse the reef channel in course of extension, it is possible that more stone will be discolsed shortly.

Windmill Hill re-appeared on the dividend list after an absence of 2½ months, principally as the outcome of driving and stoping southward on the old eastern reef at 2610ft. This level is in 135ft. on 14in. of payable quartz. In the three stopes above the level there is a similar width of reef of better quality, last week's average exceeding 21 dwt. per ton. At 50ft. overhead there is an intermediate level to 63ft., with a colour or two of gold showing in 10in. of stone in the end; a few colours being also revealed in these stopes. Northward, where some rich stone was formerly discovered, the outlook is less promising. At 2100ft. the company are driving on the "Koch's" main east back in the hopes of meeting with profitable stone, as the tribs. in the adjoining mine have been getting averages of 7½ oz. to 14 oz. per ton from the quartz along this back. Remarkable features of these eastern reefs are the richness and limited extent of the gold shoots.

## Castlemaine and District.

(From Our Correspondent.)

Spring Gully had another highly payable crushing last Saturday. The expectations were great, considering the look of the stone being broken out. There were 203 tons sent to the battery, and they yielded 180 oz. This stone came principally from the northern stopes over the slide at 200ft., where it runs from 3ft. to 5ft. wide, and apparently maintains its value. There is now in sight a big body of quartz receding into virgin country. The outlook is such that the management is jubilant, and development work is being pushed forward rapidly in other parts of the mine.

South Wattle Gully mine, after a tedious wait, now announces that stone is being broken out for the battery. The 300ft. level main drive is 302ft. from the shaft, and shows a small reef in the face, which is 3ft. wide as it goes upward. It is carrying fair mineral and gold, but water is troublesome. However, it is expected to drain off in a few days. At the 230ft. level the rise over west leg has got up 11ft., where a reef 10in. wide is seen, and estimated to be payable. Quartz Hill tunnel has been driven from, and the crosscut is in 8ft. There is 2ft. of stone showing, and it gives prospects of gold.

The closing down of the Francis Ormond battery will affect prospecting work in Chewton proper, and the immense tracts of gold-bearing country to the north and east of both Chewton and Castlemaine. The gradual decline of payable mines and dismantling of plants has now reduced the number of batteries to practically one, the Spring Gully. There may be one or two others, excepting those got by new companies, but they are not in constant use, and not used by the public. None of the various shows between Yapeen and Fryerstown, nor at Chewton, have reported of late, with the exception of McCann's mine at Yapeen. This is getting on well, but no crushings have been put through.

## Maldon.

(From Our Correspondent.)

New Day Dawn has gold-bearing leaders in the end of No. 1 level, 27ft. in. The stone cut at surface about 50ft. north and 30ft. west of the shaft is 4ft. wide, and carries what is estimated to be payable gold.

Maloney's Red, White and Blue continues to improve in outlook. A crushing of 64 tons was put through last week for a yield of 16 oz. 8 dwt. The dirt was sent up from the stopes between 159ft. and 84ft. levels.

The North British (Oswald's) cleaned up parcels of residues on Friday last, as follows:—Copper plates, 70 oz. 12 dwt.; 200 tons of slimes, 69 oz. 16 dwt.; chlorination plant, 30 tons, 296 oz. 5 dwt.; total 436 oz. 18 dwt.

Derby United have been extending the 680ft. level on a 15in. reef well laminated. In the rise over the level the intermediate has been connected with the level from the top of the rise. Opening out has been started south on a reef slightly broken. Poor stone is being stoped over the north intermediate. The cyanide plant treated 150 tons for 30 oz. smelted gold.

South German Company held an extraordinary meeting on Saturday last at Maldon, with Mr. C. Calder in the chair, and there was a large attendance of shareholders. A resolution was unanimously agreed to that the capital of the company be increased by raising the amount of each of the 30,000 shares from £1 to £2, making the total capital £60,000. In the intermediate level below 1750ft. the contractors have completed timbering and securing the level, and repairing the mullock pass. A start will be made to extend the level north next week. Through cleaning out the lobby from the dam to the pump the battery has been stopped for a fortnight, but tributers' dirt is now being crushed. All the parties are hard at work.

## Daylesford.

(From Our Correspondent.)

The North Ajax are pushing ahead with their bottom level drives, and in north the face is looking highly encouraging. The payable formation has increased in size as a result of this week's driving, and is now over 40ft. thick, with every likelihood of making larger. Going south, the reef makes larger, and is now about half the thickness of the opposite end, and the stone continues to come down strong at the back of the drive. The prospects are good enough for a battery; and one of ten heads is to be erected without unnecessary delay. In the meantime, a crushing of 100 tons will be run through the parent mine's mill.

The Ajax are following south a very fair sample of gold-bearing quartz about 3ft. thick at No. 7 level. The face is now about 40ft. from the shaft. The drive from No. 9 in the same direction is stopped for the present at 31ft. in.

The Nuggety-Trafalgar are nearly ready for opening out a 700ft. level, only about six feet sinking being required before operations will be commenced to develop the east and west country.

The North Nuggety-Ajax are operating up a couple of feet of profitable reef in a drive 40ft. off the west crosscut at No. 7 level, about 14ft. north. Other payable crushing stone is broken from the higher north stopes at No. 5. Though, in the stopes below, the make is smaller in size, it is of superior value. If Dame Rumour's statements be true, the alleged encroachment on the Central Ajax by this company will be fought out in the law courts at an early date.

The various gold-bearing faces at the Central Ajax continue to keep up their average size and value and to provide sufficient payable stone to keep the ten heads of stampers going full time, with two shifts working below. A few weeks hence, the additional milling powers will be ready for crushing. Then the full shifts will be operating below and the stopes will get proper attention. Shaft sinking is not being neglected. "Go down" seems the motto here, as with several other of our local mines.

## TASMANIAN MINING.

### Mt. Lyell District.

(From Our Correspondent.)

Queenstown, June 20.

The smelting returns of the Mount Lyell Company for the last four-weekly period may be considered satisfactory inasmuch as although the aggregate amount of material treated with two furnaces in constant operation was only 17,428 tons of material, made up of 10,857 tons Mount Lyell ore, 4118 tons North Lyell ore, 1861 tons Comstock ore, and 646 tons metalliferous fluxes from the Lyell Tharsis mine, as against 17,840 tons for the previous month, made up of 12,284 tons Mount Lyell ore, 2308 tons North Lyell ore, 2308 tons Comstock ore, and 940 tons Lyell Tharsis fluxes, the yield of copper was 18 tons more, that of silver 1500 oz. more, while the gold yield was also a few ounces higher. Certainly the average copper value of the 17,000 odd tons of material furnaced was not too good, being only about 1.80 per cent., as against the ordinary average value of about 2¼ per cent. This, however, is only what may be expected until they are able to get back to the old 10,000 tons a month production of North Lyell ore, which, with its 6 per cent. value, is absolutely necessary to assist in keeping the average grade of the material treated at between 2 and 2½ per cent., and a consequent copper output of from 600 to 650 tons a month.

The current four-weekly period will show an appreciable increase of ore smelted over that of the preceding period, as three furnaces will have been in blast for the full time, the third having been blown in about the first day of the term. All three furnaces have been and are running regularly since the third was started, and although the output of ore will hardly reach the dimensions necessary to keep them going up to their full capacity for a few weeks, yet it is pretty certain that the quantity treated during the current four-weekly period will, with three furnaces running, reach over 25,000 tons, while the proportionate tonnage of North Lyell ore treated is likely to be higher and thus bring about a comparatively larger output of copper. And highly satisfactory as the recovery made by the company since the disaster has been, it must be admitted that there is still a big leeway to be made up in the way of regaining a copper production of between 600 and 650 tons a month, and there is only one way to make this up, and that is by increasing the output from the North Lyell mine.

Regarding operations at the mines generally matters continue to go along smoothly. At the North Lyell they are well advanced with the work of getting the 1100ft. line into productive order. The 1000ft. and 850ft. levels are providing practically the whole of the output of the mine, ore-breaking being in progress in four stopes at each level. The construction of the concrete fireproof pump chamber at the 700ft. level is completed, and the preliminary work for building a similar chamber at the 1100ft. level is in hand.

At the Mount Lyell and Lyell Comstock mines the usual productive and development work is in progress. A start has been made at the latter mine to extend the No. 5 or lowest level tunnel, which is about 100ft. below No. 4 tunnel level workings. This tunnel was started and driven about 200ft. by the old Comstock Company, with the objective of striking a shoot of 6 per cent. ore located below No. 4 level by diamond drilling; but, like a good many other undertakings of the company, it "stopped short" owing to lack of funds. It is understood that it will take between 500 and 600ft. more driving to reach the point where the downward continuation of the ore shoot should be met with, and under the new management the work will be pushed ahead as vigorously as possible. Regarding the appointment of a successor to Mr. A. L. Dean, chief metallurgist, who has resigned his position and will sever his connection with the Mount Lyell Company about the end of next month, it is freely rumoured that a gentleman of wide experience from Canada is likely to be appointed. Mr. Dean also practised his profession in Canada prior to joining the staff of the Mount Lyell Company.

A movement is on foot among the railway companies in Russia to purchase collieries and petroleum wells from which to draw their own supplies of fuel. The Vladicaucas Railway is already negotiating for oil wells, while now the authorities of the South Russian Railways are planning the acquisition of collieries. It is doubtful, however, whether anything will come of the project, as it is estimated that the interest on the capital outlay will represent a relatively high cost of fuel.

# SOME PROMINENT BENDIGO MINES (V.).

(From Our Bendigo Correspondent.)

(Continued from issue June 12.)

## The Golden Pyke Group.

### Constellation Company.

This company's original lease did not embrace the centre, or reef channel proper of the "Pyke" fold, being restricted to the eastern beds; but of late years, by acquiring the holding of the defunct McDuff Co., a good length of the anticline was secured, next north to the Golden Pyke. In this way the whole of the reef is workable in the "McDuff" area, the eastern backs not entering the south lease till they get a considerable depth below the cap. The Golden Pyke present reef extends into this southern portion somewhere about the depth of 590ft. and for a length of 400ft. north, where the reef becomes available altogether. For the present the formation is being opened up north of the Golden Pyke boundary. It was first intersected by crosscutting off the 525ft. plat at the main shaft, at 50ft. inside the latter company's lease. Securing a tribute of 15ft. in height, a level was driven north, to 100ft. into the north area. A rise was also extended to 75ft. on the formation, at the boundary. The crosscut disclosed very profitable stone, and it was a fortunate thing for the Golden Pyke that operations were restricted to 15ft. above the rails in the 50ft. north. The first good returns by the Constellation came from this tribute block. Continuing the level into their own ground, the reef became smaller and of inferior quality. In the end there is 2in. to 4in. of low-grade quartz along the ripple-marked wall. The beds are not pitching as rapidly south here, and another important geological feature is the altered inclination of the faulting, a strong slide in the overhead stopes showing a slight north pitch. In driving this level, operations appear to have been along the bottom of the Golden Pyke best shoot of profitable stone, first revealed in that company's rise above 643ft. The level has evidently passed through this shoot, and the prospects in the front stopes do not indicate that it is extending with the same vigour overhead. The first stope is not more than 20ft. from the face, taking 6in. of low value stone, but a little gold is visible in the second stope at 65ft. further south; where the reef temporarily enlarges to 14in. In the third stope is 4in. to 9in. of closely laminated stone, which was of good quality till about a couple of weeks ago. This stope is not far above the fault referred to and within 65ft. from the boundary. The next and last stope working is but 10ft. behind, and the same distance above the third. Just now the best stone is broken here, and this portion of the reef has been of good quality from the rise on the boundary. Stoping has been in progress to 75ft., the full height of the rise, but for 15ft. above the last stope now working, the reef has "pinched" to 2in. and 3in., and fallen off in quality. A remarkable change is noticeable in these upper workings. The rise went through 6in. to 2ft. of good stone to a height of 50ft., the formation steadily enlarging to 5ft. in the latter stages, being largest at the top. This increased width of crushing material has not been found continuous northward, for immediately north of the rise the stone narrows to 2in. a length of a couple of feet. Up to the present most of the stoping has been confined to this greater width of stone, and the better grade shoot seen in rising; and both have been depleted to a considerable extent. The "pinching" of the reef may prove to be but local, but very little disposition is being shown to determine if this is so by pushing on with the front stopes and making the height of stoping more uniform. Instead, understoping is to be commenced from the level, where the rise came through from 622ft. The 622ft. crosscut met 18in. of quartz, which showed a few colours of gold, and was deemed payable on the first breakings. Subsequently, in rising through to 525ft., the quality deteriorated, and nothing of value was recorded till the last 15ft., when payable prospects were disclosed in 4in. to 6in. of stone. This appears to be the bottom of the payshoot seen in the 525ft. level, and it will be understoped for the length of about 60ft. south to the boundary. At 622ft. there is over 300ft. of ground available in this direction, and a level has been started on the reef. The first 15ft. of driving disclosed an irregular make of quartz, of no value, in the hanging wall. Beyond this, the reef has "pinched" out, but may "make" again in the next 20ft. The extension of a crosscut to the same back from the north or "McBeth" shaft, at a short distance from the Golden Pyke boundary, is looked to for more favourable developments during the next three months. This crosscut will be started from the 420ft. crosscut early in June, and should reach the reef within 70ft. or 80ft. It will probably intersect the back at a few feet above that portion of the reef exposed in the highest stoping off the rise above 525ft. Like the Golden Pyke ground, former operations in this old shaft were along the upper limits of the formation. The east back is said to have been disclosed close to the 300ft. plat at this shaft, and was apparently of no particular value. The company are in a good position for meeting with favourable developments in the northern portion of the holding, but the stronger demand for the scrip of late appears to be somewhat premature in the face of the prospects, and the direction of stoping at 525ft. Much of the present value is evidently speculative, and in sympathy with the forward movement in Golden Pyke shares, for, so far, no comparison exists between these mines. The Constellation are about to credit. The installation of more powerful machinery at the McBeth shaft during the next few weeks will necessitate a fair outlay, but this additional expenditure may be financed by instalments.

### Golden Age Company.

Adjoining the Golden Pyke Company on the south is the Golden Age, their connection with the former being only of comparatively recent date; through the acquisition of the lease and shaft of the now defunct Johnson's Reef Extended Co. This ground was purchased for a very small sum, and has nearly doubled the length of the Golden Age holding along the "Pyke" fold in the shortest part, and which is now over 1000ft. From the Golden Pyke to well into this northern area of the Golden Age the reef channel has a consistent south pitch, the more important faults having a steady inclination in the same direction, and, approaching the Golden Age shaft, the pitch is gradually reversed, with the faulting conforming to the altered inclination of the beds. As this change does not occur abruptly, the "dish" has a fairly lengthy sweep, before the north pitch becomes pronounced in the southern portion of the lease. In extracting a reef some years ago, associated with one of the east backs of the "Pyke" channel, it was found that the quality of the quartz deteriorated while operations were along the "dished" section of the folding, good results being forthcoming from both the north and south ends of the original lease. Whether similar conditions will prevail along the other reefs allied to the parallel east backs at this depth is quite another matter. Associated with these backs, however, are a couple of very important faults, which are assumed to be identical with the two more prominent slides visible in the Golden Pyke workings, upward from the 643ft. level. In the latter mine, the numerous minor breaks, which are supplementary to the larger fractures, have exercised a very direct influence on the auriferous character of the deposits along these upper, eastern backs. Further south, the small slides are much less prevalent, but the evidence is very conclusive that the quartz deposition and the quality of the reefs are due to the action of the larger faults. These are, approximately, 70ft. apart throughout the Golden Age lease, the lower break existing close to the synclinal fold well below the 853ft. crosscut. The upper slide is only a few feet under this crosscut, and both breaks are well overhead at 400ft. in the north level. On the south boundary, the top fault is located at about 30ft. above this depth. It is in this direction that operations are being concentrated for the present, with the object of connecting the Princess Dagmar rise on the boundary. The inducement for expediting this connection is the circumstance of fair grade stone having been stoped to the boundary, for a limited height, by the adjoining company. These payable results came from a few feet under the top slide, and a short distance above it, after passing through a lower grade shoot of stone immediately above the faulting. The Golden Age at one time sunk a winze on this stone from the 750ft. level, at a few feet south of the shaft, and obtained a fair sample of gold; but these prospects proved fleeting, and work was suspended. At 853ft. the main south level has been advanced to within 50ft. of the boundary. Starting above the upper slide, the fault appeared underfoot later, and is 30ft. overhead in the end. At intervals the indications were flattering, but nothing valuable with any permancy was discovered. Stoping has extended back to the winze referred to, a distance of about 230ft., and to a height of 70ft. At this point the top stope would be fully 80ft. above the upper fault. With a varying width of 3in. to 3ft., the reef is largest in the upper stopes, but, as in the level, the quality is erratic, and on the whole results have been unpayable, and the operations north from the south end are looked to to make some amends for the failure up to the present. An intermediate from the stopes, which have been squared into the main level, is now going in at 30ft. above the latter, and should connect during the next few days. At present, driving is along the course of the fault, where a few colours of gold have been visible in 6in. of quartz. Operations are now entering the top of the shoot of payable stone referred to, as existing under the break in the next mine, but this quartz does not appear to be very extensive. In any case, the main level will need to be extended to work this 50ft. economically, and on connecting, stopes will be started from the south boundary, above the slide. At the outset there will be low grade stone to beat out, but the outlook should improve in gaining a height of 15ft. This shoot, however, does not promise to be as permanent as where stoped in the Princess Dagmar ground, though it should furnish a few profitable returns. The adjoining company carried their rise to 58ft. above the higher fault. In the top, the reef still shows a little gold, but is smaller. The block of ground available to the Golden Age south of the shaft would amount to a length of about 200ft., and an average height of between 70ft. and 80ft. through to the 750ft. level. As yet, nothing is known of the formation above the latter in this direction. As another slide, the importance of which has not yet been appreciated, exists in the vicinity of the 750ft. level, there is a strong probability of the auriferous quartz continuing overhead. Recent results in the Princess Dagmar mine confirm the impression that the gold shoots are short, and no estimate can therefore be formed of the value of the ground still remaining intact southward. The present reef is allied to the first of three east backs exposed in the main 853ft. crosscut. The next is the old "Golden Age" reef, from which several dividends were paid. This was worked throughout the original lease, but is to a great extent unprospected in the old Johnson's Reef Extended ground. The third back has been considered identical with the "Dagmar" formation, but it has never been seriously considéred, though a consistent producer for some time in the two next mines south. Further west are a couple of other bedded quartz veins untested. The work done north of the shaft on the formation now receiving attention in the south end, was from an east crosscut off the former north level, driven on the Golden Age reef. Intersecting the stone between the two slides, the level was continued to 400ft. from the shaft, stopping at 30ft. under the lower fault. Rises were put up and intermediates driven north and south without payable results; though the reef was of a promising character and varying from 6in. to 15in. in width. The end of the level being still nearly 300ft. short of the north or "Johnson's Reef Extended" shaft, the work in this direction has been discontinued, with the object of opening up the reef more expeditiously from the latter. This north shaft will be equipped with a winding plat about the end of the month, when operations will probably be started on an east back showing in the 654ft. crosscut. The former company drove 68ft. south and 36ft. north on this back, revealing 6in. to 12in. of gold-bearing quartz. A rise was also put up and stoping entered upon, but as returns were irregular, the reef was not persevered with. This is deemed to be the reef worked at 853ft. off the main shaft, and also the continuation of the Golden Pyke 447ft. formation, though sufficient data are not available to form any definite opinion. By continuing the level for another 120ft. or 140ft., it is anticipated that the Golden Pyke 643ft. south level will be connected. It is interesting to note that payable returns were got by the old company, though the averages varied considerably. On an inspection of these shallow workings when the machinery is in order, a better estimate may be formed of future prospects. The old plans show that three or four east backs, each carrying stone, were intersected by these upper crosscuts off the north shaft, but the exploratory work was apparently very restricted. This company have another string to their bow, in shaft sinking to reach the Collmann reef on the Paddy's Gully reef channel.

### Princess Dagmar Company.

The last return of about 2 oz. 8 dwt. per ton from the 853ft. reef last cleaning up brought this mine into greater prominence. This intermediate level started south from the north boundary, working through the Golden Age shaft. Very fair prospects were seen at the outset, just under the top fault, but for some time afterwards the stone was very small and of low value. The level is advanced to 180ft. At 65ft. from the end the reef began to improve in size and quality, after passing a break in the beds of the hanging wall. The stone was considered payable in the next 40ft., and for the last 30ft. the quality has been much more remunerative. The enrichment was found in a new make of stone coming up from underfoot, and some excellent specimens were extracted from this shoot, which has proved to be 8in. to 15in. thick. The richer quartz lasted for a few feet only, but there is still fair gold in the larger width of reef in the face, and the extent of this profitable shoot below the level has still to be ascertained. Three or four stopes run back for a height of 58ft., to the top of the rise on the Golden Age boundary. In rising, the first 8ft. above the slide, there was no indication of the richer shoot that was immediately entered overhead, and in which the rise continued for about 25ft., the last stages showing inferior quality stone. In the top the reef is a few inches wide, and contains a little gold. More quartz will be found to exist above as the stopes increase in height. It was in beating out the shoot risen through that the profitable yields were obtained some weeks ago, but the bulk of this stone has been depleted. The front stopes are on low grade quartz, but well above the faulting the reef is highly mineralised, and contains a good sample of gold. As far as known, the reef has not been worked at any other point. For some time it was assumed that the formation was identical with a back followed into the syncline, below 867ft. at the company's shaft. These workings extended to about 200ft. north. From the end a level was lately driven on an east back, far enough to connect the 853ft. level from the Golden Age end, by rising. In the rise 6in. to 12in. of well mineralised stone has been exposed, but only a couple of colours of gold were found. As the rise is high enough to hole through to the level, and was thought to be on the same reef, these prospects seemed to indicate a very limited shoot of good stone in the higher workings. During the last few days, however, it has been practically determined that the reef in the level is allied to another back, to the east of the rise, a circumstance that has given rise to a stronger demand for scrip. The increasing width of gold-bearing stone in the level appears to point to the possibility of the auriferous quartz extending into the synclinal fold underfoot, in the form of an inverted reef. This would ensure a greater permanency, and considerably enhance prospects. When a connection is made the dimensions of the main reef will be ascertained by pushing ahead with the level, where the trough will eventually be traversed as the formation rises rapidly south. The possibilities of the inner stone seen in rising are also arresting attention. Further west is the Golden Age reef, which has not been seriously considered from this end, though the company stoped it for a short distance from the Golden Age mine a couple of years ago, but without much success. The Dagmar formation lies still further west, and is deeper in the strata. Through the northern portion of the holding this profitable quartz was associated with a contorted eastern back, thinning out considerably near the Golden Age boundary. In the opposite direction the crumpled beds were absorbed in the general folding of the rocks over centre. The reef entered the Johnson's Reef lease at 100ft. south of the main shaft, with a spread of 40ft. across the cap. Some rich stone continued into this adjoining property, along the western turnover. At 1845ft. the Princess Dagmar are driving north on a small east back, connected with an unexplored reef on the Pyke channel. The back is considered to be the recurring west back of the rich reef worked to the tune of over £80,000 in dividends on the main Garden Gully reef channel about 20 years since. It will be of interest to ascertain whether the quartz associated with the same beds over the Pyke fold is also payably auriferous. The company are just about out of debt. This week's milling should be profitable, though a reduction in average may be anticipated.

(Concluded.)

---

# A SILVER FIND.

## Fascinating Report from South Australia.

News of what purports to be a prodigious discovery of silver comes from the Cowell district of South Australia, where the Cowell Blocks Development Syndicate and the Cowell Proprietary Silver Mining Syndicate have acquired prospectors' claims aggregating 440 acres and 60 acres respectively.

The field, it is stated, was discovered by a prospector named Atkinson nearly a year ago, and was, unsuccessfully, brought under the notice of Adelaide speculators. It is situated 18 miles, by a good road, from Cowell, which was formerly known as Port Franklin. The ore is stated to be similar to the Broken Hill deposits, and is carbonate and silicious. From the prospectors' claim on the Proprietary Company's lease 19¾ cwt. of ore was treated for a return of 2326 oz. silver, producing a value of £286 5s., with £2 18s. from the lead contents. Subsequent independent assays by Mr. W. W. Dodds and Mr. W. Hartlett gave returns from the carbonate of 5849 oz. silver to the ton, and 4837 oz. to the ton respectively. The silicious assay averaged 3330 oz. per ton. The samples assayed were brought from the dump by Mr. M. L. Grand, one of the directors, who states that the ore was taken at random. Mr. O. V. Colvin, 47 Queen-street, Melbourne, who has been appointed manager of the parent company, says he has never seen anything to equal the ore. Very little work has been done on the lease; but a 10-ton sample is being bagged for treatment at one of the smelting furnaces. Mr. W. Coleman is chairman of the directors of the Proprietary Syndicate, which includes a number of well-known Victorian gentlemen.

The Cowell Blocks Syndicate has, as chairman of directors, Mr. Alfred Hamilton, who is at present on the field, accompanied by W. M. Bennetts, of Broken Hill, who will inspect the property and report to the directors.

---

# BROKEN HILL TREATMENT METHODS.

## Recent Developments.

## Selective Flotation.

By J. Malcolm Newman.

In my preceding articles I dealt with "Some Features of Broken Hill Mining," as described in papers submitted for discussion before the recent Congress of the A.I.M.E. at Broken Hill. I propose now to review Broken Hill treatment methods with special reference to the flotation process. The most commonly used, best known and most generally applicable of these is the Minerals Separation Process, the evolution of which on the Central mine has been described by Mr. Hebbard in a valuable paper submitted at the recent Congress. The paper is a concise historical account of nearly 20 years' struggle to solve the problem of segregating the lead, zinc and silver of the ores into products capable of being marketed and smelted commercially.

It is as well, perhaps, at the outset to describe the average Broken Hill ore. The unaltered ore consists of a mixture of galena, blende, quartz, rhodonite, garnet, calcite and pyrites. The galena is almost pure argentiferous lead sulphide, while the blende is an impure zinc sulphide, combined with sulphides of iron and manganese. The percentages of rhodonite and calcite vary at different points along the line of lode. For instance, the north end of the North mine, the south end of the South mine, and the whole of the South Blocks mine yield calcite ores, and contain less than 5 per cent. of rhodonite. The rhodonite percentage on the other mines varies from about 15 per cent. on the Proprietary to 45 per cent. on the Junction North. The higher specific gravity of galena enables a large percentage of that mineral to be recovered by jigs, concentrating tables, and vanners, but owing to the fact that the specific gravity of blende differs very little from that of garnet and rhodonite, it is impossible to make a separation of these minerals by water-concentration alone. The Broken Hill garnet has a specific gravity of about 4.2; the blende about 4.0, and the rhodonite about 3.6.

Bearing in mind the above facts, Mr. Hebbard's chronology will be found most interesting. It is as follows:—

From 1895 to Present Date.—Water concentration in jigs, tables and vanners, producing high grade galena concentrate, and as bye-products zinc, middlings, tailings and slimes.

1901 to 1907.—Mechernich magnetic process, treating rich zinc middlings produced by water concentration for the recovery of the following products:—

(1) Garnet, rhodonite product, waste.
(2) Blende product, a marketable concentrate.
(3) Galena, blende, quartz products, which on further treatment on wet concentrating tables and vanners, produced lead concentrate, zinc concentrate and waste quartz product.

N.B.—The wet mill tailings and slimes not treated by this process.

1901.—Experiments on Flotation by Frothing carried out on the Central mine without commercial results.

1901 to 1902-3.—Potter and Delprat Processes. In these hot solutions, containing sulphuric acid and salt cake (acid sodium sulphate) respectively are applied to fine granular ore or tailings, producing carbon di-oxide gas, which floats off the galena and blende, leaving the quartz and rhodonite behind. This process has been commercially successful in treating middlings and tailings, but will not without modification treat slimes. It is limited also to the rhodonite ores, containing only a small percentage of calcite, because of the solubility of calcite in sulphuric acid.

1904 to 1905.—The Cattermole or Granulation process, consisting in the agitation of a mixture of pulped ore, oil and water, containing a suitable acid or an alkali with soap or other emulsifying agent, so as to agglomerate the oil-coated particles into granules. The oil was thus employed in a state of emulsion in water in the presence of an emulsifying agent, such as soap. After agitation the mixture was passed into an up-current separator or classifier to remove the lighter non-oil-coated particles from the agglomerated masses of oil-coated particles. The lighter sands having been eliminated, the pulp passed to a second series of agitators to increase the size of granules, and thence to a second classifier for the removal of the heavy sands. From the bottom of this second classifier some granulated concentrate was recovered, but the heavy sands from the overflow also carried over with the up-current a large amount of granulated mineral. This mixture of granulated mineral and heavy sands passed then to a third series of agitators, and thence to a shaking table, where the granulated "air-bally" mineral, rendered more buoyant by directing on to the surface of the moist pulp jets of compressed air, was buoyed to the surface of the water and floated off the bottom of the table, whilst the gangue sank and was delivered over the end of the table. The plant for this process consisted of—

(1) Grinding apparatus.
(2) Vat for emulsifying various oils.
(3) Set of six mixers in series.
(4) Up-casts for separating sands and floats.
(5) Second set of mixers for further aeration.
(6) Upcasts for further separation of sand and floats.
(7) 3rd set of mixers for re-aeration.
(8) Wilfley tables for the separation of coarse sands from granulated sulphides.

This process is especially noticeable as being the first process to treat slimes successfully.

1905 to 1906.—Frothing Process (Flotation), developed in connection with the Granulation process. It was found that by lowering the percentage of oil a "mineral froth" was produced as distinct from the "granules" produced with a higher percentage of oil. Based on this fact, Messrs. Sulman, Picard and Ballot took out their patent under which "finely powered ore suspended in acidified water is mixed with a small proportion of an oily substance, such as oleic acid, amounting to a fraction of 1 per cent. on the ore, and agitated until the oil-coated minerals form into a froth which can be separated from the gangue by flotation. Heat may be applied to facilitate oiling, and either shaking tables or spitz boxes may be used to separate the frothy mineral from the sands and the gangue slime." This was followed by Mr. Chapman's patent, under which

"(1) The ore, suitably crushed, is agitated with acidified water in the first mixer and heated.
"(2) Oleic acid is subsequently added in the second vessel.
"(3) The pulp is maintained at the desired temperature in the third and following mixers with violent agitation in each mixer to ensure complete and thorough erasion."

1907.—A slimes plant started on Central mine, treating accumulated dump material, closed down after treating 40,000 tons.

1908 to 1911.—A Minerals Separation plant treated 710,000 tons of Central mine accumulated tailings.

1909 to present date.—Zinc section added to the wet mill on the Central mine treating all the bye-products of the wet mill. "It may be mentioned that up to January, 1913, this plant has treated 1,225,011 tons of ore, and recovered 239,408 tons of lead concentrate and 399,090 tons of zinc concentrate."

In addition to the events described by Mr. Hebbard, the following, which occurred on mines other than the Central, have had far-reaching results, namely:—

1903 to present date.—The Broken Hill Proprietary Co. has worked the Potter-Delprat Process on a large scale, treating old accumulated tailings and current mill tailings, but not slimes. The capacity of the plant is 12,000 tons per week.

1907 to 1912.—The Elmore Vacuum Oil Process worked at the Zinc Corporation treating old tailings. Capacity, 700 tons per day. Worked also on the British mine. On both these properties the Elmore has been replaced by the Minerals Separation Process.

1910 to present date.—The Amalgamated Zinc (De Bavay) Company is treating 11,000 tons of tailings per week by the De Bavay "Skin Float Process," which depends on the property of greased particles of sulphides floating as a film on the surface of water. This process, though entirely successful on granular material, does not treat slimes.

1911 to 1912.—Bradford's Slime Process on Broken Hill Proprietary mine. A modified Potter Acid Process, depending on the principle of enclosed agitation and aeration. This process treated accumulated slime dumps, and had a capacity of 2500 tons per week.

The foregoing is then the history of the struggle, the net result of which has been the large increase in recovery of metals stated by Mr. Hebbard to be as follows:—

Recoveries in 1895.—Silver, 45 per cent.; lead, 65 per cent.; zinc, 7 per cent.

Recoveries in 1912.—Silver, 92.7 per cent.; lead, 94.1 per cent.; zinc, 91.8 per cent.

Based on these recoveries the figures given by Mr. Hebbard, summarising the work done in the Central mine mill during the twelve months ended December the 28th, 1912, show a metal value extracted from the ore of over £7 per ton of ore at recent metal prices. Allowing, say, £3 10s. for Broken Hill costs and profits, we find that £3 10s. per ton of ore, or £7 per ton of combined lead and zinc concentrate, is required to cover the smelting charges and smelting losses. It is well known that smelting—of zinc ores in particular—is expensive, and that some metallurgical loss is unavoidable in all smelting operations, but £7 per ton of concentrate strikes one as an exceptionally high figure. The spelter convention and metal brokers can, no doubt, be blamed to a certain extent, but of course the great source of loss lies in the fact that the various Broken Hill concentrates are still complex in composition, with the following results:—

(1) The lead concentrate contains from 6 to 10 per cent. of zinc, which not only is not paid for by the smelting companies, but is charged for in their returning charges.

(2) The silver in the zinc concentrate is subject to a big deduction from the assay, the remainder only being paid for at about 50 per cent. of its value.

(3) The lead in the zinc concentrates is subject to deduction from the assay, and the remainder is then also only paid for at about 50 per cent. of its value.

This state of affairs, as is well known, is largely the result of imperfect slime treatment by present methods. Until quite recently, the Central mine and the Junction North were the only companies treating current mill slimes. As stated above, both the Central and the Proprietary erected plants to treat old dump slimes, but neither of these is now working. The South mine has over 300,000 tons of slime stacked, the Amalgamated Zinc and Proprietary are stacking slimes, the British and North mines have sold their old slimes dumps to the Junction North. The position seems to have been this:—It was recognised that the Minerals Separation, and perhaps other processes, would recover the lead, zinc, and silver from the slimes, leaving a clean worthless gangue, but it has been almost an impossibility to separate the lead and zinc slime concentrate into marketable products. The method used for attempting this is wet concentration of the mixed concentrate float on tables and vanners, taking advantage of the difference in specific gravity of galena and blende, the operation being known as "de-leading." By this means, an imperfect separation is effected, and the products, though in themselves probably not very suitable for smelting, can be mixed with the higher grade products obtained in the wet mill and zinc tailings mills, to form a marketable product. That this method does not give entire satisfaction is evidenced by the fact that all the mines along the line of lode have been experimenting with a view to finding a process to separate the lead and zinc in the slime concentrates more effectively. The processes that are being evolved to effect this have been called "Selective or Preferential Flotation Processes." One of them is already well known as Horwood's process, and consists in subjecting the concentrates to a sulphatising roast by which the galena particles are coated with sulphate of lead, while the blende particles are unaffected. After roasting, the material is refloated, the unaltered blende floating and the coated galena remaining behind. The Zinc Corporation has a plant running on this process, and it certainly appears to be effecting a perfect separation.

The other selective processes appear to depend upon the fact that by controlling the aeration of the pulp, and by controlling the chemical composition of the solutions, the character of the float can be controlled. This seems to be the basis of all the new processes, the chief of which are:—Owen's, Lister's and Bradford's. The writer, with other visiting members of the Institute to Broken Hill, had the privilege of seeing Lister's process at work on current mill slimes on the Zinc Corporation's South Blocks mine, and there is no room for doubt that on the particular ore being worked in that mine, the process is an undoubted success, and it would be doing the Broken Hill investigators an injustice to doubt that the principle will be modified to suit all the classes of ores and products found at Broken Hill; for instance, one hears a good deal about the presence of certain salts in solutions causing preferential flotation. It is, therefore, reasonable to revise our ideas of the values of the Broken Hill mines in view of the development of these "selective" processes.

There is no reason to think that much change will take place in the preliminary crushing followed by jigging, since this process eliminates a considerable percentage of the lead as a very pure concentrate rich in silver, and very low in zinc. The lead and silver thus obtained are paid for by the smelters at nearly full value, with very low returning charges.

As the mines deepen and draw more of their ore from deeper levels, the proportion of coarse crystal galena decreases. The effect of this is already seen in the Broken Hill mills in a diminution in the amount of jigging done. The fine jigs for treating middlings have been almost universally abolished, being largely replaced in the mills of to-day by Wilfley and similar tables. The reason for this is the necessity for finer grinding to free the metals in the more compact ores of the deeper levels. Unfortunately, fine grinding produces lead slimes carrying rich silver values. Only a small proportion of this fine lead can be recovered as a clean product on the tables, and the remainder either goes away in the slimes to be stacked, or is recovered as in the Mineral Separation plants with the zinc concentrate, and partially separated from the zinc by de-leading on concentrating tables, the resulting products, as previously stated, being still complex. This is where Selective Flotation comes in, for it acts perfectly on slimes so that the lead is recovered as a clean product, carrying the silver, and the zinc is recovered as a high-grade concentrate containing very little lead and silver. The new practice in Broken Hill will, therefore, be an all-sliming process in contra-distinction to the present practice, which aims at producing as little slime as possible. Just as the necessity for fine grinding resulted in flint tube mills replacing Heberli mills, ball mills, and to a less extent grinding pans, so the sliming requirements of the future may be expected to introduce new machines, such, perhaps, as the steel ball tube mill or the Hardinger mill.

Without, for the time being, considering the improvements which seem possible in the purity of the coarser concentrates, let us consider the immediate results of Selective Flotation on current mill slimes. Thus, an average slime, assaying, say, 10 per cent. of lead, 10 oz. silver, and 12 per cent. of zinc will yield by selective flotation:—

(1) A high grade lead concentrate, assaying about 50 ozs. of silver to the ton, and worth about £10 per ton net.

(2) A high grade zinc concentrate worth about £2 per ton,

with average metal prices, such as lead, £15 a ton, silver 2s. an ounce, and zinc £20 a ton.

On the above slimes these products will be worth £1 10s. per ton of slime, and on average Broken Hill slimes the figure can be safely put at £1 per ton. The mine most affected by this wonderful result is probably the South mine, which has a fine asset in its 330,000 tons of stacked slime, and in the similar quantity of potential slime in its ore reserve. The Junction North mine has, apparently, good reason to congratulate itself on its recent purchase of slime, as well as on the fact that, instead of making unattractive metallurgical products, its present plant can, with very little alteration, be adapted by the introduction of selective flotation to the production of first-class products. The Zinc Corporation has already published figures showing that the Lister process is giving them a very much enhanced profit. The Amalgamated Zinc De Bavay Company has been stacking the slimes which have to be washed out of its purchased tailings before treatment by the De Bavay process. The treatment of these wsahed-out slimes by selective flotation will give this company enhanced profits, and so on similar results will accrue to all the Broken Hill mines; in fact, it is quite safe to say that the net value of all Broken Hill ores will go up from two to four shillings per ton on account of wet mill slimes alone. Roughly speaking, the additional value given to Broken Hill ores on this basis is £1,000,000 to £2,000,000 depending on metal prices, without taking into account the fact that lower-grade ores will become payable.

---

# TAILINGS PUMPS AND WHEELS.

## Westralian Practice.

In reply to an inquiry, the State Mining Engineer of Western Australia (Mr. A. Montgomery) has favoured us with the following information regarding tailings pumps and tailings wheels in the State:—

There are quite a variety of appliances used in this State for the purpose of elevating tailings. There are many tailings wheels in use and still being put in, but mostly in the smaller mills and for low lifts. For the high lifts required in large mills plunger pumps of the Cornish type are generally preferred to the large tailings wheels which would be required for an equal lift, mainly on account of the less first cost and much smaller space occupied. The stuffing boxes through which the plungers work are often provided with a flushing ring of clear water, under pressure, which keeps sand from entering them, and details of construction are, in general, quite similar to those of similar pumps used for raising gritty water in shaft-sinking. The sizes vary greatly, also the lifts, in various plants, according to the output of the mills. When choosing a pump, allowance must, of course, be made for the greater weight of a mixture of sand and water than of clear water in comparing the volume of material which may be raised by a given pump with its capacity when lifting water only. Tailings pumps are used for any ordinary stamp mill tailings and slimes, and for either vertical or inclined lifts. Frenier spiral pumps are now much used for small lifts, and not uncommonly are put in in series, one lifting to the next one, for higher lifts. They have given very satisfactory results. Centrifugal pumps are used a good deal, but mostly for circulating fine sands and slimes. Two- and three-throw plunger pumps are also in common use for lifting tailings and slimes.

---

# HOPE FOR BALLARAT.

## A Scheme of Government Aid.

Mr. Herman, the Director of Geological Survey (V.), has prepared a promising scheme of State aid for mining in Ballarat East. It has received the sanction of the Cabinet.

Some months ago the Last Chance Company applied for a grant of £1000 to assist them in their operations. Mr. Herman subsequently visited Ballarat, and made an underground inspection of the Last Chance and other mines, accompanied by Mr. W. Baragwanath, of the geological branch, who has been closely in touch with the industry in Ballarat. As a result of his investigation, Mr. Herman prepared a scheme, which is a departure from the practice of making comparatively small grants to a number of ventures. He decided upon recommending that substantial assistance be granted, provided the companies were prepared to put up a good sum and work on lines officially approved of. He has made a second visit to Ballarat to confer with the directors of the company, and the scheme submitted by him has been adopted.

Mr. Herman's scheme, while being carried out in the Last Chance, will be of material assistance to the Britannia to the north, and also of advantage to the Llanberris No. 1 to the south. No work is being done in the Last Chance below 800ft., although the shaft is down 1200ft. In the northern end, which is to be the scene of the projected operations, nothing is being done below 700ft. Here Mr. Herman proposes to undertake prospecting work at three different levels—the 800ft., 1000ft., and 1200ft. Above this last level they have a block of country north of what is known as the big crosscourse, 700ft. in height, and running up to 500ft. The mining that is now being done at 700ft. is just north of this crosscourse, and a drive has been extended over 90ft. east of it. This drive passed through a body of stone 12ft. thick, nicely mineralised, but poor in gold contents. The appearances, however, are favourable for an improvement here. At 800ft., according to Mr. Herman's scheme, the company will drive north on what is known as the "Leather Jacket," where there is a big lode, carrying a lot of mineral, but containing very little gold. At 1000ft. there is an old drive, but it will have to be repaired, and they will then crosscut west, and subsequently open out on an approved lode channel. At 1200ft. they have to make "northing" prior to cross-cutting, and the same policy as at 1000ft. will then be followed out. These three points have been selected after careful study of the features underground, and of the history of adjacent country. The Britannia had payable results from the same line to about 1100ft., and the Llanberris, to the south, did likewise. The Last Chance themselves, from the south of the crosscourse, won nearly £380,000 worth of gold, and paid £36,000 in dividends.

The importance of this work to the Britannia lies in the fact that that company are within three weeks of completing the deepening of their shaft to 1184ft., operations having been resumed there only a few months ago, after a long period of inactivity. The driving north in the Last Chance will prospect the country towards the Britannia, and thus help that company. Shareholders in the Llanberris No. 2 would be encouraged to work their bottom level, since a vigorous policy at the Last Chance would guarantee the keeping down of the water, which is now being kept to 1100ft. by the Last Chance. The scheme is thus of threefold interest, and has in it the possibilities of a revival of mining at Ballarat East.

Before any money is granted the Last Chance Company will have to place £1000 to their credit in the bank. Government assistance to the extent of £3000 will then be forthcoming on the pound for pound basis, but the company will have to maintain a minimum credit of £500. The grant must be expended solely on the three levels specified, the company having to meet "top" expenses. In regard to the expenditure provision is made in the terms suggested by Mr. Herman, and adopted by the Cabinet, for seeing that the whole of the money is used on sound business lines, the main object being to protect the State, but the same provisions will be of decided advantage to shareholders, who will have the satisfaction of knowing that the department's precautions will be ensuring to them as good a run as is possible for their money.

The scheme is an earnest of the Government's desire to assist the mining industry, and all that remains now to be done before it is put into operation is for the company to subscribe the necessary deposit.

---

A movement is on foot in Ballarat (V.) to have a tunnel bored by the Railway Commissioners to make a direct road route between the West and East railway station. The scheme would cost £12,000.

# THE VACANT NORTH.

Professor Baldwin Spencer, Protector of Aborigines in the Northern Territory, lectured under the auspices of the Royal Society of St. George in the Austral Salon, Melbourne, last week.

The lecturer said the Territory would, in time, become one of Australia's greatest provinces. Much had been heard of the tremendous amount of money spent on it last year by the Government, but it was nothing to what would have to be spent to populate it, and to keep it we would have to populate it, for there was not a single gun, not a fortification round its coast. A hostile army could land without trouble in it, and in a few months produce crops sufficient for its soldiers' sustenance. Then good-bye to "White Australia." Some pictures were submitted of part of the 11,000 miles of empty country between Pine Creek and Oodnadatta, after which views of the vast stretch of well-watered country towards the Gulf of Carpentaria were shown. It was here, the lecturer stated, settlement must eventuate. He paid a tribute to the Government for the scientific and economic manner in which it was having the country's possibilities investigated. The lot of the woman outback was sympathetically touched on, and an instance where one of them locked herself in a room and wept when she knew strange white men had arrived at the "station" was narrated. The woman had seen no whites for years. The lecturer went on to state that there were many water holes and plenty of artesian water right through the Territory, but in travelling black boys were essential, as they could locate water when sometimes 50 miles away.

# PAPUAN AFFAIRS.

## Oil and Mineral Prospects.

Judge Murray, Administrator of Papua, who is on a visit to Australia, emphasises the need of money for development purposes. He says that the recent deficit in the finances was only a temporary phase, and that since the Territory was taken over by the Commonwealth four years ago, and revenue has increased by £25,000, compared with an increase of £4000 in the previous four years. Trade had also largely developed, while the area under plantations had expanded from 1467 to 15,881 acres. The most important development was the discovery of oil, and if it turned out as anticipated, the prospects would be of the brightest. A large amount of money would have to be spent in putting the industry on a proper basis. The Territory was worth it.

In the report by the Federal analyst on the samples of oil on the Vailala field, Papua, Mr. P. Wilkinson gives the following results:—Odour, of crude petroleum; colour, pale (cinnamon) brown; fluorescence, bluish green; specific gravity, at 60 deg. Fahr., 0.8082; flash point at air temperature, 51.8 Fahr.; refractive index at 20 c., 1.4485; sulphur compounds almost completely absent; polarisation practically nil. The crude oil, after standing at 50 deg. Fahr. for a few hours deposited a quantity of crystalline wax matter similar to paraffin, equal to 3.4 per cent. A fractional distillation test of 100 cubic centimetres of the crude oil was made by means of a standard Engler still. The first drop of distillate appeared at 108 deg. C. (226 deg. Fahr.). The distillation was continued up to a temperature of 300 deg. C. (572 deg. Fahr.), and up to this temperature the distillate measured 81.5 per cent. A second sample of the oil was distilled in the standard Engler apparatus. The data obtained by dry distillation show that the oil contains relatively large quantities of spirit and burning oils, and smaller amounts of lubricating oils. The method of distillation applied commercially would be guided by the type of product required.

The data so far available, says Mr. Wilkinson, indicate that the Vailala field oil is closely similar to that obtained in Borneo, Sumatra, and adjacent islands. It is recognised in those oil countries that the crude oil obtained during the first flow in the boring operations is not always a guide to the character of the oil obtained after the flow has advanced. Mr. Wilkinson considers that a larger sample of the oil should be submitted for more complete analysis, with a view to determining the character of the products obtainable by steam distillation on the basis of commercial practice. For this purpose not less a quantity than from 5 to 10 gallons would be necessary. The suggestion made by Mr. Wilkinson is to be given effect to.

Mr. R. E. Chancellor, who has arrived in Sydney by the steamer Matunga, from Papua, stated that on the whole mining was somewhat at a standstill on Woodlark Island. Capital, he declared, was the only thing necessary for the development of the industry on the island. Woodlark King, a privately owned mine, from its last crushing of 120 tons, yielded 1020 oz. of gold. This mine had a large quantity of gold in view. It had been very unfortunate, as a breakdown had occurred to the machinery shortly after the installation of a new boiler, with the result that a delay of three or four months would be occasioned. There had been a shortage of labour of late, owing to the good season causing the natives to attend to their cultivations. Woodlark Island boys did not take kindly to work, with the result that it was necessary to obtain labour from adjacent islands, where the labour was satisfactory. Mr. Chancellor considers the Woodlark Islands have a great future in the direction of copper mining, and he carried several specimens to Sydney.

# MINING IN WESTERN AUSTRALIA

(From Our Correspondent.)

Kalgoorlie, June 16.

No. 1 west winze on the Victorious is now down to 60ft., the last 15ft. assaying 260s. per ton over a width of 60in. This begins to make it appear doubtful whether the rich ore-shoot is really pitching east, as originally supposed, or west, as in the neighbouring Slippery Gimlet. In the latter the pay-shoot was only 150ft. long at the surface, and gradually increased to 400ft. at the 250ft. level, entirely to the west. The Gimlet lode is 25 chains north and parallel to the Victorious lode. The four winzes at the No. 4 level of the Victorious now average as follows:—No. 1 west, 60ft. deep, 131s. per ton for 70in.; No. 1 east, 45ft., 41s. for 67in.; No. 2 east, 131s. for 70in., and No. 3 east, 174s. for 64in. The mine is now making sufficient water to supply the whole plant, but it has to be run to waste, as the company's agreement with the Government for 80,000 gals. a day at 3s. 6d. per 1000 gals. has still 2 years to run. As the Ora Banda mines are in a hollow basin, it will be interesting to see what will happen when the district gradually becomes a lake, which it undoubtedly will do if the Government insists on its present policy.

Owing to the success of the Victorious, a good deal of activity is apparent in the Ora Banda district. The Trafalgar, adjoining on the east, has been taken over by Mr. Tom Creer on behalf of an Adelaide syndicate, a combine of the Kurnalpi and Havilah syndicates. This lease is on the strike of the Victorious lode, and has very big chances; but it is 500ft. away from the nearest workings. Many ore-shoots, however, may be found in that distance. Apparently a gutter runs through this property, as one of the original shafts went down 80ft. before striking country, while, at other points, a few feet of sinking get through the surface overburden. Mr. Creer is an optimist, and thoroughly deserves any luck that may come his way, and everybody hopes that he and his Adelaide backers may have a win, and they have an uncommonly good chance of striking a winner.

The Golden Horseshoe Co. has just declared its ore reserves on December 31, 1912, as 714,100 long tons, of a value of 34s. per ton. This compares with 804,200 tons, of an assay value of 32s. per ton on December 31, 1911. Why an up-to-date man like Mr. Sutherland, manager of the mine, should continue to publish his reserves in long tons is a problem difficult to solve. Mr. Sutherland introduced the filter press on the Lake View Consols in 1897, and solved the slimes problem, and the tube mill on the Golden Horseshoe, a very few years later, and both these processes are now in common use on every goldfield of the world, and produce millions of pounds sterling yearly otherwise lost.

Mr. W. Rose Grant, who floated the Siberia Consols in Adelaide under most disadvantageous circumstances, has now taken charge of the mine, and will give investors a straight go. The lode on the property averages quite 90ft. wide, and contains numerous rich pipes, or ore-shoots, as the returns of £25,000 from 1000 tons testify. At a depth of 180ft., water level, very rich ore is exposed for anyone interested to see, but no development has been done at this depth. This is water level, and further sinking may disclose an unlimited supply, as happened in the case of the Victorious. In any case, as Ora Banda is only 12 miles away by road, and less as the crow flies, the water difficulty is merely an incident.

The 10-head mill on the Edna May, at Westons, has made a start, and should prove a regular producer in future. Mr. M. Williams, the manager, has started sinking a new shaft to replace the original shaft, which collapsed, but, unless he gets a contingent of Victorian alluvial miners to aid him, it is an absolute certainty that the new shaft will collapse when the "spewing" ground is reached. The writer is not talking secondhand, but from what he saw on the North Lead, Kanowna, 14 years ago, and what he has seen since.

# THE COAL MINING INDUSTRY.

## New South Wales.

### Southern District.

(From Our Wollongong Correspondent.)

People connected with the trade say the demand for Illawarra coal and coke is prospectively good.

Coalcliff colliery, for which has been secured a contract for railway supplies for 1914, of 100,000 tons, has been preparing for that contingency for some time in the way of increasing the outputting plant. When the new colliery was ready for work, some three years ago, it was estimated that ere this it would be one of the largest producers in the district, but the lack of adjacent accommodation for workmen, and the inadequacy of the railway service, upon which the colliery has to rely mainly, have negatived the estimates.

The offer of the North Bulli Coal Co. of an electric light installation from Austinmar to Stanwell Park (about four miles) has not been accepted by the Bulli Shire Council. The Council is feeling that the present installation has been a big achievement, and for the present is inclined to think well enough has been done. But it is quite evident the Council is not to be allowed to rest in this question of improvement of lighting the hitherto dark thoroughfares of the shire; two or three applications from streets not in the electric system have already been received. Besides the main road, the installation extends over 27 miles of bye roads.

The Dromedary Mountain, in the Tilba district, which was at one time very promising, but has proved to be of the casual character common to south coast gold bearing areas, is again receiving attention. A discovery of a reef showing free gold has attracted a number of the class who are always on the qui vive, and when a good find is made, are quickly in the vicinity pegging. Williams and Twyford made the new find, and there is no doubt have raised some good stone; they have been interfered with in sinking by wet weather.

The Ettrema Mines Ltd. (Sassafras) the other day got a further suspension on their leaseholds of six months. The reason given was shortage of capital. The offer of the proposition in the Melbourne and London markets has not proved a draw, although the show when first made known gave hopes of being the foundation in the district of a big mining and smelting industry. Its great disadvantage is its location at the bottom of a deep gorge.

# REPORTS OF COMPANIES AND CORPORATIONS.

## Mount Lyell M. and R. Co. (T.).

The comparative table shows the smelting and the converter returns of the Mount Lyell M. and R. Company for the last two 4-weekly smelting periods:—

| | *May 14. | †June 11. |
|---|---|---|
| Mt. Lyell ore treated, tons | 12,284 | 10,857 |
| N. Mt. Lyell ore treated, tons | 2,308 | 4,118 |
| Lyell Comstock ore .. .. | 2,308 | 1,861 |
| Total ore treated, tons | 16,900 | 16,836 |
| Fluxes and purchased ores .. | 940 | 646 |
| Blister copper produced, tons | 308 | 326 |
| Contents— | | |
| Copper, tons .. .. .. .. .. | 304 | 322 |
| Silver, oz. .. .. .. .. .. .. | 23,745 | 25,271 |
| Gold, oz. .. .. .. .. .. .. | 498 | 523 |

*The ore treated was higher than the average grade, owing to the North Mount Lyell ore having been drawn entirely from the 850ft. level stopes.

†Two furnaces in operation from 15th May to 9th June, inclusive; third blown in on 10th June.

## New Specimen Hill G.M. Co. (V.).

Mr. W. D. Thomson presided at the half-yearly meeting of the New Specimen Hill G.M. Co., Daylesford, in Melbourne last week.

The chairman, in moving the adoption of the reports and balance-sheet, said the half-year was more profitable than the previous term. The stone won had at times given irregular values, but upon the whole fair profits had been made. A dividend of 6d. per share would be paid on 4th July, after payment of which they would have over £1000 in hand. They would need money to sink the shaft another lift. They were commencing this work, as they had 4ft. of stone on the McTavish lode, in the bottom of the present shaft, and they hoped to get another shoot of gold at a depth. Development work was progressing favourably; they had a lot of stone in sight, and the outlook was very promising.

The reports and balance-sheet were adopted.

# ENGINEERING and ELECTRICAL RECORD

Vol. XXVII. MELBOURNE AND SYDNEY, JUNE 26, 1913. No. 761.

THE ENGINEERING AND ELECTRICAL RECORD *is published every Thursday morning. Price Sixpence.*

*All communications should be sent to the Editor; those having reference to business matters should be addressed* CRITCHLEY PARKER.

CASUAL ADVERTISEMENTS *on this page 15s. per inch per insertion.*

Australian
General Electric Co.
217 Clarence Street, Sydney.
Tel.—Central, 3405, 4397; City, 2381.
"Penfold House," Cr. Queen and Little Collins Sts., Melbourne.
Tel. Central, 2647.
Representing—
GENERAL ELECTRIC CO., U.S.A.
The
BRITISH THOMSON-HOUSTON CO. LTD., of Rugby, England.
The GUARANTEE of EXCELLENCE on GOODS ELECTRICAL

## SYDNEY CITY COUNCIL.

At the last meeting of the Sydney City Council, the following recommendations of the Electric Light Committee were adopted:—

That extensions of electricity mains be approved as follows:—(a) Pearl-street, from substation, along Lansdowne-street and Marlborough-street, to supply premises of Messrs. David Jones and Co. Estimated cost £380. No guarantee required. (b) Woollahra, Cranbrook-road, from New South Head-road, to supply new house and provide supply to new buildings. Estimated cost, £100. No guarantee required; (c) Woollahra, Victoria-road, from Ginahgulla-road, to supply premises of Mrs. King. Estimated cost, £115. No guarantee required; (d) St. Peters, From Sydenham-road Substation to King-street, to raise pressure at Spear's Brickworks. Underground cables and laying of conduits to carry suspended 10,000 volt cables. Additional cost for underground work, £122 10s.; (e) Annandale, Johnstone-street, from Substation in Collins-street, new distributing main. Estimated cost, £465. Johnstone-street, along Collins-street to Nelson-street, and along west side of Nelson-street to Messrs. Beale and Co.'s premises, overhead main. Estimated cost, £215; (f) St. Peters, Unwins Bridge-road. Underground cable, being portion of mains [illegible] from Sydenham-road Substation along George-street and King-street, but where overhead mains cannot be carried by present poles; also the laying of two fibre conduits at same time to carry high tension feeders. Estimated total cost, £122 10s.; (g) Kensington, Eastern-avenue and Carlton-street, new main to reduce pressure on overloaded portion. Estimated cost, £140; (h) Hunter-street, to join existing feeder, additional cable to supply "Sun" office in Elizabeth-street. Estimated cost, £127, additional to amount of £270 already approved.

That with regard to a letter from the British General Electric Co. Ltd., asking for further consideration for their tender for high tension [illegible], which they stated they could not supply within the time required, viz., 12 weeks, and for which other arrangements were made, a report by the City Electrical Engineer dated 29th May, 1913, be adopted, such report stating that in the opinion of the City Electrical Engineer the company have no claim whatever on the Council as things now stand.

That with regard to the surplus for the year 1912, as shown by the Electric Lighting Balance-sheet submitted by the City Treasurer, amounting to £38,889 1s. 1d., the following appropriations be approved and authorised: £2576 1s. 1d. —To write down the charge standing against the capital in tools account; £34,369—To further write down goodwill account of purchased companies; £1944—To be carried forward.

That approval be given for the expenditure of £2500 to provide for the supply of electricity to a limited portion of the area of Strathfield Municipality.

That approval be given for the purchase of the following electrical apparatus from Messrs. Staerker and Fischer, who are giving up their electrical business:—25 x 8 ampr. size outdoor type arc lamp resistances; 25 x 10 ampr. size outdoor type arc lamp resistances; at the price of 12s. 6d. each; 44 x 60 hour direct current flame arc lamps, at the price of £1 each; 25 x 60 hour alternating flame arc lamps, at the price of £1 each.

That approval be given for the payment to the Chief Railway Commissioner of the sum of £377 7s. 2d., for the construction of railway siding at the Power House, Pyrmont, being £177 7s. 2d. in excess of the estimate of £200 originally supplied by the Railway Department.

That authority be given for the purchase from Mr. Max Wurcker, at a cost of £30, of a printing frame with lamp for the purpose of making prints from tracings in dull weather, this being in substitution of the amount of £15 recently granted for the purchase of two arc lamps for the same purpose, also for the provision of necessary wires and fixing, at a further estimated cost of £4.

That authority be given for the purchase of one hundred tons of bitumen from Messrs. W. G. Watson and Co. Ltd., at a cost of £695, as an extension order under their existing contract, which provides for repeat orders within twelve months from the acceptance of tender.

That three lines of conduit be laid in Kelly-street, from Wattle-street to Blackwattle-lane, for future use, at an estimated cost of £90 13s. 2d.

That the 30 k.w. pole transformer at Darling Point be replaced with one of the 100 k.w., at an estimated cost of £30, to meet the increased load.

That necessary work at substations be carried out as follows:—(a) Botany, at Anderson's Tanneries—Erection by the City Building Surveyor, of a small substation, at an estimated cost of £150 and equipment. Estimated cost, £65; (b) Annandale, at Substation No. 15, Johnstone-street—Installation of additional 100 k.w. transformer and necessary switchgear. Estimated cost, £59. The necessary material is in stock; (c) Daceyville Substation No. 32—Erection of switchgear, etc., for the control of public lighting. Estimated cost, £59.

That a claim by Mr. L. Gaffney for compensation for injury alleged to have been caused by an electric light pole lying in Ridge-street, be settled by the payment of a sum of £50.

## LITHGOW (N.S.W.) INDUSTRIES.

(From Our Correspondent.)

Lithgow (N.S.W.), June 21.

Much satisfaction is expressed in Lithgow at the settlement of the question of the letting of the iron pipes contract. Mr. C. H. Hoskins says the acceptance of the firm's tender for the supply of cast-iron pipes for the Government will mean immediate pressure on the blast-furnace plant, and give the firm an incentive to push on with all rapidity towards the completion of the second blast furnace, and, possibly, the erection of a third blast furnace in the immediate future. The blast furnace is now working satisfactorily, and in a few days will be quite up to the highest output it has ever reached. In fact, when another hot-air stove is connected with the furnace, the output will be greater than ever before. Fires have been lighted in the new coke ovens to dry the brickwork in readiness for a start to be made at making the firm's own coke. The acceptance of the tender for cast-iron pipes means that the pig-iron for the pipes will be made at Lithgow. The making of these pipes has been the mainstay of the blast furnace in the past, as the firm's Sydney business is by far the biggest consumer of pig-iron of any firm in Australia. The price in the new contract may appear somewhat high, but that has been brought about wholly and solely by the increased cost of labour.

Mr. Hoskins has just returned from South Australia, where he obtained an order for 7500 tons of pig-iron. This is the second contract the firm has had from the South Australian Government, the first being for 8500 tons. The engineering authorities in that State speak very highly of Lithgow pig-iron, and say it is superior for pipe-making purposes to any imported iron, being worth fully 4s. a ton more than the foreign article. The South Australian Government pipe works are using 250 tons of Lithgow pig-iron per week. The works cost £60,000, but this amount has since been very much written down. Up till recently, part of the land at Port Adelaide was occupied by the Railway Department in conjunction with the pipe-making department, but the railways have now removed their works, and the pipe-making department has estimates out for additions, to cost from £16,000 to £20,000, and when these are completed, the works will require 400 tons of pig-iron from Lithgow per week.

Mr. A. C. Wright, the manager of the Commonwealth Small Arms Factory, at Lithgow, states that a further batch of one hundred rifles are on the point of completion, while a further two thousand guns are almost assembled. The continued wet weather has rendered the road to the factory almost impassable, and the manager is appealing to the Municipal Council to take steps to have the thoroughfare placed in proper order.

## CHEAPER CABLE RATES.

Reductions in the rates for cable messages via Pacific are foreshadowed by an agreement which has been made between the Canadian Government and the Universal Radio Syndicate, Ltd., an English company, which has acquired the rights and patents of the Poulsen system of wireless telegraphy, for the establishment of a wireless system of communication between Canada and England. The rates which have been agreed upon for the transmission of messages across the Atlantic will involve considerable reductions on those now charged by the cable companies—about half. The matter is obviously of considerable importance to Australasia in connection with the despatch of cablegrams to England via the Pacific.

The rates proposed across the Atlantic are 8d. a word for code messages and 4d. for plain telegrams, instead of a shilling, charged by the Cable Companies; 2½d. a word for Government messages, as compared with 5d. for cables; and 2d. a word for press messages, as compared with 3½d. by cable. The contract with the Canadian Government is for five years, and the company deposited 50,000 dollars with the Canadian Finance Minister last month as a guarantee of the satisfactory installation of the system.

If an arrangement is come to between the Pacific Cable Board and the Poulsen syndicate on these lines, the rates would then be:—Ordinary plain messages, 2s. 6d. a word; code messages, 2s. 10d.; Government messages, 1s. 5d.; and press messages, 6d. a word. The difference of 6d. a word for ordinary commercial messages would, of course, be material.

The chairman and managing director of the Universal Radio Syndicate, stated, in London last month, that although the contract which had been arranged with the Canadian Government for a wireless service between Great Britain and British North America provided that the service must be in operation within 12 months, he had no doubt that it would be ready by August next, and in operation in September. They had already selected a site for their European station at Ballybunnion, near the mouth of the River Shannon, on the west coast of Ireland. Mr. Baxendale added that the minimum speed of transmission would be 400 letters (or 80 words of five letters) a minute, but they were able to exceed this limit to a considerable extent. The rates of 8d. a word for code messages, and 4d for plain word messages, would ensure both classes of messages being treated as urgent.

## BRITISH AND EUROPEAN DEVELOPMENTS.

(From Our Correspondent.)

London, May 16.

The Council of the British Electrical and Allied Manufacturers' Association has just provisionally adopted standardisation rules for electrical machinery (excluding railway and tramway motors). The rules represent the work of the Standards Committee of the Association upon the subjects of standard pressures and frequencies, high pressure and insulation tests, types of machines, rating, overloads, and temperature rise. Other sections dealing with short circuit tests, commutation, pressure regulation, parallel operation, efficiency, and tolerances, are at present under consideration.

I have received a copy of the very full report issued by the manager of the Liverpool Corporation Tramways on the working of the system during the year 1912. This shows that with a car mileage of 12,590,408 (an increase for the year of 1.5 per cent.), 134¼ million passengers were carried (increase 4.4 per cent.), the receipts being £631,071 (an increase of 5 per cent.). The average earnings per car mile were 12.03d., an increase of 0.39d. The total revenue amounted to £668,220, and the operating costs were £425,018, leaving a gross profit of £243,202. This is allocated thus:—Interest, £50,096; sinking fund and loan repayment, £59,248; reserve, renewal and depreciation, £66,929; in relief of rates, £66,929. The net profit for the year is worked out at £133,858, an increase of £19,126 over 1911. On the Woolton route the two Stevens petrol-electric motor-omnibuses which were put into service last November are reported to have worked most satisfactorily. "They are operated at a much lower cost than the ordinary motor-bus, and are greatly appreciated by the public owing to their smooth running and comparatively little noise." A detailed description of the Stevens 'bus was given in this journal last year.

There are many indications of a new interest in the development of electric vehicle business. We have made many attempts at it, and the story of our failures in this department, both in respect of omnibuses and carriages, is one to forget, rather than to tell at this time of day, whether the troubles may have been technical, financial, or both. The greater rate of progress made in the United States, especially during the last few years, and the attention which electric supply men there have devoted to the cultivation of this class of load, have been held up before British central station men for purposes of reproof, and of encouragement to do better. Whether the lesson has gone home, or whether the new enterprise of certain British car builders, the coming of the Edison battery, and the greater spirit of enterprise in commercial electric supply, have all been working together in favour of electromobilism, it seems pretty certain that we are on the eve of a forward movement, for which electrical lookers-on have longed for many years past. That the coming discussion on the question at this year's convention of the Municipal Electrical Association in June will give another push to the movement is naturally expected, for at that convention engineers in charge of electricity supply undertakings have their most influential committee-men under their wing, and it is most important that these gentlemen should be convincingly impressed with the importance of a prospective vehicle-charging load, in order that the engineer may gain support for whatever schemes he may see fit to bring forward. As illustrating the interest now developing, I may quote from the report just issued by the borough electrical engineer of Ipswich (Mr. Ayton). After trying to impress upon his committee the importance of cultivating electric heating and cooking business, he turns to the great possibilities offered by "the use of electrically propelled vehicles, whether pleasure cars, or light or heavy delivery vans or waggons." He says that for years past there has been nothing wanting in the electrical and mechanical mechanism for such purpose—the excellent results and low cost of maintenance of tram-cars and electric trains are cited as testifying to that. The means of storage, he remarks, has been the difficulty up to recently, but this has now been overcome by the accumulator introduced by Mr. Edison, so that everything points to a considerable use being made in the near future of this class of automobile. With Edison accumulators it is possible to make a journey of 70 to 100 miles on one charge, depending upon the nature of the district travelled —i.e., hills and road surface. The charging of such vehicles during the night-time, says Mr. Ayton, would be a valuable addition to the load, and one which would result in immediately reducing the cost per unit generated. "For this purpose alone it will be wise to offer every possible inducement for the use of the electric vehicle at Ipswich."

Manchester's electric supply system, like other large undertakings, continues its power plant extensions on turbine lines, but the municipality, also, has its own gas supply system, and there has not always been an absence of rivalry between the two departments. The Corporation Gas Committee cannot prevent the progress of the Corporation electric power supply business, however enterprisingly it may run its undertaking, but it is ready to take advantage of any legitimate opportunity to dispose of its own commodity, even if it be in assisting in the production of electricity. Evidence of this readiness reveals itself in a quite interesting way, when the gas committee instructs its engineer and chairman to make a tour of Continental installations, and to inspect large gas engine plants in view of the possibility, even the likelihood, of an extensive use being made of gas in the generation of electricity.

Birmingham Corporation is going to buy 75 new tramcars at a cost of £83,000 for service on existing lines, and 40 more for lines to be constructed, while, under its powers to run motor omnibuses in prolongation of any of its tramways, it proposes to order 10 such 'buses for £10,000. The net profits on the tramways, after meeting all financial charges, amounted to more than £100,000, of which £56,000 is placed to rate relief.

The Institution of Electrical Engineers has just announced a number of awards for papers read during the past session. These include the Institution premium (£25) to Mr. A. E. Hadley for his paper on "Power Supply on the Rand." The Ayrton Premium (£10) to Mr. F. H. Whysall for "The Use of a Large Lighting Battery in connection with central station supply." The John Hopkinson premium (£10) to Dr. E. Rosenberg for "Self-Synchronising Machines." The Kelvin premium to Messrs. C. C. Paterson, E. H. Rayner, and A. Kinnes for "The Use of the Electrostatic System for the Measurement of Power." The Paris premium to Mr. J. S. Peck for "Earthed v. unearthed neutrals on A.C. systems." There are several other awards, but the above relate to papers which have been read, and have been referred to in these pages during the session.

The annual meeting of the Institution will take place in London on the evening of May 30th. The report of the Council for the past year possesses special interest by reason of the fact that the membership returns include the alterations and additions consequent upon the agitation of the last year or two, and the adoption of new articles and revised fees. The total of all classes of members in 1912 (May) was 6537, in which were included 3089 associate members, 1388 full members, 806 associates, and 1247 students. The figures at May, 1913, are:—Total of all classes, 7084, including 3535 associate members, 1549 full members, 671 associates, 1062 students, and 260 in the new graduate class. The net increase is 547, and it compares with an average annual increase of 137 for the preceding five years.

On Monday next the hundred and more members of the Institution who are taking part in the Paris visit, at the invitation of the Societe Internationale des Electriciens, will leave London and proceed to enter upon the excellent programme of festivities, papers, works, visits, etc., that has been prepared for them. What a feast of things technical is to be served up between May 21st and 24th—or the limited parts of those days set apart for meetings—may be gathered from the following menu card.—High-tension continuous current traction, by M. Gratzmuller; Single phase traction, by M. Latour; Electrification Schemes of the Chemin de Fer du Midi, by M. Julian; Electrification of the Paris suburban lines of the State Railway, by A. N. Mazen; Railway Electrification Problems in the United States, by H. Parodi; Petrol-electric motor trains, by J. B. Damoiseau; Long distance transmission of electric energy (continouus current). by J. S. Highfield (of London); Long distance transmission of electric energy (three phase current), by H. Leblanc; Automatic Telephony: application of Mechanical Devices to the assistance of Manual operating in telephone exchanges, by W. Slingo, engineer in chief to the British Post Office.

The Home Office has this week issued under Section 33 of the Coal Mines Act 1911, orders approving of the Oldham miner's electric safety lamp, and the Gray-Sussmann ditto, Nos. 3 and 4, for use in mines to which the Act applies.

London, May 23rd.

Some months ago reference was made here to the scheme prepared by the then city electrical engineer of Leeds, Mr. Dickinson, for meeting the rapidly growing demand for electric power. Mr. Dickinson, who went to Liverpool, has now been succeeded at Leeds by Mr. Hefford. The department of which he is the head has just issued its report and accounts for the year, and these show that the business continues to progress at an increasing rate, for the units sold are more by 5,288,940 units (29.7 per cent.) than in the previous year. The growth in revenue has not been in similar proportion, as the great bulk of the increase is in the output for power or traction purposes at a low price. Further, revenue has been reduced by a concession made to lighting consumers, the maximum price having been reduced from 4d. to 3½d. per unit last October. The private lighting sales increased by 5.5 per cent., but the resulting revenue is £1747 less than in the previous year. The number of consumers has increased from 7165 to 8101 (13.1 per cent.). The aggregate capacity of motors connected has grown from 17,291 h.p. to 22,096 h.p. (27.8 per cent.), and the heating, cooking, and ironing business, though still small, has grown, the capacity of such apparatus connected to the mains having increased by 79.7 per cent. during the year, and the advance in units sold for such purposes is at the rate of 25.9 per cent. A substantial reduction in power charges comes into force next October. Owing to the large advances in the prices of coal and other materials the increase in the revenue (aggregate) has been almost entirely counter-balanced by the addition to the working expenses, and as the capital charges are spread over a larger number of units, the total cost per unit sold is .20d. less than a year ago. The net surplus of the year is £15,509—slightly less than last year—owing to certain expenditure out of revenue upon permanent works.

It was announced yesterday by the Melbourne Electric Supply Co. Ltd., when intimating a 4 per cent. dividend for the half-year ended at February, that if the earnings continue to show the same expansion as up to the present, the dividend for the whole year on the ordinary stock may be 10 per cent., or 1½ per cent. better than for last year.

The annual report of the British Thomson-Houston Co. Ltd., mentions the progress of the extension of the different departments of the works. At December last the company had a larger number of Curtis turbines on order and in course of manufacture than ever before. The manufacturing output of the year was restricted owing to the coal strike seriously affecting deliveries of raw material, such as iron, steel, etc. After paying interest on debenture stock and loans, there is a profit of £31,000. Of this, £20,000 goes to depreciation of plant, £1696 and £6270 to other depreciations, £1825 to writing off special experimental expenses, leaving a balance of £1209.

Following up my several references here to the Dolter surface contact traction trouble at Hastings, it has to be stated that the Tramway Company now finds itself in a very perplexing position. Parliament has refused to allow the change over to overhead trolley on the section now run on the contact system, and the Board of Trade has given notice that the latter must be removed within six months from March last. The problem is what is to take its place, and the directors have this month been inspecting petrol-electric omnibuses, such as are being run experimentally in a northern suburb of London by the London County Council. Its great desire to have a uniform system, trolley throughout, cannot now be fulfilled.

On Wednesday, May 21st, Mr. A. Alison read a paper before the Junior Institution of Engineers dealing with heat accumulators and their use in exhaust steam turbine plants. By means of an entropy chart he examined the theoretical extent to which the recovery of power could be carried under ideal conditions, this providing the standard for the measurement of the efficiency of the means adopted in practice. The Rateau heat accumulator was described in detail, also the Adamson-Rateau and Rateau-Morison system, and particulars were given of several existing installations in steel works, collieries, etc., together with tests of same. The conclusions arrived at, stated briefly, were as follows:—The introduction of the heat accumulator has rendered it commercially possible to recover a considerable amount of power that would otherwise be wasted. This power is obtained without any increase in the steam and fuel consumption, and in the case of a non-condensing engine, practically without any alteration to the existing plant. Results given in tabulated form made it appear that even in the case of an engine already working with a condenser, considerable gain may be anticipated by the addition of a low pressure turbine. The turbine is at present unrivalled as an agent in the conversion of the energy of steam into work, and when used in combination with a reciprocating engine, the results obtained for a given steam consumption are unequalled by any other system of compounding. Moreover, said Mr. Alison, there appears to be marked objection among colliery engineers to the introduction of any complications to the winding machinery itself, and this fact alone renders it improbable that all winding engines will be fitted with condensers in future, aside from considerations of the relative inefficiency of such an arrangement. On the other hand, the addition of an exhaust steam plant, whilst affording a great source of gain, does not in any way complicate existing machinery, nor is the operation of the primary engine suspended in the event of a breakdown occurring in the secondary motor. Against these advantages must be set off the capital cost of the turbine installations, and the cost of maintenance and repairs. A good vacuum is necessary if the best results are to be realised, and this can only be obtained if a copious natural supply of cooling water is available, or by incurring the additional expense of a cooling plant. Even if it be necessary to adopt this latter alternative, the results obtained in practice amply justify the outlay, and the manifold advantages of the system of exhaust steam utilisation invented by Prof. Rateau quite outweigh any of the foregoing objections.

## CORRESPONDENCE.

### FERRY SYSTEMS.

(To the Editor of "Engineering and Electrical Record.")

Sir,—In your issue of March 27 I read with considerable interest your criticisms of the recent strike of employees of the Sydney ferries, and note that you consider it one of the best systems of the world. There I disagree with you, and so will many others who have seen the most excellent system operating on San Francisco Bay, which has been suggested as a model for a re-organisation of the Sydney harbour traffic. I have seen ferries in Sydney, Auckland, and San Francisco, and read much of such facilities in New York and the Continent, have heard travellers speak of other systems, and conclude that the best is here. San Francisco has a city population of 430,000, while all around the bay are about 320,000 more, living at Sausalito, Belvedere, San Rafael, and distant Richmond, Berkeley, Oakland, and Alameda, and these people are catered for by 5 ferry companies, operating 26 steamers of from 400 to 1000 tons each, carrying 39,000,000 passengers per annum, or 105,000 daily. Sydney ferries, I believe, convey about 27,000,000 yearly. About 180 trips are made daily by all boats, and a 20 minute service is maintained, accelerated to 15-minute at rush hours. Monthly tickets are 3 dollars each, which covers a trip of 4 miles across the bay, and from 2 to 5 miles by electric train to various points, the average cost being, say, 7-10th of 1 cent per mile. Each steamer can accommodate 1500 people comfortably, and with the patent hydraulic gangways and movable fender gates, it is the usual work to unload 1500 or more passengers, walking 20 abreast, and load with others, in 5 minutes. The system is most excellent, and Sydney, with 695,000 persons, would do well to copy it.—I am, etc., M. W. von BERNEWITZ.

## UNIFORM COMPANY LAW.

### Sought by Chambers of Commerce.

The desirability of having company law made uniform throughout the Commonwealth was keenly discussed at the conference of the Associated Chambers of Commerce of the Commonwealth in Sydney.

Mr. H. Y. Braddon, in moving "that it is highly desirable there should be a uniform company law throughout the Commonwealth, and that this law should follow the English law as far as practicable," said that if the Federal Government were to institute a movement in this direction—if, for instance, it were to call a conference at which the States would be represented by legal and commercial men—he believed that any scheme which might be formulated would be adopted. No doubt, however, if the Federal authorities were to move in the matter without holding any such conference, the States would raise objections. Under present conditions a limited company meant one thing in New South Wales and something quite different in other States. And these differences led, naturally, to corresponding differences in the practice of the Stock Exchange.

Senator Keating (Hobart) agreed that a uniform company law was desirable. But it had been held, and well held, as the result of a decision of the High Court, that it would not be competent for the Federal Parliament to pass a company law for the whole of Australia on the lines of the English company law. It might, however, be that the State Premiers, in conference, would be willing to extend the present powers of the Federal Parliament, so as to enable it to pass a company law in the main on the lines of the English company law. He would be glad if this could be brought about without giving up the power of control. This matter was one of regulation alone. It involved no burning party question, and the surrender of powers by the States would have no party significance.

Mr. R. Manning (Perth) asked, whether, if this law was passed, the administration would be in the hands of the Federal Government or the various States? If in the hands of the Federal Government, he was instructed to oppose it.

Mr. Braddon said he would prefer to see the Federal Government invested with these powers rather than have no uniformity of the law throughout Australia.

Senator Keating instanced the possibility of State amendments from time to time, as making a uniform Commonwealth law preferable.

Mr. Braddon's motion was agreed to, with the following addition:—

"And that this conference requests the Associated Chambers of Commerce to urge the matter upon their respective Governments for consideration at the next Premiers' conference, with a view to joint and early action."

## MISCELLANEOUS.

In response to a request from Bentleigh (V.), the Melbourne Electric Supply Co. has intimated that it is intended to continue its electric service to Bentleigh, via Ormond and McKinnon.

* * *

A private meeting of St. Kilda and Brighton (V.) councillors has had under consideration the scheme for the acquiring of the Brighton-St. Kilda Electric Railway by the Prahran-Malvern Tramway Trust. The scheme includes a suggestion to reduce the gauge to the width of the tramway lines.

* * *

Certain Melbourne firms that are interested in the construction of lifts are desirous of effecting an alteration in the regulations governing speed. In Sydney the speed limit is fixed at 300 feet per minute, as against 200 feet per minute in Melbourne. The Minister for Labour (Sir Alexander Peacock) has received a communication from Mr. J. Reed, a Sydney architect, suggesting the appointment of three experts to report on the matter, and in the event of a decision being arrived at to increase the speed limit in Melbourne, to make recommendations for insuring the safety of lift attendants and passengers. Sir Alexander Peacock has asked Professor H. Payne, of the Melbourne University; Mr. H. R. Harper, electrical engineer of the City Council; and Mr. A. Stone, the Railway Department's expert, to inquire into and report upon the matter.

* * *

The Victorian Minister for Labour (Sir Alexander Peacock) has been requested to receive a deputation on the subject of licensing electrical wiremen, and has replied that the work does not come within the scope of the Factories Department. It would involve the appointment of persons competent to examine applicants and certify to their efficiency, and the department could not deal with it.

* * *

The St. Kilda, Brighton, and Caulfield (V.) Councils have adopted the report of Messrs. J. M. and H. E. Ware regarding the construction of a joint rubbish destructor. Moorabbin, which is also in the combine, still stands out. Richmond has been notified by the health officer that effluvium nuisances must occur at the Council's "tip" until a more effective means of disposing of garbage is arranged. A deputation, representing a score of municipalities, waited upon the Board of Health last week and protested against the regulation of the Board, made 18 months ago, requiring that in three years' time rubbish "tips" should be abolished. The principal objection was one of cost, but it was pointed out that the revenue from the Prahran destructor last year exceeded the expenditure by over £300. Mr. Wood, the chairman, stated that "tips" were a menace to the community, and reports which had secretly been obtained by the Board, from time to time, proved that the "tips" of some of the councils represented on the deputation were worst of all. He promised that the representations made would receive consideration.

Last week the revenue of the Prahran-Malvern Tramway Trust (V.) amounted to 1s. 4d. per car mile. It was reported that there was an enormous all round increase in traffic, and additional cars were being constructed.

* * *

A section of the new Caulfield (V.) line on the lower level is now in operation, between Malvern and Armadale. When the duplication is completed, the suburban traffic will be greatly relieved.

* * *

A meeting of the Hawthorn (V.) Traders' Association has passed a resolution requesting the Mayor to convene a public meeting of citizens of Hawthorn to urge the electrification of the present horse tramway with a loop line up Burwood-road from Power-street via Camberwell-road to the Burke-road junction.

* * *

At a conference between Prahran and Malvern (V.) Councils on the proposed Malvern-road electric tramway, a motion was carried, "that Prahran and Malvern Tramways Trust be requested to construct the Malvern-road line as a trust undertaking; that Prahran and Malvern Councils undertake to guarantee the trust against loss on this line; that Prahran and Malvern Councils consent to Balaclava-road system being made a trust line in consideration that the Malvern, Caulfield and St. Kilda Councils guarantee the trust against loss on this section as from the completion and opening of the Malvern-road line for traffic."

* * *

The Railway Commissioners (V.) have intimated that the "slack" coal from the Wonthaggi State mines is to be used in the Yarraville power house, which will supply energy to the electrified railway. To convey the material a special type of hopper truck is to be constructed. It is estimated that when the line is in full operation between 80,000 and 90,000 tons of "slack" will be burned every year.

* * *

The Victorian Cabinet has decided, as was anticipated, to introduce a Bill in Parliament for the construction of an electric tramway line from Burwood to Princes' Bridge, via Swan-street and the Yarra Bank, a distance of about 8½ miles. The proposal has the support of the Melbourne, Richmond, and Hawthorn Councils, through whose territory the line passes.

* * *

Noyes Bros. Propy. Ltd., Melbourne, has received an order from the N.S.W. Government for 250 miles of wire netting.

* * *

Hawthorn (V.) has applied for admission to the Prahran-Malvern Tramway Trust, and a conference on the question is to be held between the municipalities concerned.

* * *

The idea of electrifying the Swedish railways seems to have got a firm hold of the public mina in Sweden, and much progress towards carrying it into execution has been made already. The first great step is the electrification of the Kiiruna Railway from Kiiruna to the Norwegian frontier. This work has been advanced rapidly of late. A start has been made with the building of the transformer stations, and it is anticipated that the whole line will be opened for regular traffic in the course of this year. Satisfactory progress has also been made with the line between Stockholm and Saltsjobaden, which is also to be completed this year. The State Railways besides have made extensive experiments with two Diesel electrical locomotives, which have given very satisfactory results, while five private lines have had the question of electrification examined by experts for the working out of estimates as to the cost, etc.

* * *

In a paper entitled "On the Nature of the Toxic Action of the Electric Discharge upon Bacillus Coli Communis," read at a recent meeting of the Royal Society by Prof. J. H. Priestley and Mr. R. C. Knight, the authors came to the following conclusions:—(1) Electric discharge in air is fatal to bacteria exposed to its action; (2) the effect is due to the products of the interaction of the constituents of the air—namely, nitric and nitrous acids and ozone; (3) discharge in air-free hydrogen has no deleterious effect on the organisms, but the presence of small quantities of air allows the formation of a toxic substance, probably hydrogen peroxide, which again exerts a bacterial action; (4) it, therefore, follows that electric discharges in which the current density does not exceed $10^{-5}$ amperes per square centimetre do not exert any directly toxic action upon micro-organisms, a result which is contrary to the statements made by some previous investigators.

* * *

The Australian Metal Company is supplying to the Balmain Electric Light and Power Supply Corporation Co. Ltd., N.S.W., an "A.E.G." 2000 kw. turbo alternator, capable of generating the above output at E.M.F. of 5000 to 5200 volts

**P & O.** COMPANY'S ROYAL MAIL STEAMERS
FOR MARSEILLES, PLYMOUTH, AND LONDON.

Leave Sydney on the subjoined dates, calling at usual ports.

FIRST AND SECOND SALOON ONLY.

| Steamer. | Tons. | Commander. | Noon. | Melb., 3 p.m. |
|---|---|---|---|---|
| MEDINA | 12,500 | Notley | June 28 | July 1 |
| MOLDAVIA | 10,000 | Gordon | July 12 | July 15 |
| MALOJA | 12,500 | Weston | July 26 | July 29 |

PASSAGE MONEY TO LONDON—
Single, £41 16s to £82 10s.
Return, £69 6s. and £123 4s.

Return Tickets between Inter-State Ports are available for return by Orient, Messageries Maritimes, and N.D.L. steamers having room.

SPECIAL HOLIDAY RETURN TICKETS to COLOMBO are now issued, available for two months. Fares from Sydney, £45 2s. first saloon, and £31 18s. second saloon.

A. GORDON WESCHE, Superintendent IN AUSTRALIA, 63 Pitt-street, Sydney.

**The COLONIAL MUTUAL FIRE Insurance Company Limited.**

Principal Office: 60 MARKET-ST., MELBOURNE

Branches in all the States.
Transacts Fire, Guarantee, Employers' Liability, Marine, Burglary, and Plate Glass, Accident, Workers' Compensation and Live Stock Insurances.
Send for Prospectus.
W. TUCKER, General Manager

**Harringtons LTD**

**ANALYTICAL & METALLURGICAL DEPT.**

Lowest fees for all kinds of Assay, Analytical, and Metallurgical work.

Expert Advice on Ore Treatment, Bullion Refining, Smelting, etc., etc. Directed by a qualified Analyst from Messrs. Johnson and Sons, London; Assayers to Bank of England; H.M. Mint, The Council of India, etc.

**HARRINGTONS LTD.**
**386 George Street, Sydney.**

between each phase, complete with condensing plant and pipe work. The plant is to commence running in March next.

* * *

In order to avoid the use of expensive iridium for alloying with platinum to secure great hardness, Fritz Zimmerman, of Newark, N.J., has suggested using osmium in its place, and has received U.S. pat. No. 1,055,119, covering the process. Experiments have been made using many proportions of osmium, from ½ of 1 per cent. to 10 per cent. Alloys containing more than 10 per cent. osmium are workable only with difficulty, while those containing more than 30 per cent. are brittle and hardly workable at all. As far as hardness is concerned, one part of osmium is claimed to be equal to 2½ parts of iridium in the platinum alloy. As the demand for osmium is not great, it can be obtained at lower cost than iridium, and its alloy is the equal of the latter as regards hardness and tensile strength, and said to be more resistant to acids than platinum alone. For alloying platinum and osmium, it is necessary to bring both metals to a high degree of purity in order to remove elements which impair the good qualities of the alloy.—"Eng. and Mining Journal."

* * *

A sample of Para rubber, from Sogeri, Papua, weighing 4 lb. has been favourably commented upon in a report from the Imperial Institute. The sample consisted of large thin sheets of pale brown rubber, clean and well prepared. The physical properties of the rubber are described as excellent. The composition of the washed rubber is as follows:—Caoutchouc, 95.7 per cent.; resin, 2.8 per cent.; protoid, 1.3 per cent..; and ash, 0.2 per cent. The commercial value was estimated at 4s. per lb. in London, with fine hard Para rubber at 3s. 11d., and fair average quality plantation sheets and biscuits at 3s. 10¾d. to 3s. 11¼d. per lb. It is remarked that this rubber from Papua is of excellent quality both as regards chemical composition and physical properties. In these respects it is quite equal to the best plantation rubber produced in the East, and consignments of a similar character would always realise the current market price of the highest grades of plantation rubber. The prospects of the cultivation of the Para tree in Papua, it is stated, therefore appear to be exceedingly promising.

# Tenders Invited and Accepted

It is particularly requested that the information regarding contracts open, and the successful tenderers, be forwarded to The Editor not later than Monday of each week.

The following contractions are used throughout:—S—supply; D—delivery; M—manufacture; C—construction; E—erection; P—purchase; I—installation; R—removal. Where no contractions appear, supply and delivery is understood. The date at the beginning of each paragraph refers to the closing of tenders.

## INVITED.

### Commonwealth.

Specifications, tender-forms, etc., for tenders invited for the Postmaster-General's Department of the various States under this heading may be had as follows:—Victoria—Various State G.P.O.'s. New South Wales—Departmental Stores, Sydney, and various G.P.O.'s in other States. South Australia—Adelaide, Melbourne, Sydney and Brisbane G.P.O.'s. Western Australia—Departmental Stores, Perth, and various G.P.O.'s in other States. Queensland—Various State G.P.O.'s. All States—Various G.P.O.'s. If the Specifications, etc., may be had elsewhere in addition the places will be given in parentheses.

POSTMASTER-GENERAL'S DEPARTMENT, Melbourne.—1st July.—S. and D. of 30 nautical miles of submarine cable, as per schedule No. 858.

1st July.—S. and D. of telephone instruments, as per schedule No. 865.

1st July.—S. and D. of insulators, as per schedule Nos. 874 and 875.

1st July.—Switchboard parts, as per schedule No. 879.

1st July.—175 cable boxes, as per schedule No. 876.

1st July.—S. and D. of packing boxes, for a period of two years, from the 1st July, 1913, to the 30th June, 1915, as per Schedule No. 915.

8th July.—Instruments, telephone parts, as per schedule No. 866.

8th July.—India-rubber covered wire, as per schedule No. 873.

8th July.—Cast-iron pipes, as per schedule No. 885.

8th July. — Measuring instruments, as per schedule No. 871.

8th July.—Wire, I.R. covered, as per schedule No. 872.

8th July.—Batteries and battery material, as per schedule No. 880.

8th July.—Galvanised-iron piping, as per schedule No. 887.

8th July.—Switchboards, telephone, various, as per schedule No. 895.

8th July.—Measuring instruments, various, as per schedule No. 870.

8th July.—S., D., and E. of a common battery switchboard at Windsor, as per schedule No. 805.

15th July.—Telegraph and telephone material (switchboard parts), as per schedule No. 878.

15th July.—Galvanised-iron piping and fittings, as per schedule No. 886.

15th July.—33 tons of sulphate of copper for the State of New South Wales, as per schedule No. 955. Preference will be given to tenders which guarantee early delivery of the material.

15th July.—Relays, as per schedule No. 958. (See advertising columns.)

22nd July.—Batteries and battery material, as per schedule No. 881.

22nd July.—Wire (silk covered), schedule No. 884.

22nd July.—45 lb. wire (silk covered), as per schedule No. 883.

22nd July.—10,000 porous pots, as per schedule No. 882.

22nd July.—Ironwork, as per schedule No. 891.

22nd July.—Telephone switchboards, as per schedule No. 899

22nd July.—Telephone switchboard cable, as per schedule No. 856.

22nd July.—Telephone switchboard cable, as per schedule No. 857.

22nd July.—Sundries, as per schedule No. 892.

29th July.—Detectors, keys, staples, tongs and rosettes for table telephones, as per schedule No. 901.

29th July.—Sundries, as per schedule No. 893.

29th July.—Coach screws and spikes, as per schedule No. 904.

19th August.—105 miles of paper-insulated, lead-covered cable, as per schedule No. 906.

26th August. — 460 coin-collecting devices, electrically controlled, as per schedule No. 916. (See advertising columns.)

16th September.—S., D., E., and I., at the Telephone Exchange, Collingwood, Victoria, of a common battery switchboard, as per schedule No. 860, or an automatic, or semi-automatic, switchboard, as per schedule No. 859.

16th September.—Galvanised-iron piping and fittings, as per schedule No. 951.

23rd September.—Sulphate of copper, as per schedule No. 956, in the undermentioned quantities:—New South Wales, 140 tons; Victoria, 25 tons; Queensland, 55 tons; South Australia, 20 tons; Western Australia, 60 tons. (See advertising columns.)

23rd September.—500 letter-box fronts, small size, as per schedule No. 957.

POSTMASTER-GENERAL'S DEPARTMENT, Sydney.—2nd July.—2450 backboards for automatic wall sets, as per stores schedule N.S.W. No. 312.

2nd July.—150 brass office seals; 1800 hardened loose type; as per stores schedule N.S.W. No. 318.

9th July.—30 Morse registers, as per stores schedule N.S.W. No. 310.

9th July.—2350 relays and 88 mounting plates, as per stores schedule N.S.W. No. 311.

9th July.—Wire, galvanised iron, etc., stores schedule, N.S.W., No. 295; bridle rings, etc., stores schedule, N.S.W., No. 297.

9th July.—240 steel date stamps to stores schedule N.S.W. No. 319; and engraving on date stamps to stores schedule N.S.W. No. 320.

16th July (extended from 9th July).—Eight multiple magneto incoming junction line switchboards, with associated equipment, as per schedule No. 205.

16th July.—60 letter and newspaper boxes combined, and 80 letter boxes, as per stores schedule N.S.W. No. 316.

16th July.—100,000 tin slides and 100,000 seal cups, as per stores schedule N.S.W. No. 317.

27th August.—(1) Telephones to stores schedule N.S.W. No. 301; (2) switchboards to stores schedule N.S.W. No. 302; (3) lamps, electric, incandescent, to stores schedule N.S.W., No. 304.

POSTMASTER-GENERAL'S DEPARTMENT, Perth.—9th July.—S. and D. of wire, india rubber covered, and cotton, silk or wool covered, to W.A. schedules Nos. 265 and 266.

9th July.—Insulators to W.A., schedule No. 277.

9th July.—Ironwork generally to W.A. stores schedule No. 293.

16th July.—S. and D. of wire, bronze and copper, to W.A. schedule Nos. 260, 267, and 273.

23rd July.—S. and D. of switchboards and parts, telegraph and telephone instruments, to W.A. schedules Nos. 254, 255, and 256.

30th July.—S. and D. of switchboard cable, to W.A. schedule No. 275.

30th July.—S. and D. of steel towers, battery material, wire and iron work generally, to W.A. schedules, Nos. 259, 262, 263, 268, and 269.

6th August.—S. and D. of insulators, telegraph and telephone material, and iron poles, to W.A. schedules, Nos. 258, 261, and 264.

POSTMASTER-GENERAL'S DEPARTMENT, Brisbane. — 30th July.—Cable, as per stores

**Osborn's Truck Wheels & Axles**

**Osborn's Mushet High Speed Steel, Twist Drills, Mining Steels, Crusher Jaws and all classes of Castings.**

Samuel Osborn & Co. Ltd., Sheffield, are Standard Makers.

**Gibson, Battle & Co. Ltd.**

**535 Kent St., Sydney.** **486 Collins St., Melbourne.**

S.A. Agent: C. C. Deland, Victoria Square, Adelaide.

schedules Nos. 254 to 260 (omitting 258); wire, copper and accessories, as per stores schedule No. 267; wire, covered, as per stores schedule No. 268.

30th July.—Battery, glassware, as per stores schedule No. 252; battery material, chemicals, etc., as per stores schedule No. 253; conduits, earthenware, as per stores schedule No. 261; crossarms and spindles, wood, as per stores schedule No. 262; wire, steel strand, as per stores schedule No. 270.

27th August.—S., D., and E. at the Telephone Exchange, Brisbane, of five sections of switchboard, common battery, multiple, and other equipment to schedule No. 243, specification No. 458.

10th September.—Telephone Exchange, Brisbane, nine sections of a trunk line switchboard, to schedule No. 244, specification No. 461, and the general conditions, drawings, etc., attached thereto.

24th September. — Ironwork, as per stores schedule No. 264; pipes, cast iron, as per stores schedule No. 265; poles, iron, etc., as per stores schedule No. 266; wire, G.I., as per stores schedule No. 269.

POSTMASTER-GENERAL'S DEPARTMENT. Adelaide.—9th July.—17,000 cast-iron brackets and 8500 steel spindles, as per schedule No. 298.

16th July.—Telegraph and telephone material, schedules Nos. 277 to 286.

13th August.—Telephone parts, as per schedule No. 292, and switchboards, as per schedule No. 293.

DEPARTMENT OF HOME AFFAIRS (Works Director, Victoria). — 7th July.—Cold storage installation at Naval College, Jervis Bay.

21st July.—S. of laundry plant to Captains' Point, for the Naval College, Jervis Bay, N.S.W.

DEPARTMENT OF HOME AFFAIRS.—Federal Capital Power Plant.—1st September. —S. of sect. 1, main power-house switchgear; sect. 2, switchgear for Diesel engine plant.

DEPARTMENT OF HOME AFFAIRS.—Kalgoorlie-Port Augusta Railway.—2nd September. —M., S., and D. of 80 lb. steel rails and fishplates; M., S., and D. of iron dog spikes and steel fishbolts and nuts for 80 lb. rails.

DEPARTMENT OF EXTERNAL AFFAIRS. — Port Augusta to Oodnadatta Railway.— 22nd July.—M., S., and D. of 4 wheel brake vans (3ft. 6in. gauge). (See advertising columns.)

DEPARTMENT OF TRADE AND CUSTOMS. —1st July.—M., S., and D. (at Melbourne) of an automatic flashing light for Emery Point, Port Darwin, and also of an automatic flashing post light for Fort Point, Port Darwin.

28th August.—S. and D. of eight (8) automatic flashing lights.

DEPARTMENT OF DEFENCE.—27th June.—Chemicals for the Commonwealth Cordite Factory (acids sulphuric, acetone, nitrate of soda, soda ash and glycerine).

## Victoria.

VICTORIAN RAILWAYS. — 26th June. — Electric stove retention valves, copper wire, reinforced concrete pipes.

26th June.—Copper wire.

27th June.—Circular saws.

27th June.—Spiral riveted steel pipe, with flanges, watertight brackets and fittings.

30th June.—Oil for gas making, as ordered, during period ending 30th June, 1914.

30th June.—Spiral riveted steel pipe; windmill with pump and fittings.

2nd July.—Armouring cable.

2nd July.—C. and E. of steel superstructure, for bridge at Hanover-street, Oakleigh.

2nd July.—C. and riveting of steel columns for bridges at Cromwell, Williams and Mathoura roads, in connection with Caulfield line duplication.

2nd July.—M. (from iron which will be sold to the contractor by the corporation), S., and D. of 3 tons of ⅝in. dogspikes, 7in. long, for 80 lb. and 100 lb. "T" rails.

2nd July.—Copper plates.

2nd July.—M., S., and D. of mild steel girders, etc., for bridge over Hopkins-street, Footscray.

9th July. — M., S., and D. of wrought-iron forgings.

9th July.—M., S., and D. of galvanised-iron ambulance mountings.

9th July.—M., S., and D. of rolled steel joists, angle braces, etc., for bridge on Lilydale line.

16th July.—S. and D. of rolled steel joists, etc., for bridges on the Bairnsdale to Orbost railway.

16th July.—M., S., and D. of petrol tanks and metal cases, with wood frames.

23rd July.—M., S., and D. of one hydraulic flanging press.

30th July.—Balls and ball races for 70ft. turntables.

4th August.—Electrification of the Melbourne suburban railways—(a) circulating water and sump pumps, with motors; (b) air and water extraction pumps and motors; (c) surface condensers, hot wells, piping, and sundries.

6th August.—Steel channel bars.

13th August.—Best steel boiler plates for steel cranes, boilers, etc.

13th August.—30,000 lineal feet of wrought-iron steam pipe, 1in. diameter.

20th August.—M., S. and D. of (a) lathe, (b) sawing machine, (c) chisel mortiser, (d) cut-off machine, (e) moulding machine.

27th August.—Hollow chisels and bits.

3rd September.—S. of three petrol engines and pumps for use at Newport Workshops. (Fresh tenders.)

3rd September.—Steel faced machine knives.

10th September.—Neutral track relays.

VICTORIAN RAILWAYS COMMISSIONERS. —State Coal Mines.—30th June.—S. of copper contacts.

2nd July.—S. of two 75h.p. D.C. motors, etc.

13th August (extended from 25th June). — S. of electrical equipment.

PUBLIC WORKS DEPARTMENT. — 26th June. — Refrigerating machinery and other plant, new cool stores, Victoria Dock; contract No. 5; copper cooking vessels, Hospital for Insane, Ararat.

STATE RIVERS AND WATER SUPPLY COMMISSION. — 2nd July.—C. of 500 wheels for channel meters. The wheels are to be 5ft. in diameter, and constructed of No. 14 gauge mild steel plates and jarrah.

## New South Wales.

PUBLIC WORKS DEPARTMENT. — 11th August.—Steel bridge for Macleay River, Wauchope, to Kempsey section, North Coast railway.

11th August. — Steel bridges for Hastings River and flood channel, Wauchope to Kempsey section, North Coast railway.

3rd September.—Efficient steam tugs for use at Bellinger River and Cape Hawke, from 1st November, 1913.

RAILWAY DEPARTMENT.—6th August.— S. of one live steam feed water-heater for Ultimo power-house.

20th August.—S. of a pneumatic ash handling plant for White Bay power-house.

METROPOLITAN WATER AND SEWERAGE BOARD. — 30th June.—Construction of 1292 lineal feet stoneware and cast-iron pipe sewers in the municipality of Leichhardt.

30th June.—Contract No. 927—M., S., and D. of 4 Edwards' type air pumps, complete, and cast-iron bends.

30th June.—Contract No. 1162 A and B—C. of 2217 lineal feet of concrete pipe sewers in the Municipality of Mosman and North Sydney. (Fresh tenders.)

30th June.—Contract No. 1187—C. of 735 lineal feet of concrete pipe sewers in the Municipality of Willoughby.

30th June.—Contract No. 1188—C. of 2699 lineal feet of concrete and cast-iron pipe sewers in the Municipality of Waverley.

30th June.—Contract No. 1189—C. of 307 lineal feet of Monier pipe stormwater duct in the City of Sydney.

30th June.—S. of screw down hydrants for year ending 30th June, 1914; minimum quantity, 75.

## South Australia.

SUPPLY AND TENDER BOARD. — 1st July.—M., in Australia, S., and D. on trucks, at any South Australian railway station to be named by tenderer, of 2000 drawhooks, 2000 drawhook pins, and 1000 drawhook bridles for 3ft. 6in. gauge buffers.

8th July.—S. and D., in bond, on wharf, Port Adelaide, of 250 Wallis patent, pressed steel spring buffers, with split-ring fastening, to drawing No. 10200.

15th July.—S. and D. of best mild steel.

15th July.—S. and D. of 500 bars bright drawn hexagon steel.

NORD DEUTSCHER LLOYD
REGULAR SERVICE TO EUROPE.
REDUCED FARES TO LONDON.
TO MANILA, CHINA AND JAPAN.
Via New Guinea and Yap.
Fares to Hong Kong, £40; II., £26.
Full particulars will be sent on application to—
LOHMANN AND CO., General Agents,
7-9 Bridge-street, Sydney.
Ostermeyer, Van Rompaey and Co., Melbourne; H. Muecke and Co., Adelaide; L. Ratazzi and Co., Fremantle; Thos. Brown and Sons Ltd., Brisbane.

The Mount Lyell Mining & Railway
CO. LIMITED.
Purchasers of Ores containing Copper, Gold and Silver. Rates obtainable on application to the Secretary
Manufacturers of Coke for Smelting and Foundry Purposes, Acids, Etc.
HEAD OFFICE—
39 QUEEN-STREET, MELBOURNE.
D. G. LUMSDEN,
Secretary.

THE
-PACIFIC CABLE BOARD-
Cablegrams should be Marked
"VIA PACIFIC."
(Not Charged for.)

The quickest and most accurate route for Cablegrams from Australasia to United Kingdom, Canada, United States, Germany, New Zealand, and Pacific Islands.

This route is owned by Great Britain, Australia, New Zealand, and Canada. Australia being the largest part owner (having one-third interest), the public are urged to support the National Cable.

RATES—

| | Ordinary. | Deferred. |
|---|---|---|
| UNITED KINGDOM | 3/- | 1/6 |
| GERMANY | 3/- | 1/6 |
| CANADA | 2/4 | 1/2 |
| UNITED STATES | 2/4<br>to 2/8 | 1/2<br>to 2/4 |
| NEW ZEALAND | 4½d. | Nil |
| FIJI | 8d. | Nil |

DEFERRED RATES (IN PLAIN LANGUAGE ONLY) have now been arranged to most Countries where ordinary rate exceeds 10d. per word.

Enquiries for further information, pads of cablegram forms, maps and tariff cards, address to—

The Superintendent, SOUTHPORT, QUEENSLAND;
The Officer in Charge, 408 Collins-street, MELBOURNE; telephone 2588;
The Officer in Charge, 42 Hunter-street, SYDNEY; telephones, City 1346, City 3684;
J. Milward, Manager in the Pacific, 64 Pitt-street SYDNEY; telephones City 1346, City 3684.

15th July.—S. and D. of cold-reeled mild steel bars.

15th July.—S. and D. of solid drawn copper tubes.

22nd July.—S. and D. of chain iron.

RAILWAYS.—15th July.—C. of 8 bogie passenger brakevans, 5ft. 3in. gauge.

15th July.—C. of 17 bogie goods brakevans, 5ft. 3in. gauge.

15th July.—C. of 30 sheep vans, 3ft. 6in. gauge.

15th July.—C. of 30 sheep vans, 5ft. 3in. gauge.

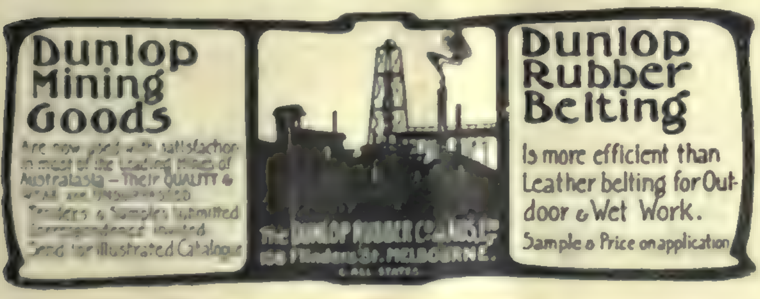
15th July.—C. of 15 cattle vans, 3ft. 6in. gauge.

22nd July.—C. of 30 or 50 bogie waggons, 5ft. 3in. gauge.

WORKS AND BUILDINGS DEPARTMENT. —16th July.—Installation electric light, Military Headquarters, Keswick.

## Western Australia.

GOVERNMENT TENDER BOARD. — 3rd July.—Tubular iron poles, for Railway Department, as per schedule No. 118A, 1913.


Dunlop Mining Goods
Are now used with satisfaction in most of the Leading Mines of Australasia – Their QUALITY & wear are unsurpassed
Tenders & Samples submitted Correspondence invited
Send for illustrated Catalogue
The DUNLOP RUBBER Co. AUS. LTD
108 Flinders St. MELBOURNE.
& ALL STATES
Dunlop Rubber Belting
Is more efficient than Leather belting for Outdoor & Wet Work.
Sample & Price on application

Note this on every belt.

Be sure you get
"DICK'S"
We know there are numerous imitations. Dick's maintains its high reputation for strength and efficiency. Every belt guaranteed. Sole agents:
JAMES HARDIE & CO.
Melbourne and Sydney.

W. F. Stanley & Co. Ltd.,

Scientific Instrument

makers, are recognised by all users as being foremost in their craft the world over. They have appointed us as the N.S.W. Sole Agents, and we are selling their manufactures at their English Catalogue Prices, plus only 15 per cent. Customs and importing expenses. Our stock is now the largest one in Australia, and embraces all the latest improvements in instruments. Write for catalogues.

FAIRFAX & ROBERTS LTD.,
Vice-Regal Opticians.
23 and 25 Hunter-street, Sydney.

Levels, Theodolites, Mining Dials, Drawing Instruments, Papers and Inks, etc., etc.

31st July.—3520 pairs of fishplates for 46½ lb. material.

RAILWAYS DEPARTMENT.—26th June.—P. of, approximately, 1000 tons of mixed scrap, mostly mild steel, suitable for a rolling mill, lying at Midland Junction.

### Queensland.

RAILWAYS DEPARTMENT.—15th July.—M. and S. of steel super-structure bridge over Pioneer River.

15th July.—S. of one 120ft. steel super-structure (one span), Caboolture River bridge.

29th July.—S. of steel superstructure for three 149ft. 6in. spans for widening Bremer River bridge.

PUBLIC WORKS DEPARTMENT. — 18th July.—Steel super-structure of two spans of 120ft. each on one cast-iron pier, and concrete abutments for new bridge over McIntyre River, Goondiwindi.

### General.

CITY OF MELBOURNE.—4th July.—S. and D. of one 15-ton pulley block.

15th July.—S., D., and E. of a steam or suction gas plant, for the City Council's quarries, Clifton Hill. (See advertising columns.)

MUNICIPAL COUNCIL OF SYDNEY.—7th July.—Arc lamp carbons.

CITY OF TOOWOOMBA (Q.) (extended indefinitely from 1st March).—Following plant:—(1) S. and E. of pumping plant of 25,000 gallons per hour capacity; (2) 10in. cast iron water pipes; (3) valves, special castings, etc. Tenders must be in accordance with specifications and conditions of tenders, copies of which may be seen, and tender forms obtained, at the offices of the town clerk, Sydney, Melbourne, Brisbane, and Toowoomba.

TOWN OF NORTHCOTE (V.) (W. G. Swift, Town Clerk).—7th July.—S., D., and laying of underground electric cables.

TOWN OF PORT MELBOURNE (V.). (A. V. Heath, Town Clerk).—8th July.—S. and D. of a 10-ton steam roller, fitted with scarifier, under terms and conditions to be seen at the council offices, Town Hall, Port Melbourne.

SHIRE OF DUNDAS (V.) (C. H. Smith, Secretary, Hamilton, V.).—2nd July.—Road-making plant.

SHIRE OF WYCHEPROOF (V.)—Electric Supply Undertaking, Township of Sea Lake (G. B. Lincolne and J. K. MacDougall, 430 Little Collins-street, Melbourne).—5th July.—S., D., and E. of one suction gas engine and gas plant complete; S. and D. of electrical plant and equipment; E. of electrical plant and equipment; S. and D. of wires and cables; S. and D. of wood poles.

SHIRE OF WYCHEPROOF (V.).—Electric Supply Undertaking, Township of Wycheproof (G. B. Lincolne and J. K. MacDougall, 430 Little Collins-street, Melbourne.)—5th July.—S., D., and E. of one suction gas engine and gas plant complete; S. and D. of electrical plant and equipment; E. of electrical plant and equipment; S. and D. of wires and cables; S. and D. of wood poles.

SHIRE OF MILDURA (G. B. Lincolne, J. K. MacDougall, Managers Electric Supply Department).—28th June.—S. and D. of centrifugal pumps, 1600gal. and 10,000gal. per hour; S. and D. of 2 electric motors, direct current, 5 h.p. and 1½h.p.; S. and D. of wood piping, 5in. diameter; S., on rails of one open-ended tank, new or second-hand, approx. 22ft. x 5ft. 6in.

CAIRNS HARBOUR BOARD (Q.) (T. R. Hall, Secretary).—26th June.—S. of a quantity of mild steel round bars.

MELBOURNE AND METROPOLITAN BOARD OF WORKS (Geo. A. Gibbs, Secretary).—27th June.—S. and D. of 10 tons of 3in. and 20 tons of 5in. C.I. pipes of Australian manufacture.

27th June.—S. and D. of 20 24in. C.I. hatch boxes, of Australian manufacture.

29th July.—S. and D., at the Metropolitan Farm, Werribee, of two steel wire plough ropes.

METROPOLITAN WATER AND SEWERAGE BOARD, Brisbane (Q.) (Geo. Johnston, Secretary). — 26th June.—S. and D. of 5000 water meters.

1st July.—S. and D. of 50 tons of best soft pig lead, with the right to purchase an additional 50 tons. (See advertising columns.)

31st July.—41,000 casks Portland cement, under contract No. 10, 1913; and 41,000 casks Portland cement, under contract No. 11, 1913.

MUNICIPAL TRAMWAYS TRUST, Adelaide (W. G. T. Goodman, Chief Engineer and General Manager.—1st July.—S. and D. of wooden poles.

15th July.—M., S., and D. of steel rails.

29th July.—S. and D. of bonding material.

19th August.—M., S., and D. of steel poles.

Specifications relating to the S. and D. of copper cable and wire may be obtained on application to W. G. T. Goodman, Engineer and Manager. Tenders will be invited at 48 hours' notice, at a later date, and specifications are now issued to facilitate prospective tenderers obtaining quotations.

THE BROKEN HILL SOUTH S.M. CO. N.L. (F. C. Howard, Managing Director). —27th June.—S. and D. of stores and mining requisites for the 12 months ending 31st July, 1914.

O.K. COPPER CO. N.L. (in liquidation) (Sidney Cornish, 23 Brookman's Building, Adelaide, S.A.)—21st July.—P. of large traction plant; also smelting, converter and mining plants, buildings, stores, etc., estimated to have cost £75,000, comprising engineering plants, 30-ton weighbridge, 4 Babcock boilers, also number of engines of mines, smelter and converter plants, air compressor, pumps of various descriptions; also 9 traction engines, number of trailers, together or separately; also large quantity of stores and sundries. The whole mine and plant as a going concern, or the mine, including all leases; the whole of the plant, in one lot; any article of machinery and plant separately. (See advertising columns.)

JUNCTION NORTH BROKEN HILL MINE N.L. (T. H. Palmer, General Manager).—12th July.—S. of mining stores for 12 months, commencing 1st August next. (See advertising columns.)

THE PLACER TIN MINING CO. N.L. (J. V. M. Wood, F.C.P.A., incorporated accountant, official liquidator, official assignee, etc., 34 Queen-street, Melbourne).—21st July.—Dredging plant of the above, situate at Germanton, New South Wales, comprising a Standard mining dredge, by Thompson and Co., Castlemaine, with all improvements; compound engine (dry-back marine type), dredge boiler; connections, fittings, nozzles, etc.; also electric lighting plant, with lamps and fittings complete; substantial oregon pontoon, and quantity of plant, stores, etc.

THE TRUSTEES, EXECUTORS AND AGENCY CO. LTD., 412 Collins-street, Melbourne.—7th July. — P. of silk, grit gauze, binding, etc., machinery.

SYDNEY MECHANICS' SCHOOL OF ARTS (N.S.W.) (W. M. Fairland, Secretary, 275a Pitt-street, Sydney).—30th June.—I. of electric light.

HEALESVILLE WATERWORKS TRUST (C. H. Alexander, Secretary).—30th June.—S. and laying of about 12 chains of 2in. G.I. pipes, and about 8 chains of 1in. G.I. pipes.

BROKEN HILL PTY. BLOCK 10 CO. LTD. (O. B. Ward, General Manager, Broken Hill).—15th July.—S. and D. of all mine requisites for 12 months from 1st August next.

HUNTER DISTRICT WATER SUPPLY AND SEWERAGE BOARD.—2nd July.—Bilge pump, capacity 200gal. per minute.

2nd July.—Vacuum pump, small size.

NEW WYLLIE CREEK DREDGING CO., 16 O'Connell-street, Sydney.—14th July.—P. of dredging leases, sluicing plant, dam, etc.

CITY OF CAULFIELD (V.) (F. Jowett, Town Clerk).—23rd July.—P. of old tramway rails and fishplates. (See advertising columns.)

## ACCEPTED.

### Commonwealth.

POSTMASTER-GENERAL'S DEPARTMENT, Melbourne.—Nine generating plants, each comprising a 15-17½b.h.p. 2-cylinder vertical marine oil engine, coupled direct and mounted on the same bed-plate, with a direct current generator set, delivery as follows:—3 f.o.b. Melbourne, Victoria, £915; 3 f.o.b. Fremantle, Western Australia, £924; 1 f.o.b. Darwin, Northern Territory, £312; 1 f.o.b. Cooktown, Queensland, £312; 1 f.o.b. Rockhampton, Queensland, £308—Maritime Wireless Co. (Shaw System) Ltd., Randwick. (This cancels the notice of acceptance of tenders for 10 generators, which appeared in the "Mining Standard" of March 6th, 1913.)

2200 steel gains (drawing No. V.2508, £105 8s. 4d.; 15,400 steel gains (drawing No. V.2509), £737 18s. 4d.—J. H. Garbutt, South Melbourne.

100 (approximate quantity) steel date stamps, £150; 30 (approximate quantity) steel date and time stamps, £52 10s.—Quirk and Morton, Melbourne.

72 plugs, 3-part, £10 16s.; 9 keys, order wire, 16s. 6d.; 34 resistance spools, 560w., £2 13s. 10d.; 340 yards, switchboard cable, £28 6s. 8d.; 96 yards, switchboard cable, £6 8s.; 72 yards, switchboard cable, £3; 17 indicators, clearing, drum type, £18 16s. 10d.; 160 jacks, local, 5-point, £16 13s. 4d.; 160 indicators, line drum type, £100; 480 jacks, multiple, 3-point, £18; 16 terminal strips, £4 8s.; 3 terminal strips, 15s.—British Insulated and Helsby Cables Ltd., Melbourne.

100 long-distance telephones, £271 5s. — J. Bartram and Son Pty. Ltd., Melbourne.

1 auto carrier, £135—Shields Motor Co. Pty. Ltd., Melbourne.

POSTMASTER-GENERAL'S DEPARTMENT, Sydney.—4320 telephones, automatic, common battery, wall pattern, £2 17s. each; 480 telephones, automatic, common battery, table pattern, £2 17s. each—The Automatic Telephones (Australasia) Ltd., Sydney.

280 oilskins, 11s. each; 60 jackets, 8s. 3d. each —S. Weingott and Sons Ltd., Sydney.

### Victoria.

VICTORIAN RAILWAYS.—Telegraph wire, No. 10½, at £13 3s. 9d. per ton—R. Johnson, Clapham, and Morris Ltd.

Motor-driven hot water centrifugal pumps, at £55 per set—Falkiner-Boll Patent Electric Shearing Machine Co.

Rolled steel joists, angle braces, etc., for bridge over Joseph-road, Footscray, siding to electric power station, rates — Dorman, Long and Co. Ltd.

Mild steel girders, etc., for renewal of bridges, North-Eastern line, rates — Dorman, Long and Co. Ltd.

Wrought-iron side brackets, at 9 3-8d.—Trembath and Co.

### New South Wales.

PUBLIC WORKS DEPARTMENT.—Two 90 k.v.a. synchronous motors for State Timber Yards, Uhr's Point—Australian General Electric Co., Sydney.

NATIONAL WORKS, HARBOUR, AND DRAINAGE WORKS.—Conveyor belt for Port Kembla coal loading plant—Perdriau Rubber Co. Ltd., Sydney.

Three-phase electric motors for Walsh Island Workshops, Newcastle — Australian General Electric Co., Sydney.

METROPOLITAN WATER AND SEWERAGE BOARD.—One 3-ton overhead traveller for Homebush pumping station, £79 15s.—C. J. Morris and Co.

One mild steel and elevated service tank at Wahroonga, £5500—Sydney Steel Co.

### Western Australia.

PUBLIC WORKS DEPARTMENT. — Three Worthington pumps, £67 10s.—G. Kent Ltd.

Two Worthington feed pumps, £290 — G. Kent Ltd.

Four boilers, £2670—Imperial Electrical Engineering Co.

RAILWAYS DEPARTMENT.—Carriage roof lamp oil, 2s. 9¼d. gal.—Vacuum Oil Co.

Steel blank milling cutters, 1s. 7¾d. lb. — Eagle and Globe Steel Co.

Boiler feed pump, £102—A. G. Mumford Ltd. (per Agent-General).

WATER SUPPLY DEPARTMENT.—Machinery and fittings, £127 12s.—Geo. Kent. Ltd.

### General.

MELBOURNE AND METROPOLITAN BOARD OF WORKS.—33 screening frames for screening chamber at Preston reservoir No. 1, £191 15s.—The Atlas Co. of Engineers Pty. Ltd.

1000 tons of engine coal for pumping station, Spotswood, £1025 — McIlwraith, McEacharn and Co. Pty. Ltd.

Gun-metal condenser tube plates and other sundries required in connection with the overhauling and repairing of No. 1 engines and pumps at pumping station, Spotswood, £157 10s.—Geo. W. Kelly and Lewis Pty. Ltd.

COLLINGWOOD TECHNICAL SCHOOL (M. Richmond, Principal).—S. and fitting up of engineering, turning and fitting machinery, £666 —A. Lugton and Sons.

CHARLTON WATER TRUST (V.).—Concrete water tower, £762—Reinforced Concrete and Monier Pipe Co.

## Commonwealth of Australia.

Postmaster General's Department,
Melbourne, 20th June, 1913.

TENDERS will be received at the office of the **Deputy Postmaster-General, MELBOURNE,** until 3 p.m. on the undermentioned dates:—

15th July.—Relays (Sch. 958); and 33 tons of Sulphate of Copper for New South Wales (Sch. 955). See Commonwealth Gazette, 21st June.

26th August.—460 (in lieu of 300) Coin Collecting Devices (Sch. 916). See Commonwealth Gazette, 7th June.

23rd September. Sulphate of Copper for various States (Sch. 956). See Commonwealth Gazette, 21st June.

C. E. FRAZER,
(1217) Postmaster-General.

---

## PORT AUGUSTA TO OODNADATTA RAILWAY.

TENDERS, addressed to the Secretary, Department of External Affairs, Melbourne, will be received up to 11 a.m. on Tuesday, 22nd July, 1913, for the Manufacture, Supply and Delivery of 4 Wheel Brake Vans (3ft. 6in. gauge).

Drawings, specifications, etc., will be on view on and after 24th June, 1913, at the undermentioned offices:—

Commonwealth Railways, 84 William street, Melbourne,

Commonwealth Works Director, Customs House, Sydney, and

Commonwealth Works Registrars, Brisbane, Adelaide, Perth, and Hobart.

The charge for each copy of specification will be £1 1s., and for each plan 5s., which must be paid before the documents can be issued.

Tenders are to be endorsed "Tender for 4 Wheel Brake Vans," and are to be accompanied by the deposit mentioned in the Form of Tender.

JOSIAH THOMAS,
Minister of State for External Affairs.

---

## THE METROPOLITAN WATER AND SEWERAGE BOARD.

TO LEAD MERCHANTS AND OTHERS.

Sealed tenders will be received until 12 o'clock noon on Tuesday, 1st July, 1913, for the Supply and Delivery of Fifty (50) Tons of Best Soft PIG LEAD, with the right to purchase an additional 50 tons.

Specifications, general conditions of contract, and contract deeds may be seen, and forms of tender and conditions of tendering obtained at this office.

Tenders to be endorsed on envelope "Tender for Pig Lead." The lowest or any tender not necessarily accepted.

By order,
GEO. JOHNSTON,
Office of the Board, Secretary.
Albert-street, Brisbane.
17th June, 1913.

---

## CITY OF MELBOURNE.

TENDERS will be received until 3 o'clock p.m. on Tuesday, 15th July, for—

Supply, Delivery, and Erection of a Steam or Suction Gas Plant, for the City Council's Quarries, Clifton Hill.

Specification may be seen at the office of the City Surveyor, Town Hall.

JOHN CLAYTON,
Town Clerk.

Town Clerk's Office,
Town Hall, Melbourne,
14th June, 1913.

---

## MUNICIPALITY OF ALBURY.

LOAN FOR ELECTRICITY WORKS.
Under LOCAL GOVERNMENT ACT 1906-7-8.

£10,500, at 4½ PER CENT. PER ANNUM, in £50 DEBENTURES.

TENDERS will be received at the Town Hall, Albury, for the whole or any portion of the above Loan, up to 4 p.m. on 1st July, 1913.

No tender below par will be entertained.

Prospectus, stating conditions of retirement of debentures, etc., and tender forms may be obtained on application.

A. E. [illegible], Town Clerk.

Town Hall, Albury, June 6, 1913.

---

## THE MELBOURNE AND METROPOLITAN BOARD OF WORKS.

LOAN "CC" OF £300,000, AT 4 PER CENT.
FOR FORTY YEARS.

Underwritten by the Commonwealth Bank of Australia.

In exercise of the powers conferred by The Melbourne and Metropolitan Board of Works Acts of the Parliament of Victoria and with the consent of the Governor-in-Council, THE MELBOURNE AND METROPOLITAN BOARD OF WORKS has resolved to contract a Loan of Three Hundred Thousand Pounds (£300,000) by debentures redeemable in Forty years secured upon the Metropolitan General Fund and upon all rates leviable by the Board upon the City of Melbourne and the other Metropolitan Municipalities.

This loan has been authorised for the purpose of providing funds towards completion of the sewerage and drainage of the Metropolis and extension of the water supply, and for the repayment of part of Loan "E" of £500,000 falling due on the 1st October, 1913, the balance of which has already been arranged.

The debentures will bear interest from the 1st July, 1913, at the rate of 4 per cent. per annum, payable half-yearly, on the 1st January, and the 1st July, the first payment of such interest being due on the 1st January, 1914.

The debentures will be issued in denominations of £100, £500, and £1000, and applicants must state in their tenders the number and value of the debentures they desire to receive.

Tenders will be received at the Board's Offices, 110 Spencer Street, Melbourne, for the whole amount, or any portion thereof, until 2.30 p.m. on MONDAY, 7th JULY, 1913.

Each tender must be sealed, addressed to "The Chairman of the Melbourne and Metropolitan Board of Works," and endorsed "Tender for Loan debentures."

No tender below £96 10s. per £100 will be accepted.

Tenders must be accompanied by a deposit in cash or by a bank cheque, payable to the Secretary of The Melbourne and Metropolitan Board of Works, equal to 10 per cent. of the face value of the debentures applied for.

The balance may be paid at any time after notification of allotment, but must be paid on or before the 26th September, 1913.

As the coupons of Loan "CC" debentures will carry interest from the 1st July, 1913, successful tenderers when paying balances must also pay interest at 4 per cent. per annum from the 1st July to date of such payment on the face value of debentures allotted to them less interest on deposits from 7th July at 4 per cent. per annum.

Instead of a cash deposit, any holder of debentures of Loan "E" falling due on the 1st October, 1913, may lodge a debenture or debentures equal to 10 per cent. of the face value of the debentures applied for, stating on the annexed Form of Tender the number of and amount represented by the debentures of Loan "E" to be exchanged for those of this issue. The tender having been accepted and notification of allotment given, the debentures held in Loan "E" must be presented for exchange on or before the 26th September, 1913, and adjustments will then be made in regard to the interest coupons of the old and new debentures and the cash to be received in respect to the difference between the face value of the debentures and the price tendered for ~~the purchase~~ thereof.

Tenders of the highest premium will have preference, and to Tenderers of even rates debentures will be allotted proportionately to the applications. Tenders at a price including a fraction of a shilling other than sixpence will not be preferentially accepted in respect of such fraction.

Failure to pay the balance on the due date or to comply with the conditions in the preceding paragraph but one will cause the deposit of 10 per cent. and all accrued interest thereon to be forfeited to the Board.

Only members of recognised Stock Exchanges of Australasia will be allowed brokerage of ½ per cent. upon their accepted tenders.

Tenders will be opened at the time and place before specified, in the presence of Tenderers or their agents.

Principal and interest will be payable at the Board's Offices, in Melbourne.

Debentures of Loan "CC" will be issued by the Board as soon as available, and, where necessary, interim receipts for money received will be furnished by the Board's Treasurer.

Under authority conferred by Acts of Parliament, the Board is empowered to borrow a sum of £9,750,000, exclusive of moneys required to pay off any loan or part of a loan, and exclusive of £2,389,933 payable to the State Government of Victoria in connection with the Metropolitan Water Supply Works transferred to, and vested in, the Board. Of the amount last mentioned, a sum of £701,271 has been paid out of loan moneys, leaving a balance payable to the State Government of £1,688,662.

By Section 22 of the Trusts Act 1896, No. 1421, amended by Act No. 2022, Section 4, it is provided (*inter alia*) that it shall be lawful for a trustee, unless expressly forbidden by the instrument (if any) creating the trust, to invest any trust funds in his hands in debentures issued by The Melbourne and Metropolitan Board of Works, and it shall also be lawful for a trustee authorised by any Act of the Parliament of Victoria, or by the instrument creating the trust, or by this section, to invest in debentures issued by The Melbourne and Metropolitan Board of Works, notwithstanding that the price paid therefor by such trustee exceeds the redemption value.

Copies of the authorising Acts and other relevant documents may be inspected at the Offices of the Board.

Prospectuses and tender forms can be obtained upon application at the Board's Offices, The Commonwealth Bank, the Commercial Bank, the Bank of Victoria, the English, Scottish, and Australian Bank, the National Bank, and their various branches and agencies, and upon application to the members of the Stock Exchanges of Melbourne, and the other Stock Exchanges in Victoria and the adjoining States.

W. J. CARRE RIDDELL, Chairman.
GEO. A. GIBBS, Secretary.

Offices of The Melbourne and Metropolitan
Board of Works,
110 Spencer Street, Melbourne,
20th June, 1913.

---

## CITY OF CAULFIELD.

SALE OF OLD TRAM RAILS, &c.

TENDERS are invited for the purchase of about 80 tons of OLD TRAMWAY RAILS and FISH PLATES, the whole not having been used much. The rails are each about 26ft. long, and weigh approximately 485 lb. Tenders at per rail to be delivered to me not later than 4 p.m. on Wednesday, the 23rd July, next. The highest or any tender will not necessarily be accepted.

F. JOWETT, Town Clerk.
Caulfield, 24th June, 1913.

---

## TONGKAH COMPOUND
## No Liability, Puket, Siam.

A Dividend (the 14th), of 1/- per share, and also a Bonus of 2/- per share, have been declared, Payable at the registered office of the company, National Mutual Buildings, 395 Collins-st., Melbourne, on Thursday, 17th July, 1913. Transfer books will be closed from 10th to 17th July, both days inclusive. By order of the Board.—E. J. KENNEDY, Manager.

---

## THE TONGKAH HARBOUR TIN DREDGING CO. N.L.

Notice of Dividend.—Notice is hereby given that a Dividend (the eleventh) of ten per cent. (2/-) per share has been declared, Payable on 22nd July, 1913, amounting to £15,000, and for this purpose the share register will be closed from 15th to 22nd July inclusive.

H. J. WISE, Manager.
Hobart, 13th June, 1913.

---

NOTICE is Hereby Given that the Patentees of Australian Letters Patent No. 3650/1912, dated 16th January, 1912, for "Improvements in or relating to apparatus for the magnetic separation of Ores and other material," is prepared to satisfy any demands and all requirements of the public respecting the said invention. Offers will also be received for the issuance of licenses.

Further information and particulars obtainable from EDWARD WATERS & SONS, Patent Attorneys, 414-418 Collins-st., Melbourne, and 7 Moore-st., Sydney.

---

## NEW SPECIMEN HILL G. MINES

No Liability, Daylesford.—A Dividend, the first, of Sixpence per Share, £1000, has been declared, Payable to registered shareholders at the office of the Company, 67 Queen-st., Melbourne, on Friday, 4th July, 1913. Transfer books will be closed from Saturday, 28th inst., until after date of dividend.

J. H. DILL, Manager.
67 Queen-st., Melbourne. 18th June, 1913.

---

## CATHCART CENTRAL GOLD MINING COMPANY NO LIABILITY.

The Half Yearly General MEETING of shareholders will be held at the National Trustees' Buildings, 125 Queen-street, Melbourne, on Monday, 30th June, 1913, at 3 p.m. Business: 1. To receive and adopt reports and balance sheet. 2. To elect five directors and two auditors. 3. General.

D. MURRAY, Manager.
430 Little Collins-street, Melbourne.

## JUNCTION NORTH BROKEN HILL MINE, NO LIABILITY.

TENDERS are hereby invited for the Supply of Mining Stores for twelve months, commencing 1st August next. Schedules are obtainable from the Company's offices at Sydney, Melbourne, or Broken Hill, and should be received by the Broken Hill office not later than 12th July, 1913.

T. H. PALMER,
General Manager.

## ALFRED RONALDS.

Will the relatives and friends of the late Alfred Ronalds (author of Ronalds' "Fly-Fisher's Entomology") please communicate with—

Critchley Parker,
"Mining Standard,"
Melbourne or Sydney.

## DIVIDENDS OF MINING COMPANIES.

The following dividends and bonuses of mining companies in Australia have been declared and are payable on the dates mentioned:—

### June.

26th.—Zinc Corporation, 1s. 6d. (ord. and pref.), £89,882.
26th.—North Broken Hill, 2s., £60,000.
26th.—Windmill Hill, 6d., £751.
26th.—Golden Pyke, 1s., £1400.
26th.—Wandiligong Dredge, 1s., £300.
26th.—Nell Gwynne, 6d., £700.
26th.—Great Northern, 6d., £750.
27th.—Broken Hill South, 6s., £60,000.
28th.—Mt. Bischoff, 10s., £6000.
29th.—Ivanhoe, 3s. 6d. (less income tax), £35,000.
30th.—Maori Queen, 5s., £625.

### July.

2nd.—Ajax Central, 1s., £1500.
2nd.—Sulphide Corporation, 1s. 6d. ordy. and 2s. pref. (less British I.T.), £96,250.
4th.—Broken Hill Water, 1s. 6d., £15,000.
4th.—New Specimen Hill, 6d., £1000.
5th.—Kalgurli, 4s. (less British I.T.).
McGregor-Cloucurry (final £18 18s. 4d. per 100 shares).
22nd.—Tongkah Harbour, 2s., £25,000.
Australian Agricultural Co., £3 16s., £76,000.
Yuanmi (additional), 1s. 6d., £26,250.

## BANK CLEARINGS.

The Melbourne Bank Clearing House reports as follows for the week ended 23rd June:—

| | | | | | | |
|---|---|---|---|---|---|---|
| Total clearance | | | | £5,301,841 | 19 | 5 |
| Settled by certificates | £254,000 | 0 | 0 | | | |
| Settled in coin | 485,133 | 6 | 10 | | | |
| | | | | £739,133 | 6 | 10 |
| Total clearance for the corresponding week of 1912 | | | | £5,487,334 | 7 | 1 |

## INDUSTRIAL.

Demonstrations were held in Sydney last week of the "Hart Ebbott" suction-gas producer, for which the patentees claim that it will operate on any kind of hard fuel, producing a good quality clean gas. It is supplied as portable plant suitable for engines from 4 to 30 horsepower, and for stationary plants up to 1000 h.p.

## MINERAL SEPARATION.

### Use of Eucalyptus Oil.

(Contributed).

The theory that no matter how useless a thing may appear to be, some employment will be found for it, if it be kept long enough, is receiving to-day some justification in the production of Eucalyptus Oil for Mineral Separation.

Some of the Peppermint varieties of the Eucalypt family have, until recently, been mostly regarded as mere cumberers of the ground. Their timber is practically useless for any purpose one grows cautious, however, and adds "at present"—and the land on which they grow is almost invariably poor, while their growth is so persistent that to fell or ring-bark them only means that in a very short time they are replaced by a dense growth of suckers. Consequently, the owner of such bush, until recently, had nothing much of which to be proud or on which to add to his banking account; yet the advent of the De Bavay process of mineral separation provided a means of turning these trees to such account that many of the small landholders in the districts where they grow thickest have found it worth while to forsake their ordinary occupations and devote themselves entirely to distilling the essential oils required in the process. There are over 200 varieties of Eucalyptus now classified, and probably many more which have not as yet received specific names, but it is some of these before mentioned Peppermint varieties that meet in particular the requirements of the process. Their oils contain a large percentage of Phellandrene, which, while being detrimental to their use for medicinal purposes, increases their suitability for this purpose, and they are large yielders, giving in the case of "E. Amygdalina" up to 40 lbs. of oil per 1000 lbs. of leaves, and can thus be produced sufficiently cheaply to be profitably employed.

The action of the oil used in the mineral separation process (which has been described in the columns of the "Mining Standard") is purely mechanical and not chemical, and its suitability is determined by a certain specific gravity and degree of viscosity which are found in conjunction in these oils.

A recent visit to one of the stills belonging to the Eucalyptus Oils Ltd., which company is operating in the Braidwood district, N.S.W., afforded an opportunity of inspecting the methods employed in producing the oil, and supplied a cheerful example of another source of wealth to Australia, which, with the extension of the patent process (since its complete success has been proved here) to other mining countries, will, doubtless, also mean in the future a very valuable export trade.

The first step taken is to fell the trees selected, and as the foliage only is required, all of them having a fairly good leaf growth, from saplings to those of about 18 inches diameter, receive the attention of the axe. The large branches are then lopped off, and these, in turn, cut up with a knife to branchlets not exceeding 16 inches in length. The wood is useless, consequently as little of it is left as possible, having due regard to the time taken in the trimming. These branchlets are heaped by the fallen tree, and later collected by bullock or horse drays, which traverse the bush on rough tracks cut for the purpose. Thence they are conveyed to the still, which is usually situated on the side of a running creek. The form of still mostly used is made from square 400 gallon tanks, with the tops cut out and steam proof lids substituted; these are used singly, coupled, or in three, as the output may demand.

Fire holes dug under them, and pipes carried from the sides through the running water and emptying their mixture of distilled oil and water into a suitably-placed receiver, complete the plant, and the oil is subsequently skimmed from the top of this receiver, very much in the same manner as cream is skimmed from milk. A wooden platform is usually employed at the bottom of the tank, leaving some inches under it in which to boil the water, and the tank having been filled with the leaves and tightly pressed down, the lid is screwed on, the fire lighted, and nothing remains but to attend to the stoking for a period ranging from 4 to 6 hours, by which time practically all the oil contained in the leaves has been carried off into the receivers. It is not claimed that this form of plant is an ideal one, and better percentage results can be obtained by the use of an improved class of still; but the cruder form has many advantages, including that of being rapidly constructed, easily moved from place to place as circumstances may require, and of being so simple in construction as to need little or no expert attention. The oil, when taken from the receiver, having been tested and classified, is packed in drums and is then ready for use. In the case of the medicinal oils, it has further processes of redistillation to undergo in separating its various constituents for the uses to which they are applied, but as it is only in regard to the oils used for mineral separation that these enquiries were made, they do not come within the scope of this article.

In conversation with the local director, it was gathered that Eucalyptus Oils Ltd. possess various leases and rights over thousands of acres of this country, and their stills are scattered far and wide, involving a very constant supervision and inspection; but it is pleasant to see, in a district which has not been blessed with great agricultural or pastoral capabilities the establishment of an industry bringing profitable and constant employment to many of its inhabitants on their formerly unproductive lands; and it is to be hoped that with the great extension of the export trade which must seemingly come in the near future, the benefits of the industry will be still more far-reaching.

## MIXED MEMS.

The ease with which a hammer drill can be rotated by hand is chiefly dependent on the amount of jiggle or "kick" which it shows in operation. The degree of this kick is mainly determined by the ratio of the air-feed piston diameter to the hammer diameter. This must be small or the drill will be pressed hard and continuously against the rock and will be exceedingly difficult to turn. The advantage of an easy-turning machine from the miner's point of view is evident. The advantage to the company is just as real. There is a point in drliling flat holes where so much time is lost in changing steel, that the stoper loses its advantage over the piston type. The hole does not clear itself of cuttings, the drill is wedged in, and it may easily happen that more time and much more labour are expended in getting the steel out of the rock than in getting it in. In rotating the drill, the flute of the steel on the bottom of the hole moves the cuttings back and forth; for each swing a certain amount of motion of the cuttings toward the collar takes place, and a little driblet of dust drops from the hole. If the number of rotations is greater, more cuttings are removed, the hole is kept cleaner and the steel is easier to extract. If the machine rotates with difficulty the miner will rotate it slowly. If it rotates easily, he will rotate it frequently, and by wasting less time extracting the steel, will drill a greater footage per shift. Incidentally the jiggle of the steel in the hole helps to keep the cuttings moving down freely and the miner also works more energetically in all respects if not exhausted by wrestling with a stuck drill. An air drill is rather a tool than a machine. It is a greater consumer of manpower than of mechanical power. Ease and convenience are of greater importance than mechanical efficiency, and good management gets a maximum output from the workman by providing him with a maximum amount of this ease and convenience.

The Finance Committee of the Manchester Corporation (England) has pointed out that, on the basis of 5 per cent. on capital expenditure, the Tramways Department should contribute £103,117 to rate relief for the past completed financial year. The Tramways Committee, however, have protested against a larger sum than £100,000 being allowed, which sum was provided for in the annual estimates. The Corporation are to be asked to sanction a visit by the general manager and permanent way engineer to London, Glasgow, Paris, Berlin, Hamburg, Vienna, New York, Boston, Philadelphia, Chicago and Toronto to study methods of passenger transportation.

To stop the alleged theft of gold by labourers in the gold mines in the Cripple Creek district of Colorado (U.S.) three big companies, operating mines there, are seeking to get the Supreme Court to review the action of the Eighth United States Circuit Court of Appeals in refusing to restrict the business of assayers in the vicinity in small purchases of gold. Senator Thomas heads a corps of attorneys which has presented the matter to the Supreme Court. They state that hundreds of thousands of dollars worth of high-grade ore are lost by the mine owners annually in this way. It is charged that the 48 persons sought to be enjoined are engaged in no other business than buying and selling ores stolen by workmen and others. Edward C. Stimson and James J. Banks have filed papers in opposition to the review, hoping that the decision in their favour by the lower court will be allowed to stand. They denounce the movement of the mine-owners as an attempt at "government by injunction."

Mr. R. E. Chancellor, who is at present visiting Australia, stated at Brisbane in a short interview that on the whole mining was somewhat at a standstill on Woodlark Island (P.), but he declared that capital was the only thing necessary to develop the industry on the island. Woodlark King, a privately owned mine from its last crushing of 120 tons yielded 1020 oz. of gold. There had been a shortage of labour lately owing to the good seasons, causing the natives to attend to their cultivations. Woodlark Island boys did not take kindly to work, with the result that it was necessary to obtain labour from adjacent islands. Mr. Chancellor considers that the Island has a great future before them in the direction of copper mining. The building of the railway line will solve the question of traction, and the many possibilities of the Island will then have an opportunity of development.

A plain warning has been addressed to the miners at Chillagoe (Q.) by the directors, who suspect their men of an inclination to follow the example of the Cloncurry strikers against the continuance of contract labour. It is computed that about 1000 men are likely to be affected if, as is probable, the Einasleigh, the Etheridge Gold Mines and the Mungana close down owing to the cessation of work at the Chillagoe reduction plants.

## VICTORIAN GEOLOGY.

### The Ararat District Deep Leads.

In Bulletin 28 of the Victorian Department of Mines, Mr. Stanley Hunter deals with the Ararat, Cathcart, and Langi Logan Deep Leads, the issue including a map and nine plates. The area specially referred to occupies about 100 square miles of hilly and undulating country to the S. and E. of the town of Ararat. The whole of the large branches and tributaries, Mr. Hunter says, which converge into one main lead in the S.W. portion of the parish of Langi Logan, have their source in the ranges of the main divide, and within a large triangular area, having its apex some eight miles north of Ararat, the E. and W. sides of this triangle being formed by the water shed of the main divide, and having, at the S. end of each two great masses of granite. The W. tributaries are all, more or less, payably auriferous, but the E. tributaries, leading from the Ordovician strata and granite of Larne-Gerin, and trending S. as a sub or basaltic lead near Dobies railway station, are unproved. The slates and sandstones over which these E. tributaries flow are traversed by numerous quartz reefs and veins.

After dealing with the historical side of Ararat's foundation, the Bulletin says four classes of alluvial ground exist in the district —Recent, Upper Newer Pliocene, Lower Newer Pliocence, and Older Gold Drift. Beginning at the N. end of the field, the Caledonian mine was last worked in 1902-3 on the Caledonian lead. The upper branches of this lead include Old Deep Lead, Picnic, Wilkies, California, Tomkins, and Nuggety Gullies, Leslies, and Nothing Great Leads, and re-deposited gravels from Bridal Hill, Parr's and Canton Leads. Below the junction of the foregoing the old workings were known as the Wet Lead, and below the junction of Parr's and Wet Lead it is referred to as the Caledonian Lead. The poppet heads of the Caledonian mine are still standing and the shaft appears to be in fair order. About £[illegible] was spent here by the company in shaft sinking, erection of plant, installation of a 22in. pump, and driving. By report, the cause of stoppage was due to insufficient depth of shaft, heavy water, and widespread wash, necessitating the uncovering of too much ground for the amount of gold won. The Caledonian Lead joins with the Black Lead, which has for its tributaries Oliver's, Blind, and Camp Leads, together with a large amount of rich re-deposited gravel from the Canton Lead. This fact was recognised by the early miners, and companies were formed to test the ground. The first shaft sunk in this vicinity was known as the Junction Lead shaft, and 1 oz. 16 dwt. of gold was taken off the bottom. Owing, however, to the wash-dirt being thin, the water heavy, and the driving hard, the mine was closed down. The last attempt was made by the Grand Junction Co., but, fortunately, this company shared a similar fate to the preceding ones. Doubtless, when the wash in these leads becomes more concentrated by the narrowing of the gutter, they will prove remunerative.

The next southerly mine started in the early days is the Britannia, but whether this is on the lead proved by the Grand Junction Co., or on a gutter containing re-deposited gravel from Commissioner's Hill, can only be determined by a line of E. and W. bores in the Police Paddock Reserve. It is stated that the Britannia Co. obtained 3000 ounces of gold from its claim, which it then sold to a new company. The gutter is locally reported to be about 40 feet wide and the wash dirt from 3 to 6 feet in thickness. The possible trend of the lead proved at the Grand Junction mine is shown on the plan (Junction Lead); it may join near the Langi Logan North shaft with the Warrayatkin lead trending southward through the Public Reserve, and the position of which has recently been located by the Great Langi Logan Co. Boring operations are being carried out under contract by the Goldfields Diamond Drilling Co.

The Langi Logan North Co. was formed in October, 1909, and consisted of 100,000 £1 shares, 20,000 of which are paid up to £1. On the remaining 80,000 shares 5s. 6d. per share has been called up. A four-compartment main shaft, 17ft. by 7ft. in the clear is now being sunk, and has reached a depth of about 120ft. The mine manager is Mr. Andrew Harris and the legal manager is Sir. A. J. Peacock.

Somewhere in the vicinity and southward of the Langi Logan North shaft is another large tributary, referred to on the plan as the Larne-Gerin Lead, trending south-westward from the Main Divide, and this is joined by a smaller tributary (Mount Challicum Lead) and branches trending northerly and north-westerly from Mount Challicum and the Ordovician outcrop to the east. The value of both of these tributaries is unknown, no mining has been attempted and much boring is required to locate them and test their values. The strata over which they pass consist mostly of brown and yellow sandstones and micaceous slates traversed and intersected by innumerable quartz veins. It is reasonable to assume that the water in these leads will be considerable. A smaller lead, but one which should be payable, lies to the west of the foregoing, and is referred to on the plan as the Victory Lead. This may possibly have for its tributaries Chinaman's, Old Kairn's, Gap, Cook's, Deadman's, Garden Gully, and Hopkins' Leads, with possibly also a portion of re-deposited gravels from the southern end of the Canton Lead. At the same time it must be pointed out that the outcrop of Ordovician on the railway line eastward of the Garden Gully tributary may belong to the Main Range, as the continuation of a spur forming the southern bank ("reef") of the Garden Gully Lead, and if this occurs it will preclude the Garden Gully, Deadman, and other tributaries to the north from joining the Victory Lead. More boring is required to settle this doubt. The Cathcart Victory Co. was formed in November, 1909, and three bores were sunk to locate a shaft site. The Hopkins tributary was proved to be between 250 and 300 feet wide, but the fall was so rapid that the level from the new shaft which was opened out at 90 feet from the surface, was soon lost. The company then decided to wash all the gravel available and abandon the mine. About £3370 worth of gold was obtained. Mr. Alex. Dow is the mining manager, the legal manager is Mr. Percy Cook.

To the south of the Cathcart Victory is the New Langi Logan mine, and more boring is required in this locality to locate in a more detailed manner the position of the lead and tributaries, and also to determine if the wash originally located by Government bores in 1885 is the main lead, embracing the junction of the Warryatkin, Larne-Gerin, and Mount Challicum Leads, or whether it is the Victory Lead and its tributaries passing through the Cathcart Victory lease.

To the west of the New Langi Logan mine are the Cathcart and Cathcart Central mines. The Cathcart has been in operation for a number of years on the Hard Hill Lead, which in its turn derived a great deal of its gold values from the older gravel deposit known as the Cathcart Hill.

The present Cathcart G.M. Co. was formed in 1906. It took over the whole of the assets and liabilities of the original company, known as the Cathcart Proprietary Co. The capital consists of 80,000 £1 shares, 20,000 of which are paid up to the full amount of £1. Out of the original distribution 27,250 shares have been forfeited and not since re-issued, thus the present list is 52,750. £156,161 worth of gold has been won and £121,691 paid in working costs, plant, etc., while £50,012 has been distributed in dividends. Mr. George Bryant is the mine manager and Sir. A. J. Peacock is the legal manager.

The Cathcart Central mine was started in May, 1909, with a share register of 50,000 10s. shares, on each of which 6s. 10d. has to date been paid. About £23,000 has been expended at the mine in underground development work, and winding and pumping plant. The ground so far proved is extremely rich, 155¼ fathoms yielding 1258 oz. of gold, valued at £4993. The ground held by the company has been well and systematically bored, and the direction and length of lead workable by this company is clearly defined. Mr. D. Murray is the legal manager and Mr. Roberts has charge of the mine.

About a mile southward of the foregoing is a line of bores (section F), sunk for a syndicate with a Government drill and under Departmental supervision in 1899. Six bores in all were completed, proving a somewhat wide but well-defined lead. The most westerly bore bottomed at 113ft. on what is apparently a continuation of a flat spur extending from a hill of metamorphic rock to the west. Between this hill and the granite ranges still further to the west a small lead probably exists. The fact of a western gutter having been found in the most southerly line of Government bores (section H) is some proof of this. A line of bores between the metamorphic hill and granite range will settle this question.

At the Langi Logan South mine five bores (section G) were sunk by the company and auriferous wash proved, but this wash is some 16 feet higher than the lead proved a mile to the north in section F, and as the average fall per mile in the lead is nearly 19ft., the gutter in the vicinity of section G should be some 35ft. lower than the wash proved in section F. It is possible that a folding in the rocks has commenced here, and that the lead, together with the superincumbent strata, is being slowly elevated, and if so, this will account for the apparent want of depth in the bores. It is, however, advisable that a little more boring be done here. The Langi Logan South Co. was formed in October, 1909. The capital consists of 60,000 £1 shares, of which 10,000 are fully paid up. On each contributing share 10s. 11d. has been called up. Shaft sinking operations are nearly finished and a complete modern pumping and winding plant is installed. Up to date about £26,500 has been expended by the company. Sir A. J. Peacock has the legal management and Mr. E. J. Alexander has charge of the mine.

Viewing the field generally, it is probable that the whole of the western leads will be profitably mined. The eastern and north-eastern leads are of unknown value, and they must first be located by boring.

In the southern middle portion of the field possibilities exist for auriferous deep leads, but boring is required here also, and without that no definite information is available.

MANNESMANN
WELDLESS TUBES · For Water, Steam, Gas, Air, Oil, Etc. LAPWELDED TUBES
USED BY STATE GOVERNMENTS, MUNICIPALITIES & THE PRINCIPAL MINING COMPANIES IN AUSTRALIA.
Stocks carried by NOYES BROS. (SYDNEY) LTD. (MELBOURNE) PTY. LTD.

LIQUID FUEL for Diesel & all Crude Oil Engines.
"SHELL" SPIRIT, "SHELL" BENZINE, LUBRICATING OILS AND GREASES.
Prices and particulars on application to
THE BRITISH IMPERIAL OIL CO. LTD. Adelaide, Brisbane, Fremantle, Melbourne, Sydney and New Zealand

## PROFESSIONAL CARDS.

### G. H. BLAKEMORE,

CONSULTING METALLURGIST
For Copper and Lead.

MINING ENGINEER.
CASTLEREAGH CHAMBERS, 16 CASTLEREAGH ST

Telegraph Codes Bedford McNeill 1908 Edition
Moreing & Neal
A B C 5th Edition

Cable Address Radgate Telephone 7124 City

---

### MATTHEW C. COATES, A.M.I.E.E.

CONSULTING MECHANICAL and ELECTRICAL ENGINEER Expert Reports given for Power Generating Plants, Factory Installations, Steam, Gas and Electric.

99 QUEEN STREET, MELBOURNE.

---

### GOYDER & HALLETT,

ASSAYERS AND ANALYSTS

110 **Gawler Place, Adelaide.**

Telephone 169

Metallurgical and Chemical Processes Investigated.

Ores Sampled and Assayed

---

### T. J. GREENWAY, M.I.M.M., F.I.C.

MINING AND METALLURGICAL ENGINEER.

60 QUEEN STREET, MELBOURNE.

---

### KAY, MACNICOL & CO.,

Mechanical, Mining &
Electrical Engineers.

BROKEN HILL CHAMBERS.
31 QUEEN STREET, MELBOURNE.
Cable Address "Engineer" Melbourne.
Telephone, No 4883

---

### J. D. AUDLEY SMITH,

MINING ENGINEER.
9 Bridge-street, Sydney

Telegraphic Address-
Audley Smith,
Mining Engineer
Sydney.

Telephone No -
City 2677.

---

### WALTER F. SMITH,

MANAGER FLOATER G.M.
Ravensthorpe, W.A.
Mines Sampled, Valued, and Reported on.
ASSAYS MADE.

Code: Bedford McNeil.
Reliable Information Furnished on the Phillips River Gold and Copper Field.

---

### McCARTY, UNDERWOOD & CO.,

CONSULTING ELECTRICAL AND MECHANICAL ENGINEERS.

31 QUEEN STREET, MELBOURNE

Telephone, 7096

---

### E. A. WEINBERG,

MINING AND METALLURGICAL ENGINEER,
19 QUEEN STREET, MELBOURNE.

---

### ROBERT ROSTRON,

CONSULTING ENGINEER.

**GAS AND OIL ENGINE SPECIALIST.**

2 Aberdeen House, 204 CLARENCE ST.,
SYDNEY.

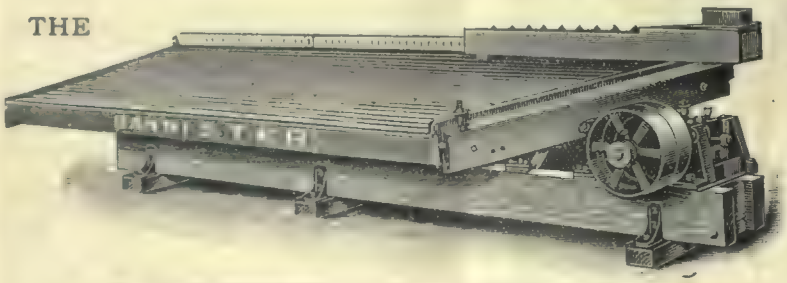
---

A cable message from London says that Mr. Winston Churchill, First Lord of the Admiralty, announces that the Colonial Office is actively securing the development of oil supplies throughout the Empire. The Admiralty's immediate task, however, is to provide definite quantities for the next few years.

---

## MY CARD

THE



**CONCENTRATOR**

4 "Bannister" Concentrators have just been installed at the Central Tin Mine, Renison Bell, Tasmania, similar in design to the Tables at Mt. Bischoff and other Tin Mines in Tasmania.

**Victorian and Tasmanian Representative for Allis-Chalmers Co.**

**L. BANNISTER,** (Late of N. Guthridge Ltd.),

'Phone 7354. **39 QUEEN STREET, MELBOURNE.**

---

# "INGREY"

## PATENT WEIGHING & RECORDING MACHINES

ARE

**Installed in H.M. Dockyards.**
**Certified by the Board of Trade.**
**Accurate and Reliable.**
**Automatic in action and**
**Pay for themselves in a year!**

## H. A. HARVEY & CO. LIMITED, LONDON.

**Australian Representative — LASCELLES PARRINGTON & BRACHE.**
**London House, 97 Elizabeth Street, Melbourne.**
**New Zealand Buildings, Pitt Street, Sydney.**

---

Established 1860.

# Bondholders' Register

**Publishes the Actual Numbers of all Drawn Bonds Throughout the World.**

PUBLISHED FORTNIGHTLY.

**10s. PER ANNUM**

73 Farrington St., LONDON, E.C.

Australian Offices,

376 Flinders Lane, MELBOURNE.

---

## DEPARTMENT OF MINES

## SOUTH AUSTRALIA.

MINERS' RIGHTS are issued at the Mines Office, King William-street, authorising the holder to prospect for Metals and Coal, or Oil, and to peg out Gold, Mineral, Coal, or Oil Claims. Price, 5s., tenable for 12 months. Licenses to search for Precious Stones, Phosphates, Oil, Rare Minerals, Metals, or Earths are issued over specific lands, not exceeding five square miles, to each person, at 20s. per mile for 12 months; the holder has a right to a lease. Leases are issued of the following areas:—Gold, 20; Mineral, 40; Coal or Oil, 640; Salt or Gypsum, 640; Phosphates, 100; Precious Stones, Metals, or Earths, 40; Mineral Springs, 40; Mining Works, 10; Smelting Works, 10 acres respectively. Each lease is for 42 years. Gold, Mineral, Salt, and Gypsum at 1s. per acre per annum; Coal and Oil, at 6d. per acre per annum till Coal or Oil is found, then 1s. A royalty of 6d. in the pound on net profit must be paid in addition.

One man must be kept employed for every five acres held on gold lease; one man for every 10 acres on mineral lease; and one man for every 40 acres on coal or oil leases.

Any number of Gold, Mineral, Coal, or Oil Leases may be held by one person, and up to four Gold or Mineral leases may be amalgamated.

Business and Occupation Licenses are granted.

Subsidies are granted to assist the development of Mines, and Diamond Drills are loaned. Free assays are made of Ore from Crown Lands. Ore is treated at Government batteries — Mount Torrens and Petersburg—at 5s. per ton, and cyanided for 5s. per ton. Tarcoola—at 10s. per ton for parcels over 5 and under 25 tons, and cyanided at 7s. 6d. per ton for parcels over 5 tons. Assays are made of samples sent to the works.

Advances made on parcels delivered at batteries.

MINING ON PRIVATE PROPERTY.

Private Land can be Resumed for Mining or Proclaimed a Goldfield, or owners can be compelled to grant leases over their property on conditions.

The Minerals on all Leasehold Lands and on all Lands granted since 1888 belong to the Crown, and are available for mining on after the miner has arranged for paying for any damage he may do to the surface of the ground.

F. C. WARD,
Acting Secretary to the Minister of Mines.

---

THE

## University of Sydney.

DEPARTMENT OF ENGINEERING.

The course for the degree of Bachelor of Engineering in Mining and Metallurgy extends over a period of four years, during which lectures and practical instruction are given in the following subjects:—

Chemistry, Physics, Mathematics, Descriptive Geometry, Geology, and Economic Geology, Mineralogy, Engineering Construction, Mechanical Engineering Materials and Structures, Electrical Engineering, Surveying, Building Construction, Mining, Metallurgy, Assaying, Engineering Design and Drawing.

The Chemical, Metallurgical, Physical, Geological, Mechanical and Electrical laboratories are thoroughly well equipped with modern plant and machinery.

The Academic year commences in March. The fees are nine guineas per term, or a total cost for graduation of £125 8s., including Matriculation and Degree Fees. Students who do not wish to take up the full course may select individual subjects.

Full particulars will be found in the University Calendar, which may be obtained upon application.

H. E. BARFF,
Registrar.

*Supplement to the "Australian Mining Standard," January 8, 1914.*

# INDEX.

# THE AUSTRALIAN MINING STANDARD

VOLUME L.

[illegible]

JULY TO DECEMBER,
1913.

[illegible]

CRITCHLEY PARKER Pty. Ltd.
MELBOURNE, SYDNEY, LONDON, NEW YORK.

# INDEX.

Abbreviations.—Editorial, E.; Reports and Balance Sheets, R.; Comments and Leaderettes, C.; Articles, A.; Publications, P.; Letters, L.; Investors' Column, I.; Biographical, B.; Our Big Mines, M.; Illustrated, Ill.

Page.

A.

Abandoned Mining Shafts—
  Eaglehawk (V.): Deputation to Minister 204
  Protest by Borough of Eaglehawk (V.) C. 358
Aberdeen (Scotland) Corporation Tramways: "Pay as you enter" Cars Successful 218
Abermain Colliery Co. (N.S.W.) R. 7
Abernethy Main, Purchase of 7
Accidents—
  Eleanora Mine, Hillgrove (N.S.W. 63
  In Power Stations and Workshops (United Kingdom) 179
  First Aid in 450
  Queensland Railways, 1912-13 220
  Recommendations to Reduce Risks in Running of Diesel Oil Engines 347
Adelaide (S.A.) City Council: Motor Lorries Successful 198
Adelaide (S.A.) Electric Supply Co. 73
Adelaide Hampton Boulder Gold Mine, N.L. (W.A.), Floated 351
Adelaide, Melbourne and Sydney Stock Exchanges: Revised Scale of Brokerage Charges C. 164, 172, C. 273.
Adelong Gold Estates (N.S.W.) I. 4, I. 250, C. 317, C. 568.
Advance of Electricity: C. Vermer's Address 515
Agriculture, Use of Explosives in 258
A.1. Gold Mines (V.) I. 567
Aims of Japan E. 62
Air, see Liquid Air.
Ajax Central (V.) I. 166, I. 484
Ajax Central and North Nuggety Ajax (V.): Dispute Settled 51
Ajax North (V.) I. 231
Alaska Mining, Sushanna River 299
Aldridge, A. J.: Telephone Transmission Calculation 13
Alignment of Machinery: Wm. Sinclair (Ill.) A. 53, A. 72, A. 93
Allgemeine Elektricitaets Gesellschaft: Elec Protective Devices 178
Allgemeine Elektricitaets Gesellschaft: Electric Railway Scheme to Connect Gesundbrunnen (Berlin) to Neukoelln 396, 475
Alloys of Copper 40
Aluminium as an Electrical Conductor: Wer[illegible] A. 32.
Alunite in South Australia: L. Keith Ward's Report 550
Amalgamated Engine-drivers' Association (V.) 554
Amalgamated Hill End Co. (N.S.W.): Star of Peace Lode C. 337
Amalgamated Miners' Association, Broken Hill: Labour Federation Preamble Adopted 105
Amalgamated Miners' Association (N.S.W.): Claim for Variation of Award 30
Amalgamated Society of Railway Employees, Perth (W.A.): Application for Cancellation of Registration of Perth Tramways' Union Dismissed 284
Amalgamated Zincs I. 23
Amalgamated Zinc (De Bavay's) Ltd. R. 236, R. 255, C. 503.
Amalgamating Machine (New Gold): Successful Run 160
America, Ore Concentration in 362
Amery, L. S. (M.P. for Great Britain): Remarks on Australia C. 293

Page.
Anderson, Alexander, President Assoc. of Mining Electrical Engineers: Speech 473
Andrews, E. C.: Cobar Copper and Gold Field. Part I. P. 12
Angus, A. R.: Apparatus for Averting Railway Collisions 450
Annan River Co. (Q.): Additional Capital C. 360, C. 381
Arbitration, Unpopularity of, in Australia C. 272.
Architecture and Engineering: W. B. Griffin's Remarks 216
Ardlethan (N.S.W.): Applications for Titles During Half year 23
Ardlethan Options Co. (N.S.W.) C. 230
Argentine: Petroleum Deposits at Comodoro Rivadevia: Govt. Development C. 381
Arseno-Pyrite, An Unusual Occurrence of, in Ballarat (V.) District 171
Auckland (N.Z.) Automatic Telephone System 354
  Electric Tramways Co. Ltd.: Increase of Capital 329, 391, 471
Australasia. Dr. James Bryce's Impressions C. 544, E. 563

Australia—
  Big Mines: Dividends Compared C. 336
  Brokers' Conference 50
  Company Law E. 41
  Cook Government, The E. 1
  Cook Government, The: Election Frauds Enquiry C. 22
  Crude Oil, Demand for Duty on 8
  Diamond Fields: D. Groves' Lecture 483
  Federal Capital Design Alterations: W. B. Griffin to Advise 180
  For Ourselves: Mr. Collier's (W.A.) Policy E. 187
  Mineral Outputs, 1912 E. 227
  Mining: Views of Mr. W. J. Loring 3
  Motor Importations: Customs Returns 137
  Oil, Duty on, Needed C. 62
  "Petroleum Exists in": Pamphlet by George D. Meudell C. 249
  Post Office E. 41
  Preference to Unionists C. 42
  Smallpox Scare, The E. 21
  Timbers (Cabinet): R. T. Baker P. 48
  Trade Disputes, Cost of: Quarter ending March 31, 1913 54
  Transcontinental Railway: Water Bores 38
  Wireless Telegraphy: Charge for Licences Revived 184
  See also Commonwealth.
  See also Tropical Australia.
Australian Agricultural Co., Newcastle (N.S.W.) R. 172
Australian Capital Invested Abroad C. 273
Australian Character: Sir George Reid's Speech at Sydney Town Hall C. 563
Australian Mineral Output E. 399
Australian Mutual Provident Society: Cash Bonuses 401
Australian Navy, Oil Fuel for 357
Australian Oil Industry: Important Questions 320
Australian Oil Wells Co., N.L. 280, 318, C. 381
  G. D. Meudell's Pamphlet: Gibb Maitland's Report 504
Australian Shale Oil Industry: Federal Government Assistance Required 114
Australian Transport and Panama: Jas. Alex. Smith's Paper (Ill.) 492

Page.
Australian Wireless 490
Australian Workers' Union: Responsibility for Cloncurry (Q.) Strike C. 63, 64
Australian Workmen: Industrial Dishonesty E. 104
Austral Malay Tin Ltd. 105, 337, 357, C. 360, C. 568
Austral Otis Road Rollers (Ill.) 573
Automatic Gold Recovery Ltd.: Jones Process 229
Automatic Selective Telephones: E. G. Godfree A. 92
Automatic Telephone System, Auckland (N.Z.) 354

B.

Baker, R. T.: Technical Education Series No. 18: Cabinet Timbers of Australia P. 48
Bald Hills (T.) Osmiridium Field: Government Geologist's Report Quoted 215
Bald Hills (T.) Osmiridium Mines, N.L.: Registered 230
Ballarat (V.) Electric Tramways: One-man-one-car Dispute 34
Ballarat (North) Locomotive Works: Strike 47
Balsillie Wireless System for Australia 490, 517
Bank of Australasia R. 288, R. 396
Bank of New South Wales R. 513
Baragwanath, W., Geological Surveyor: Report on Bendigo (V.) Field 29
Barraba—Bingara (N.S.W.) Railway: Mr. John Harper's Evidence 55
Barytes: see Mt. Major.
Basedow, Dr. H. (M.A.): Opinions on S. Aust. Oil Areas 365
  Report on Eyre's Peninsula Petroleum Oil Co.'s Property (S.A.) 325
Bayly, P. G. W.: Report on Briquetting Powlett (V.) Coal 410
Bealiba G.M. Co. (V.) Floated 64
Bear Gardens and Pothouses E. 544
Beatrice River, Herberton (Q.): Gold Discovered 546
Beattie, Dr. (Liverpool University): Method of Sterilising Milk by Electricity 170
Beauchamp, J. W.: Electricity for Domestic Use in West Ham, Eng.: Report 71
Beaufort Deep Leads (V.) I. 23, 502
Beaufort (V.): Strike Against Non-unionists 318
Beaufort (V.): Unionist Outrage 345, C. 356
  Miners Acquitted 501
  T. Abrey Remanded 550
Bell, Stanislaus Napier: Obituary 145
Bendigo Field (V.): Geological Surveyors' Report 29
  In First Half of 1913 6
  Strike C. 2, C. 22, C. 316
Bendigo (V.) Mine Owners' and Federated Mining Employees' Associations: Conference on the Non-union Question C. 228
Bendigo Miners' Association: Obligations C. 524
Bendigo (V.) Miners: Partial Strike 47
Bendigo (V.) Mines: Compulsory Unionism Advocated 112
Bendigo (V.) School of Mines: Decrease in Number of Students C. 144
  Deputation to Minister 28
Benzine: see Petrol.
Berlin City and Circle Railway: Electric Rail Motor Car: Trials XIII.
Berlin City Circular and Suburban Railways. Electrification Bill Pased 308

Page.
Berlin Electric Railways: Gesundbrunnen to be Connected with Neukolln Allgemeine Electricitaets Gesellschaft's Scheme 396, 475
Berlin: Electricity Works Connections . 313
Berlin: Telephones . XIII.
Best, T. J. S.: South German Reef Extended G.M. Co., Lease No. 6707 Forfeited to . 248
Bernewitz, M. W. von: Cyanide Practice, 1910-1913 . . P. 566
Billabong Creek—Henty (N.S.W.) Railway Authorised .. 307
Bimbimbie Gold Mining Co. (N.S.W.): Order Passed for Winding Up . C. 63
Bingara—Barraba Railway (N.S.W.): Mr. John Harper's Evidence .. 55
Bismuth Ores: Experiments in Concentration .. C. 465
Bisulphite Process at British Metals Extraction Co. (Wales) .. 30
Blackball, Westland (N.Z.): Strike Ended 266
Blasting, Liquid Air for .. .. .. .. .. .. XVI.
Blenman Copper Mine (S.A.): H. Jones' Report .. 550
Block 14, Torrington (N.S.W.): in Difficulties .. .. .. C. 317
Boggabri—Manilla Railway (N.S.W.): Mr. John Harper's Evidence .. 55
Boiler: see Turnbull.
Bombala—Nimitybelle Railway: Deputation 71, 73
Border Mining Co., N.L., Koetong (V.) .. 501
Border Railways: New South Wales and Victoria: Conference of State Premiers .. . 199
  N.S.W. Legislative Assembly Bill Ratifying Agreement between Premiers Passed C. 316
Boreholes: Plea for Their Preservation .. 314
Boring Plant, Prospecting .. .. .. 11
Botany—Sydenham (N.S.W.) Railway: First Sod Turned at Botany .. .. 368
Bourke's Hill Tin Sluicing Co., Emmaville (N.S.W.) .. .. .. C. 294, C. 317
Braddon, H. Y.: Company Law in Australia E. 41
Bradfield, J. J. C. (M.E., M. Inst. C.E.): Linking Sydney with North Sydney: Supplement .. .. .. A 411
Bradfield, J. J. C.: Scheme for North Shore (Sydney) Cantilever Bridge Recommended by Parliamentary Standing Committee .. 183
Bradford (Eng.) Electric Lighting Plant: City Electrical Engineer's Proposals for Improvements .. .. 200
Brazilian Government: Concession to Marconi Co. .. .. 265
Breinl, Dr. Anton: Lectures on Tropical Australia .. .. .. C. 482
Brewer, Robt.: Carburation in Theory and Practice .. .. .. P. 512
Brick Masters' Association (N.S.W.): Attitude towards Brick and Pipe Makers' Wages Board .. .. .. C. 62
Bridge (Steel Cantilever) to be Built over St. Lawrence River, Quebec (Canada) .. .. 476
Brierley, Wynford: Patent Signalling Apparatus to Prevent Collisions .. .. 452
Brighton—St. Kilda Electric Tramway: Deputation from Municipal Councils .. .. 133
"Brisbane" Charcoal Retort: Ill. .. .. 574
Brisbane Tramways: Government to Purchase after 1920 .. .. .. 451
Brisbane Water Supply Plant .. .. 136
Bristol: City Electrical Engineer's Progress Report .. .. .. 71
Britain in the Mire .. .. .. E. 335
Britain's Oilfields .. .. .. 280
British Admiralty: Contract with Mexican Eagle Oil Co. .. .. 69, 209
  Contract with United British West Indies Petroleum Syndicate .. .. C. 209
British Association for the Advancement of Science—
  Australian Visit .. .. .. 369, 501
  Distinguished Visitors .. .. 196, 238, 357
  Facilities to Inspect Victorian Industries to be given .. .. .. 183
  German Visitors .. .. .. 396
  Past President's Invited .. .. 525
  Birmingham Meeting .. .. .. 304, 327
British Association. Manchester Meeting: Engineering Section: Committee's Report .. 387
British-Australian Oil Co. (N.S.W.)—
  English Company Formed to Acquire Works .. .. .. C. 381
  Reconstruction .. .. 43, 64, 156, 209, 230, 401
  Report by Mr. Robertson Law .. .. 29
British Broken Hill Pty. Co. .. .. R. 480
British Coal Mines: 1912 Output of Coal Diminished by Strikes .. .. 183
British Electric Traction Co. .. .. R. 52
British General Electric Co.: Cinematograph Views of English Works at Lyceum Theatre, Sydney .. .. .. 284
British Imperial Oil Co.: Contract with Commonwealth Defence Department .. .. 357
British Insulated and Helsby Cables Ltd. (Prescot, Eng.) v. London Electric Wire Co. and Smiths Ltd. (Salford) .. 116
British Metals Extraction Co. Ltd. (Wales): Bisulphite Process .. .. .. 30

Page.
British Navy, see British Admiralty.
British Politicians— ..
  Visit to Australasia .. .. .. 190
  And Sydney Vaccination Regulations .. C. 164
British Railways: Decline in Number of Passengers Carried in 1912 .. .. .. 186
British Westinghouse Electric and Mfg. Co. Ltd.: Capital Written Down .. .. 369
Broadbent, Frank, M.I.E.E., etc.: Dynamo and Motor Attendants and Their Machines (7th edition) .. .. .. P. 566
Broken Hill (N.S.W.): Amalgamated Miners' Association: Labour Federation Preamble Adopted .. .. .. 105
Broken Hill Junction Co. v. Junction North: Settlement .. .. .. 501
Broken Hill Junction Lead Mining Co. .. C. 360
Broken Hill Litigation: Mine Ventilation Rights .. .. .. 324
Broken Hill Ore: Carried to S. Aust. Ports .. 480
Broken Hill Pty. Block 10 Co. Ltd. I. 338, M. 380
Broken Hill Pty. Block 14 Co. .. .. M. 404
Broken Hill Pty. Co.—
  American Machinery Ordered .. .. 34
  Iron and Steel Works at Newcastle (N.S.W.) .. .. .. R. 177
  Profits .. .. .. 145
Broken Hill South Extended Ltd. (N.S.W.): Reconstruction .. .. .. 318, 483
Broken Hill South S.M. Co., N.L. I. 165, M. 191, 483
Broken Hill Treatment Methods: J. Malcolm Newman .. .. .. A. 51
Broken Hill Water Supply .. .. R. 113, 318, 501
  Umberumberka Scheme .. .. .. 318
Brookes, Herbert .. .. .. B. 3
Brunswick (Vic.) Electrical Installation Scheme .. .. .. 15
Bryce, Dr. James: Impressions of Australasia C. 544, E. 563
Buechner, L. W. G.: An Unusual Occurrence of Arseno-Pyrite in Ballarat (V.) District 171
Bullfinch Pty. Ltd. (W.A.) .. 294, I. 359, C. 548
Burgess, Frank P.: Obituary .. .. .. 318
Burke-road—Union-road, via White Horse-road Tramway (Melbourne) .. .. .. 327
Burnt Creek G.M. Co., Dunolly (V.): Winding Up .. .. .. C. 316, 565
Burren Junction—Coonabarabran (N.S.W.) Railway Authorised .. .. .. 307
Burrinjuck Dam (N.S.W.): Pendulums to Test Effect of Weight of Water in Vicinity 257, 346
  Prof. David's Statements .. .. .. 257
Business, The Dignity of: H. E. Morgan .. C. 104
Butler, D. B.: Portland Cement: Its Manufacture, Testing and Use (3rd edition) .. P. 566
Butler, Edward: Modern Pumping and Hydraulic Machinery .. .. .. P. 88

C.

Cable Communication: Royal Dominions Commission: Evidence .. .. .. 555
Caledonia Mine,, Warrandyte (V.): Deputation .. .. .. 3
Caledonian Coal Co. (N.S.W.): Purchase of Abernethy Main .. .. .. 7
Caledonian Collieries Ltd., Newcastle (N.S.W.) .. .. .. I. 43, R. 171
Camberwell (V.) Town Council: Agreement with Melbourne Electric Supply Co. Ltd. .. 63
Canadian Government and the Oil Industry .. 159
Canadian Pacific Railway: Electrification Scheme .. .. .. 367
Canberra Electric Plant: Contracts let .. .. 556
Cancer Origin: A Theory of Charles Green C. 356
Carbon Filament Lamps .. .. .. 535
Carburation in Theory and Practice: By Robt. Brewer .. .. .. P. 512
Carlisle (V.) Co. .. .. .. I. 106
Carnotite Discovered near Olary (S.A.) in 1906 .. .. .. 483
Carnotite Ore: Its Value as a Source of Radium: Prof. R. Sommer's Experiments .. 483
Carpathia Tin Mining Co., Ardlethan (N.S.W.) .. .. C. 190, C. 209, C. 401
  Dr. R. L. Jack's Report .. .. C. 274
Carrickalinga Head (S.A.): Alumite Discovered: L. Keith Ward's Report .. .. 550
Cassilis G.M. Co. N.L.—
  Application for Loan under Victorian Mines Development Act .. .. .. 214
  Increase of Capital .. .. .. C. 381
Castlemaine District (V.) Slum Dams: Valuable Clay for Pottery .. .. .. 357
Castlemaine (V.) Strike .. .. .. 496
Cathcart Central G.M. Co., Ararat (V.) .. R. 22, I. 43, 318, C. 361
Central Ajax G.M. Co., Daylesford (V.) .. R. 269
Central R. W. and Blue (V.): New Saddle Reef at 880ft. .. .. .. 531
Chaffers G.M. Co. Ltd. (W.A.) .. .. 142, C. 527
Chambers, J. S.: O. Connell v. .. .. .. 47
Charcoal Industry, The .. .. .. 574
Charters Towers and Depth .. .. E. 163, 173

Page.
Charters Towers Mines (Q.)—
  Deep Sinking: Discussion in Legislative Assembly .. .. .. 466
  Government Board's Report .. .. .. 385
Chemin de Fer du Midi Electrification of: Jullian .. .. .. A. 33
Chester (Eng.): Hydro-Electric Plant .. .. 473
Chilean Mining Code .. .. .. 565
Chillagoe Co. Ltd. (in liquidation): Report for Year ended March, 1913 .. .. .. M. 465
Chinn (Henry): Inquiry .. 153, 184, C. 188, 262
  Senator De Largie's Remarks .. .. C. 188
Chinn Stick (The), and the Government Dog E. 543
Chrome-Nickel Wire. Tests in Germany .. .. 60
Claude, Georges: Luminescent Neon Tubes .. A33
Clifton Hill-Prahran (via Richmond) Tramway Scheme (V.): H. S. Dix's Report .. .. 257
Cloncurry (Q.) Mines—
  Labour Troubles .. .. .. 47
  Strike Ended .. .. .. C. 63, 64
Coal Briquettes, see Briquettes.
Coal, By-Product of: as a Substitute for Petrol: Successful Tests .. .. .. 287
Coal-cutting Machines: New Development at Mt. Kembla (N.S.W.) .. .. .. 386
Coal Mine at Mt. David (N.Z.): to be Developed by the Government .. .. .. 120
Coal Storage Bin (used at Ashland, Kentucky 20
Coal Vend Appeal: Reasons for Dismissal .. 89
Coal Vend Case: Fines Remitted .. .. .. 518
Coal Vend Cases: Counsel's Fees .. .. .. 311
Coates, Matthew C.: Power Gas Producers: Supplement .. .. .. A. 440
Cobar Copper and Gold Field, Report on: E. C. Andrews (Part I.) .. .. .. P. 12
Coburg (V.): Electric Tramway Scheme Opposed .. .. .. 176
Coff's Harbour (N.S.W.) Scheme: Authorised 307
Coincidence, Remarkable: Editorials of "Town Planning Review" and "The Salon" .. .. 217
Collee (W.A.) Scheme for Generating Electricity to Supply Perth .. .. .. 288
Collie Scottish Co-operative Colliery Co. Ltd. (W.A.): In Liquidation .. .. .. 30
Collier, P., W.A. Minister for Mines: Policy of Australia for Ourselves .. .. E. 187
Collieries, Power Transmission in : W. H. Telfer's Paper .. .. .. 514
Collisions (Railway), Prevention of—
  A. R. Angus's Invention .. .. .. 450
  Brierley's Patent Signalling Apparatus 452
  Chris. Wirth's Invention .. .. 450, 540
Colonial Bank of Australasia Ltd. .. .. R. 351
Colonial Sugar Refining Co.: Bonus .. .. 378
Colonial Sugar Co.'s Appeal: Decision of Privy Council .. .. .. C. 564
Commonwealth Buildings, Strand, London: Messrs. Dove Bros.' Tender Accepted .. .. 200
Commonwealth Defence Department—
  Contract with British Imperial Oil Co., Melbourne .. .. .. 357
  Stores: G. Gatehouse's Report .. .. .. 554
  Unprofitable Factories, Mining Stores .. 534
Commonwealth Electoral Bill: Amendments E. 227
Commonwealth High Court, see High Court.
Commonwealth of Australia: Official Year Book, 1913 .. .. .. P. 197
Commonwealth Oil Corporation—
  Application for Total Suspension of Labour Conditions .. .. C. 249, 256
  Claims for Bonus .. .. .. 159
  Duty on Crude Oil asked for .. .. .. 8
  Federal Bonus. Deputation .. .. .. 137
  Further Application for Suspension .. .. 572
  Reconstruction .. .. .. 64, 196
  Works at Newnes (N.S.W.) Deserted .. IX.
Commonwealth Patents Law: Associated Chamber of Manufactures' Resolution .. C. 356
Commonwealth—
  Postmaster-General's Department: Electrical Mechanics Wanted .. .. 237, C. 462
  Post Office .. .. .. E. 41
Commonwealth Small Arms Factory, Lithgow N.S.W. .. .. .. 330, C. 378, 471
  Failure to Produce Sufficient Rifles .. .. 517
Commonwealth (The) and State Debts .. A. 348
Commonwealth Trade Returns Compared .. .. 15
Commonwealth Wireless Station at Esperance (W.A.) Opened .. .. .. 96
Commonwealth Wireless Stations .. .. .. 96
Commonwealth, see also Australia.
Company Law .. .. .. E. 41
Conapaira Tinfield (N.S.W.) .. .. .. 294
  J. B. Jaquet's Report .. .. .. C. 381, 386
Conder, Hartwell (M.A., A.R.S.M.)—
  Ore Deposition at Mt. Lyell (T.) .. .. A. 386
  Report on Draining of Zeehan Mines (T.) 236
Constellation (Bendigo, V.) .. .. .. I. 295
Contract System and Day Labour .. .. C. 144
Contract Work on the Rand Field (South Africa) .. .. .. C. 482
Cook, Joseph, Prime Minister of Australia: Remarks on Chinn Inquiry Committee .. C. 188
Cooking, Electric .. .. .. A. 116
Coolah—Craboon (N.S.W.) Railway Authorised .. .. .. 307
Coonabarabran—Burren Junction (N.S.W.) Railway Authorised .. .. .. 307

Page.

Cooper, C. H. (M. Inst. C.E.): Paper on "Highways" ... 472
Copeton Diamond Mines (N.S.W.) ... A. 510
Copper Alloys ... 46
Copper Mines of Peru: A Rival to Australia C. 463
Copper, see also Fire Fly Mine.
Cordeaux (N.S.W.): Second Water Supply Dam: Enormous Cost ... 307
Corners in Stocks, Sydney Stock Exchange Regulation Against ... E. 272
Corowa (N.S.W.): Railway from Wahgunyah (V.): Deputation ... 70, 73
Corrugation (Rail) in Chicago (U.S.A.) ... 59
Cost of Living, and Trades Union Levies C. 124
Cost of Living Inquiry: N.S.W. Labour Council's Attitude ... C. 316
Cowell Blocks Development Syndicate, see also Cowell Consolidated.
Cowell Consolidated Silver and Copper Mining Co.: Amalgamation of Cowell Pty. and Cowell Blocks Companies (S.A.) ... 229, 343
Cowell Pty. S.M. Syndicate, see also Cowell Consolidated.
Cox, Robert: Recipient of Royal Humane Society's Medal: Death ... 105
Craboon—Coolah (N.S.W.) Railway Authorised ... 307
Crane (Large) at Hamburg Shipbuilding Yard ... 38
Craven, A. W.: Obituary ... 502
Crustal Folding and Mountain Building: Prof. Jas. Park ... A. 88
Curie, Mme.: Probable Visit to Australia ... 546
Curlewis—Gilgandra Railway (N.S.W.): Negatived by P. W. Committee ... 116
Curse of Victorian Mining ... E. 335
Cyanide Practice, 1910-1913: Edited by M. W. von Bernewitz ... P. 566
Cyaniding: Action of Oxidizers ... 396

D.

Damoiseau, J. B. G.: Petrol-Electric Motor Vehicles ... A. 14
David, Prof. T. W. E.: Statements about Burrinjuck Dam (N.S.W.) ... 257
Day Labour and the Contract System ... C. 144
Day Labour v. Piece Work ... C. 462, C. 481
Daylesford Field (V.): H. S. Whitelaw's Report ... 571
Deane, H., Engineer-in-Chief Commonwealth Railways: Report on Kalgoorlie-Port Augusta Railway ... 153
  Report on Kalgoorlie-Port Augusta Railway Water Supply ... 450
Decentralisation, Necessity for, in Australia C. 247
Deep-Lead Dredging ... I. 526
Defence Department: see Commonwealth.
Delegated Railway Construction in New South Wales ... E. 1
Deloraine Gold Mines (S.A.) ... R. 570
Deniliquin-Moama Railway Act 1873: Bill Passed to Amend in New South Wales Legislative Assembly ... C. 316
Deniliquin-Moama Railway Co. (N.S.W.): Traffic Receipts for Half-Year ... 183
Diamond Creek G.M. Co. (V.) ... R. 84
Diamond Jubilee Mine (S.A.): H. Jones' Report ... 550
Diamonds: see Australia.
Diamonds: see Copeton.
Diatomaceous Earth ... E. 315
Dick, Alexander: Obituary ... 463
Diesel Oil Engines: Equipment of Vessels C. 316
  Recommendations to Reduce Risk of Explosions and Accidents ... 347
Diesel, Rudolph: Disappearance off S.S. "Dresden" ... 294, 338, 391
Direct Current Generators: Largest Ever Built ... 580
Disasters (Mining), Rescue Work in ... C. 500
Disasters—
  North Mt. Lyell (Tas.): Report of Royal Commission ... 49
  Universal Colliery, Senghenydd, Wales 351
Disease and Infection ... E. 21
Disinfectant Fluid, Electrolytic: Production and Distribution in London ... 178
Dix, H. S.: Report on Clifton Hill-Prahran (via Richmond) Electric Tramway ... 257
Domestic Electric Cooking and Heating—Results of One Year's Working: Paper by Prof. J. T. Morris, M.I.E.E. ... 347, 370
Dove Bros.: Tender for Commonwealth Buildings, Strand, London, Accepted ... 200
Dowser's Art: Tests at Guildford, Surrey ... 59
Dowser: see also Water Diviner.
Dredged Areas, Utilisation for Agricultural and Pastoral Purposes ... C. 356
Dredgers and Steel: Ill. ... A. 491
Dredge, The "Devastating": J. H. Gray's Opinion ... 383
Dredging Inquiry Board (V.) ... 12, C. 228
Dredging Machinery (Powerful) for Philippine Dredges Ltd.: Chas. Ruwolt Pty. Ltd., Melbourne ... 229
Drills, Steel-pointed: Martel ... 34
Dubbo-Werris Creek (N.S.W.) Railway Authorised ... 307

Page.

Dubbs-Werris Creek Ry. (N.S.W.): Construction Recommended by P.W. Committee ... 116
Duke and Main Leads Consols Mine, Maryborough (V.) ... C. 360
Duke Extended Co., Maryborough (V.) ... I. 146
  Inadvertent Negligence ... E. 247
Dunedin (N.Z.) Tramway Employees' Union: Decision against Joining United Federation of Labour and Social Democratic Party ... 201
Dunlop Rubber Co. of Australasia Ltd. ... R. 332, I. 359
Dunstan, B. (Q. Govt. Geologist): Opinions on Gympie Goldfield ... 396
Durham, Edward B.: Mine Surveying ... P. 566
Dust Exhauster: Newport (V.) Workshops ... 199
Dynamo and Motor Attendants and Their Machines, by Frank Broadbent, M.I.E.E., etc. (7th edition) ... P. 566

E.

Eaglehawk (V.) Mines: Strike ... 63
Eak Pickling Can for Frosting Glass Bulbs of Incandescent Lamps ... 313
Earth (Form of): Tetrakedral Hypothesis: Prof. Jas. Park ... 50
Echuca-Moama Railway: Bill Passed in New South Wales Legislative Assembly ... C. 316
Ecuador Oil Concessions ... C. 209, 501, 542
Edison and Swan United Electric Light Co. Ltd.: Report ... 536
Edison Storage Battery Cars at Gisborne (N.Z.) ... 34
Edna May Central G.M. Co., Westons (W.A.) 273, C. 293, I. 484
Edna May G.M. Co., Westons (W.A.) ... I. 65, C. 360, I. 464, C. 527
Edwards, E. H.: Possibilities of Increasing Profits on Inter-Urban Tramways ... A. 52
Elder, Smith and Co. Ltd.: Provident Fund for Employees ... C. 482
Eleanora Mines Ltd., Hillgrove (N.S.W.) ... C. 568
  Accident ... 63
Election Frauds: Enquiry by the Cook Government ... C. 22
Electric Carrier Co., New York: Electric Carriers for London G.P.O. ... 473
Electric Circuit Theory and Calculations: by W. Merron Maycock ... P. 512
Electric Cooking ... A. 116
  Prof. J. T. Morris' Paper ... 347, 370
Electric Lamps, "Half-Watt" ... 475
Electric Lamp, Tungsten ... 475
Electric Lamps, Miner's: Wm. Maurice's Lecture ... 24
Electric Light in Provincial Towns (V.) by Local Industrial Companies ... 116
Electric Power, Prime Movers for: Ferranti A. 31
Electric Railways, Safety of: Report of London Select Committee on Motor Traffic ... IX
Electric Resistance: Silit ... 60
Electric Smelting of Tin and Zinc Ores ... 306
Electric Supply for Domestic Purposes ... 32
Electric Vehicles ... 369
Electric Winding on the Rand Mines ... A. 44
Electrical Accidents: see Accidents.
Electrical Conductor, Aluminium: Welbourn A. 32
Electrical Energy: Generated by Application of Wind Power: W. H. Myers ... A. 390, A. 448
Electrical Engineering: Influence on Mechanical Engineering: Dr. E. Hopkinson's Speech ... 473
Electrical Engineer's Meeting in Paris ... 14
Electrical Power and Irrigation: Regulations for Transmission and Supply and Sale in New South Wales ... 217
Electrical Station Engineers, Association of: London Meeting ... 92
Electrical Systems in Australia: Multiplication of Voltages ... E. 276
Electrical Traders and Contractors' Association, Victoria ... R. 13
Electricity, Advance of: C. Vernier's Address 515
Electricity for Domestic Use: J. W. Beauchamp's Report (West Ham, Eng.) ... 71
Electricity Generating Scheme, Collie (W.A.): For Supplying Current to Perth ... 288
Electricity in Mines: Siemens Bros. Dynamo Works Ltd. ... P. 300
Electrification of Chemin de Fer du Midi: Jullian ... A. 33
Electrolytic Disinfectant Fluid: Production and Distribution in London ... 178
Electrolytic Refining Co's Wages Board ... 132
Elsmore Tin (T.) ... I. 189
Engine Drivers' Award ... 388
Engine Drivers' Certificates (V.) ... 306, 554
Engine Drivers' Examinations (N.S.W.) ... 54
Engine Drivers' Examinations (V.) ... 68
Engines: see Gas Engines.
England. Electric Traction and Industries: Premier Watt's Observations ... 133
England. Tramways and Light Railways Association: Congress at Blackpool ... 52
England: See also United Kingdom.
Escha-Roland Horn for Motor Vehicles: Siemens' and Halske Ltd.'s Design ... 540
Eternal Railway Question, The ... E. 187

Page.

Ethelburga Syndicate: Proposal to Sell Parapara Iron Ore Deposits to N.Z. Govt. ... C. 336
Etheridge Gold Mines Ltd. (Q.) ... R. 84, R. 131
  Liquidation and Reformation of New Company ... 401
  Report on Queenslander Mine ... C. 401, 483, C. 485
"Every Man His Own Builder": G. Gordon Sampson ... P. 88
Ewing, J.: Paper on "The Flood of Water Through Pipes" ... 284
Ewing, N. K.: Bill for Prohibition of Preference to Unionists in Tasmanian Legislative Assembly ... C. 292
Examination Papers, How Not to Set ... E. 523, C. 545
Explosions in Mines: Prof. Haber's Device for Prevention ... 396
Explosions: Recommendations to Reduce Risks in Running of Diesel Oil Engines ... 347
Explosives, Minimising Danger From ... C. 292
Explosive: see Nobel.
Extraction of Gold: Jones' Process ... 229
Eyre's Peninsula Petroleum Oil Co. (S.A.): Dr. H. Basedow's Report ... 325

F.

Fair Rents Bill: Rejected in N.S.W. Legislative Assembly ... C. 292
Falkenthal Rectifiers ... 269
Fawcett, J. H.: Report on Golden Springs Mine, Blayney (N.S.W.) ... C. 381
Fearnley, A. R.: Presidential Address to Municipal Tramways Association at Sheffield 368
Federal Arbitration Court Awards: Mr. Justice Higgins' Remarks ... C. 228
Federal Capital Plan: Royal Commission Required ... C. 80
Federal Capital: W. B. Griffin's Appointment C. 336, C. 356
Federal Ore Co. ... C. 527
Federal Parliament: Powellising: Select Committee Appointed ... 392
Federal Public Service: Number of Employees 330
Federal Public Works Committee: Bill to Establish ... C. 545
Federal Railways ... 574
Federal Railways: East-West and North-South ... 367
Federal Territory: Offside Machine Men's Strike ... 189
Federated Gas Employees' Union v. Metropolitan Gas Co. (Melbourne) and Others: Mr. Justice Higgins' Judgment ... 248
Federated Mine Employees' Association, Ballarat (V.) Branch: Half-Yearly Meeting ... 63
Federated Mining Employees' and Bendigo (V.) Mine Owners' Associations: Conference on the Non-Union Question ... C. 228
Federated Mining Employees' Association: Dissatisfaction in Victoria ... 565
Federation of Labour: Refusal to Join, by Miners' Union at Seddonville State Colliery (N.Z.) ... 165
Ferguson, W. H.: Report on Mt. Major (V.) Barytes ... 508
Ferranti, S. Z. de: Prime Movers for Electric Power ... A. 31
Fire Fly Field, Hall's Peak, Hillgrove (N.S.W.): Copper-Silver-Lead-Zinc Find: J. B. Jaquet's Report ... C. 504, 511
First Aid in Electrical Accidents ... 450
Fitzmaurice, Sir Maurice: on Perth (W.A.) Sewerage Scheme ... 575
Fitzroy Dock, Sydney: Boiler Plant Defective 137
  Imbroglio ... C. 144, 153
Fitzroy, Northcote, and Preston Proposed Electric Tramway ... 176
"Flood of Water Through Pipes, The": J. Ewing's Paper ... 284
Forman and Co., Shipbuilding Yards: Strike 575
Fraser, James, N.S.W., Engineer-in-Chief for Existing Lines: Report on Diversion of Railway between Picton and Mittagong (N.S.W.) 284
Fraud Perpetrated on Bank Manager, Albury (N.S.W.) ... 23
Frazer, C. E. (M.R.H.): Obituary ... 483
Fremantle-Kalgoorlie (W.A.) Broad Gauge Railway: Norton Griffith Co.'s Offer to West Australian Government to Build ... 329
Frenchman's Reef, Daylesford (V.) ... I. 126
Frosting Glass Bulbs of Incandescent Lamps: New Process, Eak Pickling Can ... 313
Fuel (Oil) for the British Navy: Influence on Coal Mining Industry ... 69
Functions of Government ... E. 271

G.

Garforth, W. E. (LL.D.): Paper on Use of Stone-Dust for Prevention of Colliery Explosions ... 301
Gas Engine Design: Important Advance: Ill. 389
Gas Engine Testing: W. A. Tookey's Paper ... 472
Gas Producers: see Power Gas.
Gatehouse, G.: Report on Deficiencies in Defence Department Stores ... 554

Page.

Gauge Question: see Railway Gauge.
General Electric Co. Ltd., London and Witton R. 115, R. 154
Generators: see Direct-Current.
Genesis of Life: Prof. Jas. Park .. .. A. 30
Genesis of the Earth: Prof. Jas. Park .. .. 12
Geology of Petroleum: Fernand Peter's Opinion .. .. .. .. .. XII.
Gilgandra-Curlewis Ry. (N.S.W.): Negatived by P. W. Committee .. .. .. .. .. 116
Gilgandra-Quambone Ry. (N.S.W.): Construction Recommended by P.W. Committee .. 116
Gippsland (V.) Coal Fields: Private Enterprise Discouraged .. .. .. .. .. .. .. E. 21
Gippsland Copper Co. (V.) .. .. .. .. C. 485
Gippsland Copper, Platinum and Gold Mining and Smelting Co., N.L., Walhalla (V.): Application for Loan under Victorian Mines Development Act .. .. .. .. .. .. .. 214
  Government Assistance Refused .. 256, A. 324
Gitsham Gold Extraction Process .. .. C. 361
Glasgow Electrical Exhibition .. .. 492, 555
Godfree Telephone: Ill. .. .. .. .. .. .. A. 92
Goepner-Whitter Patent .. .. .. .. .. .. 27
Golden Goose Lease, Moliagul (V.): Fine Specimens Found .. .. .. .. .. 480, 483
Golden Hope Mine, Blakeville (V.), Abandoned 64
Golden Horseshoe Estates Co. Ltd. (W.A.) M. 25
  London Hamburg Gold Recovery v.: Judgment .. .. .. .. .. .. .. .. .. .. 27
  Ore Reserves .. .. .. .. .. .. .. .. 7
Golden Springs Mine, Blayney (N.S.W.) .. C. 485
  J. H. Fawcett's Report .. .. .. .. C. 381
Gold Extracting from Selenite Ores: Niemann's Process .. .. .. .. .. .. .. .. A. 174
Gold: Extraction from Refractory Ores by Volatilisation: Howe Process .. .. .. A. 175
Gold Extraction Process, Gitsham .. .. C. 361
Gold-Ore Sampling: Charles E. Locke .. .. A. 11
Goldsbrough, Mort and Co. .. .. .. .. .. I. 4
Goldschmidt Wireless Patents: Godfrey Isaac's Speech .. .. .. .. .. .. .. .. .. .. 472
  To be Purchased by Marconi Co. .. .. .. 284
Gold Stealer (Suspected) Fined at Boulder (W.A.) Police Court .. .. .. .. .. .. 288
Gold Stealing at Bendigo (V.): Trial of Miners .. .. .. .. .. .. .. .. .. 69, 288
Gold Stealing at Daylesford (V.): Trial of Miners .. .. .. .. .. .. .. .. .. .. 184
Gold Stealing at Gaffney's Creek Mines (V.): Miners Sentenced .. .. .. .. .. .. .. 483
Gold Stealing at Jamieson (V.): Miners Arrested .. .. .. .. .. .. .. .. .. .. 401
  Prosecutions .. .. .. .. .. .. .. .. 480
Goodrich Copper Mine (N.S.W.) .. .. .. 565
Government, Functions of .. .. .. .. .. E. 271
Granite Quarries, Harcourt (V.): Notable Blasting Operation .. .. .. .. .. .. .. 229
Gray, J. H.: Opinion on the "Devastating" Dredge .. .. .. .. .. .. .. .. .. .. 383
Great Boulder Pty. G.M. Ltd. (W.A.) .. M. 125
Great Britain Sluicing Co. Ltd. .. .. .. C. 548
Great Britain: see also United Kingdom.
Great Carpentaria Mine (N.T.): Grant to Company .. .. .. .. .. .. .. .. .. .. 100
Great Cobar Ltd. (N.S.W.): Manner of Working Condemned .. .. .. .. C. 504, C. 548
  W. Pellew-Harvey's Report .. .. .. C. 548
  Revenue .. .. .. .. .. .. .. .. .. 161
Great Extended Hustler's (V.) .. .. I. 24, 531
Great Fitzroy Mines Ltd. (Q.) .. M. 147, R. 148, I. 319
Great Langi Logan Co., Ararat (V.) I. 502, C. 527
Great Southern Gold Mining Co., Rutherglen (V.) .. .. .. .. .. .. .. .. .. .. C. 361
Great Zeehan Dundas S.L.M. Co. (T.) 10, C. 337 C. 360
Great Zeehan Dundas S.L.M. Co. (T.): Ironstone Formation .. .. .. .. .. .. .. 44
"Greater Melbourne" Bill: Second Reading in Legislative Assembly .. .. .. .. .. .. 281
Greater Melbourne Council, and the Tramway System .. .. .. .. .. .. .. .. .. .. 152
Greater Melbourne Tramway Trust: Conference at Town Hall .. .. .. .. .. .. 133
Greater Sydney Council and North Shore Bridge: Mr. John Sulman's Evidence .. .. 96
Grebin, Dr. James: Oil Prospecting in Papua for Commonwealth Government .. .. .. 204
Green, Charles: "A Theory of Cancer Origin" C. 356
Greenfinch Pty. Co., Westons (W.A.) .. .. C. 360
Griffin, W. Burley: Architecture in U.S.A. .. 216
  Federal Capital Design Alterations .. .. 180
  To Supervise Carrying Out of Federal Capital Plan .. .. .. .. C. 336, C. 356
Grove, Daniel: Lecture on Diamond Fields of Australia .. .. .. .. .. .. .. .. .. 483
Gudgeon, Cyril W.: "Scheelite Mining in N.Z." Ill. .. .. .. .. .. .. .. .. .. .. A. 409
Guinea Gold No Liability, Yodda Valley, Papua .. .. .. .. .. .. .. 169, C. 293
Gwalia Consolidated G.M. Co., Wiluna (W.A.): In Liquidation .. .. .. .. C. 337
Gympie (Q.) Goldfield: Opinions of Government Geologist (Mr. Dunstan) .. .. .. .. 396

Page.

H.

Haber, Prof.: Device for Preventing Explosions in Mines .. .. .. .. .. .. .. .. .. .. 396
Hadfields Ltd., Sheffield .. .. .. .. 575
"Half-Watt" Electric Lamp .. .. .. .. 475
Hamilton, J. B.: Paper on "Urban Passenger Transport" .. .. .. .. .. .. .. .. 391
Hampden Cloncurry Copper Mines Ltd. (Q.) I. 250, I. 402, R. 532, M. 549
Hansel Mundy Case .. .. .. E. 207, L. 234, 294
Harcourt (V.) Granite Quarries: Notable Blasting Operation .. .. .. .. .. .. .. 229
Harden G.M. Co. Ltd. (N.S.W.): Resignation of Directors .. .. .. .. .. .. .. .. C. 402
Hargraves Consolidated G.M. Co. Ltd. (N.S.W.) .. .. .. .. .. .. .. .. .. C. 527
Harper, John (N.S.W. Ry. Commissioner): Evidence on Barraba-Bingara Ry.; also Manilla-Boggabri .. .. .. .. .. .. .. 55
Henty-Billabong Creek (N.S.W.) Railway Authorised .. .. .. .. .. .. .. .. .. .. 307
"Herald" Shares, Fall in .. .. .. .. .. C. 124
Hercules (T.) .. .. .. .. .. .. .. .. .. I. 526
Hercules and Energetic (V.) .. .. .. .. I. 379
Hercules (T.) Ore: Laboratory Tests .. C. 190, C. 209
Hercules-Primrose Amalgamation (T.) .. 10, 236
Hercules-Primrose Mines (T.): Amalgamation with Tasmanian Smelting Co.: Capital Required .. .. .. .. .. .. .. .. .. .. C. 465
Herman, Hyman, Director of Geological Survey: Report on Cassilis Gold Mine (V.) .. 214
  Report on Maryborough Goldfield (Q.) .. IX.
  "Some Phases of Mining in Victoria" .. 69
Heydon, Mr. Justice: Remarks on Wilful Miners .. .. .. .. .. .. .. .. .. .. IX.
Higgin, Alfred J.: Thermit Welding: Illustrated .. .. .. .. .. .. .. .. A. 218, A. 259
Higgins, Mr. Justice: Awards of Federal Arbitration Court .. .. .. .. .. .. .. C. 228
  Judgment in Case Federated Gas Employees' Union v. Metropolitan Gas Co. and Others .. .. .. .. .. .. .. .. .. 248
  "Peace, Industrial Peace" .. .. .. .. E. 377
Highways: C. H. Cooper's Paper .. .. .. .. 472
High Court's Powers .. .. .. .. .. .. .. E. 355
Hillgrove District (N.S.W.): Southern Part to be Inspected .. .. .. .. .. .. .. .. 357
Hobart, H. M.: Paper on Long Distance Electric Railways .. .. .. .. .. .. .. .. 517
Hodgkinson Goldfields (Q.) .. .. .. .. A. 572
Hopkinson, Dr. E.: Influence of Electrical on Mechanical Engineering .. .. .. .. .. 473
Horn (Escha-Roland) for Motor Vehicles: Siemens and Halske's Design .. .. .. .. 540
Horse-shoes, Machine-made .. .. .. .. .. 100
Houses, Monolite: S. B. Marchant's Invention 516
Housing Question (for Working Classes) in Sydney: Prof. Irvine's Report .. .. .. C. 188
Howe, Ben: "Gold Recovery by Volatilisation" A. 175
How Not to Set Examination Papers .. E. 523, C. 545
Huddart, Parker Ltd. .. .. .. .. .. .. I. 250
Humble, W.: Report on Mine Rescue Stations in Europe .. .. .. .. .. .. .. .. .. .. 279
Hunua Falls (N.Z.) Hydro-Electric Lighting Scheme .. .. .. .. .. .. .. .. .. .. 329
Hyde, James M.: Minerals Separation Ltd.: Decision .. .. .. .. .. .. .. .. .. C. 293
Hydro-Electric and Metallurgical Co. (T.): Assembly's Resolution Rejected .. .. .. 388
  Financial Difficulties: Tasmanian Government Approached .. .. .. 237, 260, 306
  Great Lake Scheme .. .. .. .. .. .. .. 496

I.

Iddings, Joseph P.: "Igneous Rocks: Composition, Texture and Classification; Description and Occurrence" .. .. .. .. .. .. .. P. 370
Igneous Rocks: Composition, Texture and Classification, Description and Occurrence. By Joseph P. Iddings. Vol. II. .. .. .. P. 370
Ignoring of Shareholders .. .. .. .. .. E. 103
Illuminating Engineering Society of London: Committee's Reports on Lighting of Schools and Libraries .. .. .. .. .. .. .. .. .. 199
Imperial Wireless Chain, and British Postal Department .. .. .. .. .. .. .. .. .. 73
"Inadvertent Negligence" at Duke Extended Co., Maryborough (V.) .. .. .. .. .. E. 247
Industrial Dishonesty .. .. .. .. .. .. E. 104
Industrial Peace: Mr. Justice Higgins' Ideal E. 377
Industrial Workers: Universal Strike Proposed .. .. .. .. .. .. .. .. .. .. .. C. 80
Insect Extermination, Electric .. .. .. .. .. 38
Institute of Inventors of New South Wales .. 516
Institute of Local Government Engineers of Australasia: Vic. Section: Conference .. .. 387
Inventors of N.S.W.: see Institute.
Iodide (Mineral Hill) Co. (N.S.W.) .. C. 190, R. 204
Iron and Steel Works, Broken Hill Pty. Co.'s, Newcastle (N.S.W.) .. .. .. .. .. .. R. 177
Ironbark (V.) Co. .. .. .. .. .. .. .. .. I. 210
Iron Phosphates at Whitfield (V.) .. .. .. .. 466
Ironstone Formation on Great Zeehan Dundas Silver-Lead Mine (T.) .. .. .. .. .. .. 44

Page.

Ironworkers' Union (V,) Preference to Victorians: Deputation .. .. .. .. .. .. .. 63
Irrigation, Electrical Power Applied to: see Electrical.
Irvine, Prof. R. F.: Report on Housing Question in Sydney .. .. .. .. .. .. .. C. 188
Irvine, W. H., and the Marconi Company. Solicitors' Explanation .. .. .. .. .. L. 217
Isaacs, Godfrey, and the Goldschmidt Patents 472
Isaacs, Sir Rufus: Appointed Lord Chief Justice of United Kingdom .. .. .. .. .. E. 335
  As Probable Successor to the Lord Chief Justice .. .. .. .. .. .. .. .. .. C. 145
Ivanhoe Gold Corporation Ltd. (W.A.) .. C. 485
Ivanhoe Gold Corporation Ltd., Kalgoorlie (W.A.): Ore Reserves .. .. .. .. .. C. 360

J.

Jack, Dr. R. Logan: Report on Carpathia Tin Mining Co., Ardlethan (N.S.W.) .. .. .. C. 274
Jaquet, J. B. (A.R.S.M., N.S.W. Chief Inspector of Mines): Report on Conapaira Tin Field .. .. .. .. .. .. .. .. .. C. 381, 386
  Report on Fire Fly Field (N.S.W.) C. 504, 511
Japan, Aims of .. .. .. .. .. .. .. .. .. E. 62
Japanese Coal for U.S. Navy .. .. .. .. .. 105
Jensen, Dr. H. I.: Report on N. Territory Mineral Fields .. .. .. .. .. .. .. .. .. 395
  Report on Perwick Creek Tinfield (N.T.) 501
Johnson (W.A. Minister for Works) and the Contract System .. .. .. .. .. .. .. C. 144
Johnson's Reef (V.) .. .. .. .. .. .. .. .. 553
Jones, H.: Report on Blinman Copper and Diamond Jubilee Mines (S.A.) .. .. .. .. 550
Jones, S. N.: Process for Gold Extraction .. 229
Julius, G. A.: Report on Fitzroy Dock (Sydney) .. .. .. .. .. .. .. .. .. C. 144, 153
Jullian: Electrification of Chemin de Fer du Midi .. .. .. .. .. .. .. .. .. .. .. A. 33
Jumbunna (V.) Coal Mine, N.L. .. .. .. R. 311
Junction North Broken Hill Co. (N.S.W.) .. I. 43, M. 533
  Broken Hill Junction Co. v.: Settlement 501
  Requisition by Shareholders .. .. .. .. 42
  Special Meeting .. .. .. .. .. .. .. .. 131

K.

Kalgoorlie (W.A.) Electric Supply: Charge to Picture Shows .. .. .. .. .. .. .. .. .. 216
Kalgoorlie (W.A.) Electric Tramways Ltd.: Business Depressed .. .. .. .. .. .. .. 218
Kalgoorlie Field: Dr. Malcolm Maclaren's Geological Report .. .. .. .. .. .. .. .. 230
Kalgoorlie-Fremantle: see Fremantle-Kalgoorlie.
Kalgoorlie-Port Augusta Railway: see also Trans-Continental Railway.
Kampong Kamunting Tin Dredging Co. Ltd. 105, R. 483
  Two Large Bucket Dredges to be Erected 358
Kavanagh, E. J., M.L.C.: Speech at Melbourne Trades Hall, "Creation of a Trades Unions' Grand Council" .. .. .. .. .. .. .. .. C. 248
Kermode, George: Appointment to Municipal Surveyors' Board (V.) .. .. .. .. .. .. 64
Kew (V.) Council: Offer to Purchase Victoria Street Bridge—Kew Horse Tramway .. .. 176
Kick's Law: Rock Crushing Tests .. .. .. .. 44
Kieselguhr .. .. .. .. .. .. .. .. .. .. E. 315
Killing Private Enterprise .. .. .. .. .. E. 21
Kils (Congo) Mines .. .. .. .. .. .. .. .. 386
King Poseidon G.M. Co., Tarnagulla (V.): Request for Government Grant .. .. .. .. 184
Kitchen (J.) and Sons Ltd. .. .. .. .. .. I. 402
Kitchen, Electrically Equipped: At Old Ship Hotel, Brighton (Eng.) .. .. .. .. .. .. 535
Knibbs, G. H.: Government Statistician: Official Year Book .. .. .. .. .. .. P. 197
Knox, William: Obituary .. .. .. .. .. .. 166
  Burial of Remains at Kew (V.) .. .. .. 380
Kulamadu (Woodlark Island) G.M. Co. .. R. 100
Kuranui-Caledonian Ltd. (N.Z.): Proposal for Reconstruction .. .. .. .. .. .. .. .. 255
Kynoch Ltd.: Relations with Employees .. C. 164, 183, R. 186

L.

Laage, Herman: To Advise on Schmatolla Process .. .. .. .. .. .. .. .. .. .. .. 284
Labour Disputes: see also Labour Troubles.
Labour Troubles—
  Bendigo Gold Field .. .. .. .. C. 2, C. 22
  Bendigo (V.) Miners .. .. .. .. .. 47, 112
  Cloncurry (Q.) Mines .. .. .. .. .. .. 47
  Pelaw Main Colliery, Maitland (N.S.W.) 130
  Preservation of Order .. .. .. .. .. C. 463
  Seaham Colliery, Newcastle (N.S.W.) .. 28
  Stanford Merthyr (N.S.W.) .. .. .. .. 28
  Sunshine (V.) Agricultural Implement Works .. .. .. .. .. .. .. .. .. .. E. 79
  White Hills, Bendigo (V.) .. .. .. .. .. 47
Labour Troubles: see also Strikes.
Lacmalac G.M. Co. N.L., Tumut (N.S.W.): Formed .. .. .. .. .. .. .. .. .. .. C. 274
Lacmalac Mine, Tumut (N.S.W.): Re-Opening .. .. .. .. .. .. .. .. .. .. .. C. 548
Lake View and Star Co., Kalgoorlie (W.A.) C. 381
Lambton B. Pit, Newcastle (N.S.W.): Strike 28
Lamps, Carbon Filament .. .. .. .. .. .. 535

Page.
**Lamps (Electric), for Miners: Wm. Maurice's** Lecture .. 24
Lancefield G.M. Co. (W.A.) .. C. 317, 357, C. 402
Lang Logan Central Co., Ararat (V.) .. C. 504
Lang Logan South (V.) . I. 379
**Last Chance United Co. (V.): Grant** .. .. .. 3
Latour, E. A. de: Report on Queenslander Mine, Etheridge Gold Field (Q.) .. C. 401, 483, C. 485
Launceston (T.) City Council: Bill to Amend Tramway Act Submitted . 307
Launceston (T.) Electric Undertakings: Report for 1912-13 .. 515
**Law, Robertson: Report on British Australian** Oil Co. .. . 29
Lawrie's Find, Tanami (N.T.): Lionel Robinson and Co.'s Inspection C. 360
Lead: see Fire Fly Mine.
Lebrina Gold Mines (T.) C. 504
Lefroy Leads Mining Co. (T.): Formed 545
Leipzig Telephone Exchange: Sub-Exchanges on Semi-Automatic System . 60
Lighting of Schools and Libraries: Illuminating Engineering Society of London: Reports 199
Lime Burning: Schiantella Process 284
Linking Sydney with North Sydney: by J. J. C. Bradfield: Supplement .. A. 411
Liquid Air for Blasting .. XVI.
Llanberis No. 1 (V.) . I. 146
**Local Government Engineers: see Institute of.**
Locke, Charles E.: Gold Ore Sampling A. 11
Lock-Outs and Strikes: New Zealand Government's Proposals for Abolition C. 228, C. 524
Locomotive Turbo-Electric: Illustrated 283
Lode Hill Co., Cooktown (Q.) . I. 126
London and South-Western Railway Co.: Scheme for Electrification of Suburban Lines . 555
London—
  **Aron Electricity Meter Ltd.** .. .. .. **R. 91**
  Board of Trade Regulations: Overhead Wires .. . 13
  London City Corporation: City Engineer's Annual Report 218
  London County Council: Motor 'Buses and Tramways .. .. .. .. .. .. .. .. .. 91
  Motormen and Conductors: Absence through Illness . C. 123
  Electric Lighting Amalgamation 516
  London Electric Wire Co.: British Insulated and Helsby Cables Ltd. v. .. 116
  London Hamburg Gold Recovery Co. Ltd. v. Golden Horseshoe Estates Ltd.: Judgment 27
  Imperial College of Science and Technology .. .. .. .. .. .. .. .. .. .. X.
  Lighting of Schools and Libraries: Reports 199
  Marconi Committee: Work Finished 115
  Motor Omnibus Competition with Tramways 71
  Motor Traffic, Select Committee on: Report IX.
  Municipal Electrical Conference 31, 54, 94
  Port of London Authority's Dock Improvement Schemes 178
  Post Office Electric Railway (East to West) Authorised 71, 283
  Post Office Electric Railway: Electric Carriers 473
  Post Office Telephone and Telegraph Society Opening 514
  Street Lighting: City Engineer's Annual Report .. .. .. .. .. .. .. .. .. .. 218
  Telephone Service Unsatisfactory: Deputation to P.M.G. by London Chamber of Commerce 134
Long Distance Electric Railways: H. M. Hobart's Paper 517
Long Tunnel G.M. Co. N.L., Walhalla (V.) C. 503
Lord Roberts G.M. Co. N.L., Daylesford (V.) C. 293
Loring, W. J.: Mining in Australia .. 3
**Ludowici and Son Ltd., Sydney** .. .. .. .. **R. 137**

M.

McCarty, F. A.: Report on Prince's Bridge-Middle Park (V.) Electric Tramway 176
McDonald's Reef Co., German Gully, Fryerstown (V.) 27
McGill University: Rock Crushing Tests 44
**MacGregor: Smoke-destroying Process** .. .. C. 42
**Machinery, Alignment of: Wm. Sinclair** (illustrated) A. 53, A. 72, A. 93
Maclaren, Dr. Malcolm: Geological Report on Kalgoorlie Field 230
Madame Berry, Kingston (V.) I. 547
Maitland, Gibb: Report on West Aust. Oil 504
Malaya Tin Corporation 546
Malay Tin Syndicate of Sydney C. 402
Malay States—
  Rubber Cultivation: J. E. Pratten on 11
  Tin Dredging 105
  Tin Mining: J. E. Pratten on 11
Maltese Miners: Departure from Mount Lyell M. and R. Co.'s Mine C. 190
Manchester Corporation: Generating Stations to be Supplemented 452
  Tramways .. .. .. .. .. .. .. .. R. 34
Mangere-Onehunga (N.Z.) Bridge 96
  George Nicols' Tender Accepted 262

Page.
Manilla-Boggabri (N.S.W.) **Railway: Mr. John** Harper's Evidence .. .. .. .. .. .. .. .. .. .. 55
Manukau Harbour (N.Z.): Bridge Connecting Onehunga with Mangere .. .. .. .. 96, 262
Maori Queen Pty. Gold Dredging Co., Bright (V.) .. .. .. .. .. .. .. .. .. .. .. .. .. C. 360
Maranboy Tinfield (N.T.) .. .. .. .. .. C. 527
  Government Battery to be Erected .. .. C. 465
Marchant, Prof. E. W.: Address on "The Vocation of the Electrical Engineer" .. .. .. 535
Marchant, S. B.: Monolite Houses .. .. .. 516
Marconi Co.: Concession from Brazilian Government .. .. .. .. .. 265
  Enquiry Committee's Action .. .. .. C. 42
  **Mr. W. H. Irvine, K.C.: Solicitor's Explanation** .. .. .. .. .. .. .. .. L. 217
Marconi Scandal: Suspension of Members by London Stock Exchange .. .. .. C. 400, 480
Marconi Wireless Telegraph Co. Ltd.: **Increase of Capital to Purchase Goldschmidt Wireless Patents** .. .. .. .. .. .. .. .. .. .. **284, 472**
Marconi Wireless Telegraph Companies: Reports for 1912 .. .. .. .. 239
Marshall Shoe Ltd. .. .. .. .. I. 295
**Martel, L.: Steel-pointed Drills** .. .. .. .. **34**
Marvel Loch Co.'s Comet Lease .. .. .. C. 567
**Maryborough Goldfield (Q.): Geological Survey**: Mr. Hyman Herman's Report .. .. IX.
**Maryborough (V.) Railway Workshops Extension** .. .. .. .. .. .. .. 73
**Marylebone (London) Municipal Electrical** Undertaking .. .. .. .. .. .. R. 116
**Maryvale-Mt. Edwards (Q.) Railway: (Via** Recta) .. .. .. .. .. .. .. C. 462
Maurice, Wm.: Miner's Electric Lamps .. 24
**Maycock, W. Merren: Electric Circuit Theory** and Calculations .. .. .. P. 512
**Mead, Elwood: Californian University Professorship** .. .. .. .. 190
Mechanical Engineering, Influence of Electrical **Engineering on: Dr. E. Hopkinson's Speech** .. **473**
**Mechanics (Electrical) Wanted: For Postmas**ter-General's Department .. .. 237, C. 462
**"Megger" and "Omega": London Chancery** Court Case .. .. .. .. .. 473
**Melbourne: "Australian Evening Mirror," New** Newspaper .. C. 124, 249
Melbourne City Council—
  Electric Light Committee .. .. C. 22
  **Contract with State Coal Mine Expired** .. **326**
  **Electric Light Cable: Siemens Bros.' Ten**der to be Accepted .. .. 326
  Electric Supply Committee 136
  **Electric Supply Undertaking** .. .. .. .. **387**
  Penny Sections: Refusal of Motor 'Bus Co.'s Application .. .. .. C. 400
  Trouble: Report of City Electrical Engineer E. 207, 223
  **Street Watering** .. .. .. .. .. .. **C. 2, 33**
  Swanston and Flinders-streets' Subway C. 208
**Melbourne Electric Supply: City Council and Municipalities: Electrical Engineer's Report 186**
**Melbourne Electric Supply Co.—**
  Agreement with Camberwell (V.) Town Council .. .. .. .. .. .. .. .. .. .. .. 63
  **Enlargement of Plant** .. .. .. .. .. .. .. **74**
**Melbourne Gas Supply, see Metropolitan.**
Melbourne Motor-bus Co. .. .. .. .. .. .. C. 42
Melbourne Motor 'Buses and Tramways .. 91
Melbourne Observatory: **Necessity for Removal from City** .. .. .. .. .. .. .. .. 240
Melbourne Public Library .. .. E. 462
Melbourne, Smallpox in .. .. E. 61
Melbourne Stock Exchange Co. .. C. 378
**Melbourne Stock Exchange: Refusal of Official** Quotation .. .. .. 480
Melbourne Suburban Railways—
  **Electrification Scheme** .. .. .. .. .. **346, 375**
  Power Plant for Electrification Scheme: Siemens Bros.' Tender Accepted .. . 451
  **Power Station for Electrification Scheme C. 164, 177, 199, 328, 346, 392**
Melbourne, Sydney **and** Adelaide Stock Exchanges: Revised Scale of Brokerage **Charges** .. .. .. .. .. .. **C. 164, 172, C. 273**
Melbourne Trades Hall—
  **Speech by E. J. Kavanagh, M.L.C.,** "Creation of a **Trades** Unions' Grand **Council"** .. .. .. .. .. .. .. .. .. **C. 248**
  **Speech by R. S. Ross, "One Big Union** Practicable" .. .. C. 248
Melbourne Tramway and Omnibus Co. I. 82
  **Inefficiency of** .. .. .. .. .. .. .. .. **C. 42**
  Motor 'Bus Proposal .. .. R. 154
  **Offer from Kew Council to Purchase Vic**toria-street Bridge—Kew Horse Tramway .. .. .. 176
  Year's Receipts .. .. .. .. .. 115
**Melbourne Tramway and Railway Systems:** Sunday Time Tables to be Improved C. 164
**Melbourne: Tramway Extension Demanded** .. **70**
**Melbourne Tramways .. 216, 257, 327, 471, 490, 516, 534**
  Burke-road via White **Horse-road** to **Union-road** .. .. .. .. .. .. .. .. .. .. 327
  Competition and Threatened **Spoliation** .. 304
  **Increase of Service and of Traffic** .. .. 176
  **Motor 'Bus Competition** .. .. .. .. .. .. 451
**Melbourne Tramway Services** .. .. .. .. .. .. **115**

Page.
Melbourne Tramway Trust and Motor Omnibus Competition .. .. .. .. .. .. .. .. C. 81
  Issue with Melbourne Tramway and Omnibus Co. .. .. .. .. .. .. .. .. .. 198
Melbourne University Council: "Appointment Board" Scheme .. .. .. .. .. .. C. 104
Melbourne University: **Examiners' Methods E. 523, C. 545**
  Proposed Chair of Architecture .. 217, 261
**Melbourne Water Supply: Profits for 1912-13 136**
Meriba—Paringa (S.A.) Railway: Completed 307
Merz, C. H.: Melbourne Suburban Electrification Scheme: Position of Power Station C. 164, 177, 199
**Mesothorium, Demand for** .. .. .. .. .. .. **311**
Messageries Maritimes: Cold Storage Suggested .. .. .. .. .. .. .. .. .. .. .. .. .. 23
Meteoric Iron (Large), Discovered at Delegate (N.S.W.) .. .. .. .. .. .. .. .. .. .. 160
**Meters, Tapping Electric** .. .. .. .. .. .. .. **133**
Metropolitan Board of Works Debentures (V.) .. .. .. .. .. .. .. .. .. .. .. I. 275
Metropolitan Gas Co., Melbourne—
  **Federated Gas Employees' Union v.: Mr. Justice Higgins' Judgment** .. .. .. 248
  Government Bill .. .. .. .. .. .. 219
Metropolitan Municipal Tramways Trust Bill (Melbourne): Proposed Amendments .. .. 257
**Meudell, George D., F.J.I., F.R.C.I., F.R.G.S.:** Pamphlet on "Petroleum Exists in Australia" .. .. .. .. .. .. .. .. .. C. 249
Meudell, W. Grant: Obituary .. .. .. .. 380
**Mexican Eagle Oil Co.: Contract with British** Admiralty .. .. .. .. .. .. .. 69, C. 209
**Middle Park—Prince's Bridge Electric Tram**way (V.) .. .. .. .. .. .. .. .. .. 73, 216
  F. A. McCarty's Report .. .. .. .. .. 176
**Mildura (Vic.) Shire Council Electrical Com**mittee .. .. .. .. .. .. .. .. .. .. 14
**Milk: Sterilising by Electricity: Dr. Beattie's** Method .. .. .. .. .. .. .. .. .. .. .. 170
Millen, Senator, on Fitzroy Dock (Sydney) Imbroglio .. .. .. .. .. .. .. .. .. 153
**Milne, John, F.R.S., F.G.S., Mining Engineer and Seismologist: Death** .. .. .. .. .. 105
Mine Manager's Association (V.) .. .. .. 511
Mine Surveying: by Edward B. Durham .. P. 566
Mineralogy: An Introduction to the Theoretical and Practical Study of Metals: Alex. Hamilton Phillips, D.Sc. .. .. .. .. .. P. 88
**Minerals Outputs, 1912** .. .. .. .. .. .. **E. 227**
Minerals Separation Process: Patent Rights Vindicated .. .. .. .. .. .. .. .. .. .. 226
  Tests at Mt. Lyell Mining and Railway Co. (T.) .. .. .. .. .. .. .. .. .. .. 161
**Minerals Separation Ltd. v. James M. Hyde:** Decision .. .. .. .. .. .. .. .. .. .. C. 293
Miners' Association, see also **Amalgamated Miners' Association.**
Miners' Phthisis: Conference arranged between Victorian Ministers and Labour Party .. 142
  Conference of Victorian Ministerialists and Labourites .. .. .. .. .. .. .. .. 160
  **Evils of: Rand Mines, South Africa** .. **183**
**Mining Reform and Millions: C. E. Walker E. 143**
**Mining Shafts (Abandoned): Eaglehawk Deputation to Minister** .. .. .. .. .. .. .. **204**
Mining World Index of Current Literature, **Vol. III.: by Geo. E. Sisley** .. .. .. .. **P. 513**
**"Mirror (The) Ltd.": Melbourne Evening Newspaper Co.: Prospectus** .. .. .. .. .. **249**
Mississippi Power Scheme .. .. .. .. .. .. 370
**Mitchell, John: Principal of Newcastle (N.S.W.) Technical College and School of** Mines: Retirement .. .. .. .. .. .. .. .. 546
**Moama—Deniliquin Railway Act, 1873: Bill Passed to Amend in N.S.W. Legislative Assembly** .. .. .. .. .. .. .. .. .. .. .. **C. 316**
Moama—Deniliquin Railway Co. (N.S.W.): **Traffic Receipts for Half-year** .. .. .. .. **183**
Moama—Echuca Railway: Bill Passed in N.S.W. Legislative Assembly .. .. .. .. C. 316
Moama—Moulamein Railway (N.S.W.) .. .. 199
  Bill Passed in N.S.W. Legislative Assembly .. .. .. .. .. .. .. .. .. .. .. C. 316
Modern Pumping and Hydraulic Machinery: Edward Butler, M.I. Mech. E. .. .. .. .. P. 88
**Molybdenite: Discovered near Bega (N.S.W.) 265**
**Molybdenite Ores: Experiments in Concentra**tion .. .. .. .. .. .. .. .. .. .. .. .. C. 465
Molybdenum, Uses and Prices .. .. .. .. A. 570
**Monolite Houses:** S. B. **Marchant's** Invention 516
Montgomery, James: Rich Gold Specimens Found at Golden Goose Lease, Moliagul (V.) .. .. .. .. .. .. .. .. .. .. .. .. **480, 483**
Moonta (S.A.) and Wallaroo Mining and Smelting Co. .. .. .. .. .. .. .. M. 232
**Moore, A. Capper, President of Chamber of** Mines (V.) .. .. .. .. .. .. .. .. .. .. 145
**Morgan, H. E.: The Dignity of Business** .. C. 104
Morris, Prof. J. T. (M.I.E.E.): Paper on **Domestic Electric Cooking and Heating:** Result of One Year's Working .. .. 347, 370
Mort's Dock and Engineering Co. Ltd. .. .. R. 137
**Motor 'Bus v. Tramways: Councillor Russell's** English Impressions .. .. .. .. .. 329
Motor Omnibuses in London: Competition with Tramways .. .. .. .. .. .. .. 71
**Motor Omnibuses in Melbourne: Competition with Tramways** .. .. .. .. .. .. .. 91

Page.
Motor Traction .. A. 389
Motor Vehicles, Petrol Electric: Damoiseau A. 14
Moulamein—Moama Railway .. 199
  Bill Passed in N.S.W. Legislative Assembly .. C. 316
Mount Balfour Copper Co. (T.) 145, C. 548, C. 568
Mount Bischoff Extended T.M. Co., Waratah (T.) .. C. 485
Mount Bischoff Mine (T.): Dividends Compared .. C. 336
Mount Bischoff Tin Mining Co. (T.) .. R. 149, M. 167, 189
Mount Bonnie Mining Co. (N.T.) 401, R. 485, 565
Mount Boppy Block 51, N.L. (N.S.W.) .. 23
Mount Carrington Copper Mine, Drake (N.S.W.): Mr. Powell's Report .. I. 24
Mount Cuthbert (Q.) .. I. 65, I. 189, C. 527
Mount Edwards Maryvale (Q.) Railway: Via Reeta .. C. 462
Mount Elliott Ltd. (Q.) .. C. 317, R. 501
Mt. Gordon Copper Mine (Q.) .. 23
Mount Hope Copper Mine (N.S.W.): Renewed Activity .. C. 274
Mount Jasper (T.) .. I. 210, 224
Mt. Kembla Coal and Oil Co. (N.S.W.): Properties to be Purchased by Mt. Kembla Collieries Ltd. .. 105
Mt. Kembla Collieries Ltd.: Registered (N.S.W.) .. 105
Mount Kembla (N.S.W.) Colliery: Coal-cutting Machines: New Development .. 386
Mt. Lyell Blocks (T.) .. I. 502
Mt. Lyell Co. (T.) .. R. 512
Mount Lyell Co.'s Mines (T.): Strike .. 278
Mount Lyell M. and R. Co. Ltd. .. M. 507
  Departure of Maltese Miners .. C. 190
  Disaster: Govt. Mining Engineer's Report 49
  Proposed Amalgamation with Wallaroo (S.A.) Phosphate Co. .. 396
  Treatment of Low-grade Copper Ores: Tests .. 161
Mt. Lyell (T.) Ore Deposition: by Hartwell Conder .. A. 386
Mt. Major (V.) Barytes: W. H. Ferguson's Report .. 508
Mt. Morgan G.M. Co. Ltd. .. M. 83
Mount Murphy Wolfram Mining Co., Benambra (V.): First Meeting .. 311
Mt. Oxide Mines Ltd. (Q.): Transfer to London Co. of same name .. C. 465
Mt. Oxide (Q.) Options: Agreement by English Company .. 142
Mt. Oxide Mine (Q.): Registration .. 209
Mt. Oxide Mine (Q.): Shareholders Ignored E. 103
Mount Ross Diamond Mine (N.S.W.) .. C. 274
Mountain Building: Prof. Jas. Park .. A. 88
Murray, Cosmo: Report on New Gold Amalgamating Machine .. 357
Murray River and South Australia .. 326
Myers, W. H.: Wind Power: Application for Generation of Electrical Energy .. A. 390, A. 448

N.

Nangle, James: Appointed Superintendent of Technical Education (N.S.W.) .. B. 403
  Remarks on Technical Education .. 449
Narrabri (N.S.W): Wireless Station Erected by H. A. Warden .. 452
National Bank of Australasia .. R. 357
Naval Depot, Garden Island, Sydney: Transfer to Commonwealth .. 55
Neon Tubes, Luminescent: Claude .. A. 33
Neil, Chas.: Railroad Disasters in U.S.A. Due to Employees' Mistakes .. C. 272
Neuburger, Henry: Opinions on Geology of Petroleum .. XII.
Newcastle (N.S.W.) Coal: To be Tested for Production of Motor Oils .. 365
Newcastle (N.S.W.)—
  Floating Dock: Public Works Committee's Report .. 142
  Technical College and School of Mines .. 546
New Chum Consolidated (V.) .. I. 189
New Gold Amalgamating Machine: Cosmo Murray's Report .. 357
  Successful Run .. 160
New Imperial Co., Buninyong (V.): Mine Plant Sold .. 42
New Langi Logan (V.) .. I. 231, I. 464, C. 503, C. 527
New Mariners' Mine, Steiglitz (V.) .. 466
Newman, J. Malcolm: Broken Hill Treatment Methods .. A. 51
Newnes (N.S.W.), Decline of .. IX.
Newport (V.) Workshops: Dust Exhauster .. 199
New Salak South Tin Dredging Co., Malaga .. 560
New South Wales Arbitration Commission:
  Scheme for Strike Insurance .. 99
  Arbitration: Dr. Robertson's Views .. 65
  Border Railways Bill Rejected .. 392
  Coal Industry: Probable Adverse Effect of Increased Use of Oil Fuel on Big Liners .. C. 336
  Coal Mines Regulation Act, 1912: Electricians' Examination .. 116

Page.
New South Wales—
  Coal Mines Regulation (Amending) Bill 1913: Proposed Amendment of 1912 Act .. 173
  Colliery Employees' Federation (Northern District): Protest Against Employment of Russians .. 28
  Industrial Laws Commission: Discrepancies in Rates of Pay .. 137
  Leases and Titles During Half Year .. 23
  Metalliferous Mining Board .. 30
  Mineral Returns for First Half Year of 1913 .. 148
  Mines Department Report on Russians as Miners .. 28
  Mining Act Amendment Bill .. 145, E. 163
  Oil Companies .. 64
  Oil Shale Companies' Business Losses C. 249
  State Cement Works: Choice of Site .. 262
  State Coal Mine Projected .. 23
  State Electric Supply .. 326
  Technical Education: Proposed Re-organisation .. C. 524
  Wages Board (Brick and Pipe Makers): Attitude of Brick Makers' Association C. 62
New South Wales Commission on Arbitration: A. B. Piddington's Report .. E. 461
New South Wales Engine Drivers' Examinations 54
New South Wales Government: C. G. Wade's Censure Motion Rejected .. C. 188
  Roads Bill: Deputation to Minister .. 137
  Smith, Timms and Co. Claim Compensation .. 136, 142
New South Wales Labour Council: Attitude Towards "Cost of Living Inquiry .. C. 316
  Requests for Aid from Victorian Unions 248
New South Wales Legislative Council: Decentralisation Scheme: Sir Allen Taylor's Motion .. C. 247
  Fair Rents Bill Rejected .. C. 292
  Sydney City Railway Bill Rejected .. 346
New South Wales Public Works Dept.—
  Agreement with Norton, Griffiths and Co. 176, 239
  Annual Report .. IX.
  Big Undertakings .. 203
New South Wales Railway Construction (Delegated) .. E. 1
New South Wales Railways: Annual Report .. IX.
  Appeal by Chief Commissioner Against Award of No. 4 Board: Mr. Justice Heydon's Arguments .. 281
  Award: Employees of the Service .. 73
  Construction Loan Bill .. C. 208, 220, 257
  Development Since 1901-2 .. 347
  Division of Line Between Picton and Mittagong: James Fraser's Report .. 284
  Earnings .. C. 248
  Eighty English Locomotives Ordered .. 34
  Importation of Engines .. 15
  North Coast Railway: Estimated Cost of Sections .. 239
  Progress During Six Years .. 94, 237
  Roslyn to Taralga .. 15
  Sydney to Sydenham: Delay in Quadrupling Line .. C. 124
  Taralga .. 15
New South Wales: Railways to be Constructed .. 203
New South Wales Railways and Tramways: Chief Commissioner's Report for 1912-13 177 13 .. 177
New South Wales Tramways .. R 94
  Deficit .. C. 500
  Development Since 1901-2 .. 347
New South Wales Water and Sewerage Board R. 55
  Twenty-five Years' Review .. C. 400
New York (U.S.A.): Steel, Circular Courthouse 96
New Zealand—
  Automatic Telephone Exchanges .. 60
  Automatic Telephones: Western Electric Co.'s Tender Accepted .. 95
  Black Sand Beaches: G. W. Eaton Turner .. A. 9
  Hydro-Electric Scheme at Wairoa Falls .. 92
  Labour Unity Congress Grab for Power .. C. 80
  Mines Department: Annual Report .. 278, 322
  Mining Act Amendment Bill .. 576
  Mining in 1912 .. E. 481
  Mining Industry: Ministerial Statement .. 171
  Oil Field Near Rotorua .. 23
  Oil Wells .. 114
  Public Works Expenditure .. 517
  Re-afforestation .. 266
  Re-afforestation: Royal Commission .. 74
  Road Making Expenditure for 1912-13 .. 307
  Royal Commissions: 1902-1912 (inclusive) 269
  Scheelite Mining: By Cyril W. Gudgeon. Ill. .. A. 409
  Telegraph Extensions: Expenditure in 1912-13 .. 183
  Wireless System Complete .. 261
New Zealand Government—
  Arbitration Act Amendment Bill .. C. 228
  Proposals for Abolition of Strikes and Lockouts .. C. 228, C. 524
  Parapara Iron Ore Deposits: Proposed Purchase from Ethelburga Syndicate C. 336

Page.
  Submarine Cables: Repairs Needed .. 96
  Vote Towards Mining Interests .. 183
New Zealand Government Coal Mine at Mt. David to be Developed .. 120
New Zealand Green Stone: Huge Block of .. 43
New Zealand Oil Fields Ltd.: Order for Winding Up .. 114
  Profits of Promoters .. 256
New Zealand Parliament Members' Salaries: Penalties for Absence without Leave .. C. 336
New Zealand Railways: Minister's Annual Statement .. 287
New Zealand State Colliery (Seddonville): Miners' Union: Refusal to Join Federation of Labour .. 165
New Zealand, Strikes in: Annual Report of Secretary for Labour .. 256
New Zealand Sulphur Co., White Island (N.Z.) 565
Nicaragua: Insecurity of Investments .. C. 548
Niccol, George: Tender Accepted by New Zealand Government for Manukau Harbour Bridge .. 262
Niemann, J. H.: Treatment of Selenite Gold Ores .. A. 174, 300
Nimitybelle-Bombala (N.S.W.) Railway: Deputation .. 71, 73
Niven, J. J.: Obituary .. 190
Nobel's Explosives Co. Ltd.: Use in Agriculture .. 258
Non-Union Question: Federated Mining Employees' and Bendigo (V.) Mine Owners' Associations: Conference .. C. 228
Non-Unionists, Employment of: Bendigo Miners' Protest .. 47, C. 316
Non-Unionist Strike (V.): Meetings .. 276
North Australian Exploration Ltd. .. 483
Northcote, Fitzroy and Preston: Proposed Electric Tramway .. 176
North Illawarra (N.S.W.): Electric Lighting Scheme .. 451
North Mt. Farrell Co. (T.) .. 469
North Mt. Lyell Mine (T.): Carelessness of Employees: Strike .. C. 273, 278
North Mt. Lyell Mine (T.). See also Mt. Lyell M. and R. Co.
North Nuggety Ajax (V.) .. I. 275, C. 567
  Gold Stealers Arrested and Fined .. 184
North Nuggety Ajax (V.): Ajax Central Dispute Against, Settled .. 51
North Shore Bridge and the Greater Sydney Council: Mr. John Sulman's Evidence .. 96
North Shore Bridge (Sydney) and Norton Griffiths Co. .. 282
North Shore Bridge, Sydney: J. J. C. Bradfield's Scheme Recommended by Parliamentary Standing Committee .. 183
North Shore Bridge, Sydney: Premier's Announcement .. 368
North Tambi Tin Mines N.L., Perak (F.M.S.) .. C. 360
Northern Territory Development .. C. 564
  Government Battery on Maranboy Tin Field .. C. 465
  Lawrie's Find, Tanami: Lionel Robinson and Co.'s Inspection .. C. 360
  Mineral Fields: Dr. H. I. Jensen's Report .. 385
  Mineral Returns for 1912 .. 114
  Oil-bearing Leases: Worthless Options: Report .. 114
  Tin Discovered at Beswick Creek .. 224
  Tin Mining .. XII., 501
Northern Territory Railways .. 534, 574
Northern Territory Railways Commission: Inspection of Country .. 138
Norton, Griffiths and Co.: Agreement with N.S.W. Works Department .. 176, 239
  Offer to Build North Shore (Sydney) Bridge .. 282
  Offer to West Australian Government to Build Fremantle-Kalgoorlie Broad Gauge Railway .. 329
Nor'-West Prospecting Syndicate (W.A.): Acquisition of Interest in Speakman's Find, Hampton Plains Estate, Coolgardie .. C. 337
Nuggets (Large) Found on "Kitten" Claim, Poseidon Field (V.) .. 273
Nuggety Ajax (V.) .. I. 502
Nuggety G.M. Syndicate, Maldon (V.): Sale of Plant and Machinery .. 165
Nuggety Trafalgar (Q.) .. I. 65

O.

O'Connell, E. v. Chambers .. 47
Official Year Book: See also Commonwealth.
Ohinemuri (N.Z.) Mines' and Batteries' Union: Qualifications for Membership .. C. 124
Oil, Bonus: Claims of Commonwealth Oil Corporation .. 159
Oil Companies in New South Wales .. 64
Oil Fields of Papua: Dr. J. Grebin's Prospecting Work .. 204
  New Discovery at Kerema and Vailala .. 279
  To be Investigated .. 114
Oilfield on Vailala River, Papua: Expert Cabled for .. C. 62
Oil-Electric Ship, "Tynemount" .. 369
Oil Fuel as a Substitute for Coal: Effect on N.S.W. Coal Industry .. C. 336

Page.
Oil Fuel Economiser Ltd., Sydney: Registered 136
Oil Fuel for the Australian Navy 357
Oil Fuel for the British Navy C. 209
  Influence on Coal Mining Industry 69
Oil Fuel on R.M.S. "Niagara" 22
Oil v. Coal: Testing Newcastle Coal 365
Oil in South Australia: Experts at Variance 344
Oil Wells of New Zealand 114
Oil (Well) Industry and the Canadian Government 159
Oil: See also Australian Oil Wells Co.
  See also British Australian.
  See also Commonwealth.
  See also Ecuador.
  See also Mexican Eagle.
  See also Petroleum.
  See also South Australia.
Olary (S.A.): Carnolite Discovered in 1906 483
Old Hauraki Mine (N.Z.): Work to be Temporarily Stopped 171
"Omega" and "Megger": London Chancery Court Case 473
Onehunga—Mangere (N.Z.) Bridge 96
  George Nicol's Tender Accepted 262
One-Man-One-Car Dispute: Ballarat (V.) Electric Tramways 34
Oodnadatta—Pine Creek Railway: See also Trans-Continental Railway.
Oodnadatta—Port Augusta (S.A.): State Control of Railway Line 73
Ore Concentration: Experiments on Molybdenite and Bismuth C. 465
Ore Concentration in America 362
Ore Deposition at Mt. Lyell (T.): by Hartwell Conder A. 386
Ores (Selenite Gold), Treatment of: Niemann Process A. 174
Oroya Leonesa Ltd., Nicaragua: Scheme for Reconstruction C. 548
Osmiridium C. 463
Osmiridium Lode, Bald Hill (T.) 209, A. 215, 230
Oswald Gold Mines, Maldon (V.) C. 527
  Theft 501
Outtrim-Howitt and British Consolidated Coal Co. E. 21
Overhead Wires: London Board of Trade Regulations 13
Oxide Creek Flotations (Q.) 23
Oxide Creek Mine (Q.): Arthur Williams' Statements C. 486
Oxide Junction (Q.): Formed C. 503
Oxidisers, Action of, in Cyaniding 396

P.

P. and O. S.N. Co.: Contingency Fund 502
Pacific Cable Board: Annual Report 220
Pacific Light and Power Corporation (U.S.A.): Water Power Scheme 94
Panama and Australian Transport: Jas. Alex. Smith's Abstract of Paper: Ill. 493
Panama Canal: Model, Electrically Connected 96
Papua, Development of 30
Papua—
  Federal Budget Proposals 307
  Guinea Gold Dredging Property 169
  Mining Matters 483
  Oilfield on Vailala River: Expert Cabled for C. 62
  Railway Construction C. 62
Papuan Oil Fields 166
  Dr. J. Greban's Prospecting Work 204
  New Discovery at Kerema and Vailala 279
  To be Investigated 114
Papuan Rubber and Trading Co.: Difficulty of Obtaining Native Labour C. 249
Parapara (N.Z.) Iron Ore Deposits: Ethelburga Syndicate's Proposal to Sell to N.Z. Government C. 336
Paringa—Meriba (S.A.) Railway: Completed 307
Paris—Electric Engineers' Meeting 14, 33
Park, Prof. Jas.: Crustal Folding and Mountain Building A. 88
  Genesis of the Earth 12
  Tetrahedral Hypothesis of the Form of the Earth 50
Parliamentary Ethics E. 563
Parodi, H.: Railway Electrification Problems in U.S.A. 33
Parsons, Charles L. (U.S. Bureau of Mines): Announcement of Establishment of American Radium Institute 565
Patents, see Commonwealth Patents.
Patents: see also, United Kingdom.
Patriotism in Tenders for Public Supplies C. 500
"Payable" and "Unpayable": Promiscuous Use of Terms C. 567
Payne's Find Development Co. (W.A.) C. 381
Peace, Industrial Peace E. 377
Pelaw Main Colliery, Maitland (N.S.W.) Labour Troubles 130
Pellew-Harvey, W.: Report on Great Cobar Ltd. C. 518
Pensions for Members of Parliament C. 544
Pensions for Members of Parliament, and Annuities for their Widows: Deputation to Prime Minister of New Zealand C. 208
Perth (W.A.) Electric Tramway System taken over by the Government 34
Page.
Perth (W.A.) Electric Tramways Ltd.: Voluntary Liquidation 154
Perth (W.A.) Municipal Gas Works: Report 517
Perth (W.A.): Power House and Plant for Trams, Lighting and Electrification Schemes 348
Perth (W.A.) Sewerage Scheme: Sir Maurice Fitzmaurice's Opinions 575
Peruvian Copper: A Rival to Australia C. 463
Perwick Creek (N.T.) Tinfield: Dr. Jensen's Report 501
Peters, Fernand: Geology of Petroleum XII.
Petrol and Benzine, Substitutes for: by H. Kershaw Walker A. 385
Petrol Electric Motor Vehicles: Damoiseau A. 14
Petroleum: Crinoline Point (S.A.) 325
"Petroleum Exists in Australia": Pamphlet by George D. Meudell C. 249
Petroleum, Geology of: Fernand Peters' Opinion XII.
Petroleum: see also Argentine.
Petroleum: see also Oil.
Petroleum Syndicate: see also United British West Indies.
Philippine Coal Consumers' Association 90
Philippine Dredges Ltd.: Powerful Machinery for Bucket Dredger 229
Phillips, Alex. Hamilton: "Mineralogy: An Introduction to the Practical Study of Metals" P. 88
Phillips, Sir Lionel: Attempted Assassination 546
Phoenix Switchboard Terminal 313
Piddington, A. B.: Report on N.S.W. Industrial Laws E.461
Piece Work v. Day Labour C. 462, C. 481
Pine Creek—Oodnadatta Railway: see Trans-Continental Railway.
Pioneer Tin Mining Co., Bradshaw's Creek (T.) R. 229
"Point Five's Club," London, and Electric Supply 32
Porepunkah Gold Dredging Co. (V.) R. 63
Portland Place Mansions Ltd.: St. Kilda (V.) 265
Port Augusta—Kalgoorlie Railway: see Trans-Continental Railway.
Port Augusta to Oodnadatta (S.A.): State Control of Railway Line 73
Port Augusta (S.A.) Water Supply 401
Portland Cement: Its Manufacture, Testing and Use: by D. B. Butler (3rd edition) P. 566
Port Davey Tin Mines (T.): Liquidation C. 548
Port Melbourne Council: MacGregor: Smoke-destroying Process C. 42
  Report of Electric Light Committee Adopted 180
Port Melbourne Electric Supply 472
Port of London Authority: Dock Improvement Schemes 178
Port Phillip Heads: Deepening the Channels 449
Port Pirie (S.A.) Town Council: Electric Light: Duplication of Plant 155
Port Swettenham Rubber I. 319
Poseidon Alluvial (V.) I. 165
Poseidon (V.) Nuggets 99
Poseidon United G.M. Co., Tarnagulla (V.): Nuggets Found on "Kitten" Claim 273
Post and Telegraphic Congress, Italy, 1911: "Chronique Illustree du Concours International de Telegraphie Pratique" P. 48
Postal Electric Supplies 392
Postal Electricians: Annual Conference 554
Postal Electricians' Award E. 143, 152, C. 292
Postal Electricians' Wages: Award not Retrospective 226
  President Varies His Award 328
Postmaster General's Report 573
Post Office, The (Commonwealth) E. 41
Pottery Clays, Victorian 512
Pottery, Valuable Clay for: Castlemaine District (V.) 357
Powell, F. B.: Report on Mt. Carrington Copper Mine, Drake (N.S.W.) I. 24
Powellising Process in W.A. 136
Powellising: Select Committee Appointed 392
Power (Electric), Prime Movers for: Ferranti A. 31
Power Gas Producers: by Matthew C. Coates. Supplement A. 440
Power Transmission in Collieries: W. H. Telfer's Paper 514
Powlett (V.) Coal: Briquettes 410
Powlett River District (V.): New Agreement 28
Powlett River Field (Vic.): State Coal Mine E. 21
Prahran (V.) City Council: Approval of Clifton Hill—Prahran Tramway Scheme 284
Prahran—Clifton Hill (via Richmond) Tramway Scheme (V.): H. S. Dix's Report 257
Prahran—Malvern Tramways (V.): Enlargement of Trust 281
Pratten, J. E.: Tin and Rubber in the Malay States 11
Preece, Sir W. H.: Obituary 403
Preference to Unionists, Prohibition of: N. K. Ewing, M.L.A.: Bill in Tasmanian Legislative Assembly C. 292
Prentice Automatic Wireless Train Control 283
Preston, Fitzroy and Northcote: Proposed Electric Tramway 176
Prime Movers for Electric Power: Ferranti A. 31
Page.
Primrose Co. (T.): Amalgamation with Hercules Co. 10, 236
Primrose—Hercules Mines (T.): Amalgamation with Tasmanian Smelting Co.: Capital Required C. 465
Prince's Bridge—Middle Park Electric Tramway (V.) 73, 216
Prince's Bridge—Middle Park (V.) Electric Tramway: F. A. McCarty's Report 176
Proctor, C. Faraday: Address to Western Section: Institution of Electrical Engineers 514
Prospecting Boring Plant 11
Prussian Government Railways (Electric): Improved Overhead Feeders 60
Pyrenees Pty. G.M. Co., Redbank (V.): Geologist's Report 175
Pyrites Ltd., Sydney: Registered C. 568

Q.

Quambone—Gilgandra Railway (N.S.W.): Construction Recommended by P. W. Committee 116
Quambone—Warren Railway (N.S.W.): Negatived by P.W. Committee 116
Queensland:
  Artesian Water-bearing Country: Investigation of Intake Beds 220
  Mineral Output for 1911-12 194
  Railway Consolidation Bill Postponed 96
  Railway Management: Royal Commission Required 96
  Shale Formations of Central District: Report 114
Queensland National Bank I. 338
Queensland Railways: Accidents in 1912-13 220
  Annual Report, 1912-13 303
  Government Workshops: Savings in Two Years: Commissioners' Report 262
  In 1912-13 240
Queensland Rubber C. 317
Queensland, Towns in P. 13
Queenslander Mine: Etheridge Goldfield (Q.): E. A. de Latour's Report C. 401, 483, C. 485

R.

Radium, Demand for 255, 344
Radium Extraction Co. of S. Australia Ltd. C. 485
Radium: From Carnotite Ore: Prof. R. Sommer's Experiments 483
Radium Hill Co., Olary (S.A.) I. 295, 545
  Prof. Rutherford's Opinion of Specimens 49
  Reports 105
Radium Hill (Sydney) Co.'s Mine, Olary (S.A.): J. Bowie Wilson's Report 545
Radium Institute to be Established in U.S.A. 565
Radium Pty., Adelaide (S.A.) 20
Rail Corrugation in Chicago (U.S.A.) A. 59
Railless Electric Traction: Trolley 'Bus in Great Britain (Ill.) 135
Railway Collisions: See Collisions.
Railway Electrification Problems in U.S.A.: Parodi 33
Railway Gauge Question: Trans-Continental Railway E. 187
Railways, Long Distance Electric: H. M. Hobart's Paper 517
Rand Mines (S. Af.): Contract Work C. 482
  Electric Blasting Appliances Introduced 160
  Evils of Phthisis 183
Rand Mines Steam and Electric Winding A. 44
Re-afforestation in New Zealand 266
Rectifiers, Falkenthal 269
Red Rock Mine, Tenterfield (N.S.W.) C. 465
Reid, Sir George: Arrival in Melbourne 351
  Speech at Sydney Town Hall on Australian Character C. 563
Reincke's Wireless Telephony Ltd.: Registered 261
Removal, A Big: Commercial High School, San Francisco (Ill.) 95
Rescue Stations (Mine) in Europe: W. Humble's Report 279
Rescue Work in Mining Disasters C. 500
Review of a "Review" E. 355
Revision of Acts of Parliament E. 291
Road Roller: Made by Austral Otis Engineering Co. for Port Melbourne Council (Ill.) 573
Roads (Good) Association of N.S.W.: Deputation to Minister 137
Robertson, Dr.: Views on Arbitration in N.S.W. 65
Robertson, J. A.: Inaugural Address to Scottish Local Section of I.E.E. 555
Rock Crushing Tests: McGill University (U.S.A.) 44
Rockhampton (Q.): Railway-Tram Service Established 240
Rodda, Stanley Northey: with Portrait B. 525
Roles, Thomas: Bradford (Eng.) City Electrical Engineer: Improvement Proposals for Electric Plant 200
Rose of Denmark Gold Mines: Gaffney's Creek (V.) R. 113
Ross Goldfields (N.Z.) Reconstructed Co.: Application for Subsidy 171
Rosstown (V.) Railway: Deputation to Minister 177

Page.
Ross, R. S.: Speech at Melbourne Trades Hall, "One Big Union Practicable" .. C. 248
Rotary Converters Ordered for Melbourne Substations: Railway Electrification Scheme .. 238
Round Hill Mine (T.) .. A. 197
Round Hill S. and L.M. Co. (T.): Advantages of Tributing System .. C. 337
Royal Bank of Australia .. R. 351
Royal Commissions Act: Excessive Powers C. 564
Royal Dominion Commission: Cable Communication .. 555
Royal Humane Society of Australasia: Analysis of Awards .. 100
Royal Humane Society: Clark Gold Medal .. 50
Royal Exchange Co., Sydney .. R. 52
Royal George Mining Co., Bendigo (V.): Winding up .. 165
Royal Mint .. R. 23
Royal Mint, Melbourne: Coins Issued since 1872 .. 100
  Half-year's Returns .. 50
Royal Mint, Perth (W.A.): Coins Issued since 1899 .. 100
  Half-year's Returns .. 50
Royal Mint, Sydney: Coins Issued since 1855 100
  Returns .. 76
Royal Standard Mine, Yuin (W.A.): Ore Reserves .. C. 568
Rubber Cultivation in Malay States: J. E. Pratten .. 11
Ruby Well, Meekatharra (W.A.) .. 317
Russell, Councillor: Motor 'Bus v. Tramways: English Impressions .. 329
Russell's Freehold Gold Estates, Carngham (V.) .. C. 485
Russian Metal Industries .. 56
Russians as Miners in Northern District, N.S.W. .. 28
Rutherford (Prof.): Opinion of Specimens from Radium Hill Co., Olary (S.A.) .. 49
Ruwolt (Chas.) Pty. Ltd., Melbourne: Powerful Machinery for Philippine Dredges Ltd. 229

S.

Safes, Burglar Proof .. 96
St. Kilda-Brighton Electric Tramway: Deputation from Municipal Councils .. 133
St. Lawrence River, Quebec (Canada): New Steel Cantilever Bridge to be Erected .. 476
Samoa: Wireless Station at Apia .. 136
Sampson, G. Gordon: "Every Man His Own Builder" .. P. 88
San Francisco Commercial High School: A Big Removal (illustrated) .. 95
Scheelite Mining in N.Z.: By Cyril W. Gudgeon (illus.) .. A 409
Schmatolla Process of Burning Lime: Herman Laage to Advise .. 284
Scott, E. K.: Paper on "Large Prime Movers and Boilers for Power Houses" .. 535
Seaham Colliery, Newcastle (N.S.W.): Labour Trouble .. 28
Selenite Gold Ores, Treatment of: Niemann Process .. A. 174, 300
Shafts. See Mining Shafts.
Shareholders, Ignoring of .. E. 103
Shell Transport and Trading Co. Ltd.: Profit in 1912 .. 43
Shepparton (V.) Lit by Electricity .. 392
Shoalhaven River (N.S.W.) Hydro-Electric Scheme .. 392
Siberia: Mineral Wealth .. 87
Siemens Bros.' Dynamo Works Ltd.: "Electricity in Mines" .. P. 300
Signalling Apparatus, Brierley's Patent: To Prevent Collisions .. 452
Silit: New Electric Resistance Material .. 60
Silver. See Fire Fly Mine.
Silvertown Co. (Melbourne) .. 329
Sinclair, Wm.: Alignment of Machinery .. A. 53, A. 72, A 93
Sisley, Geo. E.: Mining World Index of Current Literature, Vol. III. .. P. 513
Skyscraper Buildings: Unrevealed Dangers C. 564
Slingo, W.: Mechanical Devices in Telephone Exchanges .. A. 33
Sluicing. See Hydraulic Sluicing.
Smallpox in Melbourne .. E. 61
Smallpox Scare in Australia .. E. 21
Smith, Jas. Alex.: Paper on Panama and Australian Transport: Abstract (illus.) .. 493
Smith, Timms and Co.: Writ Against N.S.W. Government .. 136, 142
Smiths Ltd. (Salford, Eng.): British Insulated and Helsby Cables Ltd. v. .. 116
Sommer, Prof. Rudolf: Experiments on Carnotite Ore and Its Value as a Source of Radium .. 483
South African Coalfields .. A 302
South Australia—
  Government Geologist (L. Keith Ward): Annual Report .. 343
  Oil Bonus .. C. 548
  Oil Interview with Dr. Basedow .. .. 365
  Petroleum at Crinoline Point .. 325
  Petroleum Fields, Existence of: Experts at Variance .. 344
  "Review of Mining Operations," First Half of 1913 .. E. 355
South Australia and the River Murray .. 326
South Australian Oil Wells Co.: G. D. Mendell's Statements .. 525
South Australian Radium: L. Keith Ward's Report .. 344
South Australian Radium Pty. Co. .. 49
South Australian Railways: Annual Report, 1912 13 .. 303
  Broken Hill Pty's Proposed Change of Route 282
  Satisfactory Returns .. 199
South German Reef Co. (V.) .. I. 24, I. 106, I. 146
South German Reef Extended G.M. Co., Maldon (V.): Lease No. 6707 Forfeited to T. J. S. Best .. 248
South Melbourne Council: Electric Tramway from Middle Park to Prince's Bridge .. 73
South New Moon (V.) .. 197
Spargo Creek Mine (V.): Departmental Report .. IX.
Speakman's Find, Hampton Plains Estate (W.A.) .. C. 337, C. 381, C.568
Stamp-Selling (Automatic) Attachment to Pillar Boxes: Trial to be Made in Melbourne .. 307
Stanford Merthyr (N.S.W.): Labour Trouble 28
State Debts and the Commonwealth .. A. 348
Statutive Body: Proposal for Establishment E. 291
Steam Winding on the Rand Mines .. A. 44
Steatite: Discovery in Bathurst District (N.S.W.) .. C. 188
Steel and Dredgers .. A. 491
Steel and Iron Works, Broken Hill Pty. Co.'s: Newcastle (N.S.W.) .. 177
Steel, Arthur C.: Obituary .. 463
Steel Indent Co., Sydney: Registered .. 100
Steel Works at Newcastle (N.S.W.), Broken Hill Pty. Co.'s .. 452
Sterilising Milk by Electricity: Dr. Beattie's Method .. 170
Stock Exchange Regulations: Conditions of "Quotation" .. 172
Stockton-Borehole Colliery (N.S.W.): Strike .. 28
Stone-Dusting in Collieries, For Prevention of Explosions: Dr. W. E. Garforth's Paper .. 301
Storing Battery Cars (Edison) at Gisborne (N.Z.) .. 34
Strikes and Lock-outs: New Zealand Government's Proposals for Abolition .. C. 228, C. 524
Strikes—
  Beaufort (V.) .. 318
  Bendigo Gold Field .. C. 2, C. 22, 47, C. 316
  Blackball, Westland (N.Z.): Ended .. 266
  Cloncurry (Q.): Ended .. C. 63, 64
  Eaglehawk (V.) Mines .. 63
  Federal Territory: Offside Machine Men 189
  Forman and Co.'s Shipbuilding Yards .. 575
  Lambton B. Pit, Newcastle (N.S.W.) .. 28
  Mount Lyell (T.) Co.'s .. 278
  Non-Unionist (V.): Meetings .. 276
  North Ballarat (V.) Locomotive Works .. 47
  North Mount Lyell (T.) Mine .. C. 273, 278
  Stockton-Borehole Colliery (N.S.W.) .. 28
  Thompson and Co. Pty. Ltd. (Castlemaine (V.) .. 496
  Strikes (Effect of) on Coal Industry of N.S.W. .. C. 336
  Effect of, on Output of British Coal Mines in 1912 .. 183
Strike Insurance: Scheme Outlined to N.S.W. Arbitration Commission .. 99
Submarine Mines: Exploded by Wireless: Ulivi's Method .. 388
Substitutes for Petrol and Benzine: By H. Kershaw Walker .. A. 385
Sulman, John: Evidence before Greater Sydney Council .. 96
Sunshine Agricultural Implement Works (V.): Labour Trouble .. E. 79
Sunshine and Toil .. E. 79
Swallow and Ariell .. I. 547, I. 567
Switchboard Terminal, Phœnix .. 313
Sydenham-Botany (N.S.W.) Railway: First Sod Turned at Botany .. 368
Sydney and Suburban Hydraulic Power Co. R. 96
Sydney Arbitration Commission: Machine-made Horseshoes .. 100
Sydney Associated Chambers of Commerce .. E 41
Sydney City Railway: Bill Rejected in Legislative Council .. 346
Sydney Harbour Trust Commissioners' Official Handbook, "The Port of Sydney" .. P. 567
Sydney Harbour Trust: Remodelling Scheme 307
Sydney Housing Question: Prof. R. F. Irvine's Report .. C. 188
Sydney, Melbourne and Adelaide Stock Exchanges: Revised Scale of Brokerage Charges .. C. 164, 172, C. 273
Sydney Municipal Council: Electric Light Committee's Recommendations .. 31, 260, 284, 326, 367, 451, 490, 574
  Proposed Loan for Electric Lighting Purposes .. 284, 326
  Report of Electric Lighting Committee .. 70
  Electrical Supply: Additions to Power House .. 306
Sydney Stock Exchange: Regulation Against Corners in Stocks .. E. 272
Sydney Tramway Fares .. 534
Sydney Tramways Electric Power Station .. 387
Sydney Tramways: Extensions Since 1907 .. 136
Sydney Underground Railway Scheme C. 104, 116
Sydney University: Decline in Number of Engineering Students .. C. 317
Sydney University Mechanical Engineering Department: Diesel Engines .. 32
Sydney University Senate: Matriculation for Engineering: By-laws to be Amended .. 184
  Walter and Eliza Hall Fellowship: Regulations Governing Award Adopted .. 348
Sydney Water and Sewerage Board Pipes: Report of Royal Commissioner .. 95
Sydney Wharf Labourers' Union: Demands C. 124
Sydney with North Sydney, Linking: By J. J. C. Bradfield: Supplement .. A. 411

T.

Tapping Electric Meters .. 133
Taranaki Oil Wells Ltd. (N.Z.) .. 114
Tarcoola Blocks (S.A.) .. C. 485
Tasman and Crown Lyell Extended Co. (T.): Treatment of Ore .. C. 504
Tasmanian Legislative Assembly: Bill to Assist Tasmanian Smelting: Primrose and Hercules Companies .. C. 485
  Hydro-Electric Scheme Rejected .. 388
  N. K. Ewing's Bill: Prohibition of Preference to Unionists .. C. 292
Tasmania: Area between Macquarie Harbour and Port Davey to be Opened to Prospectors .. 566
Tasmanian Companies Act. Amendments Required: Deputation to Attorney-General C. 208
Tasmanian Copper Co. Ltd. .. R. 498
Tasmanian Government: Approached by Hydro-Electric and Metallurgical Co. .. 237, 260, 306
Tasmanian Smelting Co.: Amalgamation with Hercules—Primrose Mines .. C 465
  Government Grant .. 236
  Works Temporarily Closed .. 311
Taylor, J. E.: Reduced in Rank (American Marconi Scandal) .. C. 42
Taylor, Sir Allen: Motion in N.S.W. Legislative Council for Definite Scheme of Decentralisation .. C. 247
Technical Education: Jas Nangle's Remarks 449
Technical Education, Series No. 18 (Cabinet Timbers of Australia): R. T. Baker .. P. 48
Telegraphy: Induction Resistances .. 60
Telephone Exchanges, Mechanical Devices in: Slings .. A. 33
Telephone, Godfree (Ill.) .. A. 92
Telephone Service: Economies to be Effected .. 556
Telephone Transmission Calculation: A. J. Aldridge .. 13
Telephone: See also Automatic.
Telephony. Reincke's Wireless: Company Registered .. 261
Telephony: See also Wireless.
Telfer, W. H.: Paper on "Power Transmission in Collieries" .. 514
Tenders for Public Supplies, Patriotism in C. 500
Tetrahedral Hypothesis: The Form of the Earth: Prof. Jas. Park .. 50
Tewkesbury Amalgamated Gold Dredging Co., Porepunkah, Ovens River (V.): Experiments in Utilisation of Dredged Land for Tree Planting .. C. 356
Thermit Welding: Alfred J. Higgins, F.I.C. (Ill.) .. A. 218, A. 259
Thompson and Co. Pty. Ltd. (Castlemaine, V.) .. A. 474
  Machinery for Brisbane Water Supply Department .. 136
  Strike .. 496
Tindall's Gold Mining Co., Coolgardie (W.A.) .. C. 548
Tin Mining in Malay States: J. E. Pratten .. 11
Tin Ores, Electric Smelting of .. 306
Tin. See also Conapaira.
  See also Maranboy.
  See also Northern Territory.
  See also Perwick Creek.
Tongkah Compound Tin Co., Puket, Siam .. I. 4, R. 7, C. 548
Tongkah Harbour Tin Dredging Co., Siam .. C. 527
Tookey, W. A.: Paper on Gas Engine Testing 472
Trades Union Levies and the Cost of Living C. 124
Tramway Employees Union, Dunedin (N.Z.): Decision against Joining United Federation of Labour and Social Democratic Party .. 201
Tramway Rolling Stock: Prahran—Malvern Tramway Trust .. C. 80
Tramways, Inter-Urban: Possibilities of Increasing Profits: E. H. Edwards .. A. 52
Tramways, Motor 'Bus v.: Councillor Russell's English Impressions .. 329
Tramways: "Pay as you Enter" Cars in Aberdeen, Scotland .. 218
Tramways: See also Motor Omnibus Competition.
Trans-Australian Railway: See Trans-Continental Railway.
Trans-Continental Railway: Gauge Question E. 187
  Kalgoorlie—Port Augusta: H. Deane's Report .. 153
  Number of Men Employed .. 329
  Rolling Stock .. 329
  Water Supply: H. Deane's Report .. 450

Page.
Trans-Continental Railway: Oodnadatta (S.A.)–Pine Creek (N.T.):
  Permanent Survey .. .. .. 180
  Preliminary Survey .. .. .. 284, 451
Transport. See Australian.
Transvaal Mines. Production: Jan. to June, 1913 .. .. .. 301
Treatment: See Ores.
Tributing System, and Round Hill S. and L.M. Co. (T.) .. .. .. C. 337
Tropical Australia: Dr. Anton Breinl's Lectures .. .. .. C. 482
Tungsten Electric Lamp .. .. .. 475
Turbo-Electric Locomotive (Ill.) .. .. .. 283
Turnbull Boiler. Tests at Surrey Hills .. .. 498

U.

Ulivi's "F" Rays: Submarine Mines Exploded by Wireless .. .. .. 388
Umberumberka Water Scheme, Broken Hill 113, 318
Undaunted Mine, Blakeville (V.) Purchased 64
Union-road—Burke-road, via White Horse-road, Tramway (Melbourne) .. .. 327
Unionist Outrage at Beaufort (V.) .. 345, C. 356
United British West Indies Petroleum Syndicate: Contract with British Admiralty C. 209
United Kingdom:
  Coal Mining Industry and Oil Fuel for the British Navy .. .. .. 69
  Coal Output, Decrease in. Report of Chief Inspector of Mines and Quarries .. 283
  Factories and Workshops: Chief Inspector's Annual Report .. .. 179
  Lord Chief Justiceship, and Lord Alverstone's Rumoured Resignation .. C. 145
  National Insurance Act and Malingering C. 123
  Patents Law .. .. C. 356
  Postal Department and the Imperial Wireless Chain .. .. 73
  Postal and Telegraph Employees' Wages and Conditions: Report .. .. 261
  Postmaster General's Report .. .. 492
  Sir Rufus Isaac's Appointed Lord Chief Justice .. .. .. E. 335
United States Navy: Coal Purchased from Japan .. .. .. 105
United States of America. Radium Institute to be Established .. .. .. 565
  Railroad Disasters Due to Employees' "Mistakes": Chas. Neil's Statement C. 272
Universal Colliery, Senghenydd, Wales: Disaster .. .. .. 351, 498
"Urban Passenger Transport": J. B. Hamilton's Paper .. .. .. 391

V.

Vaccination, and the Visit of British Politicians .. .. C. 164
Vegetable Creek T.M. Co. (N.S.W.) .. C. 465
Ventilation Engines: Broken Hill Litigation 324
Verner, C.: Advance of Electricity: Address 515
Via Recta: Mt. Edwards—Maryvale (Q.) Railway .. .. C. 462
Virginia Mine, Bendigo (V.) .. .. C. 248
Volatilisation, Extraction of Gold by: Howe Process .. .. A. 175
Victoria:
Companies Act: Bill for Amendment .. .. E. 335
  Chamber of Mines .. .. R. 108
  Cost of Living. Returns .. .. 288
  Dredge Mining and Hydraulic Sluicing, 1912 .. .. .. R. 142
  Dredging Industry .. .. C. 2
  Electric Supply .. .. 96
  Geological Staff Salaries, Inquiries in other States .. .. .. 3
  Geological Survey: Status of Officers .. C. 2
  Hydraulic Sluicing, 1912 .. .. .. R. 142
  Industrial Legislation Problem .. .. .. C. 104
  Mine Managers' Associations: Amalgamation .. .. 105
  Mines Act Amendment Bill: Passed in Legislative Assembly .. .. 145
  Mines Department Report, 1912 .. .. E. 123
  Mining Industry, Government Assistance Given .. .. 100
  Mining, Some Phases of: Hyman Herman .. .. 69
  Pottery Clays .. .. 512
  Royal Agricultural Show .. 258
  State Shipbuilding Yard .. .. 309
  Technical Education: New Scholarships .. 354
  Technical Schools (Junior) .. .. .. 15
Victoria Falls and Transvaal Power Co. Ltd .. .. R. 452
Victoria in 1912: Mines Department Report E. 123
Victoria River (N.T.) Coal, Shale and Oil Co.: Report .. .. .. 114
Victorian Companies Act: Probable Adoption by Other States .. .. C. 208
Victorian Electorates .. .. .. E. 499
Victorian Employers' Federation: Legislation for the Prevention of Strikes asked for .. .. 160
Victorian Gold Miners' Wages Board: Deputation to Minister .. .. 142
Victorian Government Dredging Inquiry Board 12, C. 228
Victorian Government:
  Industrial Forecasts .. C. 400
  Meeting of P.L.C. Representatives at Bright .. .. .. 274
  Miners Phthisis: Conference .. .. .. 160
Victorian Institute of Engineers .. .. .. 535
Victorian Legislative Assembly:
  Committee to Report on Mining Conditions, etc. .. .. .. 311
  Court of Criminal Appeal Bill .. .. C. 377
  "Greater Melbourne" Bill .. .. .. 281
Victorian Legislative Council: Mining Companies Law: Amendment .. .. .. 345
Victorian Mines Department: Briquette Making: F. G. W. Bayly's Report .. .. 410
Victorian Mines Development Act: Cassilis G.M. Co. N.L.: Application .. .. .. 214
  Gippsland Copper, Platinum and Gold Mining and Smelting Co., N.L., of Cooper's Creek: Application .. .. 214
Victorian Mining, Curse of .. .. .. E. 335
Victorian Mining Enterprise .. .. .. E. 143
Victorian Mining Industry: "Government Aid" Policy: W. Watt's Comments .. .. 345
Victorian Municipal Association: Road Maintenance and Motor Bus Traffic .. .. 370
Victorian Railway Disorganisation .. .. 124, 145
Victorian Railway Department: Dissatisfaction Among Employees .. .. .. 490
Victorian Railways .. .. .. 535
  Annual Report .. .. .. 303
  Bounties Paid in 1907-8 and 1912-13 .. 240
  Construction Schemes .. .. .. 490
  Electrification .. .. .. 115, 471
  Electrification Scheme: Rotary Converters Ordered for Melbourne Sub-Stations .. 238
  Increased Wages to Railway Men .. .. 177
  M. E. Kernot's Report for 1912-13 .. .. 134
  New Installations at Workshops .. 134
  Premier's Review .. .. .. 346
  Revenue and Receipts, 1912-13 .. .. 54, 115
  Revenue from Goods and Live Stock Traffic 156
  Workshops: Interesting Figures .. .. 262
Victorian State Coal Mine, Wonthaggi: Improvement in Employees' Financial Position 249
  Output .. .. .. 501
  Sparking Tests .. .. C. 144
  Powlett River Field .. .. .. E. 21
  Powlett River Field: New Agreement .. 28
  Appeal Board .. .. .. 3
Victorian Unions: Requests for Aid to New South Wales Labour Council .. .. .. 248
Victorian Workers' Compensation Bill: Insurance Clause .. .. C. 208

W.

Wage, Minimum Living, Advanced: Mr. Justice Higgins' Judgment .. .. .. 248
Wahgunyah (V.) to Corowa (N.S.W.) Railway: Deputation .. .. .. 70, 73
Waihi (N.Z.) G.M. Co.: Hydro Electric Scheme .. .. .. 329
Waihi (N.Z.) G.M. Co.: Safety Devices .. .. 329
Waihi Reefs (N.Z.) Gigantic Consolidation Ltd.: Preliminary Prospectus .. .. .. 278
Walker, C. E.: "Mining Reform and Millions" .. .. .. E. 143
Walker, H. Kershaw: Substitutes for Petrol and Benzine .. .. .. A. 385
Walker's Ltd., Engineers, Maryborough (Q.) .. .. .. R. 137
Wallaroo and Moonta Mining and Smelting Co. (S.A.) .. .. .. R. 81, M. 232
Wallaroo Mt. Lyell Chemical Works Ltd.: Proposed New Company .. .. .. 396
Wallaroo Mt. Lyell Fertilisers Ltd.: Formed 550
Wallaroo (S.A.) Phosphate Co.: Proposed Amalgamation with Mt. Lyell (T.) Mining and Railway Co. .. .. .. 396
  Wound Up and Amalgamated with Mt. Lyell M. and R. Co. .. .. .. 550
Wandiligong (V.) Gold Dredging Co. .. .. R. 165
Wanted: Electrical Mechanics .. .. 237, C. 462
Ward, L. Keith (S.A. Government Geologist): Annual Report .. .. .. 343
  Report on Alunite Deposits, Carrickalinga (S.A.) .. .. .. 550
  Report on S.A. Radium .. .. .. 344
Warden, H. A.: Wireless Station at Narrabri (N.S.W.) .. .. .. 452
Warrnambool (V.) Breakwater: Extension .. 517
Warrnambool (V.) Town Council: Employment of Clerk of Works .. .. C. 524
Warren-Quambone (N.S.W.) Railway: Negatived by P.W. Committee .. .. .. 116
Water-Diviners: Tests of their Powers: Guildford (Surrey) .. .. .. 59
Water Supply on W.A. Gold Field .. .. .. R. 3
Watering Streets Electrically .. .. .. C. 2, 33
Watt, W. (Victorian State Premier): Comments on Mining Industry .. .. .. 345
Welbourn, B.: Aluminium as an Electrical Conductor .. .. .. A. 32
Wellington (N.Z.) Typographical Union: Assisting Waterside Workers' Strike Fund C. 544
Wellington-Werris Creek Railway (N.S.W.): Negatived by P.W. Committee .. .. .. 116
Werris Creek-Dubbo (N.S.W.) Railway Authorised .. .. .. 307
Werris Creek-Dubbo Railway (N.S.W.): Construction Recommended by P.W. Committee .. .. .. 116
Werris Creek-Wellington Railway (N.S.W.): Negatived by P.W. Committee .. .. .. 116
Western Australia: Banks Bill .. .. .. 351
  Perth Electric Tramway Taken Over .. 34
  Piping for Coolgardie Water Scheme: German Tender Accepted .. .. .. 575
  State Steamer Kwinana: Voyage to Durban .. .. .. C. 365
  Government's Shipping Venture .. .. .. 498
  Proposal to Amalgamate Metropolitan Water, Sewerage and Goldfields Water Supply Permanently .. .. .. 288
  Esperance Bay Railway Bill Rejected .. 556
 Loan Bill: "Steamships £8000" .. .. 575
  Oil: Gibb Maitland's Report .. .. .. 504
  Railways: Official Report for 1912-13 .. 220
  The Government and the Ultimatum .. .. 515
  Gold Fields Water Supply .. .. .. R. 3
  Gold Output: Increase .. .. .. 480
  Industrial Legislation Problems .. .. C. 104
  Mines Regulation Bill .. .. .. 189
  Mines Regulation Bill: Abolition of Contract System .. .. .. 311
  Mines Regulation Bill: J. E. Dodd's Explanation of Provisions .. .. C. 381
  Mines Regulation Bill to be Re-introduced .. .. .. 105
  "Mining Statistics," 1912 .. .. .. E. 79
  Perth Electric Power Supply Bill .. .. 517
  Powellising Process .. .. .. 136
  Prospecting Board .. .. .. 485
  State Undertakings .. .. .. 307
  Revenue and Expenditure in 1912-13 .. 351
  Water Bores on Transcontinental Railway .. .. .. 38
  Railway Construction .. .. .. C. 62
Western Australian Bank .. .. .. R. 480
Western Electric Co. (N.Z.): Automatic Telephone Exchanges for N.Z. Government .. 60
  Automatic Telephones: Tender Accepted 95
West Ham (Eng.) Corporation Electricity Department .. .. .. R. 178
Weston's (W.A.) Field .. .. .. A. 280, L. 325
Westralian Mining in 1912 .. .. .. E. 79
White (J. G.) and Co. Ltd. (Eng.) .. .. R. 91
White Hills, Bendigo (V.): Labour Dispute .. 47
Whitelaw, H. S.: Report on the Daylesford Field (V.) .. .. .. 571
Whitfield (V.): Iron Phosphates .. .. .. 466
William Tell G.M. Co., Daylesford (V.) .. C. 504
Williams, Arthur: Oxide Creek Mine (Q.): Statements .. .. .. C. 486
Wilson, F., on W.A. Mines Regulation Bill and Abolition of Contract System .. .. .. 311
Wilson, J. Bowie: Report on Radium Hill (Sydney) Co.'s Mine, Olary (S.A.) .. .. 545
Wind Power: Application for Generation of Electrical Energy: By W. H. Myers .. A. 390, A. 448
Winding (Steam and Electric) at Rand Mines .. .. .. A. 44
Wireless Chain (Imperial) and British Postal Department .. .. .. 73
Wireless Chain: New Zealand System Complete .. .. .. 261
Wireless Communication in Inland Towns: J. G. Balsillie's Estimate .. .. .. 517
Wireless Station at Apia, Samoa .. .. .. 136
Wireless Station at Narrabri (N.S.W.): Erected by H. A. Warden .. .. .. 452
Wireless Stations, Commonwealth .. .. .. 96
Wireless Telegraphy: Chain Contract: Merits of Various Schemes .. .. .. 154
Wireless Telegraph Research and Experiment .. .. .. 515, 555
Wireless Telegraphy in Australia: Charge for Licenses Revived .. .. .. 184
Wireless Telegraphy Principles Applied to Explosion of Submarine Mines: Ulivi's Method 388
Wireless. See also Australian.
Wirth, Christoph: Apparatus for Averting Railway Collisions .. .. .. 450, 540
Wollongong (N.S.W.) Electric Current to be Supplied by Water Power .. .. .. 116
Wollongong (N.S.W.) Electric Power Co. .. 34
Wolverhampton (Eng.) Corporation Electricity Works .. .. .. R. 178
Wonthaggi. See Vic. State Coal Mine.
Woods-Gilbert Rail-Planer Ltd.: Committee's Report .. .. .. 575
World's Largest Electric Companies .. .. .. 60
Wynne, Agar (M.L.A.), and the Commonwealth Post Office .. .. .. E. 41

Y.

Y-Water (Emmaville, N.S.W.) Tin Co. .. C. 293
Yarraville (V.) as Site for Central Power Station: Melbourne Electrical Railway Scheme .. .. C. 164, 177, 199, 328
Year Book. See Commonwealth.
Yuanmi Gold Mines Ltd. (W.A.) .. .. .. C. 548
Yulgilbar Station (Clarence County, N.S.W.) Gold Deposits: Result of Inspection .. .. 545

Z.

Zeehan Flat (T.): Opening Up Needed: Deputation to Premier .. .. .. 149
Zeehan Mines (T.) Draining Schemes: Hartwell Conder's Report .. .. .. 236
Zinc Corporation Ltd. .. .. .. M. 107
Zinc, Importance of .. .. .. A. 88
Zinc Ores, Electric Smelting of .. .. .. 306
Zinc Precipitation .. .. .. 39
Zinc. See also Fire Fly Mine.

**JOINT STOCK COY.'S YEAR BOOK OF AUSTRALASIA.**

Edited by R. L. NASH (Financial Editor of "Sydney Daily Telegraph.")

The EIGHTH EDITION will record an expansion in joint stock enterprise quite unprecedented. The Australian capital dealt with (including the London contributions thereto) will be between £600,000,000 and £700,000,000 (six hundred millions and seven hundred millions), and the dividends and interest payments for 1912 exceed £30,000,000 (tbirty millions), while no less than 2500 (two thousand five hundred) new companies are added to the enumeration, and the new issues by the older companies have been enormous. The dimensions of the volume are, of course, greatly extended. THE AUSTRALASIAN JOINT STOCK COMPANIES' YEAR-BOOK is the only work giving such a record, and the vast growth of joint stock enterprise throughout these States and colonies renders it an indispensable book of reference.

Published by

CRITCHLEY PARKER, MINING STANDARD.

## CONTENTS.

JULY 3.

EDITORIAL—

Australia's New Government .. .. 1
Delegated Railway Construction .. 1
Leaderettes .. .. .. .. .. .. .. .. .. 2
News and Notes .. .. .. .. .. .. .. 3
Mining in Australia .. .. .. .. .. .. 3
Personal .. .. .. .. .. .. .. .. .. 3
Metal Quotations .. .. .. .. .. .. 4
Investor's Column—
Tongkah Compound .. .. .. .. .. 4
Adelong Gold Estates (N.S.W.) .. 4
Goldsbrough, Mort and Co. .. .. .. 4
Mining in New South Wales .. .. .. 5
Victorian Mining Activities .. .. .. .. 5
Mining in Western Australia .. .. .. 7
Tongkah Compound Co. .. .. .. .. .. 7
The Coal Mining Industry .. .. .. .. 7
Commonwealth Oil Corporation .. .. 8
The South Island of New Zealand .. .. 9
Great Zeehan Dundas .. .. .. .. .. 10
Tasmanian Amalgamation .. .. .. .. 10
Gold Ore Sampling in a School Laboratory .. .. .. .. .. .. .. .. .. .. 11
Tin and Rubber in the Malay States .. 11
Prospecting Boring Plant .. .. .. .. 11
The Dredging Inquiry .. .. .. .. .. 12
A United States Letter .. .. .. .. .. 12
The Genesis of the Earth .. .. .. .. 12
Institute of Mining Engineers .. .. .. 12
Publication Received .. .. .. .. .. 12
Electrical Traders' Association .. .. 13
British and European Developments .. 13
Tours in Queensland .. .. .. .. .. .. 13
English and French Electrical Engineers' Meeting in Paris .. .. .. .. 14
Miscellaneous .. .. .. .. .. .. .. .. 14
Commonwealth Trade .. .. .. .. .. .. 15

HENLEY'S
Electric Wires and Cables
AND INSULATING TAPES
ARE THE BEST.
W. T. HENLEY'S Telegraph Works Co. Ltd.
546 COLLINS ST., MELBOURNE.
61 YORK ST., SYDNEY.

BELTING!
Largest stock of all kinds of Machine Belting in the Commonwealth.
Conveyor and Elevator Belting for all purposes.
HOPKINS BROS. & ODLUM PY. LTD.
LEICESTER ST., CARLTON, MELBOURNE.
'Phone, Central 754 and 5202. Box 377 G.P.O.

COKE!
NORTH BULLI COLLIERY
Limited
Supplies best quality hard
SOUTHERN
SMELTING COKE.
(Weekly output 1250 tons.)
H. O. Hyde, Secretary.
Royal Insurance Building, 16 Spring-street, SYDNEY.

AUSTRALIAN MINING STANDARD.
Forwarded Post Free to any Address.
Australasia .. .. .. .. .. .. .. .. .. .. .. 26/- per
Abroad .. .. .. .. .. .. .. .. .. .. .. .. 30/- Annum.
Payable half-yearly or yearly, in advance.
All amounts should be made payable to order of "CRITCHLEY PARKER, Bank of Australasia."
12 O'Connell-street, Sydney. Tel. Central 2703
376 Flinders-lane, Mebourne. Central 7931 & 1838

BACK NUMBERS OF THE "MINING STANDARD."
The following is the rate for back copies more than a month old. Applications by post must be accompanied with cash and postage added. In no case can we guarantee to supply copies, as our storage accommodation is limited.
A postcard will be sent if the number required is out of print.
For copies three months old, ninepence; six month, one shilling; and beyond that period, one penny per month per copy.
As there is a regular demand for back copies of the "Mining Standard," newsagents are requested to send back all returns uncut and in good condition, otherwise they will not be accepted.
All Returns from Newsagents must reach us by the end of each month (the whole paper must be sent). No credit will be allowed beyond this term.
Postage — British, 1d.; Foreign, 1½d.; Australasia, ½d. per copy.
Stamps will be accepted as pre-payment.
Address communications: Publishing Department, "Mining Standard"

CASUAL ADVERTISEMENTS.
The rate for this class of advertisement is governed by the position it occupies.
If it appears on leader page or amongst or next to reading matter, the rate is 15s per inch (nonpariel) per insertion.
Towards end of reading section, set in brevier, 16 ems width, 6s per inch per insertion
If set in nonpariel the rate is 4s. per half inch.

THE AUSTRALIAN MINING STANDARD.
ESTABLISHED 1888.
It is requested that all business communications be Addressed to Critchley Parker.

THURSDAY, JULY 3, 1913.

## AUSTRALIA'S NEW GOVERNMENT

A new Federal Ministry has been formed, and the Labour rule of the Commonwealth is, for the present, at an end—at least, nominally. This is the ninth Australian Ministry in the short space of little more than 12 years, and Mr. Joseph Cook is the sixth individual to attain to the honour of being made Prime Minister of the Commonwealth. He has formed a strong Cabinet, though whether it will last or not will depend in no small degree upon three or four factors to which it is not to the interest of politicians to direct too much attention. In the first place, it will depend largely upon the readiness of the Ministry to abstain from the introduction of contentious matter. Secondly, it will depend upon the unwillingness of members generally to forego any of the three years' service for which they have been elected, and for which they are to be paid. Thirdly, it will depend upon the conviction on the part of the Opposition that they are likely to lose, rather than to gain, by the holding of another general election. We believe that, for reasons we have indicated, a conflict between the Senate and the House of Representatives will be avoided; but, if that is to be the case, it is necessary that the new Ministry should be unwilling to take the risks of a fresh appeal to the country. If it should be of opinion that it has much to gain from another election, it will be very easy for it to force a dissolution; but the game is a dangerous one, and is not likely to be played.

The personnel of the administration is of some interest to our readers. That Mr. Cook should, himself, take the office of Minister for Home Affairs is subject for congratulation, for he is a strong man, and the Home Office is the great spending office of the Ministry; and if, as is understood, the burden of administration will rest on the shoulders of the hon. Minister, Mr. W. H. Kelly, that fact affords no reason for disquietude, for Mr. Kelly is one of the most promising young men in Australian politics. That Sir John Forrest should be Treasurer is also matter for congratulation. Mr. L. E. Groom, as Minister for Customs, will have his work cut out to please both his colleagues and the ultra-fanatical Victorian protectionists. It will be a thankless position; for the Melbourne daily which voices the opinions of the wilder protectionists is absolutely insatiable in its desire for higher duties. Mr. Glynn, as Minister for External Affairs, will have control of the Northern Territory and of Papua, and it is to be hoped that he will be an improvement upon his predecessor. Well-known as a constitutional lawyer, he has yet to prove himself an administrator. Mr. Agar Wynne fills the office which has proved the grave of so many Commonwealth reputations, that of Postmaster-General. He is a first-class business man, and so it is to be hoped that he may introduce business methods into the conduct of the affairs of the Post Office. They are badly needed. When Mr. Thomas retired from that position, and his place was taken by Mr. Frazer, great hopes were entertained of the latter, as a young and active man who would "shake things up." Mr. Frazer, however, proved a disappointment. Whatever shaking up was done was done so quietly that nobody seemed to be aware of its proceeding; and the Post Office has gone on getting steadily worse. Until it is set on a much sounder footing than that on which it stands at present, the Commonwealth Parliament has very little chance of obtaining from the people authority to annex more State departments than it already controls. Perhaps, however, Mr. Agar Wynne will be able to effect the much-needed improvement.

The paltry provincialism of so large a proportion of the Australian metropolitan press is shown by a consideration of the headings adopted by the two Melbourne morning dailies, when announcing the constitution of the new Cabinet. The "Argus" puts up as its main headline, "Victoria's three members"; the "Age," still more parochial, has "New Federal Cabinet; three Victorians included. Mr. W. H. Irvine, Attorney-General; Mr. Agar Wynne, Postmaster-General." With both papers, the one thing of pre-eminent consequence is that three of the ten members of the Ministry should be Victorians; and the "Age" apparently regards it of more consequence that Mr. Irvine should be Attorney-General anl that Mr. Wynne should be Postmaster-General, than that Mr. Cook should be Minister for Home Affairs, and Sir John Forrest Treasurer. It is satisfactory to note that the equivalent Sydney dailies do not show similar State pettiness, the "Telegraph" headings making no mention of the States to which Ministers belong, and the "Herald" headings going no further in this pitiable direction than to say "Representatives of Six States"—a harmless enough statement of fact. Yet it is one of the favourite boasts of the Melbourne press that it is quite free from the paltry jealousy which constitutes so prominent a feature of Sydney journalism. Its estimate of itself is amusing enough to the unprejudiced observer; but unfortunately its actions are not amusing, helping, as they do, to keep alive the flames of what is little better than a parish patriotism.

## DELEGATED RAILWAY CONSTRUCTION.

A careful consideration of the proposed arrangement between the New South Wales State Government and an off-shoot of the Norton Griffiths Co., known as Griffiths Australia, Ltd., leaves one cold. So far as can be made out from the statements made to the Press by the Minister for Works, Mr. Arthur Griffith, and the Treasurer, Mr. Cann, the arrangement is for the carrying out of £3,000,000 worth of railway construction work, the work being undertaken by the firm, whose supervision charges are to amount to 5 per cent. on the total expenditure—the expenditure, that is to say, on the actual making of the lines. That is, in brief, the arrangement which has commended itself to the Minister for Works; but there is, of course, another side to the question. That is the financial side, which has very properly been left in the hands of Mr. Cann. The arrangement which that gentleman has arrived at with the Norton Griffiths Co. is that the latter shall undertake, when required, to underwrite in the ordinary way loans raised by the Agent-General to the State through the usual channels, to the total amount of the value of the work covered by the agreement. The arrangement may then be criticised from either of two points of view, either as a scheme for the doing of certain necessary work or as a financial proposition. Viewed in the former light it is open to one very grave objection. It offers to the contracting company no inducement to keep down expenses. Quite naturally it is to the interest of the firm to spend as much as possible within certain limits. It would surely be a more business-like arrangement to allow a definite sum for the construction of the work, and to offer a supervising firm a very considerable percentage of every pound that it could save from that amount. As it is, it is hard to see what the supervising firm is to be paid for, especially as its own supervisors are themselves to be subjected to the supervision of the Director of Public Works and any officials he may appoint for the purpose. The proposal would seem, then, to amount to paying the 5 per cent. for the doubling—or, should we say, the halving—of responsibility. The financial proposals for the scheme are obscure, and even Mr. Cann himself does not seem to be quite clear about them; in fact, in explaining the matter he made use of the significant words "as I understand the scheme," which seems to imply that, in classical phrase, " 'e dunno where 'e are." Anyway, as Mr. Cann understands the scheme, the Norton Griffiths Co. would underwrite one-third of the loan. What responsibility this would entail we are not in a position to say; and without that information criticism is useless.

But, though it cannot be said that we view with favour this proposed arrangement, there are yet some things to be said in its favour. New South Wales needs more railways, and the sooner they are built the better it will be for the State; but, in the present state of the labour market, and in the present belief of the labourer that he can squeeze the State Government to any extent whatever, constructional work cannot proceed as rapidly as it ought to proceed. There are, at the present time, 533 miles of line under construction, and the completion of this work is estimated to cost nearly £1,700,000. Another 590 miles of line has been authorised, but has not yet been undertaken. The estimated cost of this work is £2,250,000, while the estimated cost of other lines still under investigation by the Public Works Committee amounts to between £5,000,000 and £10,000,000. In the present condition of the State's financial credit, the money for this work may not perhaps be easy to obtain, but the real difficulty is, after all, the day labour question. The Public Works Department has not obtained, and is not likely to obtain, a fair deal from its workmen. If, then, the Government proposed to hand over to the company a portion of its railway construction work in order to free itself from this labour trouble, the proposal would need to be very carefully considered. But the Minister for Works assures us, and the Treasurer has confirmed the statement, that it is not intended to abolish the day labour system—that, in fact, that system shall be regarded as a "sine qua non," and that the men employed shall receive the same wages, the same holidays, and the same privileges in all respects as the men directly employed by the Railway Construction branch of the Public Works Department. That being so, it is hard to see what is the exact gain to be made from this arrangement. However, as it has been distinctly stated that the proposal will not be made a party one, it is hardly to be expected that it will ever be put into operation, for, brought forward as a non-party measure, it will scarcely have a chance of meeting with the approval of the House of Assembly.

---

The Victorian Public Service Commissioner, Mr. G. C. Morrison, is at present inquiring into the status of geological survey offices in other States of the Commonwealth, and if these investigations are followed by a more generous recognition of the gentlemen who serve Victoria in a similar capacity, the acknowledgment will be fully justified. In Victoria the Mines Department is the "Cinderella" of the Government offices. Men who have served the State faithfully and well, and whose qualifications have been proved to be without question, are miserably compensated when a comparison is made with the salaries paid to their colleagues in other less important centres of the mining industry. The need for a drastic revision is obvious. The members of the staff are held in high repute in other States, and if Victoria wishes to retain their services the Government will have to make the attractions of the office more in keeping with its importance. The work that has been done by the Department in developing and encouraging mining in Ballarat, Bendigo, and other districts is well known to those connected with the industry; yet its work has never been properly recognised by those in authority. We hope that, when the inquiries in question are completed, the officers of the Department will find the present cause of grievance removed.

* * *

Some kind friend of certain members of the Melbourne City Council should lead them into some quiet sequestered spot and gently, but firmly, give them to understand that they should never have emerged from oblivion into the glare of public observation. Recently these gentlemen blocked the way to the supply to their customers of anything but obsolete incandescent electric lamps, and now they have again distinguished themselves by the formulation of rules for the guidance of employees in the electric branch—rules which are causing no end of inconvenience and annoyance to the public. Hitherto, when anything has gone wrong with a private lighting installation, and a lamp attendant could be called up to put things right; now the lampman is only allowed to replace incandescent lights and fuses; and, if a minor repair be required, or a switch has gone wrong, he is not allowed to touch it. Quite in keeping with these findings is the recommendation of the Public Works Committee that the Council would not be justified in displacing horse haulage for electrically-driven motor carts for street watering. An electric waggon can water 23 miles of surface in eight hours; the horse-propelled vehicle covers nine miles in the same time. The cost of the former is £1 per mile more. There the Committee baulks. The horse is more economical, but cannot compare with the motor in cleanliness, and, what is of prime importance, expedition. While the leisurely Bucephalus is sprinkling the last section of his mile, the North Wind of the summer has made the first section as dry as a desiccated door mat, and the dust from it is overtaking him in the distance. The Council has not yet taken the Committee's suggestions into consideration. When it does, it is to be fervently hoped it will be alive to modern methods, and not pursue a penny wise and pound foolish policy.

* * *

The tales of desolation, pollution, and destruction so graphically portrayed by the daily press as following in the wake of the gold dredge in Victoria were rudely shattered by experts, who gave evidence at the Board inquiry in Melbourne last week. Mr. Thomas Mates, a land owner and land valuer, declared that there had been no increase of siltation since dredging began, and, in any case, his experience was that silt improved the land. A man, in his knowledge, had selected silted land for choice, and had raised excellent crops of potatoes and onions on it. Land which farmers had valued at £25 an acre was not, in his opinion, worth more than £2 5s. As an expert he wished to say that siltation improved the land. Mr. Bernard A. Smith, a civil engineer, who had made an examination of the Ovens Valley, was equally emphatic. According to tests he had made, there were no evidences of siltation due to dredging, the deposits being caused by bank erosion. While the dredges were responsible for a certain amount of discoloration in the river, the worst part of the water was quite drinkable. It was impossible, he added, in reply to a question, to account for the statements that had been made with regard to increased siltation during the past five years in the Ovens Valley. The evidence should go a long way towards dispelling the false impression that has been made upon the public mind with regard to the dredging industry.

* * *

The long-anticipated, long-threatened trouble on the Bendigo gold field has eventuated at last, two mines being closed down on Monday last because members of the Federated Mine Employees' Association refused to work alongside of those men of independent spirit who refused to be tied down to follow a course of which they did not approve. It is said that these non-unionist men with whom the unionists refused to work are very few in number; but that is hardly the point. However few they may be, they have as much right to their own views as the majority have to theirs. It would, doubtless, be still more absurd for the minority to attempt to dictate to the majority what the latter should do than it is for the majority to take up a similar attitude towards the minority; but the minority make no claim to do anything of the sort; they leave those who wish to be unionists free to go their own way, and only ask that those who are not unionists should be given similar freedom of action. But freedom of action is the last thing which a trades' union is willing to grant. From one point of view, it may perhaps have been worth while for the Bendigo mine-owners to have given way to the attempt at dictation on the part of the Trades Union, and to have told the non-unionists that they would receive no further employment unless they came into line with their fellow-workers; but that, after all, is only a very narrow way of looking at the situation. If the mine-owners gave in now, they would be laying themselves open to all sorts of encroachments, all sorts of intimidation on the part of the workers, and, moreover, they have before them the instance of the successful stand made by the Broken Hill companies against similar encroachments on the part of their employees. If they be wise, the mine-owners will realise that it is true wisdom to stick to their principles.

## NEWS AND NOTES.

A deputation of Warrandyte residents was introduced by Mr. E. H. Cameron, M.L.A., to the Victorian Minister for Mines (Mr. Billson), in furtherance of an application for a £1000 grant on the £1 for £1 basis towards the revival of operations at the Caledonia mine. It was pointed out that £100,000 worth of gold had been taken out of the mine, and about £30,000 paid in dividends. The intention was to unwater the mine to about 200ft. at a cost of £170, repair the drive going north, and make other drives. The new company had spent £1500, but wanted Government assistance now in putting on stronger machinery to work the mine more economically and scientifically. Mr. Billson said, in reply, that the Government recognised its obligation to assist the great mining industry, but after consultation with the director of geological survey (Mr. Herman) he felt that a greater amount of care would have to be exercised in making the mining grants. In future they would only be made after careful investigation, and after Mr. Herman's inspection. Provision would also have to be made that the people interested in the mining properties receiving grants kept their operations going on until the objective was reached, or put beyond all question of doubt. He would have a conference with Mr. Herman regarding the Caledonia mine.

The New Zealand Oilfields Ltd. is, a London cable says, increasing its capital to £250,000 by the issue of 500,000 profit sharing 10 per cent. cumulative preference shares of 2s. each.

The annual report of the Gold Fields (W.A.) Water Supply shows a deficit of £27,000, and anticipates a deficit of £43,000 for 1912-13. There are 1016 miles of mains, and the consumption is 3,100,000 gallons daily. The income for the year was £244,000, and the operating expenditure, including £77,000 for sinking fund payments, was £270,783.

A Director and Registrar of the Technical and Mining School to be opened at Queenstown (T.) is wanted at a salary of £500. Details may be seen in our advertising columns.

Inquiries are being made in other States by the Victorian Public Service Commissioner, Mr. G. C. Morrison, regarding the salaries paid to the geological staff. The officers ask that the geologists in the service of the Victorian Government shall be placed upon an equality, as regards status and earnings, with their colleagues in the other States. In New South Wales, the average salary of officers on the geological staff is £430; in Western Australia it is £414; in Queensland, £331; and in Victoria, only £258. On the laboratory staffs, the salaries work out at the following averages:—New South Wales, £309; Western Australia, £293; Victoria, £195. There is obviously ample room for improvement.

"The Geology of Kalgoorlie," a volume by Mr. C. D. G. Larcombe, is being issued by the Australian Institute of Mining Engineers, and can be had from the secretary at the Melbourne office.

At the last sitting of the N.S.W. Metalliferous Mining (Consolidated) Board, Mr. Alfred Nathan, on behalf of the Mine Owners' Association, raised the point that the evidence proffered by the union had not disclosed any grounds for interfering with the existing award of June, 1911. The chairman (Mr. A. K. J. Watt) said the Board decided not to interfere with any rates in the present award in excess of 8s. or 8s. 6d. per day, only on proof that there has been shown any increase in the cost of living, and also on being satisfied, either that the 8s. rate was fixed as a bare living wage, or that the 8s. or 8s. 6d. rates were respectively fixed on the bare living wage, with a small allowance for skill over and above the bare living wage. If the Board was satisfied as to both of these matters, they decided it was open for the claimants to argue that those rates should be increased so as to provide for the increase in the cost of living as a bare living wage, either in toto or in proportion. Clauses 3 and 5 of the previous award, dealing with holidays and the continuance of operations, were still open for argument, decision and evidence. Then the Board must determine the rates for the classes of labour not covered by the previous award, and the claims not interfered with in the award.

The prospector of the Victoria River Coal, Shale and Oil Co., Mr. Alex. D. McDonald, telegraphed from Darwin (N.T.) on 25th June:—"Do not consider there is anything worthy of attention in the district. Propose to return with all hands at earliest opportunity. Oswald's concession of no value."

In reply to the Wonthaggi deputation which waited on the Acting Premier of Victoria recently and urged that an Appeal Board should be granted for the miners, Mr. Murray replied [illegible] of the Railway Commissioners that the men, who were then out on strike, should return to work before the request was discussed. Last week Mr. Murray received representatives of the Victorian Coal Miners' Association, who stated that the Commissioners now appeared to be [illegible] favourable to the appointment of the Board to settle disputes at the mine, and pointed out that the Act specifically prevented them from making more than a suggestion to the general manager of the mine. If an amendment of the law really were necessary to effect the appointment of an Appeal Board, they would urge that the Government should take action. Under the existing conditions there was nothing to prevent a miner from being dismissed at any time, and they felt that the circumstances justified the appointment of the Appeal Board. Mr. Murray replied that he could not see what useful purpose the Board would serve. There would be one representative of management, who would come to the same conclusions as Mr. Broome. The general manager was required to support his officers where he felt that they were justified. The men's representative would be in precisely the same position towards his fellows. A chairman, an independent man, would be the third member, and he did not see where he would be in a different position to Mr. Broome, who was admittedly a fair man. He suggested that two or three representatives of the miners should confer with Mr. Broome, and he (Mr. Murray) would consult the general manager after that interview.

The Hampden mines (Q.) have re-started operations. There are a large number of applications for work under the new union.

Mr. H. Grigg has been appointed by the State Executive as a member of the Victorian Gold Miners' Board, in room of Mr. W. H. Hicks, who has resigned.

A new seam of good coal, 7ft. in width, has been struck on the North Bulli Coal Co.'s property, on the south coast of N.S.W.

A conference of the leading Australian Stock Exchanges is to be held in Melbourne on July 8. The Stock Exchange of Melbourne will be represented by Messrs. W. J. Roberts (chairman), W. Foster Woods and John May; Sydney by Messrs. S. L. Davis (chairman), V. A. B. Willis, A. E. H. North and H. O. Wonson (secretary); and Adelaide by Messrs. W. B. Carr (president) and J. V. Laurie (vice-president).

The Victorian State Executive has approved of an advance of £3000, under the Mines Development Act, for the Last Chance United Co. No Liability. The allowance, which is on a pound for pound basis, is for developmental operations, to be carried out subject to the control of officers of the Mines Department.

To expedite the building of the transcontinental railway, the Federal Executive have placed £150,000 at the disposal of the Treasurer.

The threatened strike against the employment of non-unionists at Bendigo came into operation on Monday at the Virginia and New Prince of Wales mines, about 200 men leaving work. The mine-owners have passed a resolution to keep the mines open, and stand by all the men who continue at work.

## MINING IN AUSTRALIA.

### Views of Mr. W. J. Loring.

Mr. W. J. Loring, one of the principals of the firm of Bewick, Moreing and Co., left Melbourne yesterday for England. During his visit to Australia he has visited some of the principal mining fields of Western Australia, New South Wales and Queensland, and he says that, though his stay in the country has been but brief, he feels as if he had been away from London ten years, so impressive are the distances in the island continent. He expresses himself as quite in accord with the views expressed in this paper from time to time with respect to railway extension in Queensland, and speaks hopefully of the possibilities of this rich northern State, and indeed of Australia as a whole. To effect the proper development of the resources of the Commonwealth outside capital is necessary, and this can only be secured by showing the world that we, the protagonists of a "white" policy, are benefiting by it, and are capable of giving other countries a lesson in development. What we want to do is to demonstrate by working results in every department that we are, at least, as good as "the other fellow." Mr. Loring does not anticipate any great labour troubles in the future, considering that the result of past difficulties has been so distasteful all round that there will be no repetition of them.

On the subject of the mining industry, he said, when interviewed shortly before leaving: "Taking into consideration the improvement which has been made in the treatment of ores containing base metals, such as lead, zinc and copper, I am convinced that developments such as are at present scarcely thought of will take place in the near future. In order to realise the possibilities of progress it is only necessary to recall the time when the mines at Broken Hill were entirely dependent for profits on lead and silver. The methods of recovery then in vogue have been very greatly improved upon, stage by stage. With the advent of the flotation process the mining industry on the Barrier took a decisive forward step, accompanied by improvements in the general work in and about the mines which have not only greatly benefited the shareholders, but are a substantial addition to the assets of the Commonwealth. Many improvements in metallurgy have been perfected at Broken Hill, flotation among the number, and though Australia cannot claim the credit of this invention, yet its establishment as an absolute necessity among metallurgical processes is due to the work done here, and Australians may well be proud of what has been accomplished in their country, and of the fact that other countries are fast following her example."

As is not unnatural, in view of his firm's interests, Mr. Loring commented particularly on the recoveries being made at the Zinc Corporation's works. Not more than seven years ago a 72 per cent. extraction of the lead values and 55 per cent. of the silver had been considered excellent. Now the higher extraction obtained permitted the profitable reserve of large tonnages of ore which could not possibly have been treated at a profit under the old conditions. The recovery in the lead mill of the South Blocks had reached the very satisfactory figure of 85.3 per cent. lead and 68.6 per cent. silver. In addition to this, the company recovered 2.3 per cent. lead by treating the zinc middlings in the central plant of the Zinc Corporation. This gave a total of 87.6 per cent. lead, which constitutes a world's record for this class of work.

## PERSONAL.

Mr. Herbert Brookes, whose portrait we print, is the new President of the Victorian Chamber of Manufactures. He is a son of the late Mr. William Brookes, manufacturer, who was a partner in the Australian Paper Mills, and was born in Bendigo. He was educated in Wesley College and Melbourne University, and took the degree of Bach. C.E. in Trinity College. After leaving college he devoted himself to mining engineering, and gained a lot of experience in the Victorian fields. At Glen Wills he was in charge of four developmental claims, and acted as local director, and in addition started a chlorination plant in anticipation of the field proving a good mineral field. Such was not to be the case, and Mr. Brookes then gained some rather useful experience in what not to do at the Dargo High Plains. This is a most useful asset to one in any way connected with mining ventures. These were both new fields, and ventures that ended, as so much does in mining, in buried hopes. Subsequently, Mr. Brookes accepted the position of local director and assistant manager of the Madane Berry West alluvial claim in the Creswick district, and got an insight into this class of mining after several years' experience. A trip to Europe intervened, when he had the good fortune to be present in the House of Commons when the Federal Constitution of Australia was presented and debated.

Subsequently Mr. Brookes became the secretary and assistant manager of the Austral Otis Engineering Company, and is now chairman of the board of directors of that company. He is also President of the People's Liberal Party, and took a prominent part in the last two referenda campaigns. He was recently elected to the board of directors of the Australian Paper Mills. He established the Association of Iron Manufacturers in Melbourne, and subsequently was instrumental in linking this influential body with the Chamber of Manufactures. His first active work in connection with the Victorian Chamber of Manufactures was in 1909, when he was elected to the Council. In 1911 he was appointed vice-president, and is now chairman of the Iron and Steel section of the Chamber, and president of an institution numbering over 1000 members.

Up to the present he has generally suffered political eclipse through the splendid achievements of his relative. He is the son in law of Mr. Alfred Deakin and the elder brother of Mr. Norman Brookes, the tennis expert.

---

Robert Cox, underground foreman in the North Lyell mine (T.), and a valued servant of the Mount Lyell company, has resigned owing to ill health. Cox has been engaged for forty years in mining. On the occasion of the disaster in the North Lyell mine, in October, Cox remained for a long period underground rendering assistance, and when he came to the surface he was suffering so badly from the effects of carbon monoxide gas that he collapsed. His health since then has been indifferent, and he is now forced to retire after many years' sterling service.

Mr. Andrew Martin, of Soldier's Hill, Ballarat (V.), who died a few days ago at the great age of 91 years, had worked in Ballarat as a miner for about forty years, and in his later days was a mine manager. Deceased stood 6ft. 6in. in height, and walked with a soldierly bearing that attracted much notice in the city.

Mr. Benjamin Lewis, who was for many years connected with the mining industry in Ballarat district, has died at Canterbury (V.), aged 64 years. He was a brother of Mr. Phil. Lewis, manager of the Ajax mine, Daylesford.

A complimentary dinner was tendered by the members of the Institution of Municipal Engineers of Victoria (incorporated) on Tuesday evening last to Mr. Thomas Walker Fowler, M.Inst. C.E., to celebrate his appointment as engineer-in-chief to the State of Tasmania. The toast of the guest was proposed by Mr. A. C. Mountain (president) and supported by Mr. George Kermode, on behalf of the Government engineers, Mr. A. E. Aughtie for the metropolitan engineers, and Mr. J. S. Lazarus for the shire engineers.

Mr. Jeffrey, civil engineer in charge of the Hydro-Electric Company's construction works at the Great Lake in Tasmania, has been appointed to the position of engineer to the Commonwealth Government at the Jervis Bay naval base. Mr. Jeffrey has had a wide experience in England and America. Mr. Creagh, a New Zealander, has taken Mr. Jeffrey's place.

Mr. Robert Blight, engineer, a former member of the Bendigo Stock Exchange, died last week, aged 80 years.

Mr. W. J. Loring and Mrs. Loring were among the passengers by the R.M.S. "Medina," which left for London on Tuesday. Mr. Loring will, after a short stay in England, leave for California to inspect some important mining properties.

Judge Murray, Lieutenant-Governor of Papua, arrived in Melbourne from Sydney on Monday for the purpose of consulting with the Minister for External Affairs. Judge Murray will leave on the return journey to Papua towards the end of this week.

Mr. H. Deane, son of Mr. Henry Deane, engineer-in-chief of railways to the Commonwealth, has received the appointment of chief assistant engineer to the Port of London Authority. Mr. Deane is a Sydney University graduate, and has recently been employed in the engineering offices of Sir Benjamin Baker, in London. He was chosen for the post out of 84 applicants.

---

# METAL QUOTATIONS.

## By Cable.

(From Our Correspondent.)

### London, Tuesday.

There was a slight recovery in the metal markets from the weakness of the last two weeks, standard stocks showing more strength towards the close. Copper, which finished at £63 last week, was as high for spot as £64 5s., but relapsed again another 10s. Electrolytic rose from £67 15s. to £68 5s.—to-day's quotation. Bear selling demoralised dealings in tin, which, after dropping to £193 10s., rose again to £200 5s., and at the end of the week was £194. Quotations were:—

COPPER.—Spot, £63, £63 15s., £64 5s., £64 2s. 6d. and £63 12s. 6d.; three months, £63 2s. 6d., £63 9s. 6d., £64 12s. 6d., £64 10s. 6d. and £64.

Electrolytic.—£68 15s.

TIN.—£193 15s., £197 15s., £200 5s., £199 5s. and £193 17s. 6d.; three months, £194 5s., £198 5s., £200 15s. and £200 5s.

LEAD.—£20, £20 12s. 6d., £20 15s., £20 and £19 5s.

SILVER.—26¾d. and 26⅝d.

ANTIMONY.—"Star" brand, £30, a fall of £1; 50 per cent. ore unchanged at £8 10s.

WOLFRAM.—(70 per cent. ore), 33s. per unit, or £115 10s. per ton.

MOLYBDENITE.—Unchanged at 2s. 9d. per lb., or £308 per ton.

MANGANESE.—(50 per cent. ore), 9d. per unit, or 37s. 6d. per ton; unchanged.

# THE INVESTOR'S COLUMN.

## Some Companies Attracting Attention To-day.

(By Our Exchange Reporter.)

### Tongkah Compound.

The success of this company's operations has been one of the pleasantest features of the mining market, and it is owing to such (all too occasional) occurrences that the public interest in a great industry is maintained. The metal mining companies other than the gold producers have not only to consider the quantity and quality of the deposits which they are exploiting, but also the price of their product in the market. It may be said that this particular concern has been exceedingly fortunate in respect to both of these important matters, for the ground treated has been of excellent quality, and the price of tin during the last year has been at a high average value. The results of the operations have been probably beyond the most hopeful anticipations, for during the year (that is during the last 12 months) £66,960, equal to 27s. per share, has been paid to the shareholders in dividends, this amount exceeding the paid up capital by £17,360. The cost of production has been £15 17s. per ton of tin oxide, and the value per ton, at about the rate of recent quotations, £128. Under these circumstances it is plain, therefore, that practically only two important questions have to be answered in order to form an estimate of the future prospects of the company. The first is that of the quantity of the ore reserves? The directors speak with great confidence upon this subject, stating that there is equal to six years' work in sight, without allowing for other dredging areas, some of which have been secured, and others under consideration. The financial position is strong, there having been £14,500 to credit at the end of May after making provision for the dividend and bonus of 3s. falling due on June 17th. The course of the market operations indicates that the shares are likely to hold their price, or perhaps, as they are now worth 69s. 6d. to 70s. ex dividend, the sellers seem to be getting scarce. This is not surprising, for on the official statement as to the ore reserves the shares certainly look worth buying, the only doubtful point being that of the metal market, but it should be borne in mind the price of tin has receded considerably from the highest touched, and the statistical position with regard to it seems sound.

### Adelong Gold Estates (N.S.W.).

It cannot be said that the shareholders in this company have so far had much reason to congratulate themselves upon the success of their undertaking, for it certainly has not been up to expectations. Many delays and disappointments are, however, incidental to dredging enterprises, and it would have been strange if this had been an exception. There is always the consoling reflection that this particular form of mining is one of the most reliable that we have both in Victoria and in New South Wales. Operations were started on the 2nd of January, but the overburden is pretty heavy, and the wash was not reached until February 17th. Since then dredging has been steadily continued, and up to the end of the current half-year, a period of ten weeks, 246 oz. of gold have been obtained—an average of roughly 24½ oz. per week. Such returns would probably not do more than pay expenses, if that, although in Victoria 12 to 15 oz. is generally sufficient for this purpose. The explanation given for the low average is that a hard bar has been met which has interfered with the operations, and there is also a quantity of overburden of clayey material varying from 27 to 30ft. to be passed through before bedrock is reached, and this, in the initial stages of the working, may to some extent have prevented the best results being obtained.

Under the adverse conditions the financial position of the company has naturally gone back, and a fresh issue of shares was found advisable, and in February the capital was increased to £75,000 by the issue of 10,000 shares of £1 each. At the date of the last taking of accounts, April 30th, the profit and loss account showed a loss for the half-year of £2046, the working account portion of this sum being £1123. These adverse circumstances had a bad effect upon the market, and prices declined considerably, for whereas the shares had for several months been in strong request up to 32s., in the vicinity of which a large number of transactions were recorded, they came back until 19s. was the best offer made, and with not very strong enquiry at that. The issue of shares already mentioned, although no doubt well justified by necessity, was one of the main causes of the retrogression, for the market conditions generally have for some time been very unfavourable towards financial demands. The question, however, now to be considered is whether the decline has reached its limit; and what are the chances of a recovery? Well, the position of affairs at the mine should be an improving one, for the No. 2 dredge, which is a larger and more important one than that first put into commission, started working this month, and should before long substantially increase the returns, for the paddock in which its operations are to be carried on is considered certain to give good payable returns as soon as bedrock is reached—a consummation to be expected in about another six weeks or so. The No. 1 dredge should also be giving improved yields in the near future, as a favourable change in the working conditions has recently taken place, the bedrock now being softer, taking the form of a highly decomposed granite. The supporters of the stock are hopeful that when both dredges get fairly going under favourable conditions that between five and six hundred ounces of gold per month will be obtained, for the reason that an acre of ground should contain not less than 400 ounces, while the capacity of the plant should be equal to one and a half acres. Assuming that the total expenses for the same period amount to £1000, a net profit of £1200 may not unreasonably be expected, say £15,000 per annum. Provision will have to be made for the repayment annually of £3000 on account of the debenture issue of £15,000, but there should not be any difficulty in doing this, and providing also for renewals, etc., leaving a dividend at the rate of probably 10 per cent. for the shareholders. Such estimates should not be taken as substantially correct, but rather as a basis for further enquiry by any persons who feel inclined to buy on the existing reduced prices, and it may be said that these shares seem to be a promising mining investment, for it has been shown by experience that once the ground has been thoroughly and honestly tested, as this has been, and the gold values well established, these dredging concerns generally prove to be very payable. The one adverse factor to be kept in mind is that the capital is fairly large, and also that the debenture issue is rather a millstone round the neck of the company; but, making due allowance for these drawbacks, the shares should be worth buying and locking up.

The latest quotations have indicated a firmer feeling.

### Goldsbrough, Mort and Co.

There is probably no stock on the whole investment list which more closely reflects the position of pastoral affairs than does this great concern, and for that reason its quotations may be taken in a measure as an indication of the financial outlook. For the four or five months there has been some fairly heavy selling from one or two quarters, and although the number of transactions was not exceptionally large, this was probably owing to a desire not to depress the market. There was naturally some anxiety as to what might be the cause of the realisations that were taking place, for although it was generally known that the balance-sheet would compare unfavourably with those of the previous three or four years, it was believed that the difference would not be of a sensational character. Nor could it properly be so described, but there is no question that the falling off in business was much greater than expected, the net profits amounting to £132,923, as against £331,737 for 1911-1912, or nearly £200,000 less. It can now be understood how serious was the outlook in pastoral affairs about twelve months ago before the bountiful rains took place, although there was a natural and perhaps justifiable endeavour to minimise or hush up how serious were the losses of stock that were being incurred. Such an occurrence gives a good idea of the character of this stock, which is nevertheless one of the soundest and most attractive on the investment list. For despite the bad year, the returns have been of a substantial nature, enabling the payment of a dividend and bonus to the amount of 15 per cent., while the reserve fund and undivided profits have increased from £456,711 to £470,273, which is not a bad performance for a lean year, and as the prospects for the coming season are very promising the shares on the present of about 40s. ex dividend should be worth buying.

---

The name of the Austral-Malay Tin Trust has been changed by the omission of the word "Trust."

Benjamin Hall and Joseph Munday have been committed for trial at the Bendigo Court of General Sessions on July 15 by the Eaglehawk (V.) Bench on a charge of having attempted to sever gold in the Catherine Reef United mine with intent to steal.

# MINING IN NEW SOUTH WALES.

## Broken Hill.

(From Our Correspondent.)

Broken Hill, June 27.

Broken Hill investors in mining stock have felt very sick this week. Metals have fallen with a heavy thud—the metals that Broken Hill is concerned in. Spelter down to £21 5s. per ton, lead at £19 10s.—folk have got to sit up and think. These, of course, are both profitable prices, but when a metal market slumps there is no knowing when it will stop. At one stage in Broken Hill's history, not so long ago, lead at £13 and spelter at £18 left a payable margin. To-day, alas! Higher wages, higher prices for supplies, higher costs. What can a mine do? It must pay the scheduled rates for everything—for labour and for goods. Proportional metal rates must, therefore, rule. The basis of profit under existing industrial conditions has not yet been worked out in detail, but it must run somewhere about £16 for lead and £20 for spelter. The limit, therefore, is not too far below.

One reason of the sudden collapse is apparently not known to local mining and ore men. Even experts closely in touch with the Broken Hill markets "bark" when asked for reasons. They freely admit that they don't know. City men—some of them—might know; but locally the fall is attributed to the wide reason of the fighting in Eastern Europe. Now that interstate warfare has really commenced, no one knows where the fighting might cease.

Broken Hill, however, only assumes in the matter. It is absolutely void of any special knowledge.

Naturally the disturbed stage of the position On 'Change is affecting the output of the mines, not seriously yet—but it is feared that seriousness may come. The big "stack" of zinc concentrates at Burns, the border town, is being moved to the seaboard, and the weekly sendaway from Broken Hill is very big. To limit this output would mean to limit the number of men at work, and the Broken Hill mines have no wish to do this.

I do not usually adopt a pessimistic tone in these notes, but it is just as well to hoist the warning flag when it is necessary—and this seems a necessary moment.

Of the Broken Hill mines themselves, there is just now little or nothing to be said. One asks a manager about developments—he smiles, and says he doesn't know the word. One talks to the underground men—they agree that nothing great is occurring anywhere.

In a sense, on most of the mines the workings are too gigantic for anything great in development to happen in the existing sphere of labour, and there is little launching out into unknown country.

The South is doing a little, but really it is only proving at depth what was shown possible at the higher levels. Crosscutting and driving is being vigorously proceeded with at the 1170ft. level, but with the one object—to open up the ore bodies determined on the 1070ft. level. Good ore certainly shows in the winzes from the 1070ft. level. When the plat at the 1170ft. level in No. 1 shaft is complete more results should come.

The British, too, is doing some searching. Thompson's No. 9 level shows pleasing results from development; the north drive on No. 10 level shows only low grade ore so far; the main crosscut on No. 11 level is in 9ft. in quartzite. Marsh and Howell sections both shape well, and the mill work is thoroughly satisfactory.

Reports from London about the British half-yearly meeting disclose little that is really fresh, except that Mr. Woodhead in future is to be just a plain director. No estimate of ore reserves was given at the meeting, and no idea of Bewick, Moreing and Co.'s connection with the mine. The chairman uttered the word, "Amalgamation," several times in speaking of status of shares, but gave no hint as to what he might be hinting at. The staff of the Zinc Corporation, it might be here mentioned, take more than a passing interest in the doings of the British.

Junction Hill figures.—1363 tons crudes, 190 tons concentrates (57.0 per cent. lead, 25.0 oz. silver, 6.0 per cent. zinc). The shortage of ore is put down to a shortage of miners. Umph!

None of the mines not mentioned seem to have anything fresh to chronicle. They have been and are doing only routine work. The North is putting in some new machinery. But all the mines are doing good work, and it would be a sorry pity to have to limit it in any way.

But lead at £19 10s. and spelter at £20 5s., and three months forward much lower, looks gloomy.

## Lithgow District.

(From Our Correspondent.)

Lithgow, June 27.

Since the recent continuous rains set in and the rivers and creeks became unusually swollen, gold dredging operations throughout the outlying districts have been seriously interefered with. Notwithstanding this disadvantage, the No. 1 plant of the Turon River Great Gold Dredging Company, in a run of 135 hours, obtained 30½ ounces of good gold.

The New Burragorang Silver Mining Company have sent away recently two consignments of ore to the Sulphide Corporation, Newcastle; the assay resulted:—No. 1 consignment: Gold, 2 dwt. 5 gr. per ton; silver, 60 oz. 1 dwt. per ton; lead, 29.25 per cent. No. 2 consignment: Gold, 12 gr. per ton; silver, 84 oz. 16 dwt. per ton; lead, 45.37 per cent.

The six-ton parcel of ore sent last week by Messrs. J. Mitchell and Son from Sunny Corner to Cockle Creek for treatment has resulted satisfactorily. This is a silver ore, and there is no difficulty in treating it. Indications point to improvement at a depth. At the Sunny Corner mine proper they are driving and rising in the lower levels, but no new developments are reported. The ground, it is stated, is very hard, necessitating the use of a great quantity of explosive. Mr. Lawler and Mr. Klug, of the Zinc Corporation, paid a visit to the mine on Thursday, and inspected the Nos. 4 and 5 levels.

The works of the Lloyd Company, at Burraga, are progressing as well as can be expected, considering the scarcity of labour. The question to-day—as it has been during the past 20 years—is, will they get sufficient wood to carry the works through the winter? It was thought when the tram line was completed that the wood question was settled, but, alas! hopes seem doomed to disappointment.

## Bathurst District.

(From Our Correspondent.)

Bathurst, June 26.

A find that would appear to be of some importance is reported from Scabbing Flat, near Trunkey. The reef, which runs from 2ft. to 3ft. wide, has been traced for a distance of over 200ft., and was discovered by a man who was dish loaming for gold, accompanied by his young son, who, upon breaking a piece of quartz, found it contained gold. The reef is now being sunk on, and good coarse gold is showing freely in the stone, which is estimated to yield 4 or 5 ounces to the ton. Whether it will go down any distance or not remains to be proved, and further development will be awaited with interest.

On the Golden Key Syndicate's ground, Hill End, prospecting has resulted in the discovery of a new reef, which was small at surface, but has now widened out to 6ft. at a depth of 35ft. A bulk crushing of some 50 tons is being treated at the Hawkins' Hill Reward Co.'s battery. The same reef has been picked up on the Reward Co.'s property, and at surface is about 6in. wide, and prospects over one ounce to the ton. A shaft is being sunk on this to see what it will make in depth, as it should run throughout the whole of the lease, and into Rowley's Reef Co.'s ground on the south. This reef lies west of the new one recently discovered, and both of them are west of the Frenchmen's reef. The new reef has been sunk on over 90ft., and is becoming more defined as well as widening out, and it is anticipated the next crushing will contain far better values than the one recently put through. In the crosscut at the 190ft. level from Exhibition shaft driving east, the Frenchmen's reef has been pierced, and they are driving north on it, on stone which is estimated to yield 2 oz. per ton.

The Amalgamated Tunnel, coming north, are on a little gold, though of no great value at present, but as the drive comes up towards the Star of Peace shaft and Rowley's Reef Co.'s ground, there is every prospect of getting on to heavy gold.

At the Mount Conqueror mine, Peel, work in a small way has been resumed after a lengthy period of suspension of labour conditions, and an additional area of ground is being applied for. It is understood an offer has been made to take the mine on tribute on a favourable basis.

Webb and Crago have a promising show north of Mount Conqueror, and are engaged in opening it up. There is a wide formation of ore, a bit on the low side perhaps, but a bulk crushing will determine its value, which it is anticipated will yield over 5 dwt. per ton.

The Locksley Copper Mine tributers are in a bit of a fix as to a way of ingress and egress to the mine, the adjoining land owner having ploughed up the old track across his paddock, and posted notices warning trespassers to keep off the land. As a result feed, to supply dray horses on the mine, has to be carted over 10 miles, whilst the carriage of ore to the railway station (2½ miles) is effectually blocked since the lines of the song—"The longest way round is the sweetest way home"—will not apply to the economical handling of copper ore destined for the smelting works, and an aeroplane service is considered too risky.

The Carpathia Company has 146 tons of milling ore stacked at Ardlethan railway station. Crushing at Barmedman is expected to be commenced in a few days. The Outcast Syndicate is putting in a dam with a view to the erection of a battery. Another syndicate purposes putting in a public crushing battery. Mr. John Nicholson has been appointed manager of the Black and White Syndicate's property.

Gold is reported to have been struck at Murrel Creek by W. Griffiths, a Wyalong prospector. A substantial deposit has been paid on the property with a view to its flotation.

Block 14, Torrington, expects to start regular mining operations to-morrow.

During the four weeks the Cangai Copper mine treated 897 tons of ore for 112 tons matte; and 120 tons of matte were treated for 74 tons shipping material, worth 63.4 per cent. copper.

Within the past few weeks miles of country have been pegged out at Arramagong East, situated about 20 miles from Young. At present there is great activity on the field, and in a week or so it will be greatly increased, as additional men are being put on almost daily. Both tin, silver and gold are promising well. A splendid sample of quartz has been taken from a shaft 30ft. deep, and in it tin is plentiful. There are coarse grains of gold showing freely.

It is reported that an asbestos deposit of a promising nature has been found at Euchareena, a small village between Wellington and Orange. The find was made by Mr. Watterson, manager of a gold dredge operating on the Macquarie River. The outcrop shows the asbestos lode to be 70ft. wide, and Mr. Watterson states that he is able to trace it for a distance of at least 700 yards. There is every indication of a huge deposit. Samples have been sent to the Mines Department for examination, in order that the commercial value of the find may be determined.

A trial shipment of 100 tons of pyritic ore has been sold by the Mount Stewart mine, Leadville, and is being despatched to superphosphate works. This ore contains 50 per cent. sulphur, and is believed to be suitable for the manufacture of sulphuric acid, which is at present imported from Spain. The ore will in the future either be mined on a large scale and shipped to various factories in New South Wales, Victoria, South Australia, and West Australia, or a big manufacturing company will be formed to establish works at Leadville. The heavy zinc ores of the mine will probably be concentrated, and the concentrates shipped to Germany, whence inquiries are coming for as much of this class of ore as can be produced.

It is reported that assays taken from the blow, 40ft. wide, on the Champion Tin Property, Ardlethan, gave a return of 41 per cent. tin oxide, of a value of £58 per ton. Flotation is talked of.

# VICTORIAN MINING ACTIVITIES.

## Ballarat and District.

(From Our Correspondent.)

The bore being put down at the Berry United in search of the lost Berry lead is expected to bottom in the course of a week. It was, at latest, down about 400ft. and has another 30ft. to go to get something like the wanted depth for the lead. A good deal of interest is centred in this work, which is invested with the greatest importance. The scheme was outlined in the "Standard" over a month ago.

The rise in indicator country at North Woah Hawp has at length reached veins, and one just cut is to be followed on. The indicator has often revealed rich nests of nuggets. They have commenced stoping the make of good stone cut some weeks ago in the 1500ft. level, where they are driving in from the New Normanby boundary. The stone is in a large flat make of good quality. It is hoped to commence deepening the shaft below the present depth of 1400ft. before the end of the year. The indications for profitable work at a greater depth are very promising.

The South Llanberris are now rising from the east crosscut at 1100ft. in the hope of getting the southern extension of the lode worked with profit by the Llanberris No. 1 Co. since the beginning of the year, and which has enabled the latter company to rejoin the circle of dividend payers.

Just at present the Llanberris No. 1 are in poorer stone on the stopes above the 1130ft. level; but in the second section of stopes at the level above the aspect is healthier. They are now ready to commence crosscutting east off south at the 930ft. level to reach, if possible, the same line of country now being exploited nearer the southern boundary at the deeper levels. Though in the 930ft. level the extent of unprospected country is greater at still shallower depths, the southernmost workings are considerably nearer the shaft, thus, in the event of the good stone being cut at 930ft., there is a reasonable prospect of a substantial extent of backs. The 1100ft. level is now within a few feet of the boundary. The company has about £1200 or £1400 at credit, including £800 on fixed deposit.

The position at the Victoria United is steadily improving, though the hoped for dividend paying stage has not yet been reached. Still, operations are being carried on at a slight margin of profit. A few weeks ago a good body of stone was cut in the rise above the 1215ft. level, but this is only now being opened up, and it looks all right. It could not be tackled earlier, as the stone was only exposed by a fortuitous fall of earth, and clearing up operations have only been done spasmodically. They have a big body of ore of from 5 dwt. to 6 dwt. grade above the 1300ft. level, and in the stopes between the 1400ft. and 1300ft. levels there is a 10ft. make, which in the last crushing averaged 5 dwt. per ton, 103 tons giving 25¼ oz. gold. This is hardly as good as the stone broken for the trial crushing recently, but it is nevertheless payable.

They are extending the south drive at the No. 7 level at the Williams' Fancy to try to get another shoot of gold. A little stone is showing on the track. The drive has another 300ft. to cut through before reaching the break beyond which in the level above a long shoot of gold was cut, which has so far enabled the company to pay several dividends. The board also intend driving north at the bottom level to prospect the country in that direction, where little work has been done below the No. 5 level. The outlook for the next level (No. 8) is, indeed, highly promising.

## Bendigo and District.

(From Our Correspondent.)

The record of mining operations on the Bendigo goldfield for the first half of the current year makes more satisfactory reading than the statement for the corresponding term in 1912, from a financial point of view. The gold production amounted to 77,500 oz. Dividends totalled £58,578; calls aggregating £52,600. This shows a surplus of £5,900. On closer examination, however, the balance-sheet counteracts the first impression, owing to circumstance of dividends being slightly under that of the same period last year, while the big drop in shareholders' contributions toward the industry is accounted for by the general restriction of developmental work, owing to financial pressure. This necessary step has probably a good deal to do with the falling off in the gold production. At the present juncture, the outlook is brightening, and the indications point to a more active period before the close of the year. Following is a list of the more profitable mines during the term:—

| | | | | Dividends. | | |
|---|---|---|---|---|---|---|
| | Tons. | Oz. | dwt. | £ | s. | d. |
| Central Red, White and Blue, 12s. per share | 13,065 | 6,713 | 6 | 19,200 | 0 | 0 |
| Golden Pyke, 6s. per share .. .. .. .. .. .. | 7,217 | 4,515 | 16 | 8,235 | 0 | 0 |
| Carlisle, 3s. 6d. per share .. .. .. .. .. .. | 9,825 | 3,104 | 12 | 6,300 | 0 | 0 |
| Do., tributers .. .. .. .. .. .. .. .. .. .. | 361 | 177 | 11 | —— | | |
| Virginia., 4s. per share .. .. .. .. .. .. .. | 12,810 | 4,064 | 0 | 5,400 | 0 | 0 |
| North Bendigo, 3s. per share .. .. .. .. .. | 4,530 | 1,920 | 13 | 3,600 | 0 | 0 |
| South New Moon, 2s. per share .. .. .. | 7,591 | 2,965 | 3 | 3,200 | 0 | 0 |
| Do., tributers .. .. .. .. .. .. .. .. .. .. | 1,339 | 757 | 3 | —— | | |
| Windmill Hill, 2s. per share .. .. .. .. .. | 1,713 | 1,671 | 17 | 3,175 | 4 | 0 |
| Great Northern, 2s. per share .. .. .. .. .. | 4,181 | 1,842 | 10 | 3,000 | 0 | 0 |
| New Golden Fleece, 1s. per share .. .. .. | 3,775 | 964 | 9 | 2,000 | 0 | 0 |
| Nell Gwynne, 1s. per share .. .. .. .. .. .. | 3,422 | 1,192 | 14 | 1,400 | 0 | 0 |
| Ironbark, 1s. per share .. .. .. .. .. .. .. | 6,223 | 2,088 | 14 | 1,239 | 13 | 0 |
| United Hustler's and Redan, 6d. per share | 3,941 | 1,779 | 6 | 1,978 | 3 | 0 |
| South Prince of Wales, 6d. per share .. | 1,686 | 605 | 3 | 750 | 0 | 0 |

The Lansell Proprietary Mines.

| | Loads. | Oz. | dwt. |
|---|---|---|---|
| Little No. 180 .. .. .. .. | 12,261 | 4,438 | 11 |
| North Red, White and Blue | 6,347 | 2,614 | 5 |
| Comet .. .. .. .. .. .. .. .. | 1,637 | 658 | 0 |
| Sandhurst .. .. .. .. .. .. .. | 1,418 | 312 | 5 |
| South Red, White and Blue | 267 | 86 | 17 |

The gold production for the week, ending June 28, 1913, amounted to 3147 oz. 12 dwt. The principal producers were: — Central Red, White and Blue, 239 oz. 14 dwt.; South New Moon, 203 oz. 5 dwt.; Golden Pyke, 202 oz. 2 dwt.; Carlisle, 176 oz.; Great Northern, 146 oz. 15 dwt.; Ironbark, 118 oz. 4 dwt.; Virginia, 112 oz. 4 dwt.; Windmill Hill, 112 oz. 2 dwt.; Catherine Reef, 108 oz. 7 dwt.; United Hustler's and Redan, 98 oz. Two dividends, totalling £2250, were announced, viz.:—Virginia, 1s., £1350, total to date, £164,736; Carlisle, 6d., £900, total to date, £317,900.

Golden Age prospects have improved in the top stopes above the 853ft. south level during the past few days, a nice sample of gold showing more freely. The better quality of the stone was reflected in the return of 54 oz. 16 dwt. from 140 tons. These stopes are located at about 200ft. from the Princess Dagmar boundary and 70ft. above the main level. This point is over 80ft. above the "top" fault, where the reef is largest at present. The development is of some importance, as the reef is solid to the boundary for the greater part from 30ft. above this slide. As better results are also expected from stoping over the same break shortly, from the south end of the lease, the outlook is more reassuring. The extraordinary delay in erecting the machinery at the north shaft is giving rise to much adverse comment. The failure to include a time clause in the contract is being taken advantage of to the fullest extent. Directors of local companies state that contractors for this class of work have taken up the position of refusing to accept contracts where there is a prospect of a penalty being enforced in the event of the work not being completed within the stipulated period.

Princess Dagmar high grade yields of the past month are due to the bringing along of a stope immediately behind the 853ft. intermediate level, which traversed rich stone for a few weeks. Stoping nearer the north boundary has been suspended for three weeks, owing to the inability to raise the material till the last connection with the main shaft is placed in working order. The reef is of fair quality in the top stopes, but the middle stopes are in low grade stone. The level is still revealing a few colours of gold, approaching the syncline. During the next few weeks the inverted cap is likely to be traversed as it rises overhead. Later, steps will be taken to keep in touch with the reef in this direction by rising and the extension of intermediate levels. The week's output of 73 tons produced the satisfactory yield of 77 oz. 18 dwt. A steady increase in tonnage is now promised.

Golden Pyke outlook on the outer or tribs' reef at 447ft. has brightened of late, the increased width of 12in. of stone revealing a fair sample of gold in rising. The rise is up over 50ft. and well above the fault where the first favourable indications were observed. After passing through the break, the width of the reef was erratic and prospects were varying. At present there is more evidence of permanency in the shoot, which is estimated as payable. Rising will be continued for the next fortnight, when the company will open out on the stone at a height of about 50ft., with the object of connecting the tributers' old workings. It was the results from these workings, some years ago, that decided the company to resume operations, when they stumbled upon the present productive stone. The most advanced stope on the main reef at 447ft. north is taking 6in. to 9in. of stone with a few colours of gold. Fair gold is visible in the second stope, in 12in. of quartz. In the south stope more gold has lately been disclosed. In the last stages of rising to connect the 543ft. and 443ft. north levels the reef contracted and showed less gold. The extension of the 447ft. level is now looked to, to again expose the richer shoot seen in the rise. Very good gold is the official description of prospects in 2ft. of crushing material in the most advanced north stopes at 543ft. Fair gold is disclosed in the some width of quartz in the first stope north of the No. 1 rise, a few colours showing in the stope south of the No. 2 rise. At 643ft. south level is in 266ft., with 3in. of stone along the hanging wall, the foot wall carrying 18in. of well mineralised reef. The stope not far behind the level is taking 6in. to 2ft. 6in. of stone, containing a few colours of gold. A rise is to be extended from these stopes, at 160ft. south of the shaft, to connect with 543ft. This work should prove of interest, as the latter level showed payable prospects underfoot for some time.

Central Red, White and Blue are meeting with more favourable indications in the north intermediate below the 318ft. main level. Here the company have been operating freely on the spurry quartz allied to the western turnover, where the best results have been obtained for a considerable time. The quality of this irregular quartz has enabled the reservation of the good shoot of stone traversed in the No. 5 winze, further north and more closely associated with the main back. Early in the month the spurs fell off considerably in quality, the gold production consequently reaching the low water mark, as the company were not in a position to draw on the No. 5 winze conveniently. During the past week, however, these western veins have again revealed fair gold, assisting toward the more remunerative return last Saturday. Another factor in this improved result was the draining on the eastern back north of the No. 4 winze. Within the next week or two the company will be able to start stoping, if necessary, from the No. 5 winze. Above 318ft. the reef is of no value at present. At 400ft. the north level is opening up a full face of stone, containing a few colours of gold, at 540ft. from the shaft. The 720ft. saddle reef continues small in driving south, but the north level, at the same depth, on the west leg of the first bedded formation is disclosing the increased width of 3½ft. of quartz, but of low grade. This stone is closely associated with the lavas. Shaft sinking is to be resumed immediately.

Lansell's South Red, White and Blue recently started rising in the western portion of a reef above 437ft., the eastern limits of which had been extensively worked many years since. The last 15ft. of rising was through fair grade ore, up to 4ft. 6in. in thickness. Stopping the rise temporarily, levels were driven on the west leg near the top, and a trial milling of 21 tons put through. This yielded 13 oz. 19 dwt.; a very satisfactory average. The rise will now be continued through to the 337ft. level, and the work of opening up the reef pushed ahead. It is stated that a good length of the west leg and cap stone are available north of the shaft. The same proprietary's Little No. 180, also on the Sheepshead line, had the better return of 166 oz. 14 dwt. for the week.

Great Extended Hustler's unexpectedly uncovered payable stone in the 1053ft. east crosscut on Saturday. The quartz is allied to an eastback, a considerable distance west of the formation for which the company are crosscutting. The gold is of a fine character, but well distributed through the 12in. to 20in. of stone opened up so far. A more detailed description of the formation will be possible on inspection during the ensuing week.

## Lauriston and Malmsbury.

(From Our Correspondent.)

After a considerable wait, another crushing has been put through the Government battery (late No. 1, South Russell's) at Lauriston from the Lloyd's A1 Syndicate. It was quite up to the previous averages, 15 tons of stone yielding 45 oz. gold. It is felt that a lot of fine gold was lost through defective gold-saving appliances. So far, over £1500 has been won from the mine. On Monday week a full meeting was held of the syndicate, with Cr. J. G. Spain in the chair. It was then decided to float the two leases held by the syndicate into one company. Messrs. M. Hanrahan (secretary) and F. Lloyd (manager) visited Melbourne and displayed some of the fine specimens taken from the mine. It was also resolved to declare a fourth dividend. The main reason prompting the flotation is the necessity of purchasing a plant to develop the mine more rapidly. The outlook is such, that the present operations would pay for a considerable time, but it is felt that a larger policy would better suit both the owners and the district generally.

What should prove another stimulus to Lauriston is the decision to begin operations again at the McCracken's Freehold shaft. The old Energetic engine-house has been shifted to the site, which is within 400ft. of the Royal Standard lead, and is the most suitable site for a slum storage accommodation. Buildings and poppet legs are in course of erection, and the boiler has been landed at the mine. Necessary machinery has also been purchased. As the old drive from the McCracken shaft to the gutter was found to be 14ft. above the wash, and economical working from that point was impossible, it is intended to open out 60ft. deeper in order to tap the wash 40ft. above the level, and then drive down the lead in the direction of Boggy Creek. By this course it is hoped to intersect the Perseverance, Star, and other known leads, and so open up a large tract of country. As the deeper level drive should cut all the combs of the slate rock at right angles, it is expected that reefs will be disclosed in addition to the alluvial gutters. The operations will be carried on under the name of the Standard-Glengonna Company.

At Drummond the Galatea mine will shortly be in full swing again. The boiler and winch have been landed, while the poppet legs have been erected.

The North Hanover mine also reports having struck a rich-looking reef, 2ft. wide and solid.

The main Hanover mine has been unwatered, and the winze has been connected with the rise. It has been decided to start driving on the formation.

The latest official report from the Malmsbury Alluvial Mine is that the main reef drive has been put out to 353ft. Face bars slate and sandstone, and water easy. The face is now 130ft. from No. 1 bore. After driving another 40ft. a bore will be put up to reach the gutter. This should be finished this week. Air pipes and blower are being fixed. At the last half-yearly meeting, held in the previous week, the Hon. D. McLeod, M.L.A., presided. In moving the adoption of the reports and balance-sheet, he said the work had been continued without a hitch. The shaft sinking was begun in January of last year. He described the present condition of the workings, as reported above. The 14in. lift was ready, and was expected to be able to cope with any extra flow of water from the bore. Puddlers were also about to be erected. There were some unnecessary parts in the plant that were purchased by the company, and they are to be sold. By this means about £400 will be raised.

### Maldon.

(From Our Correspondent.)

South German Company has started to drive the intermediate level north off the bottom of the winze below the 1750ft. level, the stone on the east wall being small, and valueless. Two of the tribute parties cleaned up, as follows:—Grigg and party, 154 tons, 49 oz. 12 dwt.; Buzza and party, 57 tons, 14 oz. 10 dwt., with sand and pyrites yet to treat. The remainder of the tributers are crushing.

The developments at the New Day Dawn mine have continued favourable during the past week. The lode north-west of the shaft has been sunk on for 10ft. It is 2ft. wide, and prospects show highly payable gold in it. A level is now being cut out from the main shaft at a depth of 90ft., in order to intersect this new find. The eastern crosscut at 90ft. has been extended to 31ft., and gold-bearing leaders are showing in the face. The mission of this drive is to cut the lode met with on the surface south-east of the main shaft.

Blow Reef (Newstead) is making preparations to put the main shaft down from 300ft. to 380ft. Some repairs have been made to the engine, and sinking will begin during the present week.

---

A line of bores is being sunk by the Mines Department two miles eastward of the Hope group of mines in the Beaufort district, with the object of ascertaining the downstream trend of lead. It is necessary at the locality being tested to locate the exact position of the lead under a basaltic plain about two miles and a half wide. A telegram received by the Mines Department states that the fourth bore has bottomed at 280ft. deep, with 6ft. of wash, containing fine colours of gold. Several additional bores will be necessary to obtain full information.

---

## MINING IN WESTERN AUSTRALIA

(From Our Correspondent.)

Kalgoorlie, June 23.

The ore reserves of the Golden Horseshoe on December 31, 1912, were only 799,800 short tons, valued at 30s. 4d. per ton, against 900,800 short tons, worth 28s. 7d. per ton, a year previously. The tonnage has declined by 101,000 tons, but the grade has improved by 1s. 9d. per ton. The amount of ore treated during the period was 317,370 short tons, against which £45,597 were expended on new development, or 2s. 10d. per ton crushed and written off. Although development is being pushed ahead down to the 2780ft. level, no ore has been taken into account below 2000ft. for No. 2 lode, which accounts for 329,860 tons of the ore reserves, and none below 2120ft. for No. 3 lode, which provides another 437,750 tons. No ore has been taken into account below 900ft. for No. 4 lode, on which a vast amount of development in exceptionally rich ore has been done during the last 18 months at the three lowest levels, chiefly from the Great Boulder Proprietary's Edwards shaft. The chairman, at the recently held annual meeting, foretold an early return of the company to the dividend list, with a probable first distribution of 5s. per share, or £75,000, to be paid within two or three months. As the company's net liquid assets, including gold in transit, on December 31, 1912, only amounted to £25,700, and the net profit since has been £16,280, the payment of a dividend will be cutting things rather fine. However, both directors and shareholders have rightly every confidence in Mr. J. Sutherland's management of the mine, and the Board must be acting on his advice.

On the Victorious, at Ora Banda, the plat at the No. 5 level has been completed, and is 24ft. long towards the lode. The crosscut south has some 20ft. to 30ft. to go to cut the lode, and may reach it at any time. As the four winzes sunk vary in depth from 45ft. to 68ft., and carry good values at the bottom, Mr. G. M. Roberts is strongly of opinion that No. 5 level will prove satisfactory. The Government 5-head mill at Ora Banda was opened by the Governor, Sir Harry Barron, on Wednesday, and has already started to work off arrears. It is marvellous how prospectors, who have been urging the erection of a Government mill for the last three years, lost all their enthusiasm once the mill started, and each tried to push his neighbour forward to crush first. The fact is that the Ora Banda lodes, near the surface, are very low grade, and none of the crushings is likely to exceed 20s. per ton, or about the same average as the Victorious showed in the oxidised zone. As the gold is very fine, and the Government has no slimes plant, the results are certain to be disappointing. Luckily for the district, Mr. G. M. Roberts has proved that the sulphide zone shows a marked improvement, and this confirms what the Oroya Links demonstrated during their option on the Slippery Gimlet in 1911, that the sulphide is better than the oxidised.

A year ago Mr. J. D. O'Brien, one of the Melbourne directors of the Augusta mine at Laverton, reported, after a brief visit to the mine, that there was plenty of gold-bearing stone to keep 20 stamps going, also a splendid water supply. Since then, an entirely new head-gear, winder and 10 stamps of 1250lb., with a capacity of 1800 tons a month, have been installed. For quite six months the stamps have lain idle, but Mr. J. C. Cray, the manager, who, a few months ago, was very voluble regarding the future potentialities of the mine, is now, and has been for months, as dumb as an oyster. Over a dozen years ago the mine was worked by the Menzies Golden Rhine Co., and abandoned for the Ida H., and the name of the company altered to the latter. The Augusta was then worked, from 1905 to 1910, by a small local syndicate, who won £58,000 from 13,000 tons, and paid £18,200 in dividends. The syndicate then ceased work, and the mine was dismantled for the second time, and lay idle till January, 1912, when it was floated in Melbourne. The new company has a nominal capital of £60,000 in £1 shares. Of this number 20,000 were offered for public subscription, and the vendors received 12,000 fully paid shares and 20,000 paid up to 10s., with a promise of £2000 from gold won. So far they have got nothing but waste paper, and are unlikely to ever get anything.

Another mine in the same district is the Mary Mac, also a Melbourne flotation, which took over a property previously known as the Lady Harriet. This mine, under the management of Mr. J. M. Potter, was equipped with a head gear, winder and producer gas engine and mill, and was to mine and treat ore at 12s. per ton. So far nothing has eventuated, and no information is available. Mr. Potter put inclusive costs at 12s. per ton, and shareholders may yet get a good run for their money; but local residents appear to be very sceptical. The treatment plant is still idle, and no official information is forthcoming, although treatment was supposed to start fully six months ago. Before putting their money into mining ventures Melbourne speculators should get reliable information from those on the spot.

The Ida H. mine, also at Laverton, is nearing the end of its tether. Two years ago Mr. R. A. Varden, of Hooper, Speak and Co., got control of the mine, and ousted Mr. Campbell Shaw, who had successfully controlled affairs since the mine's flotation in 1900. Mr. Varden saw possibilities in the property that no one, not even Government officials, could see, and promised quarterly dividends of 3d. per share. One such dividend was paid in October, 1911, and was the first and last that the company will ever pay. Mr. Varden, representing the controlling managers, appointed Mr. D. W. Welch to take charge of the mine, but the latter resigned in April, 1912, in favour of Mr. B. Overman, the metallurgist of the company. After twelve months Mr. Overman resigned in favour of Mr. Blayney, and the May return, under the latter's management, showed a loss of £177. The pay shoot on the property pitches north, and becomes very narrow, and the mine is now doomed. This has been known to the initiated for years, as the north block was thoroughly tested by the old Shamrock Co., a London organisation, before the Golden Rhine Co. bought the property.

---

## TONGKAH COMPOUND CO.

There was a fair attendance of shareholders at the half-yearly general meeting of shareholders of the Tongkah Compound, Puket, Siam, which was held at 395 Collins-street, Melbourne, on 23rd ult. Mr. J. S. Meagher presided in the absence of the chairman of directors, Mr. W. Peacock, who is in Siam in the interests of the company.

The chairman, in moving the adoption of the reports and balance-sheet for the half-year, pointed to the highly satisfactory profit—£50,000—made. He claimed it would be necessary, in order to equal the result, to go back to the palmy days of mining in Victoria. In the opinion of the mine manager, good yields should continue, as the ground ahead had been bored and prospected, and had yielded good values. Speaking on working profits and costs, the chairman said the average price received for the product now was £127 per ton, while costs only amounted to £16 per ton, so that the price of tin would have to fall considerably before profits would be jeopardised. Mr. W. Peacock's negotiations in Siam had been delayed by the decease of the High Commissioner for Siam. He was not yet in a position to announce the result of Mr. Peacock's work, but he was sure it would result in the acquisition of other profitable tin bearing properties.

The chairman intimated that an important cable had been received to the effect that the amount of the company's deposit in the hands of the Siamese Government would be sufficient to cover the cost of repairing roads and bridges and restoring the ground treated. He also explained that the increase in the number of shares in the company from 49,600 shares to 50,000 shares was due to Mr. J. S. Henry, former general manager, exercising an option of purchase at par over 400 shares. The company now had a balance in hand of £18,000.

That Eastern investors had confidence in the prospects of the company was manifest, owing to the drift of shares from Australia to the East. Some nine months ago the investments of Eastern shareholders was represented by one "small lot," now they purchased freely, and it was estimated that Eastern merchants and investors held fully one-fifth of the total share capital. As an Australian, he was not too glad of it, but it showed what the people on the field thought of the value of the property.

The reports and balance-sheet were adopted.

---

## THE COAL MINING INDUSTRY.

### New South Wales.

### Northern District.

(From Our Newcastle Correspondent.)

As mentioned recently in the columns of the "Mining Standard," the Abermain Colliery Company, which owns one of the largest mines on the South Maitland field, and is now developing another large colliery, has come to a decision not to work the afternoon shift after about September next. This means that other collieries will have to fall into line, for, otherwise, the mines that work two shifts would gradually find their men deserting them, and going to the pits where they would have to work but one shift. At a meeting of the Abermain Company, held in Sydney this week, the report for the twelve months, ended the 30th April, showed that the net profit for that period had been £24,628, which, with £12,269 brought forward, less £8500 paid in dividends in June, 1912, made £28,397. Out of this amount an interim dividend of 10 per cent., and a bonus of 2½ per cent., paid in November, amounting to £11,875. The sum of £3500 had been added to the reserve fund, leaving an undivided balance of £13,022, out of which it was proposed to pay a dividend at the rate of 10 per cent. for the six months ended the 30th April. The report stated that the trade for the period under review had been brisk, and the demand for Maitland coal was such that there was every prospect of its continuing good for the remainder of the present year.

The Caledonian Coal Company has purchased the property in the South Maitland field known as Abernethy Main, of 2600 acres, which was offered some four years ago to the South Australian Government, but was not taken up. The Caledonian Company intends to develop the property, and a shaft is already down 200ft. The depth to the coal is 1344ft., and the new colliery will be by far the deepest in Australia. There are three fine seams of coal, and the purchase of the property gives the company an area of 11,000 acres of some of the best coal land in the Commonwealth. It is almost certain that the company will soon begin the construction of a line from Cessnock—near which their property is situated—across country and through a mountain, to connect with the line running to their Killingworth property, in the Newcastle district. This will be a big undertaking, as the tunnel through the mountain will be about three-quarters of a mile long. However, it will shorten the haulage of coal from Cessnock to Newcastle by about 11 miles, and will soon pay for itself. There is also a prospect that the Caledonian Company will acquire an interest in Neath Colliery, close to Cessnock, and thus the railway will handle the output of four large mines from the day it is completed, with the probability of Bellbird and other mines sending their coal over the same line.

A wave of industrial unrest has swept over the Newcastle and Maitland districts during the past week, and on one day as many as six pits were idle, the total number of employes therein being about 2000. At Stanford Merthyr, in the Maitland district, the men are claiming the right to half an hour for "crib" time during each shift. The miners, of course, have time for their meal; but the other workers say that they have no regular time, and that on some shifts they get no chance to eat. On the other hand, the manager says that there is broken time in each shift, and that the men have plenty of time to eat their meal. The trouble has been brewing for some time, and this week the men took time on one shift, and the management then stopped work at the mine. When the next shift went on, the same thing occurred, and since then the men have refused to work through the eight hours unless the management consents to them having half an hour off. The management will not give way, and the colliery consequently lost several shifts. The men claim that they are locked out, and the management says they are on strike. At four other pits trouble arose in different ways with the wheelers, and the latter seem to be endeavouring to give the public the further proof of the truth of Justice Heydon's words, in the Arbitration Court last week, when he said that the miners were an "unruly and an ungovernable lot of men." The officers have tried to get the men to work, but in some cases were flouted. Probably an injunction will be taken against the officers of the any mine that offends in this way in future, and thus the law will be invoked to prevent a state of affairs that at times becomes intolerable. In the case of the Pelaw Main officers, an application was made yesterday for the setting aside of the injunction granted against them; but his Honor, Mr. Justice Heydon, refused to grant the application at that stage, as he said he could not see how the men were harmed by the injunction. The only thing they could not do was to break the law, and unionists could not do that any more than other persons could.

Application was made to the Arbitration Court last week for a Wages Board to deal with all employees in the coal-mining industry of the Newcastle and Maitland districts, with the exception of a few persons such as deputies, shotfirers, engine-drivers, etc. The application was adjourned, in order that certain affidavits might be filed by the Colliery Employes' Federation, which made the application. When the matter came before the Court again the application was granted, and one representative was appointed from the miners and one from the employers. The chairman has not yet been appointed, but there is a probability that the work will be taken up by Mr. C. Hibble, barrister-at-law, who was chairman of the Joint Conciliation, and who has had much experience in mining matters in the two districts named.

---

A deputation representing the Hunter River District Colliery Proprietors' Defence Association, waited upon the New South Wales Chief Commissioner for Railways last week, and preferred a request for a reduction in the haulage rates for coal. The Chief Commissioner pointed out that owing to the increased expense that he was called upon to bear, he was compelled to recommend to the Government that certain rates and fares should be raised in order to obtain additional revenue, and in view of the circumstances he could not see his way to entertain the request. On reply to a request for additional facilities for handling the coal traffic at Newcastle he promised that he would provide an additional crane at the inner basin when funds were available for the purpose. He had already forwarded particulars to the Agent-General in London, so that there would be no delay when the money was voted.

## Southern District.

(From Our Wollongong Correspondent.)

Brisk demand for southern coal continues; the only drawbacks to the trade are the continued inclement weather and the insufficiency of the railway service.

Such a period of wet weather as has prevailed here of late causes trouble in the way of land slips on the face of the range, on which are outlets of the mines. Within the past 30 years they who have known say there have been considerable changes on the range side. Certain strata are the most liable to break away when soaked. Mt. Pleasant and Corrimal Balgownie collieries, which have lines of rails traversing the face of the range, have had some trouble to keep the lines clear.

The current award (wages) of the southern collieries expires on August 10th, and there is much interest in the question of what the terms of the next agreement are likely to be. Colliery managers express the hope that they will be relieved from the more harassing of the conditions of the present. The proprietors will certainly make a big effort to get another deficiency place rule instead of the present, which makes any place deficient in which any kind of workman cannot make 11s. a day. The present deficiency place award was made by Judge Scholes. He described it as the best which could be thought of just then, but a better might be got later on. The proprietors regard the principle in operation in these deficiency place adjustments as not a fair deal for them, inasmuch as, while no allowance is made to them for the good places in which high wages are made, they have to make up the other kind to a wage of 11s.

At a meeting during the week of the Progress Association, Mr. R. Wragg, C.E., read a paper advocating the utilising of the water supply for the generation of electric current. It was stated sufficient power could be developed to light the town and drive trams, also operate a stone crushing machine in a quarry, and supply power for running the stone out on to the road. At present the water supply is in the hands of the Public Works Department, which officially is much indisposed to troubling itself about utilising water supplies as suggested, but should the idea reach the enterprising Minister for Works he might launch a scheme here of supplying motor power.

Mr. Blomfield, lately the district engineer, said at a public function the other evening that the present water supply would soon be inadequate for the district. His idea is that the district should secure a portion for its own use of the metropolitan catchment area. By removing the Consumptives' Home at Waterfall, he says, a considerable addition could be made to the catchment area. The question is certainly a factor in the industrial prospects of the district.

## Western District.

(From Our Lithgow Correspondent.)

There is some excitement over developments at Curlewis, in the Dunedoo district, about 200 miles from Lithgow, and the residents are clamouring for a railway from Gilgandra to Curlewis, so that the coal may be got conveniently to a market. The New South Wales Public Works Committee has already gone over the proposed route of railway and taken evidence. The manager quoted figures which he claimed showed that the Lithgow coal was poor compared with the North-Western coal, which he declared to be equal to Newcastle coal for steaming. He also declared that the Railway Commissioners paid from 2s. to 2s. 6d. per ton more for the Curlewis coal than for that supplied at Lithgow.

A shortage of trucks has again been felt at the Lithgow collieries during the past fortnight, this being particularly the case at the Vale of Clwydd colliery, where the men went down to work on ten days, but full time was only worked in isolated cases. During the last three days only half time was worked. At the Great Zigzag colliery ten partial days were worked, but 10½ days were recorded at the Great Cobar mine, half a shift off the "possible." Oakey Park mine worked nine days, as also did the Lithgow and Hermitage collieries. At the Invincible colliery, Cullen Bullen, only 8½ days were worked, one day being lost through a shortage of trucks, and one through a holiday. Colliery managers report that the truck supply has been so irregular that the men, instead of going in to the mines, are now beginning to wait until they see a sufficient number of trucks to hand, and, when that is not the case, go to their homes again. The various collieries have been much disorganised in consequence of this deficiency, which has affected their trade during the week or so, as well as the earnings of the men, very seriously. There is a great deal of dissatisfaction among the colliery employees generally at the continued inability of the department to render a full supply of trucks. As an illustration of the trouble, it may be mentioned that on Thursday morning, at the Lithgow and Hermitage pits, the men were waiting in the mine about two hours, as trucks had been promised at half-past nine. Up to 10 o'clock, however, only a few trucks had come to hand, and, seeing the situation, about two-thirds of the Hermitage men refused to go in to work. The position is very bad for both owners and men. It is stated that the whole trouble would be removed if the department could bring the empties into Lithgow about three hours earlier than is the general experience.

## Victoria.

### Powlett River District.

(From Our Wonthaggi Correspondent.)

Work in the State mine has continued without interruption for the past fortnight, but owing to the men who were put off not having been reinstated up to the present there has been a general feeling of uneasiness that another stoppage might take place at any time.

During the past week the officers of the V.C.M.A. have been conferring with Mr. Broome on the new working agreement which is to come into force as soon as possible. The draft agreement, as submitted by the men for Mr. Broome's acceptance, contained proposals for increased filling and hewing rates, and also increases on some of the shift rates. So far no finality has been reached, and the conference will be continued this week. A new proposal has been put forward by the representatives of the men, and is being favourably considered by Mr. Broome. It is that a fixed and set rate shall be paid for all pick work and also for all filling throughout the mine. That is to say that the minimum height of the seam shall be agreed on, and so much per ton shall be paid for that height for cutting the coal with the picks. The same method shall be adopted for fixing the height and price to be paid per ton for filling the coal cut by the coal cutting machines. This, followed out to its logical conclusion, means that a little more will be paid for places where the coal is easily got and a little less for the hard places. Of course, under such an arrangement there would be no minimum rate of pay guaranteed, as there has been in some instances in the past. At the present time there are different rates in each pit, and a uniform rate would, if practical, simplify matters. The great argument against the proposal is that when a cavil for places is drawn those who get the good places will be satisfied, as they will be able to earn good pay. On the other hand, those who draw the hard, or, what are termed bad places, will be inclined to grumble, and it is quite on the cards that some of them would not work the places they drew. This side of the question was put before the union officials, and they said they were prepared to guarantee that if their proposal was accepted that the hard places would be worked.

A special meeting of the men was held on Sunday, at which the officers reported on the stage negotiations had reached, and asked for power to settle with Mr. Broome. The request was granted, and it was decided to hold a special meeting on Saturday, when the officers will report on the result of their further negotiations. It is thought that a satisfactory agreement will now be arranged without any serious result. The only disturbing element that has appeared so far to stop this is the wheelers, who are demanding an increase of 1s. per shift in their pay, which they are not likely to get. The meeting decided to make further efforts to secure the appointment of an Appeal Board when Parliament meets.

---

## COMMONWEALTH OIL CORPORATION.

### Duty on Crude Oil Asked For.

(From Our Lithgow Correspondent.)

Lithgow (N.S.W.), June 27.

In a recent communication to the Federal authorities, Mr. E. P. Simpson, attorney to the Commonwealth Oil Corporation, explained that for years the Corporation had been making a steady effort to establish in the Commonwealth of Australia an industry for the manufacture of refined and crude oil, together with all other by-products resulting from the treatment of shale, including the manufacture of candles, wax-cake, etc. As indicating the magnitude of the company's operations, it was pointed out that the total expenditure upon property and various works approximated to £1,303,305. Of that sum over £658,945 had been expended upon machinery and plant, all of which had to be imported for the reason that it could not be satisfactorily procured within the four corners of the Commonwealth. The duty payable to the Federal Government on those importations alone amounted to the considerable sum of £22,000, while the expenditure on labour amounted to £633,093. As against that heavy outlay, the Corporation has received only the paltry sum of £5558 as its share of the bonus under the Bounty Bill.

Mr. Simpson further showed that, although the Corporation had been producing refined and other oils for a number of years, and had also to some extent exported good quality shade, its position had gradually drifted from bad to worse, and heavy losses had annually been made upon operations, with the result that the Corporation now stood in the receiver's hands; with small prospects of making the company's affairs a success, unless something is done to help the industry. The average number of men employed at the Corporation's numerous works during the past four years was about 800. This number would, of course, be gradually increased if operations could be placed on a payable footing.

The Corporation has now arrived at a stage at which a reasonable tariff or bonus on crude oil, coupled with the allocation of Government contracts in support of the local producers, is necessary to establish the business on a healthy basis. It was pointed out that if anything was to be done, it should be done at once, because those who had embarked enormous capital in the business, without so far receiving one penny in return, were, naturally, disinclined to increase their contributions. Nothing short of an indication of a desire on the part of the Government to grant substantial aid in the way of fostering the industry would induce shareholders to sink that extra capital in the concern without which it was impossible to carry on the industry.

# THE SOUTH ISLAND OF NEW ZEALAND.

## The Black Sand Beaches.

By G. W. Eaton Turner, A.O.S.M.

From the earliest days of gold-mining on the west coast of the South Island of New Zealand to the present time, gold in greater or less quantities has been obtained from the black sand leads which thread the ocean beaches. For the most part, this gold has been won by small parties of miners, who sank holes in the sands back from the high water mark until the lead sought for was reached, or until inflowing water, overwhelming the small pumps used, rendered greater depth unattainable; or by solitary "fossickers," who, after heavy storms, sallied forth, armed with shovel and copper plate, to skim the black sand layers formed by the concentrating action of the retreating waves. In these ways an extraordinary, though unrecorded quantity of gold has been obtained, in evidence whereof may be cited the instance of the Five Mile Beach at Okarito, South Westland, where it is on record that gold to the value of £850,000 was won during the years 1865-1866.

The early history of organised effort to work the leads, which along hundreds of miles of the coastline lie just above and beyond the tide limit, is obscure; and information which would throw light on the matter is meagre. No attempt, therefore, will be made to look back further than the year 1888, which seems to have witnessed a serious awakening of interest in the possibilities of these deposits. Authentic written data as to the values of the various beaches attacked are in most cases wanting, but a vast quantity of boring and prospecting was done, particularly on the Okarito claims. On the results obtained reputable engineers advised the erection of expensive machinery to work many of these deposits.

Omitting on the one hand the deposits formed daily on the active existing beaches, which, from their nature, are totally unsuited for being worked on a large scale, and on the other that older and more elevated black sand lead, which, wherever found has been practically worked out, it is proposed to deal exclusively with those deposits lying immediately inland from and above the tide level.

Geologically, these leads are of recent and late Pleistocene origin, the high level gravels and sands of marine deposition, which, notably near Charleston, occupy positions up to 600ft. above sea level, belonging to Pliocene and early Pleistocene times. In these regions the Pliocene era was characterised by extraordinary elevation, which, prolonged into early Pleistocene times, brought about extreme glacial conditions, a considerable portion of the island being covered with a field of ice to the water's edge. Following this in middle Pleistocene days came depressions with enormous activity of innumerable rivers and streams, which, aided by the glacial erosion in their irresistible flight seaward, cut through the elevated marine and fluviatile gravels of the Pliocene epoch. It is to this source that much of the gold in the recent beaches must be attributed, for, once free from the rush of the rivers, the sea took the auriferous gravels, ground and washed, re-ground and re-washed them, finally, during the period of slight elevation which followed, to leave the concentrated black sand with its associated gold spread out at the foot of the terraces which to this day mark the limit of the Pleistocene erosion.

Later, as the sea receded, these leads became covered with lighter grey sands, partly sea borne and partly blown further by the strong westerly winds; thus it is now general to find one or more ridges of æolian drift, which, like the sides of giant furrows, run parallel with the coast line. Between these drifts and the bounding terraces are often swampy depressions, which possibly at one time served as back-waters for some of the many rivers of this mountainous region.

The dimensions of the deposit vary greatly in different localities, its depth being the most constant, averaging usually from 15ft. to 25ft. The width is governed by the nature of the country forming the inland boundary, being most narrow where rocky headlands front the sea, widening out as the formation changes from rock to gravel, and generally attaining its maximum where rivers or glaciers have cut through the terrace lands to the sea. In such places the margin of the marine deposit is ill defined where it merges with the fluviatile or morainic debris.

The black sand is usually extremely fine and is composed inter alia of magnetite and ilmenite crystals and fine garnets derived from the disintegration of the metamorphic rocks principally chlorite schists, a belt of which flanks the western side of the dividing range. This fineness is even more marked in the gold particles, which are so minute that, according to one authority (T. A. Rickard), 6000 of them only aggregate one grain in weight. This may be hard to credit, but so fine are they that the writer has found, when streaming down concentrates from sluicing, that the splash of the water has carried the gold through baize, two thicknesses of calico, and a sack, only staying on the boards beneath, whence it was subsequently scraped with a knife. In fact, wherever water will go this fine gold will follow, a circumstance which calls for the utmost care in the construction of sluice boxes, tables, etc. Indeed, it often pays to burn old boxes and paving blocks and pan off the ashes.

Much of this gold is free and amalgamable, a certain percentage, however, owing to being coated with a film of iron oxide, resists this method of arrest. Some particles, moreover, are probably entirely occluded in the magnetic sand. Samples of residues after streaming down showed on assay values varying from £8 to £20 per ton, whilst dry blowings from the material caught in streaming, though showing no gold visible under a magnifying glass, gave enormous assay results. (Prize Essay, N.Z. Exhibition, 1906. J. Williams).

Owing to the continuous grinding to which it was subjected before being finally left beyond the wash of the waves, the gold is mostly of a flaky nature, and since it thus presents a large surface—in proportion to its mass—to the water, it has a tendency to float, which greatly increases the difficulty of saving it by ordinary means. In size the particles vary from occasional small discs ⅛in. to ¼in. in diameter, but of incredible thinness to an impalpable flour-like dust, which has the pleasing knack of floating on the surface after exposure to the air.

From the foregoing it will be evident that the problem of arresting the gold is by no means simple. Indeed, no matter how careful the washing or extensive the gold-saving area, if the tail race was a hundred miles in length it is not too much to say that careful scrutiny would reveal some gold passing over the end of it. Yet, notwithstanding this difficulty, it is amazing to see the crudity of many of the saving arrangements still in use, and harrowing to think of the wealth which yearly finds its way over the tail races of our claims.

Numerous concrete instances might be given by a less cautious critic, but one example must suffice to throw a glaring sidelight on this question. Some years ago the engineer to the Humphries Gully Sluicing Company installed a series of gold-saving tables, designed to give width rather than length, over which the tailings, previously run to waste from the sluice boxes, were passed. On cleaning up it was found that 27 per cent. of the total gold recovered was caught on these tables. The moral is obvious and comment surely needless.

In the process of working these beach leads, where large quantities must be put through to insure profit, three main problems confront the engineer:—

1. The elevation of the material.
2. Treatment of the sands.
3. Disposal of the tailings.

### 1.—The Elevation of the Material.

From 1888, when first an organised attempt to work on a large scale seems to have been made, several different schemes, all apparently promising, have been tried to meet this problem. Indeed, it would appear that more attention was paid to the solution of this difficulty than to the equally important one of saving the gold once in a position to treat it. Without entering into details of the machinery employed, it may be said that they partook of one of the following forms, dependent on local conditions and the individual fancy of the engineer:—

1. Dredges.—(a) Suction pump.
   (b) Bucket and ladder.
2. Hydraulic elevators.

Under the first heading may be quoted the Waipapa dredge in Otago, which was fitted with a sand pump of the Wellman type, and the bucket dredge still at work on the North Beach at Greymouth, both of which were successful. Abortive attempts to work provedly payable leads by similar appliances were made at the Five Mile and Three Mile and Saltwater Beaches at Okarito, at Hokitika, at the Paroa Beach, south of Greymouth, and at several other places along the coast; and their failure in nearly every instance may be traced, not to the poverty of the ground, but to the unsuitability of the machines, often wonderfully and fearfully constructed, and fitted with elaborate mechanical appliances too delicate or too complicated to withstand the rough handling of working conditions. The suction pumps were speedily worn out by the sand, and under the great friction ran hot, and were eventually found to be inefficient for raising gold under water: for at the Saltwater, when, having lost the nozzle in submerged timber the paddock was drained, it was found that the dredge had left solid pillars behind her, at the foot of which gold, thrown back by the boil of the suction, had lodged instead of entering the pipe.

Bucket dredges, admirably designed on the best practice of river dredging, to lift from 60 to 100 yards per hour, also failed to make good, principally owing to the inadequacy of the water supply for washing purposes, the crudity of the gold-saving devices, and sometimes, alas! to over-capitalisation, incompetent management, or both.

Where hydraulic elevating has been employed and the capital involved has been kept within reasonable limits, satisfactory and sometimes highly payable results have been and are obtained, notably at Barrytown and on the Charleston leads. This method, when practicable, must be regarded as the ideal one, since it ensures a permanent and plentiful water supply—the sine qua non of fine gold saving. The initial capital expenditure in bringing in high level water races is often considerable, even in localities well favoured; but in such cases, where extensive beaches can be commanded, the interest on such outlay could be more than paid by the annual charges for fuel, labour, and repairs inevitable under steam work; and it is the writer's opinion that excellent opportunities exist to profitably bring in water at high pressure to many beaches at present lying idle.[‡]

Recently another sand pump well proven in Australia and elsewhere has been introduced on this field, and has so far proved admirably suited to the handling of this class of material. One of these machines, an 8in. centrifugal pump driven by a 14 n.h.p. portable, has opened out a paddock of 20,000 cubic yards content, and shows hardly a sign of wear. The total height to which the material was lifted was 38ft. 6in., of which 16ft. 6in. was draw lift—a severe task for any sand pump. Its unforced capacity was 20 yards per hour of solid, with about 8 times as much water.

### 2.—Treatment of the Material.

This problem is one to which but too little attention in many cases has been paid, the few instances where it has been studied and met only serving to accentuate the deplorable carelessness in the greater number. The cast iron conservatism with which miners and dredgemasters were wont to adhere to the tenet that length in a sluice box or table was the chief desideratum is remarkable, and that it should have been held in beach mining, where the gold is all fine, more so. On river dredges, where some of the gold is coarse and room limited, it can be understood why in making provision to save such, the chances of arresting the fine at the expense of the mechanical efficiency of the machine were abandoned to luck; but beach work calls for very different methods.

It is in the Charleston and Barrytown district that fine gold saving has been most extensively and successfully studied, and the two essentials as provided there are a plenitude of water and a wide spread of tables. Space forbids an elaborate description of the tables used (in the Mines Report of N.Z. Govt. for 1902 elaborate drawings and descriptions are given), but in brief the method of treatment is as follows:—The fine sands having passed through the hopper plates are led by ducts to the tables. The pulp falls on to a flat V-shaped distributing board, leaving which it encounters a shallow well with a central baffle board, under which the sand "boils" before passing to the table proper. This table is commonly 8ft. wide and 7ft. or more in length, and is divided into transverse sections by boil boxes similar to those mentioned above, placed, say, 2ft. apart. Each section is divided longitudinally into two, and then covered with plush, the whole section having a fall of from 1½in. to 2½in. per foot, whilst a fall of 1in. is allowed between the top and bottom lip of each boil box, which is usually 5in. wide and deep. Additional water is added to the sands if necessary before admittance to the tables to allow of the whole being spread out in as thin a film as possible over the catching surface. The function of the boil box is to break up the flow of the sand, it having been proved that after travelling a short distance the pulp settles into definite strata, which prevent the fine gold coming into contact with the plush. These tables, which are so arranged as to permit of adjustment of fall to suit the varying conditions of material and water which may arise, have proved very efficient in saving fine gold, and are outstandingly the most economical and simple contrivances yet introduced for that purpose. The number of tables required is, of course, governed by the nature and quantity of the material to be treated and the water available—the main object being to spread the sand in thin layers and to several times disturb its flow.

At the Montezuma Claim, Hokitika, where it is proposed to treat 30 yards solid per hour, lifting the sand by a centrifugal sand pump, a superficial area of 400ft on 8 tables each 8ft. wide is being provided, and a second pump installed to pump water for sluicing and washing purposes. At Barrytown there are 24 tables 8ft. wide, treating from 50 to 60 cubic yards hourly: the water supply in this instance is abundant, and brought in by gravitation.

---

[‡] Such an opportunity probably exists at Okarito. There, 2½ miles from the coast, Lake Alpine, with an area of 168 acres and at an elevation of 310ft. above sea level, could be utilised for this purpose, and supply power to several claims.

### 3.—Disposal of the Tailings.

This constitutes the third main problem, failure to solve which has brought wreck to many an otherwise promising venture. At the Saltwater lagoon at Okarito, and at the Three Miles claim, the short-sighted sufficient-unto-the-day policy of dumping behind the dredge, resulted all too soon in the spoil under-running the pontoons, a disaster from which the vessels never recovered, for they sank on the scene of their fruitless labours.

With the old types of pump used, sufficient height could not always be obtained to give storage room for the spoil, which therefore had either to be dumped behind—with the inevitable result recorded—or further elevated by additional machinery provided for that purpose, involving expense which in many cases the proposition was but ill suited to bear.

Pumps of later design, however, make this difficulty less prominent, since force lifts of 50ft. to 90ft. are quite possible, if expensive. Where water is plentiful, therefore, the tailings could be run permanently out of the way to sea, as was done by the Waipapa dredge; where, however, this essential commodity is not abundant, and conservation of the available supply is a vital necessity, special arrangements must be made, either by damming the spoil behind the dredge, or back from the working face, where dry dredging is resorted to. This or the alternative of making a tailings dam away from the paddock from which the water is drained back in a ditch or flume.

At the present time a keen revival of interest in this form of mining is manifest. A new company at Charleston, another at Hokitika, are preparing to once more attack beaches long known to carry excellent gold. From north to south most of the proved ground has been again taken up, it being confidently thought that, with the advances made in recent years in fine gold saving, and the improved machinery available, the day when these beaches will be forced to yield their long held treasure is at hand.

That the gold lies there to be won is certain; that it will be won to-day or to-morrow year is equally sure, but the enterprises which shall be embarked upon must be captained by men honest to admit the difficulties besetting each individual case, trained to overcome them, and fearless to recognise the impossible. The gold is there to be won, and will be won when experience, common-sense, and honesty go hand in hand to seek it.

---

## GREAT ZEEHAN DUNDAS.

The following circular has been issued for the information of the shareholders of the Great Zeehan Dundas Silver Lead Mining Company No Liability (Tasmania):—

"2000 of the 3000 shares were originally issued, leaving 1000 in reserve. 100 of the reserved shares have been sold, and another 100 are now offered at £1 each to cover current expenses. It is unlikely any more of the reserved shares will have to be offered, as it is believed the proceeds from the sale of the 200 will be sufficient to place the mine on a self supporting footing, and profits are anticipated in the near future.

"The area is about 339 acres, about seven miles from Zeehan Post Office, on a high ridge about 600ft. above level country, rendering sinking, pumping and lifting machinery unnecessary, as the mine can be worked by tunnels. Running through the leases are three distinct lode formations, known as the McKimmie, Copper Nickel and Bon Accord lodes. A little prospecting has been done on the Copper Nickel lode, and trenching is now being done on the pyritic (Bon Accord) lode, showing on surface 10ft. wide, and well reported on by the mining inspector during his visit to the mine, but the bulk of the work has been done on the galena (McKimmie) lode. No. 1 adit was driven 96ft. to cut three lode formations, indicated by creek prospecting, but struck a faulty zone. No. 2 adit was put in 75ft., and contract let to drive another 50ft.; about 13ft. will complete the contract. No. 2 adit passed through three lode formations, and is now on wall of fourth. About 18ft. in the No. 2 adit, struck lode formation, unknown before (No. 4 lode), assaying 63 per cent. lead, 7 per cent. copper and 50 ounces of silver to the ton. Drove on this lode for three shifts, and it widened out to about 4ft. 12in. of solid metal, balance good seconds, worth by gold comparison ounces to the ton. When the contractors have finished in the tunnel, driving on this lode will be continued.

"The mine is difficult of access, and the Tasmanian Government have been asked to cut a track from the mine to the tram line, about one mile. The mining inspector has recommended that £100 be expended in cutting the track, and so much attention has been directed to the locality, through our developments, that the Government have put on a prospecting party ahead of our leases."

---

## TASMANIAN AMALGAMATION.

### Hercules-Primrose Agreements.

The Hercules Company's directors at a meeting in Launceston last week adopted the smelting amalgamation scheme which has aroused so much interest in Tasmania and elsewhere in mining circles. The scheme involves the Hercules and Primrose companies and the Tasmanian Smelting Company. Mr. Bowes Kelly (chairman of directors) presided, and other members of the Board present were Messrs. L. Tulloch (vice-chairman), W. Martin and O. Wathen. The manager of the Tasmanian Smelting Company (Mr. H. Harris) was also in attendance.

The chairman said: "The object of this meeting is, as you are aware, for the purpose of passing resolutions confirming an option given by your directors to Mr. E. A. Weinberg, over the mine and property of the company, subject to debts and liabilities; and I propose, as briefly as possible, to tell you the reason why your directors are now asking you to confirm the option. The circular issued to shareholders will have acquainted you with the terms of the proposed amalgamation and the policy proposed to be adopted. The ore of the mine, as shareholders probably know, is one which presents many peculiar difficulties in its metallurgical treatment. It contains various minerals—lead, zinc, copper, silver and gold—in intimate association; so intimate, in fact, that ordinary methods of treatment have failed to give satisfactory results. At great expense the Tasmanian Smelting Company evolved and gradually improved a process for the treatment of the ore, and for years back practically the only market for its disposal has been through that source. That company, however, although signally successful in treating the ore for its gold, silver and lead contents, has not hitherto had available a process for the recovery of the zinc contents, which, being in the neighbourhood of 30 per cent., really represents the most important and valuable constituent. Comparatively large tonnages of ore have been taken from the mine and sold to the smelting company and treated by what has been, from our point of view, a most wasteful process, because we have not been paid for the zinc; but most recent developments in metallurgical science now show that this zinc has not really been lost, but is to be found in a condition easy of recovery, in the enormous slag dumps at the works of the Tasmanian Smelting Company.

"Your directors have in their possession information which, on investigation, has demonstrated not only that the treatment of these dumps will give a very excellent profit, but that the treatment of the ore by the plant of the Tasmanian Smelting Company, aided by a known process for the recovery of zinc from the slags to be produced, will be highly profitable. I may be a little premature in my remarks, but I would like you to understand that we have other strings to our bow. You all have heard about the Broken Hill flotation process and the immense profits which have been made in its practical application to the vast zinciferous tailings dumps there, which were looked upon as being practically valueless until it was discovered that zinc and lead minerals carrying silver would float under certain conditions. It was for a long time considered that the Hercules ore, which is somewhat similar to Broken Hill ore, was not amenable, like it, to treatment by a flotation process, on account of the very fine and more intimate association of the minerals, but the result of recent experiments is most encouraging, and I think I am right in saying that it has now been demonstrated that the flotation process is within the range of practical application to our ore, so as to enable a classification of the metals to be made prior to smelting, as is done in the case of Broken Hill ores, and thereby lessen the heavy expenditure incidental to blast furnace treatment.

"Although I say this, I wish you to clearly understand that smelting will still be necessary, and that the flotation process will only be a means of recovering some of the zinc directly in a saleable form, and so save expense in treatment. In other words, the one process, as at Broken Hill, will go hand in hand with the other. The smelting works are a necessity. The process for the extraction of zinc from the slag is a necessity. In our case the flotation process is not an absolute necessity, for it has been demonstrated that the smelting of the ore as at present conducted at Zeehan, with the assistance of a slag de-zincing process, will give such excellent financial results as to justify us in leaving the question of the adoption of flotation for further consideration. I personally have very little hesitation in stating my conviction that the application of the proposed processes will result in securing for ourselves the whole profit to be obtained from the metal contents of the ore, and that profit I am satisfied will be a very substantial one indeed. Let me point out to shareholders that, whatever policy is adopted, capital is an absolute necessity, not only for the installation of such process as we may desire to work, but also to develop the mining on a sufficient scale to enable a large output to be maintained. This capital neither the Hercules Company nor the Primrose Company is in possession of at the present time. Also let me remind you that the contract with the smelting company is on the eve of its termination, and that for obvious reasons the smelting company will not be disposed to enter into further contracts. I have been closely associated for some years past with mining and smelting, and know that in order to do satisfactory work either a smelting company must own a mine, or a mine of the description must own a smelter, and apart from the little difficulties which must always crop up when the one party thinks the other party is making more than its share of the profit, it is also advisable that ores to be reduced should be selected for treatment in relation to their mutual fluxing properties, so as to avoid as much as possible the expense of treating otherwise unnecessary quantities of barren fluxes. You all know the history of the North Mount Lyell mine, and how its amalgamation with the Mount Lyell mine opened up an avenue for the successful treatment of its ore—previously impossible.

"Ours to a certain extent is an analogous case. Under the scheme of amalgamation the mining of the ore will be so regulated as to get the best financial results in treatment, as well as in mining; and the quality of the output will be considered on its fluxing value, as well as on the value of its metallic contents, thus putting an end to a waste of money which must go on when only immediate individual results are considered. There are many and varied reasons I could give you in support of the action of your directors, but in conclusion I only desire to say that in my opinion, and in that of your directors, shareholders should unhesitatingly confirm the option granted to Mr. Weinberg. I am confident that once the amalgamation is brought about we shall, on account of the large bodies of high-grade ore to be dealt with, see before very long an industrial development in the Zeehan-Mount Read-Rosebery district which will confer benefit not only upon those who may be directly interested as shareholders, but upon the business people of Tasmania generally, and will contribute largely to the revenue of the country."

The adoption of the first resolution was moved from the chair, as follows:—"That the action of the directors in giving Mr. E. A. Weinberg an option to purchase the mine property and effects of the company, subject to the debts and liabilities of the company (if any), upon the terms contained in telegrams between the company and Mr. Weinberg, dated May 10, May 14, May 16, and May 23, 1913 (copies of which can be seen at the office of the company), be and the same is hereby confirmed."

The motion was seconded by Mr. Massey, and unanimously carried, without discussion.

The chairman also moved: "That the directors be and are hereby authorised to modify the terms of the option in any way they may think fit in the interests of the company." He explained that the resolution represented nothing more than a protection in the event of occasion arising for some small amendment, which might be effected without the necessity of calling shareholders together.

The motion was seconded by Mr. F. Butland, and unanimously carried.

---

### Primrose Co.

In Launceston last week Mr. Lindsay Tulloch presided at a special meeting of shareholders in the Primrose Company, called to confirm the action of the directors in granting an option over the mine and its effects to Mr. E. A. Weinberg, under certain conditions, concurrent with that granted by shareholders of the Hercules Company. The chairman said he had previously stated that with this amalgamation, and a dezincing plant in operation, they could look forward to a profit of from 25s. to 30s. per ton of ore mined, and with recent investigations which had been made, and further information to hand, such an estimate of profit, he considered, was a conservative one. The motion confirming the action of the directors was carried, also one authorising the Board to modify the terms of agreement should occasion require. The chairman said that proxies representing 31,554 shares in favour of the action of the directors had been received out of the 50,000 shares in the company.

# GOLD-ORE SAMPLING IN A SCHOOL LABORATORY.

By Charles E. Locke.*

The little stamp-mill in the mining laboratory of the Massachusetts Institute of Technology, as run for student class-work, contains a feeder, stamps, plate, and vanner. Results in the past indicate that the work of these machines is just as efficient as that of a regular mill handling the same class of ore. It has been the custom to obtain ore principally from Nova Scotia, mainly because it is the nearest source of supply, and also because there is a considerable saving in freight-cost as compared with other districts. The gold in Nova Scotia ores is famously coarse, and for this reason it is almost impossible to obtain satisfactory results by sampling and fire-assay, unless an extremely large lot of ore is crushed, and all of the contained gold pellets are saved. A very interesting and most extraordinary example of this fact has been presented by a recent run in the Technology stamp-mill.

Since the capacity of the mill is about 60 kg. per hour, and since in about 5-hour run the students in any one section have an opportunity to make the necessary study of machines, it usually happens that several runs are made from one lot of ore.

When the shipment is received, it is first dried and weighed, put through the Blake breaker set at 1 or 1.5 in., and the crushed product is piled in a cone on the sampling-floor. When the crushing is completed, the ore is usually stored away in barrels for future use, and it is aimed to have each barrel of the same quality as the others. The barrels are filled up by a man shovelling around the circumference of the cone, the first shovelful going to barrel No. 1, the second to No. 2, and so on. This method of sampling is not claimed to be absolutely perfect, but it is entirely satisfactory for the purpose in view. When the time arrives for a stamp-mill run two barrels are taken at haphazard from the lot and used, the ore being fed in 10 kg. lots, which are weighed out carefully by the students, and fed as needed into the hopper of the feeder. As each student weighs out a lot he takes a small grab-sample from the residue and places it one side into the sample-bed. When the end of the run is in sight this sample-bed, which is usually nearly full of the sample, is carried to the crushing and sampling department, where the ore is first weighed, and then crushed in rolls until it passes a screen of the same size of aperture as that used in the stamp-mill. Any pellets of gold in the ore are flattened out by the rolls, and are readily picked out from the oversize of the screen. The undersize of the screen is further sampled down to an assay-sample, put through a 100-mesh screen, the pellets, if any, being saved, and the pulp assayed. The remainder of the material passing through the roll-screen is weighed out in 10 kg. lots and fed with the coarse ore into the stamp-mill.

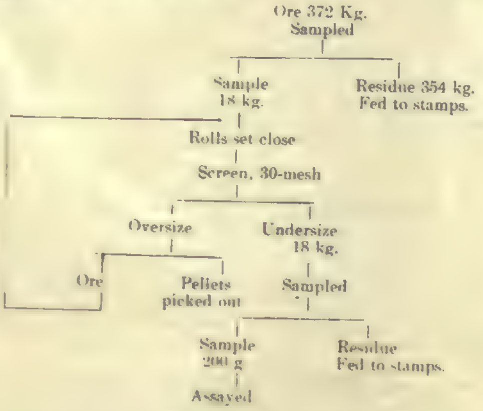
The sampling and assaying of a Nova Scotia gold-ore by the above method is entirely inaccurate, and the only justification for the procedure is that the results, when compared with the true gold-content of the ore, as shown by the recovery of gold from the amalgams, and from the assays and weights of the products, will serve as a warning to the student for his future practice.

Usually the fire-assay runs lower than the mill-assay, and this seems perfectly natural when one considers that there are comparatively few nuggets of gold in the two barrels of ore, and the chances are that the students will miss them in the sampling. Occasionally, however, chance favours the students, and they will obtain more than the proper proportion of nuggets in the sample, and in that case the fire-assay runs higher than the mill-assay.

To present specific data, a load of ore received more than a year ago from Tangier, N.S., weighed 2250 kg. net. Up to the present time there have been three separate runs on this ore, as follows:—

| | Run No. 1. 402 Kg. | Run No. 2. 353 Kg. | Run No. 3. 372 Kg. |
|---|---|---|---|
| Saved by amalgamation, per cent. | 95.58 | 97.32 | 77.02 |
| Saved in concentrates, per cent. | 1.47 | 0.99 | 3.39 |
| Lost, per cent. | 2.95 | 1.69 | 19.59 |
| Concentration, tons, 100 into .. | 2.47 | 2.29 | 2.27 |
| Assay of concentrates, gold, oz. per ton | 0.21 | 0.16 | 0.30 |
| Assay of tailings, gold, oz. per ton | 0.01 | 0.01 | 0.04 |
| Mill-assay of ore, gold, oz. per ton | 0.413 | 0.379 | 0.83 |
| Fire-assay of sample, gold, oz. per ton | — | 0.22 | 13.04 |

Looking over the tabulated data, the first two runs are not greatly different from what is usually obtained. The mill-assays agree fairly closely, 0.413 and 0.379 oz. respectively. The first run had more than its proportion of pellets in the sample, and therefore the fire-assay shows higher. In the second run the reverse is true. It is in the third run, however, that is found such a remarkable example of the workings of chance. The following tree shows the procedure in the third run:—



During the sampling it was noticed that only two pellets appeared on the 30-mesh screen, but these were both of good size. No pellets were found between 30 and 100 mesh. The pulp through 100-mesh assayed 0.08 oz. of gold per ton. After the run the amalgams were cleaned, retorted, and the fine gold determined, also all the concentrates and tailings were dried, weighed, and assayed, and the gold-contents figured. In this way the total gold in the original lot of 372 kg., including also the weight of gold in the two pellets, was obtained, and from these data was calculated the total gold there would be in a ton of ore, or, as it is called, a mill-assay. It is clear that the pellets should be included in this total, because if it had not been for the sampling they would have gone into the stamp-mill, and would have appeared in the clean-up of the mortar.

The weight of fine gold in the two pellets was 8.0446 g., this being obtained from the 18 kg. sample. The amount of gold in the amalgams and in the products was 1.9614 g., which represents the gold in the 354 kg. that was fed directly to the stamps, and also the gold in the 18 kg. of undersize that went to the stamps. Computing this as ounces per ton, the mill-assay given below is obtained. Similarly, the fire-assay in ounces per ton based on sample weighing 18 kg., pellets weighing 8.0446 g., and pulp assaying 0.08 oz. per ton, is obtained.

Mill-Assay of Total Ore.

| | Oz. Per Ton. |
|---|---|
| Gold calculated from amalgams and products ... ... ... ... ... ... ... ... ... | 0.20 |
| Gold calculated from pellets ... ... ... ... | 0.63 |
| Total ... ... ... ... ... ... ... ... ... | 0.83 |

Fire-Assay of 18 kg. Sample.

| | Oz. Per Ton. |
|---|---|
| Pulp through 100-mesh ... ... ... ... ... | 0.08 |
| Pellets, add ... ... ... ... ... ... ... ... ... | 12.96 |
| Total ... ... ... ... ... ... ... ... ... | 13.04 |

These two pellets of the third run are also accountable for the great drop in the saving by amalgamation to nearly 20 per cent. below the first two runs, and for the increase in loss from 2.95 and 1.69 respectively up to 19.59 per cent. What actually happened was that the ore fed to the stamp-mill in the third run really assayed only 0.20 oz. of gold per ton, whereas in the first two runs it assayed twice that amount. If the two pellets had gone into the stamp-mill they would have appeared in the clean-up of the mortar and the following results would have been obtained—not greatly different, as far as extractions and losses go, from the first two runs:—

| | Run No. 3. 372 Kg. |
|---|---|
| Saved by amalgamation, per cent. ... ... | 94.48 |
| Saved in concentration, per cent. ... ... | 0.81 |
| Lost, per cent. ... ... ... ... ... ... ... ... | 4.71 |
| Concentration, tons, 100 into ... ... ... | 2.27 |
| Assay of concentrates, oz. per ton ... ... | 0.30 |
| Assay of tailings, oz. per ton ... ... ... | 0.04 |
| Mill-assay of ore, oz. per ton ... ... ... | 0.83 |
| Fire-assay, oz. per ton ... ... ... ... ... ... | 13.04 |

Manifestly, the only way to smaple an ore of this kind accurately is to crush the whole of it down to a comparatively fine size; but if this were done, then the stamp-mill run would have to be sacrificed. It seems proper, therefore, to sacrifice the accuracy in sampling in order to have a satisfactory stamp-mill run.

That the fire-assay is unreliable is well known to Nova Scotia miners, because anyone in that province, unless he is a "tenderfoot," will never place much confidence in the value of a mine on the testimony of fire-assays alone, but prefers always to have the results of mill-runs on several lots of ore.

---

*Paper read at the New York meeting of the American Institute of Mining Engineers, February, 1913.

# TIN AND RUBBER IN THE MALAY STATES.

Mr. H. E. Pratten, President of the Sydney Chamber of Manufactures, who has just returned from the East, has some interesting remarks to make on tin-mining and rubber cultivation.

While the Malay Peninsula produced, he said, three-fifths of the world's tin supply, the market garden methods of the Chinese, with a spade and basket, which has existed over scores of years, was passing. "It can well be imagined," he continued, "that with this method of tin production, many of the very rich patches have been worked out. The future is for machinery. The old-fashioned method of these Chinese with the basket and bamboo is to carry the tin-bearing material across their shoulders—about a shovelful of earth at a time—to a channel where the dirt is washed by the running water, the tin remaining on the bottom in the shape of tin oxide. The future is for bucket-dredging. By this method the dirt can be turned over and washed at one-third the cost of the primitive methods adopted by the native labour. It has been my good fortune to acquire several large payable bucket-dredging areas for Australian shareholders, and I am hopeful of assisting Australian industries by procuring Australian-built dredges for this work, and the recognition that Australian firms are able to produce machines, as well as to supply the men to work them. So far there is only one dredge in the Malay States built in Australia. It is doing extremely good work, and when, with my assistance, more of a similar type of dredge are installed, the development of further sources of profit to Australian manufacturers and investors should be assured.

"There is enormous development going on in connection with rubber cultivation, and large areas are still being planted, showing, by those who ought to know, great faith in the future of the industry. And this in spite of the possibility of the discovery of synthetic rubber, or the tumbling down of prices as the result of the large areas now just coming into bearing. The Malay States contain in population as many Chinese as Malays and Indians put together. The labourers, principally engaged in tin-mining and on the rubber plantations, are largely imported from India. The Malays do but little work, apparently with a sort of philosophy, which bids them be content with the produce of their own plantations.

"Australian interests in the States are increasing. So far many of the Australians who have gone there in the past have not been of the best type, but with the development of Australian mining interests a more representative class of engineers is making the reputation of Australia better known, and I foresee in the not distant future a very large, profitable, investment and trading connection with this portion of the Empire, which, geographically, is closest to our shores. The European population is small, and consists of capable officials, who have the whole reins of government in their hands, the remainder being almost exclusively engaged in rubber-cultivation, tin-mining, and commerce."

# PROSPECTING BORING PLANT.

(Special for the "Mining Standard.")

A suitably-designed power boring plant should be of great value in preliminary prospecting work in this connection, but it would require to be adapted to local conditions. Its greatest value would be, not in obtaining actually definite wash values, but more in locating the position of the gutter at various points. While the metal values obtained would be useful as a guide, they could probably never be regarded as absolutely reliable.

The percussion type of plant will be especially considered. A diamond drilling plant would be unsuitable in many respects, not the least of which would be trouble occasioned by the vesicular nature of the basalt covering in many areas.

The problem is to put down a hole of sufficient diameter through the basalt to allow of subsequent reduction in diameter as casing becomes necessary in continuing the hole through the sedimentary material underlying the basalt covering.

Where the initial diameter of the bore is very large, however, drilling through the basalt becomes very slow, and, consequently, expensive, especially where it is of a hard, compact nature, and of considerable depth. Where a second layer of basalt occurs, underlying the more recent sediments on top, the problem becomes still more complicated. Whatever particular type of plant be used, an extensive equipment in the way of casing, etc., repair outfit, and fishing appliances for recovering lost rods is extremely necessary, as, owing to the very varying nature of the rocks being bored through, mishaps may occur most unexpectedly at any time.

## THE DREDGING INQUIRY.

The Victorian Dredging Board heard evidence in the Chief Secretary's office, Melbourne, on Friday and Saturday of last week, the principal witnesses representing the dredge owners. All the members of the board were present.

Mr. Thomas Mates, stock and station agent, testified that while there had been discolouration of the Ovens River, stock preferred it, as there was no lime in it. His experience of silt was that it improved the land. He had visited the Ovens Valley dredging properties, and ridiculed the assertion of Mr. Gallagher, of Harrietville, that he would not take £200 an acre for his land. Land at Smoko, which the farmers regarded as worth from £20 to £30 an acre, he valued at from £2 to £2 10s. At Buffalo Star portion of the tailings had been resoiled with great success. There was no reason why land coated with silt should not become productive.

In cross-examination, the witness said he, as an expert, wished the Commissioner to believe that siltation was a benefit.

Mr. C. H. A. Davis, formerly bank manager at Bright, said that the closing down of the dredges would mean a loss to the districts where they operated.

On Saturday Mr. Bernard A. Smith, civil engineer, said he had twice visited the whole of the Ovens district with a view to investigating the causes of siltation and the effects of dredging. He inspected all the plants. Siltation occurred at the time of the floods, and the flood waters caused erosion of the river banks. It had nothing whatever to do with dredging. His investigations showed that the chief cause of the siltation was, without a doubt, the natural erosion of the beds and banks of the various watercourses, both the main streams and their feeders contributing to the total effect. In all directions over the Ovens watershed were to be seen instances of this natural erosion, while in no places, except at the outlet of the Tarrawingee sludge channel, were there any marked deposits of silt in the river bed. He concluded, therefore, that the siltation of the river flats was due to the deposits of material eroded from the banks of the Ovens River and the various watercourses flowing into it, and not from the dredging operations; but that the discolouration of the water, when the river was at its low summer level, was mainly due to the dredging and hydraulicing carried on over the watershed. Except for inconvenience to stock while the silt was wet and damage done to grass, he thought the silt rather tended to improve the land than to injure it. He had tested the discolouration of the water with a sixpenny piece, and found that when it disappeared at a depth of 1in. there would be only 18 grains of silt to the gallon.

Mr. Graham said his association desired the board to consider the following suggestion:—

1. To stop dredging in all river beds.
2. To excise from existing leases all agricultural land over £2 an acre in value.
3. To recommend compensation for lessees who fulfil their covenants, and
4. To compel the fulfilment of covenants or cancellation of leases.

Mr. Graham said he thought the suggestions were perfectly fair. He hoped the board would see its way to converse the staple industry of the country—the land—and see that it was not going to be washed into the sea. He complimented the board on the earnest and thorough manner in which it was conducting its inquiries.

The commission then adjourned to a date to be fixed.

## A UNITED STATES LETTER.

(From Our Correspondent.)

San Francisco, April 30.

During April the old Consolidated Mercur was shut down. This property was in Tooele county, Utah, and here the first cyanide plant in the United States was started, and the Moore filter developed. The mine has produced 5,100,000 tons of ore for £3,100,000, and paid £700,000 in dividends.

Flotation processes (Minerals Separation) are gradually gaining headway, and the Inspiration Copper Co., Arizona, is installing a 600 ton daily plant, and, if as successful as anticipated, will probably erect a 15,000 ton plant.

At the Miami mine, Arizona, 3,000,000 tons of rock fell recently, causing an immense air-blast, which killed and injured several men and did a lot of damage.

The annual reports of the big copper companies are coming in, and the following notes are sufficient to show the immensity of operations:—

| | Tons Treated. | Copper, Tons. | Ore Reserves Tons. | Copper Contents, Per Cent. |
|---|---|---|---|---|
| Calumet and Hecla, Michigan | 2,806,000 | 33,928 | | |
| Chino, New Mexico | 1,120,375 | 14,618 | 90,000,000 | 2.24 |
| Copper Queen, Arizona | 786,368 | 44,140 | | |
| Miami, Arizona | 1,040,744 | 16,416 | 18,232,000 (1911) | 2.58 |
| Nevada Consolidated, Nevada | 2,852,350 | 31,531 | 38,853,550 | 1.67 |
| Inspiration, Arizona | (Mill building.) | | 45,000,000 | 2.00 |
| Ray, Arizona | | | 82,904,368 | 1.80 |
| Utah Copper, Utah | 5,315,321 | 45,683 | 316,000,000 | 1.49 |

The Chile Copper Co. has been formed in New York with a capital of about £19,000,000 to operate a property containing 160,000,000 tons of 2.4 per cent. copper ore, with about 300,000,000 tons probable.

## INSTITUTE OF MINING ENGINEERS.

At a meeting of the Australian Institute of Mining Engineers, held in Melbourne last week, the following gentlemen were admitted to membership:—

Members.

Mr. John Coombe, mine manager, Waihi, N.Z.

Dr. Herbert Jungham, assessor to the Prussian Government, Berlin.

Mr. D. F. Foster, metallurgist, Sutton, Surrey, England.

Mr. H. T. Garde, surveyor, Finiston, Kalgoorlie.

Mr. K. B. Moore, assistant superintendent, Youanmi S.M. Ltd., Youanme, W.A.

Mr. L'Estrange Nicolson, mine manager, Cloncurry, Queensland.

Mr. John L. Pearson, underground officer, Wallaroo, South Australia.

Mr. Harry Pomroy, underground officer, Wallaroo, South Australia.

Mr. Charles E. Rigby, engineer, Friezland, Queensland.

Mr. Harry A. Thomas, engineer, Broken Hill Block 10, Broken Hill.

Osmer B. Ward, mine manager, Block 10 Broken Hill.

Mr. Gerard W. Williams, mining engineer, Mt. Oxide, Cloncurry, Queensland.

Mr. W. G. Woolnough, professor of geology, University of Western Australia.

Associate Members.

Mr. Thos. H. Ball, assistant assayer, Chillagoe, Queensland.

Mr. Arthur Lacy Court, engineer, Central Mine, Broken Hill.

Mr. W. H. Fisher, battery manager, Kalgoorlie, Western Australia.

Mr. C. L. Irvine, surveyor, Broken Hill.

Mr. A. C. Morris, Broken Hill.

Mr. H. C. Robson, metallurgist, Spassky, Akmolinsk, Siberia.

Mr. R. M. Sewell, Hampden, Cloncurry Mine, Queensland.

Mr. F. L. Treloar, metallurgist, De Bavay Plant, Broken Hill.

## THE GENESIS OF THE EARTH.

By Professor James Park.

### The Nebular Hypothesis.

According to this hypothesis it is assumed that the Earth was a nebula of incandescent gases, the heat of which gradually radiated into space until the planet became a globular mass of glowing molten matter in which the heavier metallic constituents segregated themselves, under the influence of gravity, into a heavy central core, forming what is termed the barysphere, while the lighter material arranged itself as an outer concentric shell, constituting the lithosphere.

In course of time the glowing mass cooled sufficiently to allow the outer envelope to form a solid crust. And as the heated interior of the Earth contracted more rapidly than the rigid outside crust, the surface became crumpled and wrinkled in its endeavours to accommodate itself to the rapidly diminishing dimensions of the heated interior.

When the outer envelope had sufficiently cooled, the aqueous vapours, which up till now had covered the surface in a dense impenetrable cloud, became condensed and soon settled in the hollows. Thereafter, the newly-formed seas and the other agencies of denudation began the cycle of denudation and resorting, destruction and reconstruction which have continued without intermission through all the geological ages.

### The Planetismal Hypothesis.

This view of the origin of the Earth, as elaborated by Chamberlin and others, is merely a modification of the nebular hypothesis. It assumes that the great incandescent nebula which originally composed the solar system cooled rapidly, the cooled gases taking the form of myriads of solid meteorites, to which the name *planetismals* has been applied. Under the influence of gravity the cold meteorites segregated into knots that eventually became the nuclei of the sun, the planets, and their satellites. During their aggregation, the meteorites are believed to have bombarded one another with great violence, thereby becoming very hot.

The main source of the high temperature of the Sun and of the Earth before they cooled was not due to the heat generated by the collision of the constituent meteorites, but to the contraction and consolidation of the mass after the meteorites had come into contact.

All solid bodies possess a potential energy proportional to their distance from or height above the common centre of gravity of the globular mass to which they belong. A block of stone resting on the edge of a high tower possesses a large store of this *energy of situation*, which it loses as soon as it falls to the ground. The energy is not lost, but merely transformed into heat.

The packing or crowding of a swarm of meteorites under the influence of gravity, which always acts towards the centre of the mass, is accompanied by the generation of great heat. Meteoric matter is a good conductor of heat, and hence the whole mass would soon assume a uniform temperature. As the packing continued, the globular mass would, in time, reach its maximum density, and thereafter gradually become cool by the radiation of heat from its surface.

*The heat of contraction* might not inconceivably be sufficient to melt the materials in the upper layers, but the lower layers would remain solid, as the pressure of the superincumbent mass would be sufficient to prevent expansion, without which liquefaction could take place.

The more fusible materials in the upper layers, in accordance with the law of liquation, would rise to the surface, and in process of time solidify as a stony crust. The tendency of this process of magmatic differentiation would be to divide the constituent materials of the planet into three distinct zones corresponding to the heavy metal, lighter sulphide regulus, and still lighter stony slag formed in a reverberatory furnace.

The central core and regulus form the *barysphere*, or heavy central core, while the stony slag or crust, now modified and resorted by the action of subaerial agencies, constitute the *lithosphere*, or stony envelope.

## PUBLICATION RECEIVED.

The report on the Cobar Copper and Gold Field, Part I., by E. C. Andrews, B.A.F.G.S., Geological Surveyor, has just been issued under the direction of Mr. E. F. Pittman, A.R.S.M., Government Geologist and Under-Secretary for Mines, as No. 17 of the Mineral Resources, with 207 pages, table of contents, index, and 5 appendices. The Report is illustrated with 45 plates, 21 test figures, and 19 maps in a separate portfolio. Price 7s. 6d. In the letter of transmittal to the Minister of Mines, Mr. Pittman calls attention to the importance of the Cobar field, and to the appreciation with which this careful examination and detailed description will be received by geologists and mining engineers alike. To the expert the descriptions of the peculiar mineral associations of the copper deposits and their origin, the geological structure of the field, and the enterprise of the Great Cobar Limited in smelting huge tonnages of ore annually will be welcomed, while to the general public the special features of interest will centre round (1) the romance of the finding of the ore deposit, when, after the great flood of 1870, three tanksinkers named Hartmann, Campbell, and Gibb camped round the "raddle" hole of the aborigines and saw the veins of carbonate ore in the side of the hole like "rivers traced on a map;" (2) the large ore reserves and amount of ore expectant in the Great Cobar mines; (3) in the production of the field to date; and (4) in the fact that the C.S.A. Mine after years of idleness has the promise of a future by reason of diamond drilling work carried out in 1912. The importance of the field is shown by the fact that up till the end of March, 1913, the approximate returns for the field were about 103,000 tons copper, 500,000 oz. gold, and 1,250,000 oz. silver, the total value of which may be placed at about £8,000,000.

# ENGINEERING AND ELECTRICAL SECTION

THE FAMOUS
"Brimsdown"
"Wirum"
BRITISH MADE Lamps.

The most popular, reliable and economic lamp on the market.

Sole Agents:—
THE
LAWRENCE & HANSON
Electrical Co. Ltd.
405 LONSDALE ST., MELBOURNE.
33 YORK ST., SYDNEY.
and at WELLINGTON, N.Z.

## ELECTRICAL TRADERS' ASSOCIATION.

The report of the President (Mr. G. L. Just) of the Electrical Traders' and Contractors' Association of Victoria for the year ended 30th April, 1913, is condensed as follows:—

An affiliation of this association with others interested in the building trades—viz., The Master Builders, Master Plumbers, Master Painters and Decorators, Master Plasterers, and the Asphalters and Tar Pavers' Associations was effected in July, and should be considered among the most important steps taken by our association. No meetings of the wages board in this trade have been held during the period under review, as the new determination has just come into force. The form of indenture for apprentices was, with the alterations suggested by this association, adopted by the board, and is still in use. The resolution to get Oakleigh and Sandringham included in the area for wages board determination was duly conveyed by our representatives, but no alteration in the territory covered by the determination could be obtained. The attention of the Chief Inspector of Factories was drawn to the provision of payment in the Plumbers' Board Determination at a lesser rate than ours for employees fixing electric wires for bells, etc., and that portion of their determination was subsequently eliminated, bringing the plumbers up to the same standard of wages as our own employees. The question of travelling time and fares to be allowed employees when working away from employers' centre was brought before the association, and it was decided that actual out of pocket fares only be paid, and that employees should proceed to work on such outside jobs at nearest time to firm's usual hour of commencing work, but if where such work is to be done does not necessitate the employee leaving home earlier that such employee commence his work at usual starting hour. Technical training and the licensing of wiremen was before the members on various occasions, and satisfaction was expressed that Workingmen's College was earnestly endeavouring to provide the former. As regards the licensing of wiremen, our sub-committee has endeavoured to get that of the Institute of Electrical Engineers to meet at various times, but so far little progress can be reported; no practical suggestion on the matter having been put forward. The employees are now asking to be permitted to enter into the question, and the matter is receiving further consideration by your council. The proposed Workmen's Compensation Act came in for consideration, and the suggestion that the Government, the employer and the employees should contribute pro rata was favourably considered. It was decided to oppose the Apprenticeship Bill in its present form, especially the provision that employees attend technical instruction during working hours, and a protest was duly lodged against this Bill. It was also decided to oppose compulsory drill in business hours. During the year the association was called upon to oppose the proposal of the Melbourne City Council to apply to Parliament for power to do installation work and supply goods. The movement was a serious one, and a strong deputation was formed, which placed their views before the Melbourne City Council's Electric Supply Committee, and fortunately were successful in influencing that body to withdraw their recommendation to the council. The thanks of the association are due to those gentlemen outside the association who came forward to support us in this matter. By a deputation in January to the Controller-General, and subsequently to the Minister of Customs, the decision of the Customs authorities to charge duty of 10 per cent. and 17½ per cent. on continuity fittings, which were previously free, we were successful in getting this duty removed. Alterations to rules to permit departmental heads of firms to act as representatives have been made, and the rules otherwise revised to meet the change.

---

## BRITISH AND EUROPEAN DEVELOPMENTS.

(From Our Correspondent.)

London, May 30.

Mr. J. F. Nauheim, at the meeting of the British Thomson Houston Company held in London on Wednesday, said that the year 1912 was a very satisfactory one from the point of view of orders received, the figures both for Home and Export departments being record ones; but the strike troubles of the year had been a great handicap owing to the difficulty of obtaining raw materials. Not only was the volume of business carried over into 1913 large, justifying a very hopeful outlook, but the orders received since the beginning of the year show an important increase over those down to the same date in 1912.

New regulations have been issued by the Board of Trade with respect to overhead wires. They are issued under No. A13 of the Regulations for securing the safety of the public (Electric Lighting Acts of 1882 and 1909). There are two codes in these revised regulations, one relating to continuous voltages up to 650 and alternating current up to 250, and the other is for higher pressures. Applicants for powers will be required to make certain statements, upon which, and the merits of each case, considered decisions will be given. Among the chief alterations there is a reduction of the wind pressure from 30lb. per square inch to 25lb., which is much more favourable than prevails in provisions imposed in some European countries. In the high pressure code there is a rule requiring precautions to be taken to prevent accidents due to contact between wires and trees. Elsewhere it is not unusual to clear away the trees on each side of a transmission line, but in England a right of way is so difficult to obtain that this is often impracticable. It may happen that contact with a tree causes a wire to fuse and fall. Another new rule prohibits the carrying of high pressure wires across the premises of a consumer save under special circumstances. Such conditions may be avoided by terminating the overhead wires at the boundary of the premises. The reason for this regulation is probably that such wires might be regarded by the Home Office as service wires, and therefore excluded from the factory regulations, whereas this code is only intended to apply for cross country work. Alterations have been made in Regulations 13 for having a continuous earth wire carried from pole to pole, which is the general practice, or the ironwork on each pole must be connected to a substantial earth plate. Details respecting the crossing of roads have to be submitted by applicants for special approval. Guard wires were abandoned some years ago, and the new code suggests the strengthening of the weakest point by the duplication of the insulat and the use of a supplementary conductor wire, reaching three or four feet in both directions and securely whipped or clamped to the main wire. The supplementary wire is sometimes carried across the road if the span is short. It is interesting to note that the way is left open in regard to devices for preventing the falling of wires, as there is considerable attention being given to this matter by inventors and manufacturers, who have recently devised several improvements in this direction.

After the annual meeting of the Institution of Electrical Engineers to-night, Mr. A. J. Aldridge's paper on "The Practical Application of Telephone Transmission Calculation" will receive attention. The author says that most of the papers and lectures read lately in England and abroad dealing with the theory of telephonic transmission were highly mathematical, and though extremely valuable they were all-adapted to the practical requirements of most telephone engineers. His paper is therefore devoted to the subject more from the point of view of the "standard mile" of cable. His intention is to provide those interested in practical telephony with a means of making accurate calculations on their own account for practical conditions, rather than to establish any absolute conclusions. He does not wish to be too definite in drawing conclusions owing to the great number of varying conditions which occur, but he says that the following may be stated:—

1. For telephone purposes the voice is equivalent to a wave, the predominant frequency of which is 800 ∽; a sine wave of this frequency, if used in theoretical calculations, will give results in accordance with speech results.
2. The normally accepted equivalents of uniform lines (i.e., the equivalents calculated on the assumption of an infinite line) may be seriously wrong when applied to practice unless the equated length of the line is of the order of 20 or 25 S.M. This improvement with length, however, is only due to the fact that the terminal loss is then less important with regard to the line loss.
3. The equivalents of heavy gauge open wire lines may be improved by the addition of cables at the ends. The relation between the impedances of the various factors, however, must be taken into account in determining the amount.
4. The terminal apparatus plays a most important part in transmission, the sending instrument no less than the receiving.
5. The reflection loss at any point of a circuit may be obtained from the curves given in the paper.
6. The present system of making telephonic calculations, viz., by adding together the equated lengths of the various sections of a line, is only approximately correct. To obtain accurate results the various reflection losses must be added.
7. The present standard of comparison does not appear to be the best as a reference standard, though this or a similar one is necessary for a working standard. A better reference standard consists of a standard cable with terminals giving no reflection.
8. The overall transmission is the same in either direction over a line composed of two or more differing types, though the distribution of losses is not the same.
9. Loaded and other lines may be tested with sufficient accuracy, without the aid of speech, if sufficient precautions (as outlined in the paper) are taken.

---

## TOURS IN QUEENSLAND.

The Queensland Government has issued attractive and copiously illustrated booklets, designed to draw the attention of tourists and health-seekers to the beauties of the State. They contain exhaustive information regarding the chief points of interest in the Darling Downs, the Central District, Mackay and the North Coast, with details of the cost and means of communication between one point and another. The first of these pamphlets, "Tours on the Darling Downs," deals at the outset with Toowoomba, "an urban region marked by willow lined brooks, ruddy roads, grassy plots and verdant foliage." Here the visitor finds himself in a rich agricultural districe, prosperous and beautiful. In the winter the climate is bracing, and in the summer cool enough to permit of all outdoor enjoyments. The Downs stand on the heights of the Great Dividing range at an altitude of 4921ft. above sea level, and splendid views can be obtained in the translucent atmosphere. Crow's Nest, Mount Pleasant, Pittsworth, Warwick, Allora, Killarney, Texas and Stanhope, and their special features of mountain and river scenery, are in turn graphically pourtrayed. "Tours in Central Queensland" introduces the prospective visitors to an area of great mineral and pastoral wealth, and is elaborately illustrated. Considerable space is devoted to a delineation of Rockhampton and its surroundings, including the wonderful Olesen's Caves. A chapter is devoted to the gem industry and its centre at Sapphire Town, while picture and pen convey a lasting impression of the beauty spots, and quaint geological formations which abound on the coast and inland. "Tours on the North Coast" from Brisbane to Gympie gives an exhaustive description of the route, with a special article dealing with the beautiful Lake district of Noosa. Tours in the Mackay District shows an even more attractive locality. Those who have a holiday in contemplation would do well by a study of these booklets, which can be obtained from the Railway Inquiry Office, Brisbane, or at the various tourist bureaus.

## ENGLISH AND FRENCH ELECTRICAL ENGINEERS' MEETING IN PARIS.

(From Our Correspondent.)

London, May 23rd.

At the time of writing the joint meeting of the Institution of Electrical Engineers and the Societe Internationale des Electriciens is in full swing in Paris. A preliminary list of the subjects announced for discussion has already been given here, from which it will have been gathered that the amount of technical matter put forward for digestion was very large. From the papers now to hand it appears that to reprint them in the pages of the "Australian Mining Standard" would be too ambitious an undertaking, even were it desirable, so we shall content ourselves with indicating in the briefest possible way the very wide area covered, and, maybe, give in fuller abstract one or two that we consider to more legitimately appeal for more liberal allowance of our space. From the list already mentioned it will have been observed that the conference has been devoting a great deal of attention to electric traction questions; indeed, on the morning of Wednesday (following the reception by M. Berthelot), six papers all bearing on one aspect or other of this subject were discussed, the two long-distance transmission papers coming forward on the next day.

"Single-phase Traction" was the subject taken by Monsieur Marius Latour, who began by making a few general observations in regard to the mechanical construction of single-phase locomotives and to the erection of overhead conductors. Some cognate questions were discussed, such as the disturbance caused to telephone and telegraph lines, and some solutions of the problem of single phase traction were indicated.

"Petrol-Electric Motor Vehicles," by Monsieur J. B. G. Damoiseau, was a much fuller contribution. He first referred to the work of Heilmann, done nearly twenty years ago, briefly outlined the various petrol-electric systems, and then dealt in detail with motor-cars with internal combustion engines and with electrical or mixed drives. He said that the majority of the petrol-electric vehicles built comprised essentially an internal combustion engine driving a C.C. generator giving a variable pressure; this generator supplies the electric motors driving the car axles. For the control a special controller is employed. In certain cases cars are fitted with two cabins, from either of which the car may be driven in either direction. The details and position of the electrical gear distinguish the different types of this class of car. The paper contained full information respecting the following vehicles, a number of which were described in these pages last year:—

Motor vehicles of the Societe Anonyme de Locomotion Electrique; the Dion-Bouton system; the Wolseley-Westinghouse system on the North-Eastern Railway; vehicles of the Societe Westinghouse du Havre; ditto of the Bergmann Company and the A.E.G. on the Prussian State railways; those of the General Electric Co. of America; the British Thomson-Houston Co. (on the Great Western Railway); Swedish State Railway motor vehicles; the Pieper type vehicles; the Thomas petrol-electric system in service on the Central South African railway. The advantages and disadvantages of the different systems were considered by Monsieur Damoiseau, the question of liquid fuels was briefly touched upon, initial cost and cost of operation were discussed, and the following table showing what has been done, and where, was given. The author arrived at the following conclusions:—

"The four types of independent motor vehicles are at present: steam, accumulator, petrol with mechanical transmission, and petrol-electric. Accumulator cars, however, have been abandoned, and as the petrol engine with mechanical transmission has not been found sufficiently flexible, there remain, therefore, at present only the steam motor car and the petrol-electric vehicle. The characteristics previously enumerated for petrol-electric cars emphasise the shortcomings of the steam motor car, and the conclusion may therefore be drawn that if the use of independent motor vehicles continues to develop (there is no reason why it should not), then petrol-electric motor vehicles will preponderate."

A table of the petrol-electric motor vehicles shows the following:—British Westinghouse Co., 1 motor vehicle; Societe de Dion-Bouton, 36 motor vehicles; Societe Westinghouse du Havre, 44 motor vehicles; Bergmann Elektricitats Aktien-Gesellschaft, 15 motor vehicles; Allgemeine Elektricitats Gesellschaft, 11 motor vehicles; British Thomson-Houston Co., 1 motor vehicle; Almanna Svenska Elektriska Aktiebolaget, 2 motor vehicles; Pieper System, 11 motor vehicles; Thomas System, 1 motor vehicle; General Electric Co., 2 motor vehicles. Total, 124 motor vehicles.

Paris Suburban Railways.—The paper by M. A. N. Mazen described the electrification of the State railways system, formerly the Ouest lines, serving a very considerable proportion of suburban Paris, the total length at present being 500 km. of single track, with prospective extensions bringing it up to 800 km. in a few years' time. The information given and discussed in the paper related to the programme of electrification that the Administration is now carrying out. The author stated the various reasons (especially the fact that on most of the sections the density of the traffic is already very high and is bound to increase) of the State railway authorities for adopting the continuous current system at 650 volts. He referred to the adoption of that system and pressure for the majority of the lines in the suburbs of London, and added that everything that existed in Paris in the way of heavy electric traction, the Metropolitain, Nord-Sud, Orleans (Orsay Juvisy), Etat (Invalides-Versailles, left bank), was worked with continuous current at 650 volts. The concluding portion of M. Mazen's paper dealt with the electric power system able to furnish such current to 400 to 500 motor coaches through a third rail parallel to the track, the running rails serving as return conductor. The current is furnished by sub-stations receiving energy in the form of alternating three-phase current at 25 cycles, 15,000 volts., from the generating stations. To avoid trouble from frost after a thaw, a conductor rail with under collection was proposed. This rail weighs 76 kg. per metre; it is carried by supports of impregnated wood similar in type to those used on the Invalides-Versailles line. The motor coaches collect the current by a special shoe, called "universal," arranged so as to collect either from the upper or under surface of the rail.

"The sub-stations, placed wherever possible at junctions, contain rotary converters of 1500, 1000 and 750 kw. output, according to their importance. Their distance apart varies from 3 to 8 km., according to the density of the traffic. Almost in every case they serve also to supply energy to the railway stations or to the station approaches. A very interesting control system allows a certain variation in the voltage of the continuous current supply, and of several sub-stations being put out of action during slack hours. The starting of the rotary converters is effected from the alternating side throughout. The sub-stations are supplied by three-phase underground feeder cables at 15,000 volts, 25 cycles. The pressure of 15,000 volts was chosen, first, because underground cables were used; second, on account of the distance to be fed, so as to step down at sub-stations without very elaborate apparatus, the network being very complicated. The feeders, it should be noted, are in duplicate, to ensure complete security. Electric energy will be furnished by two power stations, the construction and working of which has just been entrusted, after public tender, to an industrial syndicate. There is a sliding scale of charges under which, when the stations are finished, electric energy will be sold to the State at an inclusive charge of about 5 centimes per kilowatt-hour.

"The two power stations, comprising steam turbine units of 5000 kw., will be placed at Moulineux and at Bezons on the banks of the Seine. When the installations are complete, they will have a capacity of about 60,000 kw., and will furnish the State with about a hundred million kw.-hours per annum. The sliding scale for supplying this current contemplates the ultimate utilisation by the State of the energy coming either from the Rhone or from the coal mines in the north. It must not be forgotten that Bezons is only 170 km. from Lens. There is, therefore, good reason for believing that before long the coal mines at Pas-de-Calais will join with the falls of the Rhone in supplying Paris with electricity through a network of feeders, combined in a system such that the seasonal, daily, and hourly variations in the demand for energy at the points of consumption are met by corresponding variations at the various points of supply, arranged so as to secure the maximum economy. As regards subsidiary works, several engine-sheds and a large repair shed at Garelle-Bezons are to be provided for maintaining the electrical rolling stock. This shed, now in course of construction, will be able to take at one time forty to fifty coaches, and will be equipped with modern cranes and up-to-date tools. One result, and not the least important result of the electrification, will be the distribution of electric energy under the most economical conditions to all suburban stations."

High Tension Continuous Current Traction.—Mons. L. Gratzmuller, in a fairly full paper, considered this system and its possibilities of development. Some installations of recent type were described. He said that the weak point was the lack of a static transformer; this had been the cause of continuous current being set aside. "Can this disadvantage be compensated by certain advantages? This is what we are now going to consider." The author reviewed rapidly the various elements of the problem:—Generation of H.T. continuous current; the overhead conductor; the motors and their accessory apparatus; the control; the safety of the system and the protection of the staff. The following is the statement of conclusions arrived at by M. Gratzmuller as the result of his study:—

"The title high-tension continuous-current traction is not very happy. It implies an entirely new type of apparatus. As a matter of fact, it only marks steady development; from 500 volts it passed to 600 volts, and then to 750 volts. The trains from Villefranche to Bourg-Madame use current at 850 volts. Certain sections of the Buda Pesth system are now run at 1000 volts, and to-day the system is applied to locomotives at 2400 volts, and even 3000 volts is talked of. This progress has been justified by improvement in the commutation of the motors, due principally to the use of auxiliary poles and to recent methods of insulation by means of mica and impregnation. The cost of transmitting the energy must not be overlooked in view of the weight of copper required for the lines and the cost of sub-stations. In order to make a comparision with other methods of traction, viz., single-phase and three-phase, the length of the line and the intensity of the traffic should be taken as independent variables, but this would lead to the comparison of estimates, a subject unsuited for discussion here. It may be mentioned, however, that heavy traffic is a favourable factor for high-tension continuous-current traction. The advantages of continuous current are principally the large starting torque, the quality of the commutation (which is shown by the small wear of the commutator and the brushes), and the light coaches. On the other hand, there are the drawbacks of the use of an exposed high-tension rotating part—particularly dangerous in damp localities—the use of a commutator, and the control of the large currents necessary when a large amount of power is required. Some companies (Ganz and Brown, Boveri) after having used the three-phase system have thought it advisable to develop single phase apparatus (Brown, Boveri), or high tension continuous-current apparatus (Ganz and Brown, Boveri). The Westinghouse Company, which started with single-phase-traction, is constructing high-tension continuous-current apparatus, whilst Messrs. Siemens-Schuckert are developing single-phase and continuous-current apparatus. It is likely that these three systems of electric traction, viz., continuous current at high pressure, single-phase, and three-phase, will find fields of application. What is certain is that all traction, whether on a large or small scale, is tending undoubtedly and rapidly towards electrical working, the weight of the apparatus and the cost of the lines being capable of further marked diminution."

(To be continued.)

## MISCELLANEOUS.

The installation of the new glow lamp telephone system at Ballarat (V.) has been completed, and will come into use within a week. Electricity is largely utilised in the new installation, and the battery and dynamo rooms resemble those of an up-to-date power system on a small scale. The Ballarat Electric Supply Company provides a 440 volt current through a 9-horse power motor.

* * *

The Mildura (V.) Shire Council's electrical committee met last week to consider the question of duplicating the plant and the proposal of the Water Works Trust to pay the council £300 per annum for lifting the river waters for the town supply. The electrical engineer (Mr. A. C. Bertoli) submitted an estimate of the necessary outlay, and his figures showed that the amount required would be about £2400, including £460 for two motor pumps capable of lifting 30,000 gallons per hour, an increase of 10,000 gallons per hour on the present conditions. The engineer's estimate and report were adopted.

* * *

The N.S.W. Railway Commissioners have decided to illuminate the whole of the stations from Sydney to Parramatta by electricity. The section from Sydney to Strathfield will be supplied from the Pyrmont power house, and a new generating station will be erected at Clyde to supply the remainder of the stations.

* * *

The population of N.S.W. on March 31 had increased 9.14 per cent. from the figures of the 1911 census. If this rate of increase be maintained the 2,000,000 total should be reached in August or September, 1915.

* * *

The New South Wales Commissioner for Railways has recommended that increased rates be charged for periodical tickets (all lines and sectional) and workmen's tickets, so as to bring these rates to the level obtaining in 1907. Ordinary single and return fares are not to be altered. This course is estimated to produce an increase in the yearly revenue of £75,000; and higher freights on certain kinds of merchandise are looked to provide an additional £72,000, making the total anticipated yield from the increased charges £147,000 per annum.

* * *

A deputation from the Coburg Improved Passenger Transit League waited upon the Acting

Premier of Victoria last week and protested against the council including the district in the East Brunswick Broadmeadows Electric tramway scheme. They argued that the scheme meant a loss, for a nine mile route, of £18,982 in the first year. They got little sympathy from Mr. Murray, who contended that the council was willing to undertake the responsibility, and that the increased cost of land values would compensate for the loss. The Cabinet was committed to a Bill, and there was no use in pursuing the matter further.

* * *

Regulations issued by the Melbourne City Council recently with regard to certain employees in their electrical branch, it is stated, have caused considerable inconvenience to some of their customers. Under the new order, lamp attendants can now only replace incandescent lamps and fuses. Formerly they were allowed to repair faulty switches, and do other minor jobs.

* * *

The extension of the Geelong electric tramway service to South Geelong was begun last week. The new line when completed will terminate at the Barwon Bridge, but provision will be made for a later extension westward along Fyans-street through Chilwell.

* * *

The New South Wales Government has at last come to a decision on the question of obtaining the additional 80 engines requisitioned by the Chief Railway Commissioner. It has now been determined to import the engines, and in all probability they will come from England. Their cost is expected to run into £447,000. The Government, according to a statement by Mr. Cann, had been led to believe that after the importation of 20 English locomotives, the last of which were delivered in February this year, railway requirements would be sufficiently covered. Mr. Johnson had estimated that Eveleigh would place one per week on the railways, and that two per month could be counted upon from Clyde. On this estimate 75 engines should have come from the factories in the year, instead of which there had been only 20 from each. The Commissioner explained, so far as Eveleigh was concerned, that he had not been able to obtain the material to carry on the work expeditiously. Both the Chief Commissioner and the Treasurer were disappointed in their expectations with regard to the output of engines from Eveleigh and Clyde.

* * *

Mr. F. L. Baer, representing the Automatic Telephone Company, is at present in Sydney supervising the installation of the automatic system at Balmain, Glebe, and Newtown.

* * *

The consulting electrical engineers to the city of Brunswick (V.), Messrs. F. A. McCarty and Co., reported to the Council on Monday night, that the cost of the installation of the scheme to date, according to contracts let, was £14,745 8s. 11d. In addition, one hundred 30ft. poles and twenty 35ft. poles would be required to complete the contract. The Council was asked to go into the question as soon as convenient, as the pole contractors would be stopping work during the week. The engineers would like to have the poles placed on order, as it was very difficult to get them out of the forest during the winter months. It was decided that the electric light foreman should be instructed to make inquiries in regard to the purchase of the poles.

* * *

In view of the developing requirements of technical education, the Victorian Cabinet has determined at once to establish four junior technical schools in the metropolitan area. It is intended probably to commence a new school at Ballarat. Mr. Murray stated that the establishment of these schools would relieve the Working Men's College, which was cramped for room, and would enable that institution to devote itself to instructing senior technical students. The new schools would be preparatory, and a considerable expenditure would be involved. The Cabinet intended to propose the conditions to each municipality in which a school was started, that it should find the ground for a site and should contribute a percentage of the cost of the buildings. Collingwood had taken the initiative, and the school was a marked success, meeting the requirements of an extensive area. Ministers considered that step very progressive.

* * *

The Hawthorn and Kew tramway extensions are proving a great convenience to citizens, and the initial success has made it necessary to add more trams to the time-table. During the week ending June 4, a car mileage of 3,683 was covered, carrying 18,745 passengers and yielding a revenue of £259 9s. 7d. During the following week the car mileage was increased to 5,987, and the passengers increased to 56,598, yielding a revenue of £391 0s. 7d. For the week ending June 18, the car mileage was again increased to 6,267. There were 19,955 passengers, and a revenue of £337 4s. 10d. resulted. The total revenue derived from the tramways for the three weeks in question amounted to £987 15s., or an average of 14.874d. per car mile.

* * *

Giving evidence before the N.S.W. Public Works Committee on the expediency of constructing a railway from Roslyn to Taralga, Mr. Kennedy, surveyor, Department of Public Works, stated that some years ago an exploration of a line to Taralga had been made, branching from the Crookwell railway at the Forest Station, thence running down the Forest Creek to the Tarlo River, crossing the latter below the junction of the Forest Creek, and finally running in a northerly direction, and following the dividing ridge between the Tarlo River and Cooper's Creek, and then joining the old trial survey from Roslyn to Taralga at the town of Taralga. As an alternative proposal, the total length of this line would be about 17 miles, while the suggested route, from Roslyn to Taralga, would be 15 miles 66 chains, and the estimated cost £87,353. He favoured the last-mentioned route in preference to the Forest line, as it would be cheaper to construct, but his contention did not imply that the Forest railway would not be practicable. Around Taralga the land was very good, while in the Forest country it was principally of a nature suitable for grazing purposes, and the timber throughout the district was scarce.

* * *

On Thursday last the last of the 1912-13 wool clip was disposed of. It is estimated 1,700,000 bales, valued at £22,000,000, were shipped from the Commonwealth during the season, New South Wales contributing 45 per cent. of the quantity.

* * *

The Victorian Institute of Electrical Engineers has arranged for the admission of student associates on the nomination of a teacher in any recognised technical school.

* * *

At a meeting of the Victorian Institute of Electrical Engineers last week, papers were read by Mr. Noel Murray on "Tests on Fire Resisting Materials," and by Mr. F. W. Chambers on "Historical Electrical Progress in Victoria." Mr. W. J. Newbigin, who, during his absence in New Zealand, was elected President of the Institute, delivered his presidential address. Mr. Newbigin, in the course of his speech, said an importer who relinquished his business in order to start a local factory was likely to find his fiscal views being slowly influenced by his change of occupation. The manual labourer who found that Government employment resulted in his obtaining more money for less work was not likely to advocate with any enthusiasm the extension of private enterprise, and the most zealous advocates of income tax were those whose own incomes were exempt. Referring to the numerous anomalies disclosed in the Commonwealth tariff guide, and more particularly those connected with the electrical trade, he observed that they would find that the duty on switches depended not on the nature of the switch, but on the company it kept. A switch coming out in aristocratic seclusion without encumbrance was admitted free; if, however, it shared a ship with poor relations of the slate or marble family it paid 20 per cent. on landing. Somewhat different treatment was meted out to arc lamp globes. A nicely brought up globe, travelling with its parent arc, came in free, but should any such globe dare to emigrate unchaperoned it very properly paid 20 per cent. on arrival in Melbourne.

* * *

In our issue of June 12 it was stated by our Westralian correspondent that the management of the Sons of Gwalia mine had decided to replace the Thomson-Houston generator by a Commonwealth generator. We are informed by the Australian General Electric Co. that our correspondent was in error, and that it is only the gas generator which is being replaced, and that the British Thomson-Houston electrical generator will continue to be operated from the new gas generator.

* * *

According to the Melbourne City Council's business paper, arrangements have been made to supply electric energy to the new Government Cool Stores at Victoria Dock for a term of five years, and authority is asked by the electric supply committee to lay an additional main at a cost of £2000 for the purpose. Still another main is to be laid at a cost of £2300, provided permission is given, to supply electrical energy to the Carlton Brewery.

* * *

Soundings are being taken between Long Nose Point and Greenwich, Lane Cove, N.S.W., preliminary to the work of building the proposed electric cable tunnel. The soundings are being carried out by the Harbour Trust for the Railway Department, and a number of workmen are employed on the punt, which is fitted with a hoist frame similar to a pile-driver. As the craft is hauled about the harbour bed is pricked with a special instrument to ascertain the depth of the rock, etc.

* * *

The Manilla (N.S.W.) Municipal Council has received three tenders for providing electric light. One of them is being most favourably considered, and a final decision will be arrived at later. In the meantime objections to the proposal are invited. The aldermen are unanimous with regard to the importance of establishing electric light.

* * *

Our Lithgow (N.S.W.) correspondent writes:—It is pleasing to state that matters have been somewhat brighter at the Lithgow Iron and Steel Works during the past week or ten days, with the result that the 9-inch, 14-inch, and 18-inch mills have worked full time; while the 27-inch mills have been engaged in rolling rails and fish-plates, and billets for some days. There is now plenty of work ahead of each of the mills mentioned.

---

## COMMONWEALTH TRADE.

The Commonwealth trade returns for May show a decrease of £384,448 in imports of merchandise, and an increase of £531,792 in exports. Exports of gold and specie were trifling in comparison with those of May, 1912, when upwards of 1½ millions was shipped. The following is a summary of the totals of Australian trade for May and the first five months of the year, compared with corresponding periods last year:—

| | May, 1912. | May, 1913. | Five Months, 1912. | Five Months, 1913 |
|---|---|---|---|---|
| | £ | £ | £ | £ |
| Imports— | | | | |
| Gold and specie | 115,146 | 172,406 | 607,050 | 694,397 |
| Merchandise | 5,911,105 | 5,526,657 | 31,551,304 | 30,245,698 |
| Total | 6,026,251 | 5,699,063 | 32,158,354 | 30,940,035 |
| Exports— | | | | |
| Gold and specie | 1,636,980 | 185,742 | 5,184,458 | 1,206,211 |
| Merchandise | 3,688,087 | 4,219,879 | 24,226,899 | 26,208,598 |
| Total | 5,325,067 | 4,405,621 | 29,411,357 | 27,414,809 |

The following is a comparison of some of the principal imports and exports of the Commonwealth for the first five months of the year, with those for the corresponding period last year:—

Imports.

| | Five Months. 1912. | Five Months. 1913. |
|---|---|---|
| | £ | £ |
| Iron and steel, etc. | 791,464 | 909,242 |
| Iron, galvanised, plate, etc. | 963,375 | 840,631 |
| Iron, pig, etc. | 140,757 | 72,674 |
| Leather | 222,581 | 189,638 |
| Machinery | | |
| Agricultural | 257,372 | 188,716 |
| Other | 2,141,426 | 2,025,230 |
| Manufactures of metals | 2,206,102 | 2,104,800 |
| Kerosene | 259,086 | 193,391 |
| Railway materials | 697,566 | 590,969 |
| Timber | 1,115,281 | 1,174,940 |
| Tinplates | 280,798 | 194,989 |
| Tools of trade | 319,942 | 308,745 |
| Bullion, gold | 529,068 | 518,453 |
| Specie, gold | 6,708 | 161,984 |
| Specie, other | 71,274 | 13,900 |

Exports.

| | Five Months. 1912. | Five Months. 1913. |
|---|---|---|
| | £ | £ |
| Leather | 204,642 | 230,684 |
| Timber | 328,421 | 341,985 |
| Copper | 954,954 | 1,080,280 |
| Lead | 550,986 | 617,895 |
| Silver | 305,888 | 340,129 |
| Tin | 274,942 | 298,099 |
| Ores (except gold) | 394,627 | 459,742 |
| Bullion, gold | 855,527 | 539,905 |
| Specie, gold | 4,315,623 | 640,974 |
| Specie, other | 13,308 | 25,332 |

**P. & O.** COMPANY'S ROYAL MAIL STEAMERS
FOR MARSEILLES PLYMOUTH, AND LONDON.

Leave Sydney on the subjoined dates, calling at usual ports.

FIRST AND SECOND SALOON ONLY.

| Steamer. | Tons. | Commander. | Noon. | Melb., 3 p.m. |
|---|---|---|---|---|
| MOLDAVIA | 10,000 | Gordon | July 12 | July 15 |
| MALOJA | 12,500 | Weston | July 26 | July 29 |
| MONGOLIA | 10,000 | Llewellyn | Aug 9 | Aug 12 |

PASSAGE MONEY TO LONDON—
Single, £41 16s to £82 10s.
Return, £69 6s. and £123 4s

Return Tickets between Inter-State Ports are available for return by Orient, Messageries Maritimes, and N D.L. steamers having room.

SPECIAL HOLIDAY RETURN TICKETS to COLOMBO are now issued, available for two months. Fares from Sydney, £45 2s. first saloon, and £31 18s. second saloon.

A. GORDON WESCHE, Superintendent IN AUSTRALIA, 63 Pitt-street, Sydney.

**The COLONIAL MUTUAL FIRE Insurance Company Limited.**

Principal Office 60 MARKET-ST., MELBOURNE

Branches in all the States.

Transacts Fire, Guarantee, Employers' Liability, Marine, Burglary, and Plate Glass, Accident, Workers' Compensation and Live Stock Insurances.

Send for Prospectus.

W. TUCKER, General Manager

**Harringtons Ltd.**

**ANALYTICAL & METALLURGICAL DEPT.**

Lowest fees for all kinds of Assay, Analytical, and Metallurgical work.

Expert Advice on Ore Treatment, Bullion Refining, Smelting, etc., etc. Directed by a qualified Analyst from Messrs. Johnson and Sons, London; Assayers to Bank of England; H.M. Mint, The Council of India, etc.

**HARRINGTONS LTD.**
**386 George Street, Sydney.**

An improved service, in which all the trains from Melbourne will be met by trams on the Brighton-St. Kilda electric line, is promised by the Victorian Railway Commissioners.

• • •

It is understood that the Victorian conference which is dealing with apprenticeship problems has agreed upon the necessity, in the interests of the various trades, of inaugurating a thorough system of apprenticeship under legal obligation. The conference favours the investing of wages boards with full powers to determine all questions relating to apprenticeship. Such a proposal is unlikely to commend itself to the Government. There are 131 wages boards, of which 100 would be called upon to deal with apprenticeship questions. Each meeting of a wages board costs, on an average, £10. The extension of operations in the manner suggested would, it is considered, greatly increase the working expenses of the boards. In America, employers are given a free hand in affording special opportunities to promising youths to learn their trade thoroughly. The view is put forward in official quarters that, as a result of the conference, a special body might with advantage be appointed, to which all apprenticeship matters could be referred.

• • •

Of the machinery for the Lake Coleridge hydro-electrical scheme (N.Z.), some £13,000 worth has already arrived, and more is on the water. Negotiations are proceeding between the Christchurch tramways and the Government for a supply of current. This is one of the first of the Government's undertakings in this direction to be put in hand. Recognising the potentialities of electrical water power installations in the Dominion, the Liberal Government always refused to allow them to fall into private hands, and many schemes in different localities have been exhaustively reported upon, with a view to their being entered upon. What will become of these enterprises under the Massey regime remains to be seen.

* * *

Smelting at the Yelta (S.A.) Government copper mine was stopped on 17th May last, and it has now been finally decided to close the underground operations at the end of this month.

# *Tenders Invited and Accepted*

It is particularly requested that the information regarding contracts open, and the successful tenderers, be forwarded to The Editor not later than Monday of each week.

The following contractions are used throughout:—S—supply; D—delivery; M—manufacture; C—construction; E—erection; P—purchase; I—installation; R—removal. Where no contractions appear, supply and delivery is understood. The date at the beginning of each paragraph refers to the closing of tenders.

## INVITED.

### Commonwealth.

Specifications, tender-forms, etc., for tenders invited for the Postmaster-General's Department of the various States under this heading may be had as follows:—Victoria—Various State G.P.O.'s. New South Wales—Departmental Stores, Sydney, and various G.P.O.'s in other States. South Australia—Adelaide, Melbourne, Sydney and Brisbane G.P.O.'s. Western Australia—Departmental Stores, Perth, and various G.P.O.'s in other States. Queensland—Various State G.P.O.'s. All States—Various G.P.O.'s. If the Specifications, etc., may be had elsewhere in addition the places will be given in parentheses.

POSTMASTER-GENERAL'S DEPARTMENT, Melbourne.—8th July.—Instruments, telephone parts, as per schedule No. 866.

8th July.—India-rubber covered wire, as per schedule No. 873.

8th July.—Cast-iron pipes, as per schedule No. 885.

8th July. — Measuring instruments, as per schedule No. 871.

8th July.—Wire, I.R. covered, as per schedule No. 872.

8th July.—Batteries and battery material, as per schedule No. 880.

8th July.—Galvanised-iron piping, as per schedule No. 887.

8th July.—Switchboards, telephone, various, as per schedule No. 895.

8th July.—Measuring instruments, various, as per schedule No. 870.

8th July.—S., D., and E. of a common battery switchboard at Windsor, as per schedule No. 805.

15th July.—Telegraph and telephone material (switchboard parts), as per schedule No. 878.

15th July.—Galvanised-iron piping and fittings, as per schedule No. 886.

15th July.—33 tons of sulphate of copper for the State of New South Wales, as per schedule No. 955. Preference will be given to tenders which guarantee early delivery of the material.

15th July.—Relays, as per schedule No. 958.

22nd July.—Batteries and battery material, as per schedule No. 881.

22nd July.—Wire (silk covered), schedule No. 884.

22nd July.—45 lb. wire (silk covered), as per schedule No. 883.

22nd July.—10,000 porous pots, as per schedule No. 882.

22nd July.—Ironwork, as per schedule No. 891.

22nd July.—Telephone switchboards, as per schedule No. 899

22nd July.—Telephone switchboard cable, as per schedule No. 856.

22nd July.—Telephone switchboard cable, as per schedule No. 857.

22nd July.—Sundries, as per schedule No. 892.

29th July.—Detectors, keys, staples, tongs and rosettes for table telephones, as per schedule No. 901.

29th July.—Sundries, as per schedule No. 893.

29th July.—Coach screws and spikes, as per schedule No. 904.

19th August.—105 miles of paper-insulated, lead-covered cable, as per schedule No. 906.

26th August. — 460 coin-collecting devices, electrically controlled, as per schedule No. 916.

16th September.—S., D., E., and I., at the Telephone Exchange, Collingwood, Victoria, of a common battery switchboard, as per schedule No. 860, or an automatic, or semi-automatic, switchboard, as per schedule No. 859.

16th September.—Galvanised-iron piping and fittings, as per schedule No. 951.

23rd September.—Sulphate of copper, as per schedule No. 956, in the undermentioned quantities:—New South Wales, 140 tons; Victoria, 25 tons; Queensland, 55 tons. South Australia, 20 tons; Western Australia, 60 tons.

23rd September.—500 letter-box fronts, small size, as per schedule No. 957.

23rd September.—General stores, for a period of two years, from the 1st July, 1913, to the 30th June, 1915, as per schedule No. 913.

14th October.—S. and E., at the Telephone Exchange, Melbourne, of a common battery multiple switchboard, as per schedule No. 868. (See advertising columns.)

4th November.—D. and E. of eight automatic telephone switchboards at the Ascot, Canterbury, Malvern, Cheltenham, Footscray, Oakleigh, Sandringham, and Williamstown Telephone Exchanges, as per schedule No. 953. (See advertising columns.)

POSTMASTER-GENERAL'S DEPARTMENT, Sydney.—9th July.—30 Morse registers, as per stores schedule N.S.W. No. 310.

9th July.—2350 relays and 88 mounting plates, as per stores schedule N.S.W. No. 311.

9th July.—Wire, galvanised iron, etc., stores schedule, N.S.W., No. 295; bridle rings, etc., stores schedule, N.S.W., No. 297.

9th July.—240 steel date stamps to stores schedule N.S.W. No. 319; and engraving on date stamps to stores schedule N.S.W. No. 320.

16th July (extended from 9th July).—Eight multiple magneto incoming junction line switchboards, with associated equipment, as per schedule No. 205.

16th July.—60 letter and newspaper boxes combined, and 80 letter boxes, as per stores schedule N.S.W. No. 316.

16th July.—100,000 tin slides and 100,000 seal cups, as per stores schedule N.S.W. No. 317.

30th July.—S., D., and E., at the Telephone Exchange, Sydney, of two sections of switchboard, common battery multiplè, to form an extension to the existing common battery switchboard at the Telephone Exchange, Sydney, as per schedule No. 264.

27th August.—(1) Telephones to stores schedule N.S.W. No. 301; (2) switchboards to stores schedule N.S.W. No. 302; (3) lamps, electric, incandescent, to stores schedule N.S.W., No. 304.

POSTMASTER-GENERAL'S DEPARTMENT, Perth.—9th July.—S. and D. of wire, india rubber covered, and cotton, silk or wool covered, to W.A. schedules Nos. 265 and 266.

9th July.—Insulators to W.A., schedule No. 277.

9th July.—Ironwork generally to W.A. stores schedule No. 293.

16th July.—S. and D. of wire, bronze and copper, to W.A. schedule Nos. 260, 267, and 273.

23rd July.—S. and D. of switchboards and parts, telegraph and telephone instruments, to W.A. schedules Nos. 254, 255, and 256.

30th July.—S. and D. of switchboard cable, to W.A. schedule No. 275.

30th July.—S. and D. of steel towers, battery material, wire and iron work generally, to W.A. schedules, Nos. 259, 262, 263, 268, and 269.

6th August.—S. and D. of insulators, telegraph and telephone material, and iron poles, to W.A. schedules, Nos. 258, 261, and 264.

6th August.—Cable, lead-covered, paper-insulated—telephone.

POSTMASTER-GENERAL'S DEPARTMENT, Brisbane. — 30th July.—Cable, as per stores schedules Nos. 254 to 260 (omitting 258); wire, copper and accessories, as per stores schedule No. 267; wire, covered, as per stores schedule No. 268.

**Osborn's Truck Wheels & Axles**

**Osborn's Mushet High Speed Steel, Twist Drills, Mining Steels, Crusher Jaws and all classes of Castings.**

Samuel Osborn & Co. Ltd., Sheffield, are Standard Makers.

Gibson, Battle & Co. Ltd.

**535 Kent St., Sydney.** **486 Collins St., Melbourne.**

S.A. Agent: C. C. Deland, Victoria Square, Adelaide.

30th July.—Battery, glassware, as per stores schedule No. 252; battery material, chemicals, etc., as per stores schedule No. 253; conduits, earthenware, as per stores schedule No. 261; crossarms and spindles, wood, as per stores schedule No. 262; wire, steel strand, as per stores schedule No. 270.

27th August.—S., D., and E. at the Telephone Exchange, Brisbane, of five sections of switchboard, common battery, multiple, and other equipment to schedule No. 243, specification No. 458.

10th September.—Telephone Exchange, Brisbane, nine sections of a trunk line switchboard to schedule No. 244, specification No. 461, and the general conditions, drawings, etc., attached thereto.

24th September. — Ironwork, as per stores schedule No. 264; pipes, cast iron, as per stores schedule No. 265; poles, iron, etc., as per stores schedule No. 266; wire, G.I., as per stores schedule No. 269.

POSTMASTER-GENERAL'S DEPARTMENT, Adelaide.—9th July.—17,000 cast-iron brackets and 8500 steel spindles, as per schedule No. 298.

16th July.—Telegraph and telephone material, schedules Nos. 277 to 286.

23rd July.—600 coppers for gravity cells, as per schedule No. 302.

13th August.—Telephone parts, as per schedule No. 292, and switchboards, as per schedule No. 293.

DEPARTMENT OF HOME AFFAIRS (Works Director, Victoria). — 7th July.—Cold storage installation at Naval College, Jervis Bay.

21st July.—S. of laundry plant to Captains' Point, for the Naval College, Jervis Bay, N.S.W.

DEPARTMENT OF HOME AFFAIRS.—Federal Capital Power Plant. — 14th July.—Tools for power transmission lines.

1st September.—S. of sect. 1, main powerhouse switchgear; sect. 2, switchgear for Diesel engine plant.

DEPARTMENT OF HOME AFFAIRS.—Kalgoorlie-Port Augusta Railway. 23rd July.—7ft. wheel lathe, single-ended punch and shears, 10 cwt. portable cupola, 5 cwt. steam hammer; (alternatively) 5 cwt. belt-driven pneumatic hammer.

29th July.—M., in Australia, S., and D. of car bodies for construction train; M., in Australia, S., and D. of car bogies for construction train.

2nd September.—M., S., and D. of 80 lb. steel rails and fishplates; M., S., and D. of iron dog spikes and steel fishbolts and nuts for 80 lb. rails.

DEPARTMENT OF EXTERNAL AFFAIRS. — Port Augusta to Oodnadatta Railway. — 22nd July.—M., S., and D. of 4 wheel brake vans (3ft. 6in. gauge).

DEPARTMENT OF EXTERNAL AFFAIRS. —Pine Creek to Katherine River Railway.—19th August.—S. 80 lb. steel rails and fishplates, sleepers, (a) steel, (b) timber (Powellised); iron dog spikes and steel fishbolts and nuts for 80 lb. rails.

DEPARTMENT OF TRADE AND CUSTOMS. 26th August.—S. and D. of eight (8) automatic flashing lights.

DEPARTMENT OF DEFENCE.—25th August.—S. and E. of an oil storage tank at Garden Island, Sydney.

## Victoria.

VICTORIAN RAILWAYS.—3rd July.—Baths, chamois leathers.

4th July.—High-speed tool steel.

4th July.—Zinc caps.

9th July.—Body blocks.

9th July.—Rolled steel joists.

9th July. — M., S., and D. of wrought-iron forgings.

9th July.—M., S., and D. of galvanised-iron ambulance mountings.

9th July.—M., S., and D. of rolled steel joists, angle braces, etc., for bridge on Lilydale line.

9th July.—C., riveting, etc., of mild steel girders for bridges at Cromwell, Williams, and Malvern roads for Caulfield line duplication.

9th July.—S. and D., as ordered during the period ending 30th June, 1914, of galvanised corrugated iron, malleable fittings, india rubber steam hose, galvanised iron rolled top baths, oxygen, oil engine cylinder oil (lubricating), whiting, tar, putty, doors, Australian pitch, expanded metal, and powdered caustic soda.

16th July.—S. and D. of rolled steel joists, etc., for bridges on the Bairnsdale to Orbost railway.

16th July.—M., S., and D. of petrol tanks and metal cases, with wood frames.

23rd July.—M., S., and D. of one hydraulic flanging press.

30th July.—Balls and ball races for 70ft. turntables.

4th August.—Electrification of the Melbourne suburban railways—(a) circulating water and sump pumps, with motors; (b) air and water extraction pumps and motors; (c) surface condensers, hot wells, piping, and sundries.

6th August.—Steel channel bars.

13th August.—Best steel boiler plates for steel cranes, boilers, etc.

13th August.—30,000 lineal feet of wrought-iron steam pipe, 1in. diameter.

20th August.—M., S. and D. of (a) lathe, (b) sawing machine, (c) chisel mortiser, (d) cut-off machine, (e) moulding machine.

27th August.—Hollow chisels and bits.

3rd September.—S. of three petrol engines and pumps for use at Newport Workshops. (Fresh tenders.)

3rd September.—Steel faced machine knives.

10th September.—Neutral track relays.

VICTORIAN RAILWAYS COMMISSIONERS. —State Coal Mines.—13th August (extended from 25th June).—S. of electrical equipment.

PUBLIC WORKS DEPARTMENT. — 3rd July.—Electric lighting and bell service at the Cool Stores, Victoria Dock, Melbourne; contract No. 6.

## New South Wales.

PUBLIC WORKS DEPARTMENT. — 14th July. — I. electric goods, No. 3, new parcels office, Central Railway Station, Sydney.

14th July.—I. electric passenger lift, No. 1, at new parcels office, Central Railway Station, Sydney.

11th August.—Steel bridge for Macleay River, Wauchope, to Kempsey section, North Coast railway.

11th August. — Steel bridges for Hastings River and flood channel, Wauchope to Kempsey section, North Coast railway.

3rd September.—Efficient steam tugs for use at Bellinger River and Cape Hawke, from 1st November, 1913.

RAILWAY DEPARTMENT.—9th July.—S. of 12 12in. water columns and 6 pillar tanks.

6th August.—S. of one live steam feed water-heater for Ultimo power-house.

20th August.—S. of a pneumatic ash handling plant for White Bay power-house.

METROPOLITAN WATER AND SEWERAGE BOARD.—7th July.—1190—C. 269 lineal feet cast-iron and concrete pipe sewers, City of Sydney, low level.

## South Australia.

SUPPLY AND TENDER BOARD. — 8th July.—S. and D., in bond, on wharf, Port Adelaide, of 250 Wallis patent, pressed steel spring, buffers, with split-ring fastening, to drawing No. 10200.

15th July.—S. and D. of best mild steel.

15th July.—S. and D. of 500 bars bright drawn hexagon steel.

15th July.—S. and D. of cold-reeled mild steel bars.

15th July.—S. and D. of solid drawn copper tubes.

22nd July.—S. and D. of chain iron.

RAILWAYS.—15th July.—C. of 8 bogie passenger brakevans, 5ft. 3in. gauge.

15th July.—C. of 17 bogie goods brakevans, 5ft. 3in. gauge.

15th July.—C. of ~~30~~ sheep vans, 3ft. 6in. gauge.

15th July.—C. of 30 sheep vans, 5ft. 3in. gauge.

15th July.—C. of 15 cattle vans, 3ft. 6in. gauge.

22nd July.—C. of 30 or 50 bogie waggons, 5ft. 3in. gauge.

WORKS AND BUILDINGS DEPARTMENT. —16th July.—Installation electric light, Military Headquarters, Keswick.

## Western Australia.

GOVERNMENT TENDER BOARD. — 3rd July.—Tubular iron poles, for Railway Department, as per schedule No. 118A, 1913.

31st July.—3520 pairs of fishplates for 46½ lb. material.

NORD DEUTSCHER LLOYD
REGULAR SERVICE TO EUROPE.
REDUCED FARES TO LONDON.
TO MANILA, CHINA AND JAPAN.
Via New Guinea and Yap.
Fares to Hong Kong, £40; II., £26.
Full particulars will be sent on application to—
LOHMANN AND CO., General Agents,
7-9 Bridge-street, Sydney.
Ostermeyer, Van Rompaey and Co., Melbourne; H. Muecke and Co., Adelaide; L. Ratazzi and Co., Fremantle; Thos. Brown and Sons Ltd., Brisbane.

The Mount Lyell Mining & Railway
CO. LIMITED.
Purchasers of Ores containing Copper, Gold and Silver. Rates obtainable on application to the Secretary.
Manufacturers of Coke for Smelting and Foundry Purposes, Acids, Etc.
HEAD OFFICE—
39 QUEEN-STREET, MELBOURNE.
D. G. LUMSDEN,
Secretary.

We helped them,
We can help YOU!

We refer to the hundreds of Mine Owners who have adopted "Atlas Diesel" Engines. This efficient and economical source of power has been brought to a wonderful state of perfection.

It is giving solid satisfaction in hundreds of Mines to-day, working under all conditions.

Naturally, the "Atlas" Engine possesses many unique features that enable it to give such satisfaction. It runs on the very cheapest fuel—petroleum residue, etc., and this, combined with its high efficiency, means extremely low running cost. It requires no device for ignition, and starts at the first injection of the fuel oil.

The Governors of "Atlas" Engines are absolutely sure in their action, and perfectly reliable.

We are Specialists in Mining Machinery. Let us solve your power problems. Write to-day or call and see the "Atlas" Engine running.

STAWN LTD.,
Engineers,
313 KENT STREET, SYDNEY.

## Queensland.

RAILWAYS DEPARTMENT.—15th July.—M. and S. of steel super-structure bridge over Pioneer River.

15th July.—S. of one 120ft. steel super-structure (one span), Caboolture River bridge.

29th July.—S. of steel superstructure for three 149ft. 6in. spans for widening Bremer River bridge.

PUBLIC WORKS DEPARTMENT. — 18th July.—Steel super-structure of two spans of 120ft. each on one cast-iron pier, and concrete abutments for new bridge over McIntyre River, Goondiwindi.

TREASURY DEPARTMENT.—29th October. —C. and E. of central sugar mill at Babinda Creek, North Queensland.

## General.

CITY OF MELBOURNE.—4th July.—S. and D. of one 15-ton pulley block.

4th July.—Trifurcating boxes, one electrically-driven winch.

Dunlop Mining Goods
Are now used with satisfaction in most of the leading mines of Australasia — Their QUALITY & WEAR are unquestioned.
Tenders & Samples submitted.
Correspondence invited.
Send for Illustrated Catalogue
The DUNLOP RUBBER Co. of AUS. LTD.
Flinders St. MELBOURNE.
& ALL STATES
Dunlop Rubber Belting
Is more efficient than Leather belting for Outdoor & Wet Work.
Sample & Price on application.

"FIBRO-CEMENT" Fireproofing
Everyone about to build should obtain full particulars of this cool, acid-proof, ant-proof and fire-resisting material. The slates for roofs and the sheets for walls and ceilings are specially suited for the Australian climate. Used by the Federal and State Governments and by all the leading Architects and Builders.
ECONOMICAL AND EVERLASTING.
Full particulars, etc., from Sole Agents and Importers—
JAMES HARDIE & CO. Melbourne & Sydney

**W F. Stanley & Co. Ltd.,**

**Scientific Instrument**

makers, are recognised by all users as being foremost in their craft the world over. They have appointed us as the **N.S.W. Sole Agents**, and we are selling their manufactures at their **English Catalogue Prices**, plus only 15 per cent Customs and importing expenses Our stock is now the largest one in Australia, and embraces all the latest improvements in instruments Write for catalogues.

**FAIRFAX & ROBERTS LTD.,**
Vice-Regal Opticians.
**23 and 25 Hunter-street, Sydney.**

Levels, Theodolites, Mining Dials, Drawing Instruments, Papers and Inks, etc., etc.

15th July.—S., D., and E. of a steam or suction gas plant, for the City Council's quarries, Clifton Hill. (See advertising columns.)

1st August.—P. of scrap electric lead, accumulator materials, etc. (See advertising columns.)

MUNICIPAL COUNCIL OF SYDNEY.—7th July.—Arc lamp carbons.

MUNICIPALITY OF NORTH SYDNEY. —29th July.—S. and E. of refuse destructor, capable of dealing with 200 to 250 tons per week.

CITY OF TOOWOOMBA (Q.) (extended indefinitely from 1st March).—Following plant:—(1) S. and E. of pumping plant of 25,000 gallons per hour capacity; (2) 10in. cast iron water pipes; (3) valves, special castings, etc. Tenders must be in accordance with specifications and conditions of tenders, copies of which may be seen, and tender forms obtained, at the offices of the town clerk, Sydney, Melbourne, Brisbane, and Toowoomba.

CITY OF CAULFIELD (V.) (F. Jowett, Town Clerk).—23rd July.—P. of old tramway rails and fishplates. (See advertising columns.)

TOWN OF NORTHCOTE (V.) (W. G. Swift, Town Clerk).—7th July.—S., D., and laying of underground electric cables.

TOWN OF PORT MELBOURNE (V.). (A. V. Heath, Town Clerk).—8th July.—S. and D. of a 10-ton steam roller, fitted with scarifier, under terms and conditions to be seen at the council offices, Town Hall, Port Melbourne.

SHIRE OF WYCHEPROOF (V.)—Electric Supply Undertaking, Township of Sea Lake (G. B. Lincolne and J. K. MacDougall, 430 Little Collins-street, Melbourne).—5th July.—S., D., and E. of one suction gas engine and gas plant complete; S. and D. of electrical plant and equipment; E. of electrical plant and equipment; S. and D. of wires and cables; S. and D. of wood poles.

SHIRE OF WYCHEPROOF (V.).—Electric Supply Undertaking, Township of Wycheproof (G. B. Lincolne and J. K. MacDougall, 430 Little Collins-street, Melbourne.)—5th July.—S., D., and E. of one suction gas engine and gas plant complete; S. and D. of electrical plant and equipment; E. of electrical plant and equipment; S. and D. of wires and cables; S. and D. of wood poles.

METROPOLITAN WATER AND SEWERAGE BOARD, Brisbane (Q.) (Geo. Johnston, Secretary).—31st July.—41,000 casks Portland cement, under contract No. 10, 1913; and 41,000 casks Portland cement, under contract No. 11, 1913.

MUNICIPAL TRAMWAYS TRUST, Adelaide (W. G. T. Goodman, Chief Engineer and General Manager).—15th July.—M., S., and D. of steel rails.

29th July.—S. and D. of bonding material.

19th August.—M., S., and D. of steel poles.

Specifications relating to the S. and D. of copper cable and wire may be obtained on application to W. G. T. Goodman, Engineer and Manager. Tenders will be invited at 48 hours' notice, at a later date, and specifications are now issued to facilitate prospective tenderers obtaining quotations.

O.K. COPPER CO. N.L. (in liquidation) (Sidney Cornish, 23 Brookman's Building, Adelaide, S.A.)—21st July.—P. of large traction plant; also smelting, converter and mining plants, buildings, stores, etc., estimated to have cost £75,000, comprising engineering plants, 30-ton weighbridge, 4 Babcock boilers, also number of engines of mines, smelter and converter plants, air compressor, pumps of various descriptions; also 9 traction engines, number of trailers, together or separately; also large quantity of stores and sundries. The whole mine and plant as a going concern, or the mine, including all leases; the whole of the plant, in one lot; any article of machinery and plant separately.

JUNCTION NORTH BROKEN HILL MINE N.L. (T. H. Palmer, General Manager).—12th July.—S. of mining stores for 12 months, commencing 1st August next. (See advertising columns.)

THE PLACER TIN MINING CO N.L. (J. V. M. Wood, F.C.P.A., incorporated accountant, official liquidator, official assignee, etc., 34 Queen-street, Melbourne).—21st July.—Dredging plant of the above, situate at Germanton, New South Wales, comprising a Standard mining dredge, by Thompson and Co., Castlemaine, with all improvements; compound engine (dry-back marine type), dredge boiler, connections, fittings, nozzles, etc.; also electric lighting plant, with lamps and fittings complete; substantial oregon pontoon, and quantity of plant, stores, etc.

THE TRUSTEES, EXECUTORS AND AGENCY CO. LTD., 412 Collins-street, Melbourne.—7th July. — P. of silk, grit gauze, binding, etc., machinery.

BROKEN HILL PTY. BLOCK 10 CO. LTD. (O. B. Ward, General Manager, Broken Hill).—15th July.—S. and D. of all mine requisites for 12 months from 1st August next.

SHIRE OF KYEAMBA (N.S.W.) (C. L. Daley, Shire Clerk).—17th July.—S. of 8h.p. portable engine.

METROPOLITAN GAS COMPANY (V.) (A. E. Bradshaw, Subst. Secretary Melbourne).—11th September.—P. of a total fixed quantity of 1800 tons of sulphate of ammonia, to be produced by this company during the twelve months ending 31st August, 1914. (See advertising columns.)

MELBOURNE AND METROPOLITAN BOARD OF WORKS (Geo. A. Gibbs, Secretary).—11th July.—S. and D. of crane, winches, and lifting gear, for screens at service reservoirs. (See advertising columns.)

29th July.—S. and D., at the Metropolitan Farm, Werribee, of two steel wire plough ropes. (See advertising columns.)

SHIRE OF NUMURKAH (V.) (T. S. Lancaster, Secretary). — 7th July.—S. and D. of road grader.

SHIRE OF KARKAROOC (V.) (Chas. A. Chamberlain, Shire Secretary). — 15th July.—S. and E. of two 15-ton weighbridges, one at Pullut railway station, one at Gama railway station.

SHIRE OF BRAYBROOK (V.). (Walter J. Andrew, Shire Secretary, Sunshine). — 18th July.—S. of portable stone-breaker, and power for driving same.

FRANKLIN COPPER AND LEAD MINING SYNDICATE N.L. (in liquidation) (A. G. Kimber, 29 National Mutual Buildings, King William-street, Adelaide, S.A.).—28th July.—P. of various mining machinery and tools.

CUMBERLAND GOLD MINING CO. N.L. (in liquidation) (N. S. Gunnersen, 6 and 7 Brookman's Building, Grenfell-street, Adelaide, S.A.).—P. of assay balance, etc.

SWISS MOUNT QUARTZ MINING CO. N.L. (V.) (Wm. Lascelles, Manager, 90 William-street, Melbourne). — 9th July (extended from 25th June). — P. of the above mine, as a going concern, including all machinery, which comprises complete winding plant, and mining equipment, consisting of horizontal engine, 18in. cylinder, 3ft. stroke, double drums, wire ropes; large Cornish galloway tube boiler, 26ft. x 6ft. 6in.; poppet heads, smith's shop, tools, cages, tanks, trucks, etc. (See advertising columns.)

NEW WYLIE CREEK DREDGING CO., 16 O'Connell-street, Sydney.—14th July.—P. of dredging leases, sluicing plant, dam, etc. (See advertising columns.)

J. PLOTTEL, 19 Queen-street, Melbourne (V.).—S. and E. of filters, steeps, cone tanks, etc. (See advertising columns.)

MELBOURNE HOSPITAL (V.) (T. R. Andrews, Secretary). — For sale, two Cornish boilers. (See advertising columns.)

## ACCEPTED.

### Commonwealth.

POSTMASTER-GENERAL'S DEPARTMENT, General.—2500gal. of American "White Rose" kerosene water white oil, 150deg. fire test, to be supplied in tins and delivered f.o.w. Brisbane, at 11d. per gallon, £114 11s. 8d.; 2500gal. of American petroleum, to be supplied in tins and delivered f.o.w. Port Moresby, at 1s. 1½d. per gallon, £138 0s. 5d.—The Vacuum Oil Co. Pty. Ltd., Melbourne.

POSTMASTER-GENERAL'S DEPARTMENT, New South Wales.—Two (Hallford) 32b.h.p. motor lorries (petrol), complete—one 4-ton lorry £880, one 5-ton lorry £930—Birt and Co. Ltd., Sydney.

POSTMASTER-GENERAL'S DEPARTMENT, Western Australia.—2000ft. pipe, cast-iron, 3in. spigot and socket, 1s. 2.88d. per feet; 100 bends, split, for 3in. pipe, to turn through 90 deg. arc, mean radius about 10½in., 17s. each—Hoskins and Co. Ltd., Perth.

500ft. pipe, water, iron, galvanised, 2½in., 11½d. per foot; 1000ft. pipe, water, iron, galvanised, 3in., 1s. 1½d. each; 200 couplings for 2½in. galvanised iron piping, 1s. each; 300 couplings for 3in. galvanised iron piping, 1s. 4¾d. each—Stewarts and Lloyds (Australa) Ltd., Perth.

Cleats, steel, galvanised, pattern "A"—100, size 1, 15s. per 100; 100, size 2, 16s. 1d. per 100; 100, size 3, 16s. 8d. per 100; 500, size 4, 18s. 5d. per 100; 500, size 5, 19s. 4d. per 100; 500, size 6, £1 0s. 11d. per 100. Cleats, steel, galvanised, pattern "B"—100, size 1, 15s. per 100; 100, size 2, 16s. 1d. per 100; 100, size 3, 16s. 8d. per 100; 500, size 4, 18s. 5d. per 100; 500, size 5, 19s. 4d. per 100; 500, size 6, £1 0s. 11d. per 100. Rings, bridle, pattern "B"—500, size 1, 17s. per 100; 1000, size 2, 17s. 7d. per 100; 1000, size 3, 19s. 11d. per 100. Rings, bridle, pattern "C"—500, size 1, 15s. 3d. per 100; 2000, size 2, 16s. per 100; 3000, size 3, 16s. 9d. per 100; 3000, size 4, 17s. 6d. per 100. Clamps, cable, pattern "A"—50, size 1, £1 4s. 11d. per 100; 1000, size 2, £1 4s. 11d. per 100; 1000, size 3, £1 4s. 11d. per 100. Clamps, cable, pattern "B"—50, size 1, £1 3s. per 100; 500, size 2, £1 3d. per 100; 500, size 3, £1 3s. per 100; 1000 brackets, steel, galvanised, for block distribution of wires, £1 1s. 4d. per 100—Hoelle and Bateman, Sydney.

250 eye bolts, steel, galvanised, for aerial bridle, 5½d. each—W. Traylen, Guildford.

15,000 pole steps, steel, galvanised, 8d. each—Victoria Iron Rolling Co. Pty. Ltd., Melbourne.

5000 spindles, steel, galvanised, for use with insulator, pattern "B," 4d. each—Williams and Co., Brunswick.

Three miles cable, paper-insulated, lead-covered, telephone, 39 pairs, 12½ lb. conductors, to be on drums of 440yd. lengths, £214 per mile—W. T. Henley's Telegraph Works Co. Ltd., Melbourne.

170 boxes, cable, distributing, 13 pairs, pattern "A," 17s. 3d. each; 160 boxes, cable, distributing, 26 pairs, pattern "A," 19s. 6d. each—James and Co. Ltd., Perth.

170 boxes, cable, distributing, 13 pairs, pattern "B," 14s. 10d. each; 160 boxes, cable, distributing, 26 pairs, pattern "B," £1 9s. 8d. each—G. Stirzacker, Perth.

800 pipes, 3in., cast-iron, 11s. 2d. each—Hoskins and Co. Ltd., Perth.

Boxes, cable, jointing, "Hargis," the cables to be drilled, tapped, and provided with a brass plug—30, size 1, 12s. each; 45, size 2, 13s. each; 45, size 3, 15s. 6d. each; 50, size 4, 18s. 3d. each; 6, size 5, £1 each; 50, size 6, £1 5s. 6d. each; 5, size 7, £1 7s. each; 5, size 9, £1 14s. 9d. each; 4, size 10, £1 18s. 3d. each—George Kent Ltd., Perth.

DEPARTMENT OF HOME AFFAIRS. — Ayr post office, Queensland, I. of petrol air gas plant, £72; Hughenden post office, Queensland, I. of petrol air gas plant, £85; Cloncurry post office, Queensland, I. of petrol air gas plant, £90; Winton post office, Queensland, I. of petrol air gas plant, £92; Chillagoe post office, Queensland, I. of petrol air gas plant, £80; Goondiwindi post office, Queensland, I. of petrol air gas plant, £89 10s.; Ingham post office, Queensland, I. of petrol air gas plant, £78—Messrs. Bartram and Son Pty. Ltd., 586-588 Bourke-street, Melbourne.

Roma post office, Queensland, I. of petrol air gas plant, £110; Longreach post office, Queensland, I. of petrol air gas plant, £93 10s.; Blackall post office, Queensland, I. of petrol air gas plant, £80; Tambo post office, Queensland, I. of petrol air gas plant, £94; Thursday Island post office, Queensland, I. of petrol air gas plant, £80; Charleville post office, Queensland, I. of petrol air gas plant, £92 10s.; Emerald post office, Queensland, I. of petrol air gas plant, £74 — Quirk's Lighting and Engineering Ltd., Elizabeth-street north, Melbourne.

DEPARTMENT OF DEFENCE. — Naval Forces of the Commonwealth. — Fuel oil for H.M.A. ships (period of contract, 10th April, 1913, to 9th April, 1915)—Supplies in bulk at company's wharfs, to ship's bunkers: (a) At Adelaide or Sydney (exclusive of duty), £4 5s. per ton; (b) at Melbourne (exclusive of duty), £4 10s. per ton—British Imperial Oil Co. Ltd., Melbourne.

Three dumb hopper barges, £25,198 17s. 6d.—Johnson and Sons Pty. Ltd., South Melbourne.

Three dumb hopper barges, £25,266—Gray Bros., Williamstown.

Two oil storage vessels, £39,000—Poole and Steel, Sydney.

(Continued on page 20.)

## Commonwealth of Australia.

Postmaster-General's Department,
Melbourne, June 27, 1913.

TENDERS will be received at the office of the Deputy Postmaster-General, Melbourne, until 3 p.m. on the undermentioned dates:—

14th October.—Supply, Delivery and Erection of a Common Battery Multiple Switchboard, at the Telephone Exchange, Melbourne (Sch. 868). See Commonwealth Gazette, June 28.

4th November.—Supply, Delivery and Erection of Eight Automatic Telephone Switchboards at the Ascot, Canterbury, Malvern, Cheltenham, Footscray, Oakleigh, Sandringham, and Williamstown Telephone Exchanges (Sch. 953). See Commonwealth Gazette, June 28.

AGAR WYNNE,
(1219) Postmaster-General.

---

### TOOLS FOR POWER TRANSMISSION LINES, FEDERAL TERRITORY.

**TENDERS** are invited, returnable on Monday, July 14, for the supply of the above.

Tenders are to be addressed "The Secretary, Department of Home Affairs, Russell-street, Melbourne," and endorsed "Tender for Tools, Federal Capital."

Specifications, conditions and tender forms may be obtained at the following offices:—

(1) The Works Director for New South Wales, Customs House, Sydney;
(2) The Works Director for Victoria, 151 Collins-street, Melbourne.

No tender will necessarily be accepted.

JOSEPH COOK,
Minister for Home Affairs.

---

### SWITCHGEAR FOR POWER HOUSE, CANBERRA, FEDERAL TERRITORY.

**TENDERS** are invited, returnable on Monday, 15th September, 1913, for the supply of the above, as follows.—

Section 1.—Main Power House Switchgear.
Section 2.—Switchgear for Diesel Engine Plant.

Tenders are to be addressed to "The Secretary, Department of Home Affairs, Russell-street, Melbourne," and endorsed, "Tender for Switchgear for Power House, Canberra."

Specifications, conditions and tender forms may be obtained at the following offices:—(1) The Works Director for New South Wales, Customs House, Sydney; and (2) The Works Director for Victoria, 151 Collins-street, Melbourne.

No tender will necessarily be accepted.

JOSEPH COOK,
Minister of State for Home Affairs.

---

Defence Department,
Melbourne, July 1, 1913.

### MILITARY FORCES OF THE COMMONWEALTH.

**TENDERS** are invited for the undermentioned supplies:—

On MONDAY, JULY 28, 1913.

Period of Supply from July 1, 1913, to June 30, 1916.

Metals; Cord; Tubing and Wire Cloth, for the Commonwealth Small Arms Factory, Lithgow, New South Wales.

Tenders will be received until 3 o'clock p.m. on the date shown, at the office of—

The Manager, Commonwealth Small Arms Factory, Lithgow, New South Wales.
The Superintendent of Contracts, Department of Defence, Victoria Barracks, Melbourne;
The Senior Ordnance Officer, Ordnance Stores, Circular Quay, Sydney;
The Senior Ordnance Officer, Ordnance Stores, Petrie Terrace, Brisbane;
The Senior Ordnance Officer, Ordnance Stores, Adelaide;
The Senior Ordnance Officer, Ordnance Stores, Perth;
The Senior Ordnance Officer, Ordnance Stores, Hobart.

Tender forms, specifications, and all information may be obtained at the offices of the above mentioned Senior Ordnance Officers, the office of the Superintendent of Contracts, Victoria Barracks, Melbourne, and at the office of the Manager, Commonwealth Small Arms Factory, Lithgow, New South Wales.

The lowest or any tender will not necessarily be accepted.

E. D. MILLEN,
Minister of State for Defence.

---

## Government Notice (N.S.W.).

New South Wales Public Service Board,
4 O'Connell-street, Sydney,
June 24, 1913.

APPLICATIONS are invited for the POSITION of SURVEYOR, Survey Department, Federated Malay States (4 vacancies). Salary, £420 per annum, with duty allowance of £75 per annum, and field and travelling allowances.

Applicants must be single men of active physique, and good constitution, not less than 25 nor more than 35 years of age; should be licensed surveyors of any Australian State or New Zealand, and be efficient in the ordinary work of a land surveyor, particularly in accurate traverse work with theodolite and measuring band. They must be able to compute and plot their work. The duties comprise chiefly the precise survey of land boundaries for registration purposes, but may include any of the ordinary work of a surveyor, i.e., triangulation, control traverses, levelling, or topographical work. Successful applicants will be required to pass an elementary examination in colloquial Malay after a year's residence in the Malay Peninsula.

Further particulars in regard to conditions of employment may be obtained from the undersigned.

Applications should reach the undersigned not later than July 21, 1913.

By order of the Board.
R. A. GILFILLAN,
(9a223) Secretary.

---

## CITY OF MELBOURNE.

TENDERS will be received until 12 o'clock noon on Friday, August 1, for:—

PURCHASE OF SCRAP ELECTRIC LEAD, ACCUMULATOR MATERIALS, ETC.

Specification may be seen at the Office of the City Electrical Engineer, Town Hall.

JOHN CLAYTON,
Town Clerk's Office, Town Clerk.
Town Hall, Melbourne,
June 26, 1913.

---

## CITY OF CAULFIELD.

### SALE OF OLD TRAM RAILS, &c.

TENDERS are invited for the purchase of about 80 tons of OLD TRAMWAY RAILS and FISH PLATES, the whole not having been used much. The rails are each about 26ft. long, and weigh approximately 485 lb. Tenders at per rail to be delivered to me not later than 4 p.m. on Wednesday, the 23rd July, next. The highest or any tender will not necessarily be accepted.

F. JOWETT, Town Clerk.
Caulfield, 24th June, 1913.

---

## THE MELBOURNE AND METROPOLITAN BOARD OF WORKS.

Separate TENDERS are invited for the undermentioned works, etc. Tenders, accompanied by the necessary preliminary deposit, and endorsed "Tender for ——" (as the case may be), must be deposited in the Tender-box at the offices of the Board, 110 Spencer-street, Melbourne, at or before 11 o'clock a.m. on the dates as specified:—

FRIDAY, JULY 11, 1913.—Supply and Delivery of Crane, Winches, and Lifting Gear, for Screens at Service Reservoirs. Preliminary and final deposit, £5.

TUESDAY, JULY 29, 1913.—Supply and Delivery at the Metropolitan Farm, Werribee, of Two (2) Steel Wire Plough Ropes. Preliminary and final deposit, £5.

Full particulars at this office. The lowest or any tender not necessarily accepted.

FRIDAY, JULY 11, 1913.—Supply and Delivery of one Venturi Meter for 36in. diameter pipe, with tube, pressure pipes, and recording apparatus complete. Preliminary deposit, £7; final deposit, £14.

GEO. A. GIBBS,
Secretary.

---

## TECHNICAL SCHOOL DIRECTOR.

Applications, closing July 16, are invited for the position of Director and Registrar to the Technical and Mining School to be opened at Queenstown, Mount Lyell, Tasmania.

Subjects: Mathematics (all branches), Mechanical Drawing, Applied Mechanics and Mining.

Applicants must hold a School of Mines Diploma or its equivalent, and should state age and teaching experience. Commencing salary, £300 per annum. Duties to be taken up in September.

J. H. HODGSON,
Hon. Sec.

Queenstown, Tasmania.
June 14, 1913.

---

## MELBOURNE HOSPITAL.

FOR SALE.—Two (2) Cornish Boilers, each 5ft. x 14ft., multitubular underfired, working at 60 lbs. per sq. in., with all mountings, in good order; also Horizontal Engine, 8in. dia. x 16in. stroke, in good working order. Facilities given for removal. Boilers and engine may be inspected at the Hospital on application to the Engineer.

T. R. ANDREWS,
June 27, 1913. Secretary.

---

## DIAMOND CREEK GOLD MINING CO., NO LIABILITY, Diamond Creek.

A DIVIDEND (the 14th) of 6d. per share has been declared, due and PAYABLE at the registered office of the Company, 31 Queen-street, Melbourne, on Monday, July 14, 1913.

Transfer books close on Monday, July 7, 1913.

GEO. B. GORDON, Manager.

---

## NEW WYLIE CREEK TIN DREDGING CO., NO LIABILITY.

### SLUICING PLANT AND OTHER ASSETS FOR SALE.

TENDERS are invited for the Purchase of the Whole of the above Company's Assets, including:

DREDGING LEASES, covering 292 acres, near Stanthorpe, Queensland, but on the New South Wales side of the border.

COMPLETE UP-TO-DATE SLUICING PLANT, comprising two horizontal engines, two tubular boilers, 10in. nozzle and gravel pumps, mounted and housed in on a pontoon, with a complete equipment of piping, giant nozzles, and all requisites.

BUILDINGS, including manager's house, store, four smaller dwellings.

WORKSHOP, with lathe and other power tools, and water-wheel driving same.

SUNDRY TOOLS, Willoughby machine, sluice boxes, tin ore bags, etc.

AND

SUBSTANTIAL DAM on the leases, impounding an unusually large supply of water, many acres in extent.

Tenderers may bid for the whole or any separate part or parts of the property for sale.

Further particulars may be obtained on application to the Office of the Company, 16 O'Connell-street, Sydney.

Tenders will be received by the undersigned until July 14, 1913. The highest or any tender not necessarily accepted.

By order of the Board,
R. N. KIRK, Manager.
Sydney, June 19, 1913.

---

## MELBOURNE MOTOR OMNIBUS CO., LTD.

Capital:
£100,000, in 200,000 Shares, of 10s. Each.

NOTICE TO SHAREHOLDERS.

The Company has now been registered.

A limited number of shares are still available, and will be allotted according to priority of application.

F. LESLIE BRUFORD,
Secretary.

Ludstone Chambers,
352 Collins St., Melbourne.

---

## MELBURNIAN BUCKET DREDGING CO., No Liability.

NOTICE is hereby given that a DIVIDEND (the 8th) of Sixpence per share has been declared, due and PAYABLE at the registered office of the Company, third floor, Broken Hill Chambers, 31 Queen-st., Melbourne, on Tuesday, July 8, 1913. Transfer books close from July 1 to 8, 1913, both days inclusive. A. F. SHOWERS, Manager.

---

## METROPOLITAN GAS COMPANY.

### SULPHATE OF AMMONIA.

TENDERS are hereby invited, and will be received up to 10 o'clock a.m. on Thursday, September 11, next, for the PURCHASE of a total fixed quantity of 1800 tons of Sulphate of Ammonia, to be produced by this Company during the twelve months ending August 31, 1914.

Specification and full particulars may be obtained on application at this office.

The highest or any tender not necessarily accepted.

By order,
A. E. BRADSHAW. Subst, Sec.
Melbourne, June 28, 1913.

---

J. PLOTTEL, Architect, South British Buildings, 19 Queen-street, Melbourne, invites TENDERS from Engineers and Machinery Manufacturers for the SUPPLY and ERECTION of FILTERS, STEEPS, CONE TANKS, etc., for the Maize Product Pty, Ltd., Maribyrnong-street, Footscray.

## SWISS MOUNT QUARTZ M. CO. NO LIABILITY.

The TIME for RECEIVING OFFERS for the PURCHASE of the above Company's MINE and MACHINERY has been EXTENDED till JULY 9, 1913. WM. LASCELLES, Manager, 90 William-street, Melbourne.

---

The patentee of Australian patent No. 15096 of July 14, 1909 (William [illegible]) for "Improvements in Electrolytic Apparatus for Refining and Separating Metals" is prepared to enter into negotiations for and to complete arrangements by way of license or otherwise on reasonable terms with any persons desiring to exploit or to adopt and carry on such invention in Australia. Inquiries to be addressed to W. J. Spruson, Patent Attorney, 91 Elizabeth-street, Sydney, New South Wales.

---

## JUNCTION NORTH BROKEN HILL MINE, NO LIABILITY.

TENDERS are hereby invited for the Supply of Mining Stores for twelve months, commencing 1st August next. Schedules are obtainable from the Company's offices at Sydney, Melbourne, or Broken Hill, and should be received by the Broken Hill office not later than 12th July, 1913.

T. H. PALMER,
General Manager.

---

## ALFRED RONALDS.

Will the relatives and friends of the late Alfred Ronalds (author of Ronalds' "Fly-Fisher's Entomology") please communicate with—

Critchley Parker,
"Mining Standard,"
Melbourne or Sydney.

---

ARTHUR H. HASELL,
GYPSUM, PHOSPHATES, GUANOS, MAGNESIA, INFUSORIAL EARTH, TIMBER, SULPHUR, Etc.
QUICKSILVER, BRASS and COPPER TUBES.
HEAD OFFICE: Lombard Buildings, 17 Queen-street, Melbourne. Tel. No. 261.
ANALYSES MADE FREE.
Branches: 2 Bridge-street, Sydney. Tele. No. 1193. Lipson-street, Port Adelaide. Tele. No. 198. Factory, Pt. Adelaide. Mines, Koonunga, Marion Bay, S.A.

---

(Continued from page 18.)

1020 pile shoes (approx.), 4s. 9d. each; 12 pile rings (12in. diameter), 12s. 6d. each; 12 pile rings (15in. diameter), 14s. 6d. each—C. C. Wiggs, Warrnambool.

**Two long range towing targets, £320 14s.—J. L. Scott and Son, South Melbourne**

**Hull of motor launch for Quarantine Dept., Queensland, £310—Norman R. Wright, Newstead, Brisbane.**

**Machinery and accessories of motor launch for Quarantine Dept., Queensland, £325—James Wilson, Brisbane.**

**Two oil storage vessels, £36,776 10s.—Mort's Dock and Engineering Co. Ltd., Balmain, Sydney, N.S.W.**

### Victoria.

**VICTORIAN RAILWAYS. — Forgings for new 15-ton trucks—Item No. 7, door hinges (butts), R.H. and L.H., at 1s. 3½d. each; item No. 8, brake shafts, at £2 4s. 9d. each; item No. 20, door hooks (complete), R.H. and L.H., at 1s. 9d. each; item No. 24, ridge pole clip studs and nuts, at 8d. each; item No. 28, ridge pole standards (as specified), at 13s. 10d. each—Geo. W. Kelly and Lewis.**

Forgings for new 15-ton trucks—Item No. 27, cylinder carriers (front, intermediate, and back), at 3s. 10d. each—Alfred Green.

**Alteration of waggon buffers for maintenance of trucks (labour only), at 4s. 2½d. each—Sewell and Gaskell.**

**Forgings for new 15-ton trucks—Item No. 5, door hinges (long), new pattern, at 3s. 3d. each; item No. 10, brake shaft brackets (inside), at 5s. each; item No. 11, brake shaft pull rods (short), at 5s. 9d. each; item No. 12, brake shaft pull rods joints, at 2s. each; item No. 14, brake hangers, at 1s. 9½d. each; item No. 19, brake fulcrum levers brackets, at 4s. each; item No. 26, rubbing plate (cylinder lever), at 2s. each—G. T. Brown.**

**30 kilowatt alternate current transformers**—Item No. 1, transformers, including fuses and extra amount of oil, as specified, at £60 12s. each—Australian General Electric Co.

**Linseed oil, as ordered, during the period ending 31st March, 1914, for Railway Construction Branch—Item No. 1, raw linseed oil, at 3s. 3d. per gallon of 9 lb. avoirdupois; item No. 2, double-boiled linseed oil, at 3s. 5d. per gallon of 9 lb. avoirdupois—Meggitt Ltd.**

Ten tons of block tin, at £220 15s. per ton—Pioneer Tin Mining Co. Ltd.

Frame slab forgings for narrow gauge engines, at £46 17s. 9d. each Mephan Ferguson Pty. Ltd.

Wrought-iron side brackets, at 9½d.—Trembath and Co. (This cancels notice that appeared in the last issue of the "Mining Standard.")

**C. and E. of rolled steel joists, columns, cross** girders, and connections, at bridge over railway at Orrong-road, Toorak, £155 15s. 5d. — **Johns and Waygood Ltd.**

One coal-cutting machine for State coal mine, £410—Sullivan Machinery Co.

**Duplicate parts for same, for State coal mine, £147 15s. 1d.—Sullivan Machinery Co.**

**One coal-cutting machine (second-hand) for State coal mine, £300—Powlett and North Woolamai Colliery Co. (not publicly advertised).**

**Galvanised iron piping, 1¼in., 5280 lineal feet, 5½d. per lineal foot—Stewarts and Lloyds** Ltd.

**Forgings for new 15-ton trucks—Item No. 17, brake truss bars, at 16s. 6d. each; item No. 25, draw bar plate, at 9s. 3d. each—Cowley's Eureka Ironworks Pty. Ltd.**

70ft. engine turntables—4, at £851 each—Cowley's **Eureka Ironworks Pty. Ltd.**

**Forgings for new 15-ton trucks—Item No. 16, hand brake lever ends, at 6s. 10½d. each; item No. 18, brake fulcrum levers, at 6s. 11d. each; item No. 21, door hooks studs (pattern 1), at 8d. each; item No. 22, door hooks studs and washers (pattern 2), at 6d. each; item No. 23, door hooks studs and washers (pattern 3), at 6d. each—Gray Brothers.**

**Controllers for 113h.p. winches for State coal mine—Item No. 1, controllers, complete, with resistances, at £59 7s. each; item No. 2, spare contact fingers, at 1s. 6d. each; item No. 3,** spare resistance grids, at 2s. each—Australian **General Electric Co.**

**PUBLIC WORKS DEPARTMENT.—Suction dredge, £63,495—The Morts Dock and Engineering Co. Ltd.**

**Machinery fittings, Agricultural High School, Colac, £119 16s. 6d.—Dalgety and Co. Ltd.**

**Conveyors and elevators, Cool Stores, Melbourne, £6037 8s. 6d.—Gibson, Battle, and Co. Ltd.**

**Insulating material, Cool Stores, Melbourne, 9d. per cub. foot, or £4 2s. 6d. per ton—The Firth Pumice Co. Ltd.**

**Electric light, Neglected Children's Home, Royal Park, £149—The Silvertown Telegraph Works Co.**

**Marine engine, boiler, etc., Williamstown Ship Yard, £2216 8s. 6d.—Thompson and Co. (Castlemaine) Pty. Ltd.**

**STATE RIVERS AND WATER SUPPLY COMMISSION.—3000 casks Australian Portland cement (contract No. 1113), 11s. per cask—Australian Portland Cement Co. Pty. Ltd.**

**S. and laying of 16in. mild steel spirally riveted pipes for part renewal Lighting Hill Syphon, Eaglehawk (contract No. 1114), £1233** 5s.—Mephan Ferguson Pty. Ltd.

**TREASURER.—P., without calling for public tenders, of one automatic feeder for folding machine, £175—S. Cooke Pty. Ltd.**

### New South Wales.

**PUBLIC WORKS DEPARTMENT. — Harbour Works.—Three 82 K.V.A. motors for Newcastle Workshops, Walsh Island, £1059—Aust. General Electric Co., Sydney.**

RAILWAY AND TRAMWAY CONSTRUCTION WORKS. — **10,000 sleepers for Wagga Wagga to Tumbarumba railway, 4s. 4d. each—H. J. Field, Corowa.**

### Western Australia.

**PUBLIC WORKS DEPARTMENT.—Scotch blocks, items 789, 790, £224 15s. 10d.—Hoskins and Co. Ltd.**

**Boilers, engine and air receiver, item 1034, £70—Imperial Electrical Engineering Co.**

**Item 1035, £84—Denny Bros.**

**RAILWAYS DEPARTMENT.—Avery weighbridge, 10-ton capacity, £116—Saunders and Stuart.**

**Engine tyres, items 602 to 608, £556 10s.—G. Wills and Co.**

**Electrical material, rates obtainable upon application — Imperial Electric Engineering Co. and Noyes Bros.**

**Steel blooms, £14 17s. per ton—G. Wills and Co.**

**Pig iron, £4 14s. 6d. per ton—W. Sandover and Co.**

**WATER SUPPLY DEPARTMENT. — 16in. steel piping, 9s. 11d. per foot—Strelitz Bros.**

### General.

**MELBOURNE HARBOUR TRUST COMMISSIONERS (V.) (R. Rudd, Secretary). — Electric light installation for dredging and transport service, £512 10s.—Clayton, Joel and Co., Melbourne.**

---

## BANK CLEARINGS.

The Melbourne Clearing House reports as follows for the week ended 30th June:—

| | | |
|---|---|---|
| Total Clearance . . . . . . . . . . . . | | £6,736,022 |
| Settled by Certificates | £620,500 | |
| Settled in Coin . . . . | 265,383 | |
| | | £885,883 |
| Total Clearance for the corresponding week of 1912 . . . . . . . . | | £6,488,799 |

## DIVIDENDS OF MINING COMPANIES.

**The following dividends and bonuses of mining companies in Australia have been declared and are payable on the dates mentioned:—**

**July.**

**4th.—Broken Hill Water, 1s. 6d., £15,000.**
**4th.—New Specimen Hill, 6d., £1000.**
**5th.—Kalgurli, 4s. (less British I.T.).**
**14th.—Diamond Creek, 6d., £875.**
**17th.—Cathcart Central, 2s., £5000.**
**17th.—Tongkah Compound, 1s., £2500.**
**18th.—Williams' Fancy, 1s., £1200.**
**22nd.—Tongkah Harbour, 2s. £25,000.**
**24th.—Associated Gold, 6d., £12,500.**
**24th.—Ivanhoe, 3s. 6d., £35,000.**
**McGregor-Cloucurry (final £18 18s. 4d. per 100 shares).**

---

It has been arranged by the Victorian Minister of Mines, that Mr. A. E. Kitson, F.G.S., Director of Geological Survey of Gold Coast, West Africa, and formerly Senior Field Geologist to this Department, shall represent the State at the International Geological Congress, at Ottawa, in August next. Mr. Kitson has recently been on a short visit to Australia. He is paying a short visit to Queensland, and will leave for Canada next week. At the Congress will meet leading geologists from all parts of the world. The State will be fortunate to be represented by one with such a close knowledge of its geology and industries as Mr. Kitson possesses, especially as he is acting quite gratuitously.

We are requested to state that the British General Electric Co. is about to make substantial reduction in the net selling prices of Osram lamps, and also that Colton, Palmer and Preston Ltd., of Adelaide, have been appointed sole agents for South Australia.

Recently the sale by the National Trustees Company and Mr. S. J. Warnock, the trustees of the estate of the late R. D. Oswald, of the Oswald Estate Gold Mine at Maldon (V.), was reported. In this connection it is interesting to note that during the time the mine has been worked by the late Mr. Oswald and his trustees, a period of 50 years, the quantity of gold won amounts to about 300,000 oz., equal, at £4 per ounce, to £1,200,000. Practically on the anniversary of its fiftieth birthday, the mine has been sold for £25,000 cash, which is a unique performance.

At the half-yearly meeting of the Radium Pty., held in Adelaide, on Friday, the following amendment to a motion for the adoption of the report was carried by 16 votes to 6:—"That the balance-sheet be accepted as a record of the company's finances, but that the majority of shareholders are dissatisfied with the manner in which the business of the company has been conducted, and with the directors' report, which shows that directors are apparently incapable of estimating the value of the proposition they are attempting to control; that they have failed to carry out the wishes of the shareholders as expressed at the last half-yearly meeting, when the suggestion was made that the vacancy in the directorate should be filled; and although the shareholders have every faith in their integrity as honest and honourable men, this meeting is of the opinion that they should resign forthwith, and that a committee of management should be temporarily appointed to carry on the business of the company, pending the calling of an extraordinary general meeting for the election of a permanent board." The chairman intimated that the directors would give effect to the wishes of the meeting.

Companies registered in Sydney last week were the Kangaloon Motor Transport Company Limited, capital £1500 in £1 shares, for the conveyance of produce and passengers and general carrying business. Registered office, Kangaloon. Ferranti and Harris Limited, capital of £6000, in £10 shares, to acquire mineral leases at Roxburgh, and to carry on the business of quarry proprietors, manufacturers, and producers of all kinds of building and ornamental stone, etc. Registered office, 79-81 Pitt-street, Sydney.

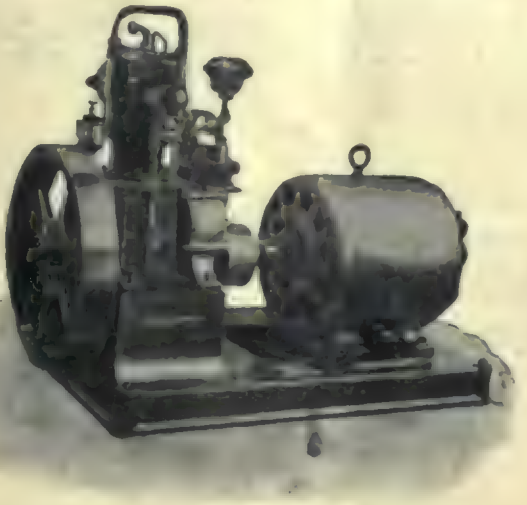
A unique coal-storage bin has been in successful use at the plant of the Ashland Iron and Mining Co., Ashland, Kentucky. The coal to be stored is crushed fine and is frequently damp, allowing it to pack solidly in the bin and to build up almost vertical. It was consequently necessary to use for storage a cylindrical tank, set vertically, and provided with a conical bottom of slight pitch tapering to the automatic bottom gate. Under this arrangement it is practically impossible for the coal to bridge over the gate under any circumstances. The steel bin is 11ft. diam. and 35ft. high, supported on a structure 27ft. above ground, and has a capacity of 75 tons. It is filled by means of an "S-A" bucket-elevator, fed by a track hopper and feeder, and is used to supply fine coal to larry cars which feed the coking ovens.

**We know**

THAT YOUR REQUIREMENTS DEMAND GOOD QUALITY, EFFICIENCY, AND ECONOMY.

**"EDISWAN" SUPPLIES**

ARE DESIGNED WITH EXPERT KNOWLEDGE, BEST MATERIAL AND WORKMANSHIP

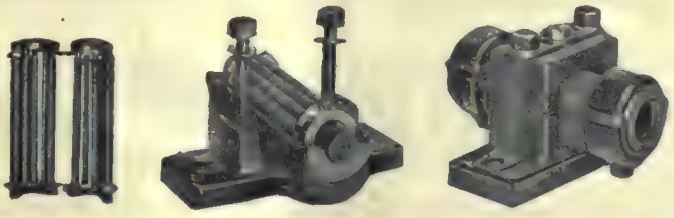


THE

**EDISON & SWAN**

**UNITED ELECTRIC LIGHT CO. LTD.,**

SYDNEY. MELBOURNE. BRISBANE.



***Be up-to-date***

AND REMEMBER THAT THE INITIAL EXPENSE IS QUICKLY REPAID BY THE SAVING EFFECTED BY USING

***KYNOCH Roller Bearings,***

THE BEARINGS THAT WILL GIVE YOU

***COMPLETE SATISFACTION.***

LUBRICATION IS ENTIRELY AUTOMATIC.

Catalogues and Full Particulars from

***KYNOCH LIMITED,***

Manufacturers of Gas Engines, Suction Gas Plants, Explosives and Ammunition.

90 William Street,
MELBOURNE.

277 Clarence Street,
SYDNEY.

**Commonwealth Bank of Australia**

**HEAD OFFICE SYDNEY**

**Branches** are open for the transaction of **GENERAL BANKING BUSINESS** at **Federal Capital**—Canberra. **New South Wales**—Sydney. **Victoria**—Melbourne. **Queensland**—Brisbane and Townsville. **South Australia**—Adelaide. **Western Australia**—Perth. **Tasmania**—Hobart. And at [illegible] NEW BROAD STREET, **London.**

Cable remittances made to, and drafts drawn on foreign places direct. Foreign bills negotiated and collected. Letters of credit and circular notes issued to any part of the world. Bills negotiated or forwarded for collection. Banking and Exchange business of every description transacted within the Commonwealth, United Kingdom and abroad. Interest paid on fixed deposits.

**SAVINGS BANK DEPARTMENT**

**Branches** are open at 3 Moore Street, **Sydney;** 317 Collins Street, **Melbourne;** Queen Street, **Brisbane;** Royal Exchange, 26 King William Street, **Adelaide;** St. George's Terrace, **Perth;** Elizabeth Street, **Hobart;** and **Canberra** (Federal Capital); and **1900 Agencies** at **Post Offices** which issue Money Orders in the **Australian Commonwealth and Papua,** from 10 a.m. to 3 p.m. daily (Tasmania, 9 a.m. to 3 p.m.), and noon Saturday.

All Branch Offices are open for **deposits** and **withdrawals** on Friday 7 to 9 p.m.

**Withdrawals on demand** may be effected at any office within the Commonwealth.

**1/- Minimum Deposit. 3% Rate of Interest on all Deposits up to £300**

JAMES KELL, Deputy Governor. JUNE, 1913. DENISON MILLER, Governor.

The case of the London-Hamburg Gold Recovery Co. and Karl Goepner and William Witter versus the Golden Horseshoe Estates Co. for infringement of plaintiffs' patents has been concluded, before Justice Macmillan, in the West Australian Courts. Judgment was given for defendants respecting their rights to use the Sulman-Teed process, and for plaintiffs in regard to the Goepner-Witter's bromide cyanogen process. The case lasted for two months. Both sides intend to appeal.

The result of the Hercules meeting relative to amalgamation with the Smelters was received in Zeehan (T.) with much rejoicing. There were fireworks' displays, while the military band and smelters' whistles were called into requisition. Mr. Warden Fisher, in announcing the good news, congratulated the district and the town of Zeehan.

**GARDNER PUMPS**

FOR

Boiler Feed and General Service.

**AIR COMPRESSORS,**

VERTICAL AND HORIZONTAL.

**GARAGE SETS,**

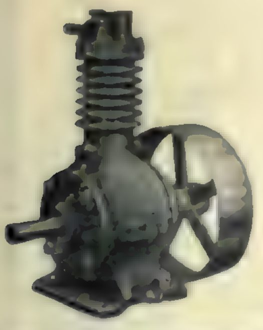
PORTABLE AND STATIONARY,

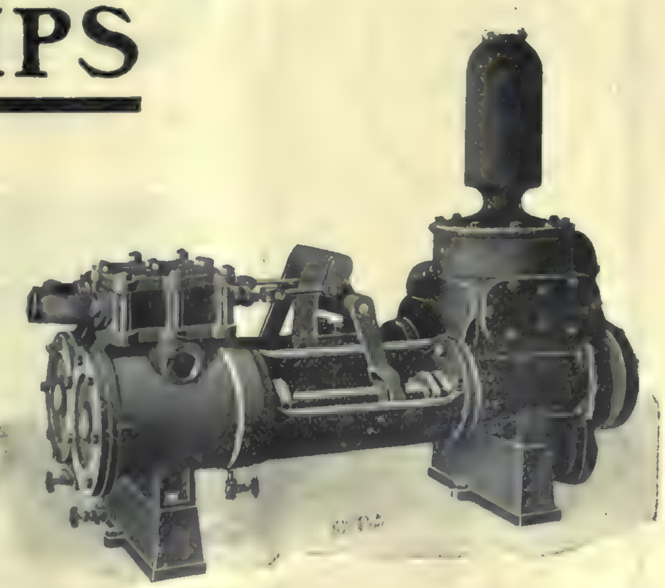
From 2½ c.f. air per minute.

**GARDNER GOVERNOR COMPANY,**

FRANK R. PERROT, Sole Representative,
204 Clarence St., Sydney. 883 Hay St., Perth.

Victorian Agent: L. Bannister, 39 Queen-st., Melbne.





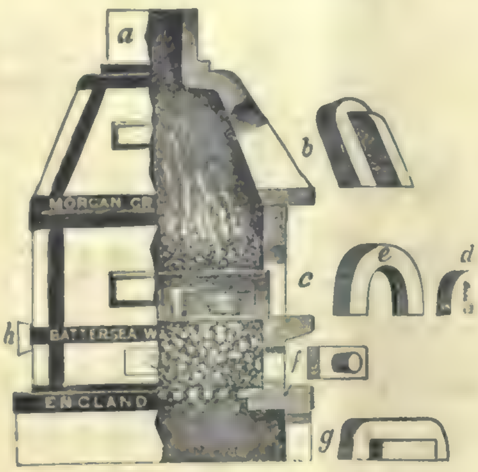
***LIQUID FUEL for Diesel & all Crude Oil Engines.***

"SHELL" SPIRIT, "SHELL" BENZINE, LUBRICATING OILS AND GREASES.

Prices and particulars on application to

**THE BRITISH IMPERIAL OIL CO. LTD.** Adelaide, Brisbane, Fremantle, Melbourne, Sydney and New Zealand

ASSAYING AND ANALYTICAL APPARATUS.

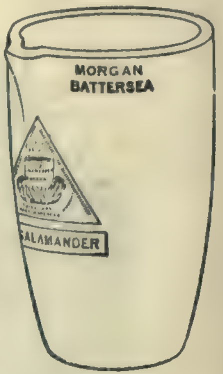


A large assortment of Assay Furnaces, Muffles, Crucibles, Roasting Dishes, Scorifiers; and Cupels of all sizes and makes kept in stock, . . . . .

All apparatus required by Assayers, Metallurgists & Mineralogists supplied, .

**Chemical Glass Ware a Specialty.**

Write for Quotations before ordering elsewhere.



ELLIOTT BROTHERS LTD.

*O'CONNELL STREET, SYDNEY.*

DALGETY & COMPANY Ltd.

BUYERS AND EXPORTERS OF

ORES

HIGHEST VALUES GIVEN.

BEST ATTENTION ASSURED.

*Lead, Copper, Silver, Gold, &c., &c.*

Offices and Laboratory:— 15-17 Bent St., SYDNEY.

Purchases of ORES are made by the Company.

SYDNEY Weights and Assays final.

Check Assays by Sellers and Buyers.

Liberal allowance made on ORES destined for sale on consignment in Europe, when owners prefer this mode of realisation.

Check Weights determined by weighings made on two independent weighbridges.

Ore Sampling.

SOLE AGENTS FOR

TANGYES LTD.,

—Birmingham—

Manufacturers of High Class

MACHINERY

including

PUMPS, HAULAGE GEAR,

STEAM ENGINES,

OIL ENGINES,

SUCTION GAS PLANTS.

Depots: Miller's Pt., Sydney.
48-50 a'Beckett St., Melbourne.

## PUBLISHERS' ANNOUNCEMENTS.

M M
M

M M
M

# Melville & Mullen PTY. LTD.

## Technical List.

**W. H. Patchell's New Book**—

**THE APPLICATION OF ELECTRIC POWER TO MINES AND HEAVY INDUSTRIES.** Price, 12/6; Postage, 6d. Dealing exhaustively with Electricity in Mines—Cables—Coal Cutters—Haulage Gears—Rating of Haulage — Winding Engines — Electric Winders—Ventilation and Air Compression — Pumping — Rolling Mills — Machine Tools—Electric Winding and Furnaces. 333 pages.

**McCulloch & Futer's New Book**—

**WINDING ENGINES AND WINDING APPLIANCES.** Price, 25/-; Postage, 6d. Chapters on The Choice of System and Comparison of Designs—Winding from Great Depths and in Coal Mines—Application of Electricity to Winding—Details of Winding Engine Design—Details of Accessory Winding Gear: with 12 folding plates. 452 pages.

M M
M

M M
M

**MELVILLE and MULLEN**

PTY. LTD. **Technical Booksellers,**

**MELBOURNE.**

---

# SIAM OFFERS

A splendid new field for Australian Business Enterprise.

# SIAM WANTS

Mining and Agricultural Machinery, Seeds, Hides, Tallow, Meats, Jams, Butter, Cheese, Potatoes, General Manufactures, also Horses, Cattle and Sheep.

**The Siam Observer (Daily),**

**The Siam Maitri**
**The Siam Weekly Mail** | **(Weeklies.)**

Siam's Leading Newspapers, which, with

**The Siam Directory**

are published at the Siam Observer Offices, Bangkok, will put you in touch with this market.
Rates and Particulars from
***GORDON & GOTCH.***

---

# Cole's Book Arcade

**Melbourne**

**Sydney**

**Adelaide**

—BOOKS Advertised—
—by Everybody are—
—SOLD AT COLE'S—

Send for **COLE'S BOOK BUYERS' GUIDE** or Catalogues on your Special Subject.

**MINE MANAGER'S** Book-keeping Manual and Office Companion, by Edwin R. Field. 3/6, postage 1d.

**ROUTLEDGE'S EVERYMAN'S CYCLOPAEDIA,** 30,000 items of literary, historical and useful knowledge. Cole's Price: 2/6, postage 4d.

**HEALTH, STRENGTH and HAPPINESS,** a Book of Practical Advice for Men and Women, by Dr. Saleeby. Cloth 3/6, paper 2/-, postage 3d.

**LIFE AND EVOLUTION,** by F. W. Headley, with 100 illustrations. Now 5/-, postage 4d.

**THE MAN FARTHEST DOWN,** a record of Observation and Study in Europe, by Booker Washington. Cole's Price: 3/6, postage 3d.

**BACKBLOCK BALLADS** and Other Verses, by Den (C. J. Dennis) from the "Bulletin" and other live papers. Paper 1/6, cloth 2/6.

**E. W. COLE, Book Arcade, Melbourne, Etc.**

---

All Australians visiting London should read the **"British Australasian," 6d. weekly**—an illustrated paper containing mail and cable news from Australia, and news of Australians in Europe and at home.

Australians are cordially invited to visit the **"British Australasian" Reading Room at the offices, 115 High Holborn, London, W.C.,** where they can see the home papers, meet their friends, use the telephone, and obtain information without charge.

---

A pulp specific-gravity balance, invented by H. Stadler, is an apparatus carefully adjusted, with a poise weight sliding on each of three bars, and has a capacity of from 1 to 2000 gm. A glass flask is taken with a capacity of 1000 c.c. of water. The flask being empty and dry, is accurately balanced by the poise weight on the first bar. It is then filled with water, and the poise weight on the second bar, when balanced, will indicate 1000 gm. If the water is emptied out, and the flask filled with a sample of pulp to be tested, the poise weight on the third bar being moved to indicate the accurate balance, the percentage of water in the pulp can then be read off. The apparatus was constructed for Rand slime, and pulp from other districts would need a factor of correction if of different specific gravity.

---

250 H.P. Turbine.
Showing Wheel and Guide Vanes.

# G. Weymouth Pty. Ltd.

**Electrical Engineers,**

**Neptune-street, RICHMOND, VIC.**

**Telephones:—**
Office, 2651 Windsor.
Works: 2507 Central.

**Manufacturers of all Classes of Electrical Machinery, Turbines, Pumps for Irrigation and Mining, Underground and Surface Mining Locos., Winches, Haulage and Winding Plants, Motors, Generators, etc.**

**Estimates submitted.**

**Correspondence invited.**

---

## PROFESSIONAL CARDS.

**G. H. BLAKEMORE,**

CONSULTING METALLURGIST
For Copper and Lead,
MINING ENGINEER,
CASTLEREAGH CHAMBERS, 10 CASTLEREAGH ST
Telegraph Codes: Bedford McNeill 1908 Edition.
Moreing & Neal.
A.B.C. 5th Edition.
Cable Address. Radgarn. Telephone 7124 City.

---

**MATTHEW C. COATES, A.M.I.E.E.**

CONSULTING MECHANICAL and ELECTRICAL ENGINEER. Expert Reports given for Power Generating Plants, Factory Installations, Steam, Gas and Electric.

99 QUEEN-STREET, MELBOURNE.

---

**VALENTINE J. CROWLEY,**

CONSULTING ELECTRICAL ENGINEER.
Hydro-Electric Plants and Transmission Lines
Designed and Supervised.
Austral Chambers, Telephone 7796.
97-99 QUEEN STREET, MELBOURNE.

---

**GOYDER & HALLETT,**

ASSAYERS AND ANALYSTS.
110 Gawler Place, Adelaide.
Telephone 169.
Metallurgical and Chemical Processes
Investigated.
Ores Sampled and Assayed.

---

**T. J. GREENWAY, M.I.M.M., F.I.C.**

MINING AND METALLURGICAL ENGINEER.
60 QUEEN STREET, MELBOURNE.

---

**KAY, MACNICOL & CO.,**

Mechanical, Mining &
Electrical Engineers.

BROKEN HILL CHAMBERS.
31 QUEEN STREET, MELBOURNE.
Cable Address: "Engineer," Melbourne.
Telephone, No. 4883.

---

**J. D. AUDLEY SMITH,**

MINING ENGINEER,
9 Bridge-street, Sydney.
Telephone No.—
City 2677.
Telegraphic Address—
Audley Smith,
Mining Engineer,
Sydney.

---

**WALTER F. SMITH,**

MANAGER FLOATER G.M.
Ravensthorpe, W.A.
Mines Sampled, Valued, and Reported on.
ASSAYS MADE.
Code: Bedford McNeil.
Reliable Information Furnished on the Phillips River
Gold and Copper Field.

---

**McCARTY, UNDERWOOD & CO.,**

CONSULTING ELECTRICAL AND MECHANICAL
ENGINEERS,

31 QUEEN STREET, MELBOURNE

Telephone, 7096

---

**E. A. WEINBERG,**

MINING AND METALLURGICAL ENGINEER,
19 QUEEN STREET, MELBOURNE.

---

**ROBERT ROSTRON,**

CONSULTING ENGINEER.

**GAS AND OIL ENGINE SPECIALIST.**

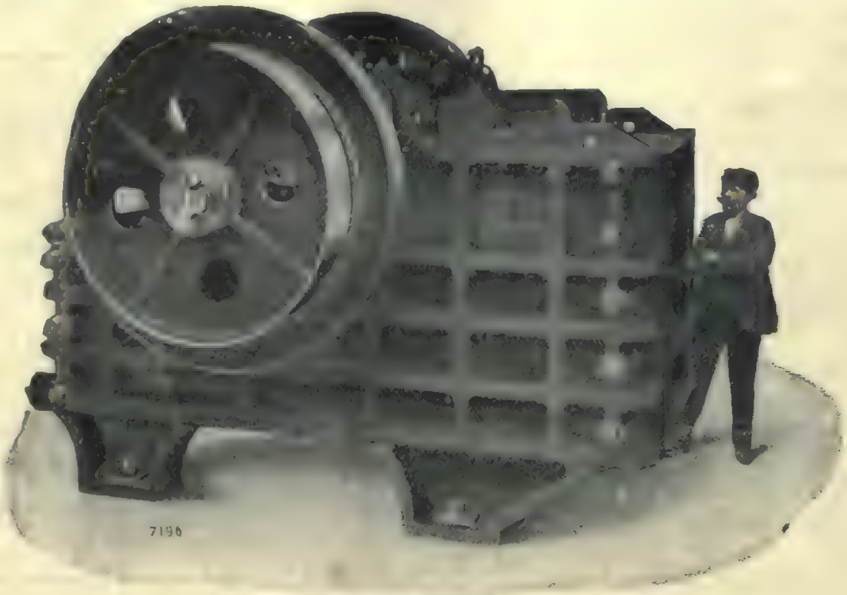
2 Aberdeen House, 204 CLARENCE ST.,
SYDNEY.

---

**ALFRED RONALDS.**

Will the relatives and friends of the late Alfred Ronalds (author of Ronalds' "Fly-Fisher's Entomology") please communicate with—
Critchley Parker,
"Mining Standard,"
Melbourne or Sydney.

**KRUPP Stone Breakers**



36 x 24 Sectional Stone Breaker.

Made of Cast Steel in Sections to allow of Easy Transport and Erection.

Made in all Sizes from 6in. x 6in. Hand Power, to 70in. x 55in. Belt Driven.

Also
Conveying, Concentrating and Crushing Machinery of all Types.

Catalogs on any Mining or Industrial Machinery sent anywhere in the Commonwealth, on application.

**NOYES BROS.** (MELBOURNE) PTY. LTD.
(SYDNEY) LTD.

499 BOURKE STREET, MELBOURNE, 115 CLARENCE STREET, SYDNEY.
STEELE & BAKER, Adelaide, S.A., Selling Agents. 26.

**Arc Lamp without Carbons**

Original Quartz Lamp

**Ideal Lighting for Halls and Open Spaces**

ADVANTAGES:

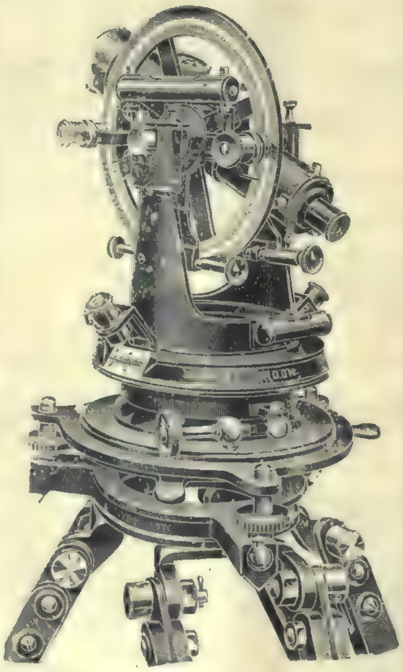
1. **The carbons are entirely dispensed with,** and no attention is required.
2. A burning duration of 1000 to 10000 hours without any manipulation whatever.
3. No regulating mechanism! No parts move when the lamp is burning.
4. Perfectly steady light.
5. **65% current economy as compared with carbon arc lamps.**

**Quarzlampen-Gesellschaft**
m. b. H. Hanau

Grand Prix Brussels 1910

Agents: AUSTRALIAN METAL CO. LTD., MELBOURNE.

TRADE **STANLEY** MARK



Largest Manufacturers of Surveying and Drawing Instruments in the World

PLEASE SEND FOR OUR K.28 CATALOGUE —POSTAGE FREE— AND COMPARE OUR PRICES WITH THOSE OF OTHER FIRST-CLASS MAKERS.

**W. F. STANLEY & CO.,**
—LIMITED—
286 High Holborn, London, W.C.

"Sirocco" Dust Fan.

Trade **"Sirocco"** Mark.

Dust Fans.

Features of this Fan:

1. The blades are so curved that they will set up a strong suction and draw the material through an extensive system of piping.
2. The blades are so strong that the impact of small hard bodies will not damage them.
3. Nothing, whether of a fibrous or dusty nature, can adhere to the wheel; the Fan will pass it without risk of becoming clogged.

**This is not a paddle-wheel Fan**

**DAVIDSON and CO., LIMITED, BELFAST, IRELAND.**

**Our AGENTS keep Fans in Stock.**

**SYDNEY.**—FERRIER AND DICKINSON, 12 Spring-street.
**PERTH.**—SAUNDERS AND STUART.
**ADELAIDE.**—UNBEHAUN AND JOHNSTONE, 100 Currie-st.
**MELBOURNE.**—FYVIE & STEWART 362 Collins-street.
**BRISBANE.**—Engineering Supply Co. of Australia Ltd.
**NEW ZEALAND.**—JOHN CHAMBERS AND SONS LTD., Wellington.

**Everything for Mining**

SUPPLIED BY US.

**CANDLES,**
**EXPLOSIVES,**
**CHERSEN ROCK DRILLS,**
**WINDING ENGINES,**
**STONE CRUSHERS,**
**ROAD MAKING PLANT.**

**CARD CONCENTRATOR,** Sole Manufacturers
**DORR THICKENER,**
**DORR CLASSIFIER,**
**B and M TANKS,**
**TILGHMAN'S AIR COMPRESSORS.**

QUARRY BARS.
WELL BORING PLANTS. BLOW OFF VALVES, ETC.

Agents in all CAPITAL CITIES of Commonwealth and NEW ZEALAND

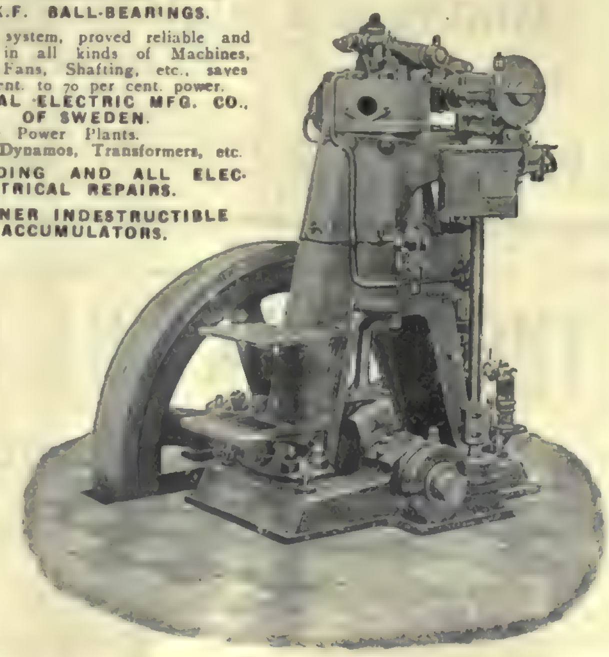
**N. GUTHRIDGE LTD.**

Offices and Stores—SYDNEY and MELBOURNE.

**SWEDISH**
**Diesel Motors.**

Cheapest and most reliable power. Under 6½oz., Crude Oil per b.h.p. hour.

**SWEDISH HIGH QUALITY IRON AND STEEL.**
Cast Steel Runners and Liners
**S.K.F. BALL-BEARINGS.**
A new system, proved reliable and durable in all kinds of Machines, Pumps, Fans, Shafting, etc., saves 40 per cent. to 70 per cent. power.
**GENERAL ELECTRIC MFG. CO., OF SWEDEN.**
Complete Power Plants.
Motors, Dynamos, Transformers, etc.
**REWINDING AND ALL ELECTRICAL REPAIRS.**
**JUNGNER INDESTRUCTIBLE ACCUMULATORS.**



**GARDNER, WAERN & CO.,**
**57 Queen-street, MELBOURNE. 334 Kent-street, SYDNEY.**
Stores and Showroom: **369 Flinders-street, Melbourne.**

"Allen's"

IMPERIAL

Manganese Steel

FOR

Dredging Pins and Bushes, and all Wearing Parts of Rock-Crushing Machinery, Points, Crossings, Etc.

SOLE MAKERS OF

THE "STAG" TUBE MILL

For Grinding Grit, or Tailings, and Granular Materials, to any degree of Fineness.

THE "STAG" BRAND OCTAGON MINING DRILL STEEL

EDGAR ALLEN & CO., LTD.,
Imperial Steel Works, SHEFFIELD.

Stocks on Hand
of
Mining and High Class Tool Steels.

AUSTRALIAN REPRESENTATIVES:
P. T. Taylor Ltd., 141 York Street, Sydney.

MAX GORLER

Buyer of—
ORES, METALS, CONCENTRATES.

HEAD OFFICE—
60 Queen St., Melbourne.

And at Castlereagh House, SYDNEY.
Argent Street, BROKEN HILL.
FRIEZLAND (Cloncurry District), Aubrey C. Waight.

Sole Agency Australasia—
C.E.A.G. MINER'S ELECTRIC SAFETY LAMP.

Established 1860.

Bondholders' Register

Publishes the Actual Numbers of all Drawn Bonds Throughout the World.

PUBLISHED FORTNIGHTLY.

10s. PER ANNUM

73 Farrington St., LONDON, E.C.

Australian Offices,
376 Flinders Lane, MELBOURNE.

A Bill has been introduced into the Belgian Parliament for the purpose of replacing the prevailing "carat" standard for weighing gold and diamonds by a metrical carat of fixed weight of 200 milligrams. Such a bare announcement does not at first suggest any suspicion of romance. Yet the result will probably be the final supersession of the most ancient standards of weight in existence. The Dutch Government has decided to wait until the reform is actually made law in Belgium before enforcing it in the world's great diamond market of Amsterdam; but the market in Amsterdam cannot fail to follow that of Antwerp. The United States has signified its intention of adhering to any agreement upon the subject which may be entered into by Belgium and Holland; and the English market will be practically compelled to adopt the new international "carat" if, as seems probable, the Belgian Bill becomes law. The ancient carat is a weight almost as old as civilisation itself. The word iteslf is Arabic, derived directly from girat, "a pod," though Greek in form. The original carat was the seed of the African carob tree, which from its uniformity in weight offered a convenient standard for weighing the precious metals and stones. But, though the traditional weight will probably be taken from us, the name yet remains, and we may be grateful for a word which breathes of Eastern bazaars.

THE BROKEN HILL PROPRIETARY COMPANY LTD.

Smelters and Refiners.

TARIFF ON APPLICATION.

MANUFACTURERS OF:
SOFT PIG LEAD, FINE SILVER, ANTIMONIAL LEAD, COKE, SPELTER, BLUEPOWDER (ZINC DUST), and SULPHURIC ACID.

Branch Offices—
LONDON, 3 Great Winchester-st., E.C.; ADELAIDE, Alfred Chbrs., Currie-st.; SYDNEY, Imperial Chbrs., O'Connell-st.

HEAD OFFICE.
Equitable Building, Collins Street, MELBOURNE.

## CONTENTS.

JULY 10.

**EDITORIAL—**

Killing Private Enterprise .. .. .. .. 21
Disease and Infection .. .. .. .. .. .. .. 21
Leaderettes .. .. .. .. .. .. .. .. .. .. .. 22
News and Notes .. .. .. .. .. .. .. .. .. .. 22

Investor's Column—

Beaufort Deep Leads (V.) .. .. .. .. 23
Amalgamated Zincs .. .. .. .. .. .. .. .. 23
South German (V.) .. .. .. .. .. .. .. 24
Personal .. .. .. .. .. .. .. .. .. .. .. .. .. 24
Mt. Carrington Copper Mine .. .. .. .. 24
Great Extended Hustler's (V.) .. .. .. 24
Metal Quotations .. .. .. .. .. .. .. .. .. 24
Miners' Electric Lamps .. .. .. .. .. .. 24
Our Big Mines .. .. .. .. .. .. .. .. .. .. 25
Mining in New South Wales .. .. .. .. 26
Victorian Mining Activities .. .. .. .. 26
Mining in Western Australia .. .. .. .. 27
Tasmanian Mining .. .. .. .. .. .. .. .. 27
The Coal Mining Industry .. .. .. .. .. 28
Bendigo School of Mines .. .. .. .. .. 28
The Bendigo Field .. .. .. .. .. .. .. .. 29
British Austn. Oil Co. Ltd. .. .. .. .. 29
N.S.W. Metalliferous Mining Board .. 30
Papuan Development .. .. .. .. .. .. 30
The Bisulphite Process .. .. .. .. .. 30
Reports of Companies, etc. .. .. .. .. 30
Coal Company's Affairs .. .. .. .. .. .. 30
The Genesis of Life .. .. .. .. .. .. .. 30
Sydney City Council .. .. .. .. .. .. .. 31
Municipal Elec. Conference in London 31
British and European Developments .. 32
Sydney University .. .. .. .. .. .. .. .. 32
English and French Elec. Engineers' Meeting in Paris .. .. .. .. .. .. .. .. 33
Motor v. Horse .. .. .. .. .. .. .. .. .. 33
Gisborne Storage Battery Cars .. .. .. 34
Lithgow Industries .. .. .. .. .. .. .. .. 34
Miscellaneous .. .. .. .. .. .. .. .. .. .. 34
Tenders Invited and Accepted .. .. .. .. 35

WELSBACH
WIRE LAMPS,
BRITISH MANUFACTURE.
SEND FOR CATALOGUE.
Welsbach Light Co. of Aust. Ltd.
302 Pitt Street, SYDNEY.
300 Lonsdale Street, MELBOURNE.
Creek Street, BRISBANE.
162 Victoria Street, WELLINGTON, N.Z.

FIRE. BRICK
Our Products have proved their superiority.
FIRE CLAY GOODS For Every Purpose.
Darley Fire Bricks will withstand the most intense heat, and will not shrink. Our bricks are made near Bacchus Marsh, Victoria, and we supply all the States.
Specialities
High-Grade Firebricks & Retorts.
Prompt Delivery. For Prices, etc., write to—
DARLEY F. B. Co.,
Oliver's Lane, Flinders St. Melbourne

COKE!
NORTH BULLI COLLIERY
Limited
Supplies best quality hard
SOUTHERN
SMELTING COKE.
(Weekly output 1250 tons.)
H. O. Hyde. Secretary
Royal Insurance Building, 16 Spring-street,
SYDNEY.

AUSTRALIAN MINING STANDARD.
PUBLISHED EVERY THURSDAY.
Forwarded Post Free to any Address.
Australasia .. .. .. .. .. .. .. .. .. .. .. .. 26/- per
Abroad .. .. .. .. .. .. .. .. .. .. .. .. .. 30/- Annum.
Payable half-yearly or yearly, in advance.
All amounts should be made payable to order of "CRITCHLEY PARKER, Bank of Australasia."

12 O'Connell-street,
Sydney
Tel. Central 2703.
P.O. Box 331.

376 Flinders-lane,
Melbourne.
Central 7931 & 1838.
P.O. Box 253.

BACK NUMBERS OF THE "MINING STANDARD."

The following is the rate for back copies more than a month old. Applications by post must be accompanied with cash and postage added. In no case can we guarantee to supply copies, as our storage accommodation is limited.

A postcard will be sent if the number required is out of print.

For copies three months old, ninepence; six month, one shilling; and beyond that period, one penny per month per copy.

As there is a regular demand for back copies of the "Mining Standard," newsagents are requested to send back all returns uncut and in good condition, otherwise they will not be accepted.

All Returns from Newsagents must reach us by the end of each month (the whole paper must be sent). No credit will be allowed beyond this term

Postage — British, 1d.; Foreign, 1½d.; Australasia, ½d. per copy.

Stamps will be accepted as pre-payment.

Address communications: Publishing Department, "Mining Standard."

CASUAL ADVERTISEMENTS.

The rate for this class of advertisement is governed by the position it occupies.

If it appears on leader page or amongst or next to reading matter, the rate is 10s. per inch (nonpariel) per insertion.

Towards end of reading section, set in brevier, 16 ems width, 6s per inch per insertion

If set in nonpariel the rate is 4s per half inch.

ALTERATION TO ADVERTISEMENTS.

As our publishing arrangements necessitate the "Mining Standard" being issued simultaneously in Sydney, Melbourne and Adelaide on the same day each week, advertisers wishing to change their advertising matter must supply same ten days in advance of publication.

ADVERTISEMENT PROOFS.

Proofs are submitted to advertisers in order to give them an opportunity of going over the advertisements before printing Any alterations from the original copy will be charged for Advertisers are specially requested to instruct their publicity departments, advertisement writers, etc., to give clear and definite instructions respecting changes of matter or new copy, to avoid incurring extra charges.

Advertising Copy must be typed and so arranged as to clearly indicate the display required for the more important features of the advertisement.

AUSTRALIAN MINING STANDARD.
PUBLISHED EVERY THURSDAY.
ESTABLISHED 1888.
It is requested that all business communications be Addressed to Critchley Parker.

THURSDAY, JULY 10, 1913.

## KILLING PRIVATE ENTERPRISE.

The directors of the Outtrim-Howitt and British Consolidated Coal Company have shown excellent reason for considering that the Victorian Government has not kept faith with Parliament or with the people in the matter of the establishment of a State coal mine on the Powlett River field. As was pointed out by the chairman of the company at the half-yearly meeting last week, Mr. McBride, who was Minister for Mines when the Bill for the establishment of the State coal mine was introduced, made three definite statements to Parliament: that the Government had no intention of entering into competition with private enterprise; that the whole of the coal basins would be thrown open for private enterprise, with the exception of such land as it was necessary to reserve for the use of the Railways and the Public Departments; and that the State mine would be subject to the same laws as applied to other coal mines in the State. Regarding the first of these undertakings, it is to be said that, if it was originally the intention of the Government not to compete with private enterprise, that intention was not adhered to. No one can say positively that on this score the Government, so far as regards the statement quoted by Mr. Stamp, has been guilty of any breach of faith. The denial of intention to compete is not quite the same thing as a definite promise not to compete (it will be noted that in saying this we refer only to the statements quoted, and do not take into consideration other statements by which the Minister responsible for the introduction of the measure may have more decidedly compromised himself). On the second and third points raised, however, there can be no question that the promises given have been shamelessly violated. We had the word of the Minister for it that the only land to be reserved would be for the use of the Railways and the Public Departments. Very good; and as the area so reserved amounts to 52 square miles, it would seem as if the requirements of the Railways and the Public Departments are very extensive. It is quite serious enough that so large an area of country in this coal-bearing district should be thus cut out from mining operations by companies or individuals, but that is by no means all, for apparently it has been decided that no leases are to be granted for the mining of coal by private companies anywhere else in the State. At least that would seem to be the inference from the fact that the Outtrim-Howitt Company, in endeavouring to obtain leases in other districts, has utterly failed to do so. The promise that the State mine should be subject to the same laws as other coal mines has also been disgracefully departed from. The State mine has been exempted from rentals and exempted from any taxation whatever, while the rentals for leases have been increased by 150 per cent., and a royalty tax of from 3d. to 6d. per ton has been imposed. How far the treatment accorded to the State mine is on a level with that accorded to private companies is shown by the fact that, were the State mine on the same footing as others, the money it would have paid to the Government in rental and royalty during the past 4 years would have amounted to nearly £52,000, equal to about £13,000 per annum. But the policy of the Government has been not only dishonest: it has been notably unwise. The coal companies of the Gippsland district are not great concerns, but they have done great work. Their existence has meant much to the Melbourne public, much to the Victorian Railway Department, much to that part of Gippsland in which they are situated; and they are deserving of fair treatment. Even had they done nothing, they would still have been deserving of that. As it is, they are being crushed out of existence; they are being prevented from opening out in new directions to make up for the falling-off in the output of their present workings, rendered unremunerative largely by the determination of the Wages Board; and for what? To further the cause of a mine that would not, unless owned by the State, be regarded as a payable proposition. To discourage so much of the coal mining industry of Victoria as does not appertain to the State is a folly of the first order.

## DISEASE AND INFECTION.

The disturbance to the Commonwealth commerce that will be caused by the proclamation of Sydney as a quarantined area must be very considerable, but the action taken is hardly to be considered as otherwise than necessary. Small-pox is so dreaded a disease that the proceedings for its eradication would have to be very drastic indeed to win the disfavour of the thoughtful public. The question in this case is not, Have the authorities taken too drastic action, but, rather, Is the action they have taken drastic enough? In some ways it seems senseless in the extreme. To announce that anyone travelling from Sydney to another State would have to be vaccinated or to give a certificate of vaccination within a period of 5 years was sensible and reasonable enough; but to allow 48 hours to elapse between the issuing of a proclamation to that effect and the putting of that proclamation into force was an act of incredible folly. We are told by way of excuse "that it was not practicable to place such extensive administrative action in force until every detail had been arranged, and every officer had been instructed." Quite so; but why not have held back the proclamation until everything was in readiness? Would not that have been a sensible course to pursue? It is small wonder that in the circumstances the public has convinced itself that the real object of the delay was to allow those members of the Federal Parliament who were in Sydney at the time of the proclamation to leave it without having to undergo the trouble and annoyance of vaccination. But indeed the Federal authorities do not seem to have had much idea where they stood, or what were their intentions, and there is very much reason for the objection which is said to be loudly voiced in the Public Health Department of New South Wales that the Federal authority has gone either too far or not far enough.

There is one necessity which is, if we may be vulgar enough to say so, sticking out feet—the necessity of federalising the laws relating to health. It is not enough to have the quarantining power in the hands of the Commonwealth so long as the legislation regarding vaccination is a State matter and consequently liable to take as many forms as there are States. Some of the States insist on vaccination; others do not; and, even among those whose laws enjoin vaccination, the law is not thoroughly and soundly enforced. The result is that a very large proportion of the inhabitants of Australia are liable to attack by small-pox. Properly speaking, we ought to go to the same length as those European States which insist upon vaccination every 7 years, for it is notorious that the complete immunity from the disease presented by vaccination does not extend over more than that period of time; but a single vaccination is at any rate better than no vaccination at all, inasmuch as even after the period of complete immunity is passed, there is still less liability to attack among the vaccinated than among the unvaccinated, and when it does come it is less severe than it is in other cases. But, apart from this altogether, so long as the question of health control is in the hands of the States instead of in the hands of the Central Government, the danger of a spread of disease from one State to another is enormously greater than there is any need for it to be. At the present time, when Sydney has been declared an infected area, what is to prevent anyone leaving that area for another portion of New South Wales, and subsequently crossing the Victorian border, without being required to be vaccinated, because the authorities are not aware that he has come from the quarantined district? Have any steps been taken, for instance, to prevent travellers from journeying from Sydney to Moss Vale, and then at Moss Vale taking a ticket to Melbourne? To stop this sort of thing will not be easy, but has any effort whatever been made to cope with it?

---

As a rule one great advantage which strikers have is that they can choose their time for striking, and they usually choose their time well. It really seems, however, as if the Bendigo (V.) miners have not been altogether well advised in their attempt to force things at the present juncture; in fact, it is beginning to look rather as if they have played into the hands of the mine-owners. The latter have, for many a long day, been more or less dissatisfied with the state of affairs in the mines. The men in Bendigo, as elsewhere, have been undisciplined, and desirous apparently of bossing the operations instead of working to instructions; and moreover, they have steadily set their faces against the steps taken by the companies to put a stop to gold-stealing. It may well be believed that the mine-owners would have done nothing to bring about a cessation of work; but, now that this has been effected by the miners themselves, the mine-owners are not altogether sorry of the chance of having a rest from the weary business of paying calls. The president of their association informed a press representative that they could settle the strike in two days if they wanted to, but he also intimated that there were many men working in the mines who, although in the Union, had no sympathy with it, and that these men the mine-owners did not desire to harass. Both the mine-owners and the mine-managers have arrived at the conclusion that the status of the shift boss should be made semi-official, so that a man filling this post may be free of the Union. It is perhaps significant that the officers of the Union have not replied to this very direct challenge. On its side there is very much talk, but it does not have a great deal of meaning. When, for instance, Mr. T. M. Jude, General Secretary of the Federated Mining Employees' Association, Victorian State, says, in that fine and large style that is characteristic of labour orators, that "they could not have too much unionism," he is obviously overlooking the fact, embodied in the classic phrase of the late W. S. Gilbert, that one may have too much "even of toffee."

* * *

The new Federal Government has not lost time in determining what action it should take in regard to the numerous allegations of fraud in connection with the recent general election. The Attorney-General, Mr. W. H. Irvine, and one of the Honorary Ministers, Mr. W. H. Kelly, who is acting as Minister for Home Affairs, have been deputed to enquire into the matter, to determine the conditions under which an investigation into all the circumstances shall be made. The enquiries that are now being pushed on have the complete approval of the Chief Electoral Officer. To enable it to be definitely ascertained to what extent duplicate voting occurred, it will be necessary for a regulation to be passed authorising divisional returning officers, subject to instructions from the Chief Electoral Officer, to open, compare, and copy the certified rolls, which are all (under the Electoral Act and regulations) in their custody in sealed parcels. The work will doubtless be an onerous one; but, for the sake of the good name of the country, it must not be shirked.

* * *

The Melbourne City Council is not altogether a happy body at the present time, the members being divided into two parties, who may be described as "Claytonites" and "Harperites" respectively. It is not easy to get at the facts, for the Council does not pursue a policy of openness in the matter; but they seem to be that Mr. Clayton, the Town Clerk, addressed to the Council a letter in which he complained that the Chief Electrical Engineer, Mr. Harper, had refused to supply him with certain documents and information that he needed in the preparation of a report for the Council. In his letter to the Council Mr. Clayton stated that the Electric Light Committee had been guilty of illegal practices in relation to the supply of current to the cordite factory at Maribyrnong and to Williamstown, and that he desired certain papers in regard to these matters. It appears that the Electric Light Committee undertook to supply electricity to the cordite factory 18 months ago, and has continued to do so since. When the Council desires to extend its electric operations outside of its own boundaries it is necessary that an Order in Council shall be obtained, covering the particular locality that it is proposed to serve. In this case an Order in Council was obtained by the Federal Government, but it was not transferred to the Council. When the solicitors of the Council had their attention directed to the matter, the advice given was that there was no danger of exception being taken to the Council supplying electricity to such an establishment as a cordite factory, especially as it was a Government factory. Another objection made by the Town Clerk was to the council's supplying current to the town of Williamstown without a Government order giving the right to lay mains in the municipality. The answer to this objection is that it was first necessary to enter into a contract before making application for an Order in Council. It is contended that the Town Clerk should have guided the committee in these matters if they were taking a wrong course. The supporters of Mr. Harper further hold that the Town Clerk had a great advantage in that he was allowed to take part in the discussion which arose on the reading of his letter, while Mr. Harper was not even present. Mr. Harper's contention is understood to be that Mr. Clayton has been unreasonable in his applications for information, and that, for his desires to have been complied with, much of the business appertaining to the chief electrician would have had to be neglected; and it was for this reason that Mr. Harper refused to supply particular information unless instructed to do so by the Electric Supply Committee. The trouble seems a rather paltry one, and it is subject for regret that it should have been made public.

---

## NEWS AND NOTES.

The possibility of developing an industry in connection with the oil shales at Port Curtis (Q.) is under consideration. Beds of low-grade shale, but not true kerosene shale, exist there, and three parties have recently taken up large areas. An examination is being made, and should results warrant bores being sunk capital will be forthcoming.

The gold purchased by the banks at Eaglehawk and Bendigo (V.) during the month of June amounted to 13,607 oz. 7 dwt. 15 gr.

Mr. H. Herman, B.C.E., Director of the Geological Survey of Victoria, will on the 18th inst. deliver to members of the Legal Managers' Association of Victoria a lecture on "Some Phases of Mining in Victoria," in the Boardroom of the Chamber of Mines.

In reviewing the work done during the past six months at the Cathcart Central Mine (V.), the chairman, at the half-yearly meeting in Melbourne, said there was in hand a balance of £6500. He congratulated the shareholders on the 2s. dividend which had just been declared, and also upon the fact that the mine was the best alluvial proposition opened in the State during recent years. Various factors had to be considered, but he was satisfied that the wash already cut up was good to maintain an average dividend of 2s. per month. The half-yearly report was adopted, and retiring directors re-elected.

The following report has been received from the mine manager of the Cowell Proprietary Silver-mining Syndicate (S.A.), under date June 28:—"I have to report important discovery on your property. I find that the horn-blende seam is carrying very good values in silver, occurring as chloride, and with no lead. I regard this as perhaps the most important find so far made. Some of the material is very rich, but the main point is that we have definitely ascertained our direction for driving, as well as its relationship to the lead deposit. The find was made the day after Messrs. Hamilton and Bennetts left here. An assay this morning gave 625 oz. of silver per ton from the material."

The Union Company's R.M.S. "Niagara" arrived at Auckland last week from Vancouver, having, with oil fuel, averaged 15½ knots on the trip.

No hitch occurred on the voyage, and the oil proved more economical than coal, and, furthermore, prevented deterioration of the ship's plates through contact with the damp coal in the bunkers. Four thousand tons of oil were taken on board at Vancouver, and 350 tons at Honolulu.

The New South Wales Minister for Mines, it is stated, intends putting several thousand pounds upon the Estimates to provide for a State coal mine.

A company, with a capital of £125,000 in 500,000 shares of 5s. each, has been registered in Sydney for the purposes of acquiring from the Oxide Creek Flotations the Mount Gordon copper mine, situated near Mount Oxide (Q.).

During the year, ended 30th June, the New South Wales Mines Department received no less than 1200 applications for titles from Ardlethan. A considerable number of leases and titles in other parts of the State were cancelled and made available for re-occupation. The revenue amounted to £135,730, being £15,000 in excess of any previous year, and exceeding the expenditure by £57,000. Expenditure included endowments £14,646, prospecting vote £8405, contingencies £15,030, salaries £37,918, and totalled £78,737.

A case heard at Albury (N.S.W.) revealed a most impudent fraud perpetrated on a bank manager. William Scott was charged with obtaining £142 by means of false pretences in the following circumstances. Accused, it was stated, represented to the manager of the bank that he had obtained from some Gippsland fossickers a good sample of gold well cleaned, and had brought it over the border to sell owing to the provisions of the Victorian Gold Buyers Act. The manager advanced £50 on the parcel, which weighed 21 oz. and had been tested with blackstone. The following day £192 was advanced on a second parcel of 64 oz. A fortnight later the two parcels were assayed in Melbourne, when it was found the total gold contents was 7 dwt. 5 gr., valued at £1 8s. The rest was copper. The gold coating had been applied evidently by an electro-coating process. Accused was found guilty and sentenced to two years' imprisonment.

A syndicate is seeking rights to develop an oil field near Rotorua (N.Z.). An analysis, it is stated, shows that the petroleum is of good quality, with an excess of lubricants.

The Mount Boppy Block 51, N.L., has been registered in Sydney with a capital of £10,000 in 2s. shares, of which 50,000 are issued as fully paid up, to operate near Canbelego, Cobar. The registered office is at Cobar.

The first shipment of machinery for the Umeari Gold Limited dredge, Umeari River, Phillipines, was despatched recently to Manila. It is anticipated dredging operations will be started by the end of the year.

Mr. W. Hanning, President of the British Chamber of Commerce in Paris, and Sir John Pilter, Chairman of the Australian Section, have had an interview with the Administration of the Messageries Maritimes line of steamers, and have represented to this steamship company the advantages which would accrue from the installation of cold storage on their Australian-Marseilles service. The M.M. have promised to examine this question, and there is reason to believe that such installation will be made. This would be an advantage greatly appreciated by Australian shippers to France.

A telegram received from the local director of the Great Zeehan Dundas Silver Lead Mining Co. (T.) announces the discovery of a tin lode in the south-west section. The lode is 20ft. wide, assaying 3½ per cent. tin. It can be traced into the hill for chains, and offers great possibilities.

Gold received at the Sydney mint during June for coinage totalled only 23,177 fine oz., valued at £98,451, as compared with 37,581 oz., of a value of £139,637 for June last year. During the past half year 272,257 fine oz. were received, value £1,156,473, against 286,047½ oz., value £1,216,100, in the first half of last year. The New South Wales gold received in the six months was 52,920½ oz. (against 41,914); Queensland gold, 119,248 oz. (against 134,808); New Zealand gold, 91,650 oz. (against 99,664½); and Papuan gold, 7490 oz. (against 5980). In the same period 1,137,000 sovereigns, £10,366 gold bullion, and £2130 silver bullion were issued. The Australian silver coin issued was £43,100 in the half-year, and bronze coin "nil," while £18,804 worn silver was withdrawn, and £25,000 British silver was exchanged.

The Peel River Land and Mineral Co. Ltd. (N.S.W.) has declared an interim dividend of 5 per cent.

The Commonwealth Public Service Commissioner is inviting applications for two positions of Assistant Examiner in the Patents and Trade Marks branch of the Attorney-General's department. The positions, which are classified in the professional division and carry a salary of £204 per annum, are open to persons both within and outside the Public Service. Particulars as to qualifications and the method of submitting applications are contained in our advertising columns. Applications close on Saturday next.

# THE INVESTOR'S COLUMN.

## Some Companies Attracting Attention To-day.

(By Our Exchange Reporter.)

### Beaufort Deep Deads (V.).

Although not yet "listed," there has been some dealing outside in the shares of this company, a rather sudden rise from a quotation of 1s. 2d. to 1s. 3d. taking place towards the close of the week. It is not improbable that more attention will be given in the near future, as the prospects are promising and alluvial concerns are more in fashion than has been the case for years. The mine is situated at Drawalla and adjoins those of the Hope, Northern Hope, and Hope Extended, all of which have been a good deal in evidence lately "On 'Change," but its operations have been carried on, for it is not a new undertaking, on the Beaufort, the main lead of the district, and the Waterloo, an important tributary. The productive work has practically been confined to the latter gutter, and the records of the Mines Department show that 4497 fathoms have been extracted for a return of 4615 oz.; a return at the rate of a little over an ounce to the fathom. The width of this lead has not yet been ascertained, for, after the drive across it had been put in for a distance of 300ft., level was lost, and there was not sufficient money available to pay for the continuation of the main lower level (which had been previously driven 80ft.) in order to drain the wash, and operations ceased. The failure to carry out this work was the principal cause of the non-success of the previous company, as panelling operations were commenced before the wash was sufficiently drained and before a sufficiently large area had been opened up; the result being that extraction had to be carried on in a small instead of a comprehensive manner, which in alluvial mining generally makes all the difference between failure and success. The existing main reef drive at 265ft. is to give the necessary level for any future operations, and only requires to be continued for about 700ft. in an easterly direction.

The Waterloo and Beaufort gutters junction in the vicinity of the shaft, and there is a length of about 5000ft. from there to the eastern boundary. In addition to this area, there will be 6000ft. of the Beaufort lead (above the junction of the two gutters), to the boundary on the western side of the lease, that is to say, 11,000ft. altogether without taking into consideration some subsidiary gutters which are known to exist. The Beaufort lead, which is the main channel of the district, has been spoken of in mining circles as not payable, but the evidence available does not seem to justify such an opinion; it would be more correct to say that its value is as yet not determined.

The shaft, which was sunk to a depth of 269ft., that is, over 50ft. deeper than the lowest run of wash in either the Beaufort or Waterloo gutters, bottomed on payable wash. A reef drive under the former lead was then put in for a distance of about 1000ft.; a rise was put up and a level driven in the wash, from which a machine of dirt gave at the rate of 13½ dwt. to the fathom. The remaining half of the gutter overlying the main reef drive was sampled by bores, which were put up into the wash, the results varying from 2 to 6 gr. The lead in the lease of the Northern Hope Company, which has given very good returns, junctions with the Beaufort lead on the western boundary of the latter company, which should be a promising factor as far as values are concerned. It will be gathered, therefore, that the Beaufort, the main alluvial channel, is enriched by at least two other leads which carry wash of a good payable quality, and it will be strange if the mine does not prove a remunerative one to the shareholders. One of the most attractive features of the proposition is the fact that the greater part of the preliminary dead work, which usually means so wearisome a delay in connection with alluvial mining, is already completed—the shaft being sunk to the necessary depth and the main under level driven nearly 1000ft. under one gutter, while only about 700ft. will require to be driven in order to command the other. The water is not heavy in either of the leads. In addition to these favourable conditions the mine is well equipped with machinery and necessary buildings, there being two Cornish boilers, winding and pumping engines (14in. lift), and two puddlers.

Favourable reports upon the property have been given by two well-known mining engineers, from which, together with that of the manager of the former company, the above information has been obtained, and under these circumstances there cannot be much doubt that the shares at about the present price are a very legitimate mining speculation, possessing more attractive features than is usually the case. Allowance must be made for the possibility of the margin of profit per fathom not being great, as the wash does not seem to be rich; yet, when the mine is sufficiently drained and opened up to permit of panelling on a large scale, the shareholders should have no cause to regret their enterprise.

There are 50,000 shares of £1 each in the company, of which 4000 are fully paid up—31,000 were sold to the public at 1s. 6d. per share, and the proceeds, less brokerage and £500 to the vendors, was placed to credit. There is a further sum of £1100 in respect of the leases, plant, and machinery payable to the vendors in instalments spread over two years from the date of flotation, and out of the gold won from the mine one of the vendors receives £250 in payments at the rate of 20 per cent. on each clean up.

Since the incorporation of the company, work has been pushed on, and the main east reef drive is in 128ft., and preparation is being made putting up a rise into the gutter. A small drive is also being opened opposite the shaft in order to prospect the run of wash passed through in sinking. The old level going out to meet the Beaufort lead is being cleaned out. It was probably the progress of this work which caused the enquiry at better prices for the shares.

### Amalgamated Zincs.

A detailed account of the operations and prospects of this important investment stock appeared not long ago in these columns, and it is, therefore, unnecessary to refer to them again at any length. The dividends for some time have been at the rate of 6s. per share in quarterly payments, which is a very excellent return on the present market price of about 30s., and despite these handsome disbursements the reserves and undivided profits have accumulated to £254,266, equal to over 10s. per share. This is, of course, a very excellent performance, and if there were an assurance of its being maintained over a reasonable period of time the shares would be well worth buying, but this is a question which requires some careful consideration. One thing is certain, and that is that the directors do not seem to regard the position with anxiety, for the dividend which has just been declared is at the usual rate, and another fact worth remembering, is that the profits have been based upon a price for spelter of £22 per ton, so that the company, under the high quotations which have been ruling until the last few months, has been doing much better than would appear. But spelter is down to £21 15s., and, although even at this great reduction there would not be much cause for anxiety, there is evidently a feeling of uneasiness on the Continental and London Stock Exchanges as to whether the decline has reached its limit. The price of spelter may be said to be artificially fixed or arranged to a great extent, and, although under the exceedingly brisk trade conditions of the last few years the quotations have not been unreasonable, judging by those of the other metals, there seems to be good reason for fearing that a period of depression is setting in. Under these circumstances it would appear not unlikely that a further drop in price would take place, but it may not be generally known that, so long as the price of spelter remains above £21, the parties to the spelter convention have the right of output to their fullest capacity, but should it fall below that price and remain so for a period of three months, then the output is reduced on a basis definitely and mutually fixed. This convention meets from time to time, as required, for the purpose of safeguarding the interests of its members, and this fact may probably have an important bearing upon the position of affairs among the great metal producers of Broken Hill.

As far as is generally known, these great mining concerns are not bound by any arrangement or agreement with regard to their output of spelter, and their only anxiety has been to produce and sell it as largely as possible while the price is good. This fact will not have been unnoticed by the members of the convention referred to, and it is fairly certain, also, that no group of financial houses however strong would be much inclined to keep up the market price of any commodity or restrict the output with this object while some companies outside, who are not restricted by any agreement or understanding, are taking the fullest advantage of the ruling quotations. These speculations upon the position must be taken more as surmise than knowledge—the latter being rather hard to obtain. It can safely be said, however, that the announcement of the usual dividend had a decidedly good effect upon the market, for, although good parcels of shares had previously been forced upon the market until 29s. was touched, a better feeling was afterwards shown, and for a while no supplies were available below 30s., the last quotations, however, being slightly under this.

The existing industrial and political conditions in other parts of the world are unfavourable for high prices in most of the metal producing stocks, but if it could be safely assumed that the adjustment of boundaries in the Balkans is to be merely a sharp but decisive incident, one not to be followed by international complications, then there would not be much risk in buying these shares.

### South German (V.).

The rise in the price of these shares, which has been from 3s. to 6s. 2d., during the last week or ten days — the market closing firmly — has reawakened public interest in a well-known and successful mine. Some years ago, with great regularity, yields of about 1200 oz. of gold, and at the rate of an ounce to the ton, were announced and, speaking from memory, the shareholders had received from £12 to £14 per share in dividends. These results were obtained from the workings down to the vicinity of 1600ft., but the run of gold was then lost and the prospecting operations have been unsuccessful in discovering it again, although the shaft was sunk to 2200ft. and several successive levels driven. These disappointing results have brought it about that in order to lighten the financial demands upon the shareholders portion of the mine has been let on tribute.

One of the tribute parties, working at 1750ft. on the eastern reef from which the previous good returns were obtained, has come on good payable stone, worth about an ounce to the ton, that is allowing for cyaniding. Such tribute parties have the right of mining an area of from 50ft. above and 50ft. below the level, and the company is now driving below these tribute workings for the purpose of meeting the continuation of the run of payable stone; which it is expected will be met in about 80ft.

Although it can hardly be hoped that the company will repeat its former record, there seems to be a reasonable chance of its once more becoming a dividend-paying concern, and the shares are a good speculative investment. The support is forthcoming from the right quarter.

## MOUNT CARRINGTON COPPER MINE.

### Mr. F. B. Powell's Report.

Recently the directors of the Mount Carrington copper mine, situated at Drake (N.S.W.), commissioned Mr. Frank B. Powell to report on the property, and the result of his investigation has been printed for circulation among shareholders.

Mr. Powell states that the mine is situated 32 miles from the Tenterfield railway station. Transport charges are from 22s. to 25s. per ton from the mine to the station. On the Pioneer workings, which were originally for gold, the extent of the ore shoot was 250ft. in length, and from 18in. to 4ft. wide. All the ore has been stoped to the surface from a depth of 180ft. on the underlie. A sample from No. 3 shaft at a depth of 160ft. gave 2 dwt. 22 gr. gold, 1½ oz. silver, and 4.2 per cent. copper, the width being 3ft. In a tunnel 300ft. down the hill, to pick up the downward continuation of the shoot, results were disappointing.

In Mr. Powell's opinion, the tunnel has been driven on the hanging wall of the lode, and the reef has been left standing. If this should prove correct, he considers there are immediately available from 200ft. to 250ft. of backs on the Pioneer lode to develop, and a good block of ore will be opened up at very little expense. An assay of a sample of a lode met at 225ft. in the tunnel gave a trace of gold, 19 dwt. 6gr. silver, and 3.2 per cent. copper, over a width of 2ft. Driving on this lode, it is thought, would give a good, solid block of ore, and the starting of that work at once is urged, the cost of driving being given as 30s. per foot.

On the Carrington lode, where the present company have concentrated most of their attention, all the ore above the tunnel level, and for a depth of 20ft. below, has been stoped out. A shaft has been sunk 100ft. below the tunnel level, and opening out has taken place at 60ft. and 100ft. Crosscuts proved the width of the lode channel at 60ft. to be 26ft., the lode consisting of a quartz matrix, containing copper and iron pyrites. Assays of samples from the north side were 2 dwt. 15 gr. gold, 2 oz. 8 dwt. 12 gr. silver, 3.53 per cent. copper, the width being 26ft. 5in. On the south side, the assays were the same for gold and silver, while the copper value was 5.22 per cent. At 100ft., results were not altogether satisfactory. In the south drive, samples taken along the floor showed about 18in. of ore, assays being 3 dwt. 6 gr. gold, 1½ oz. silver, and 7 per cent. copper. The opinion is expressed that the main body exposed at 60ft. is to the east of this south drive. In the north drive, no values were met in 30ft. of driving. While there are no definite ore reserves, a probable supply of 3000 to 4000 tons, which should average about 6 per cent., is estimated to exist in a block of ground from 100ft. up.

Mr Powell recommends that work at the 100ft. level should be discontinued, and a drive begun on No. 1 lode in the tunnel; that stripping of the lode exposed on the east side of the tunnel be undertaken; and if it demonstrates that the lode is the continuation of the Pioneer lode, establish connection with the old Pioneer workings. The suggestion is made that tests of the ore be conducted by the Minerals Separation or Murex magnetic processes, either of which, it is considered, would be successful in producing a high-grade concentrate. A combine of all the companies in the district to erect one central plant is advocated. In conclusion, it is stated that the mine thoroughly warrants expenditure on the deeper ground. It is thought to be more than an ordinary good mining gamble, and Mr. Powell recommends that at least £1000 be expended on the lines laid out.

Referring to McCrossin's lease, which is under option, it is stated that the property is valuable, providing developments are satisfactory in the main tunnel workings on the Pioneer lode, in which case Mr. Powell would recommend the purchase of the lease.

## GREAT EXTENDED HUSTLER'S (V.).

### The New Eastern Reef at 1053ft.

(From Our Bendigo Correspondent.)

With the discovery of auriferous quartz associated with an east back in the 1053ft. crosscut, the company's prospects have taken a turn for the better. Gold was showing freely when the reef was first uncovered in crosscutting, and these prospects have been fairly well maintained since in driving north and south on the back. The gold is rather fine in character, but was showing freely enough to anticipate a good return from the trial milling. These expectations have been fully realised, last Saturday's clean-up from 50 tons producing 71 oz. 10 dwt. As the material included a good proportion of country rock, the crushing having been broken exclusively in crosscutting and driving, the average of over 1 oz. 8 dwt. may be regarded as very satisfactory. The reef has been intersected at about 200ft. north of the shaft, in crosscutting for another formation known as the "Little" reef, the latter being still over 100ft. further east. The quartz is closely laminated along the footwall, varying from 8in. to 2ft. 6in., the greatest width showing in the south face where the hanging-wall portion has a less favourable appearance. Minerals abound, and the formation is of a very inviting character. The crosscut started from a north level on Valli's reef, and opened up two or three other east backs without finding any stone. At 30ft. from the back there is an almost vertical fault, which is due to meet the reef at about the same distance in the north level. Though only a small break, there is a probability of this slide having occasioned the deposition of the auriferous quartz. Similar conditions prevail at the higher levels with the faulting of some of the outer east backs, including the "Little" reef. It is the circumstance of these geological conditions localising the gold shoot that has created a doubt in regard to the permanency of the gold-bearing stone. The fault intersecting the reef diagonally will not be associated with the back for any distance unless the strike of the break varies. There is a possibility of a diagonal fault of this description swinging round and following the strike of the back, with a steep north pitch. This would assure its association with the reef for some time, and should give a greater length of gold-bearing stone, providing the break is the origin of the enrichment. For the present the extension of the levels will be proceeded with, and stopes brought along. Nothing is known of this back beyond passing through it in the 777ft. crosscut, where it carries very little stone. The cap is at a very shallow level, but several of these faulted east backs have been found productive far below the turnover. Though no other slides are visible in the crosscut, a couple of strong faults, which enriched the "Little" formation, must exist overhead. The presence of these breaks suggests the possibility of similar results being obtained where they cross the new back, and, for that reason, a good deal of interest will attach to the exploratory work northward, for they should also be met in driving, having a rapid northerly inclination.

About next month the crosscut will be continued to the "Little" reef, which is now being worked at a disadvantage, by sinking a winze and understoping, at 170ft. below the 777ft. level. This formation is faulted by three slides and the back contorted. In the vicinity of the faulting good stone has been worked at intervals. At present the reef is worth about ½ oz. per ton, taking 12in. to 2ft. of stone. The quartz being rather limited and difficult of access under existing conditions, is not much more than payable. In the hope that the shoot will continue with the faulting to the 1053ft. level, the latter crosscut was started. A synclinal fold may exist at this depth, forming an inverted cap to the Little reef. At 1326ft. a level has been driven for some time on the east leg of Valli's reef, in expectation of the gold-bearing portion of the formation, worked near the turnover in the intermediate, coming down with the north pitch of the channel. Results were disappointing in driving, so the level was stopped and a rise extended. This has led to the finding of a few colors of gold, but the stone is not yet deemed payable. The reef is intact for nearly 500ft. ahead, and was formerly payable nearer the shaft.

## METAL QUOTATIONS.

### By Cable.

(From Our Correspondent.)

**London, Tuesday.**

SILVER.—After rising to 27d., the market eased to 26 15/16d., an improvement of 5/16d. on the price of a week ago.

ELECTROLYTIC COPPER.—This has remained steady at its last week's price, £68 5s.

ANTIMONY.—Star brand and 50 per cent. ore are unchanged, being quoted at £30 and £8 10s. respectively.

WOLFRAM.—The quote for 70 per cent. ore is still 33s. per unit, equal to £115 10s. per ton.

MOLYBDENITE.—This has weakened from 2s. 9d. to 2s. 6d. per lb., equal to £280 per ton.

MANGANESE.—The quote for 50 per cent. ore has risen from 9d. to 9½d. per unit, equal to 39s. 7d. per ton.

## PERSONAL.

Mr. E. Mulcahy, Tasmanian Minister of Lands, Works, and Mines, is at present on a visit to Melbourne. He is accompanied by Mrs. Mulcahy.

Mr. Gerard Williams, manager of the Mount Oxide Mine (Q.), arrived in Sydney on Saturday and went on to Melbourne on Tuseday night. The option which the London company has on the mine expires on the 31st inst. There is a good deal of speculation as to whether it will be exercised or not.

Mr. E. F. Pittman, Government Geologist (N.S.W.), is at present in Queensland visiting some of the principal mining fields and artesian water supply systems. He is also making some arrangements in connection with the visit of the delegates of the British Association for Advancement of Science next year.

## MINERS' ELECTRIC LAMPS.

In view of the importance which is now attached to improved lighting conditions as a remedy for miners' nystagmus, considerable interest was centred in the lecture which Mr. William Maurice, F.G.S., M.I.E.E. (ex-president of the Association of Mining Electrical Engineers), delivered at the University College, Nottingham. The lecture, the subject of which was "Miners' Electric Lamps," attracted a large number of colliery managers, mine deputies, mining students, and miners. The lecturer, in his introductory remarks, stated that the first attempt ever made to adapt the incandescent lamp to mine illumination dated from 1881, when Mr. (afterwards Sir J. W.) Swan devised a form of lamp for this purpose, and it was interesting to note that these lamps were first used in a Nottinghamshire colliery. On December 12, 1885, Mr. Swan exhibited the first portable electric lamp before the North of England Institute. After touching upon the introduction of various kinds of electric lamps, Mr. Maurice said it was reasonable to assume that the improvement in the amount of illumination provided for underground workmen would have a marked effect in reducing the annual toll of accidents. The electric lamp, said Mr. Maurice, was destined to promote the welfare of the miner and the industry in far-reaching and perhaps not yet wholly recognised ways. The lecturer next alluded to the principal features of different types of electric lamps, touched upon the organisation of electric lamp installations for mines, the management of electric lamp cabins, gas-testing appliances, and, in conclusion, expressed the belief that the flame lamp was destined to rapid and complete disappearance, and that the working faces and every centre of activity in all important mines would, within the next few years, become as brilliantly illuminated as the best lighted pit-bottom. Light in the mine was not a luxury; it was an urgent and far-too-long-delayed necessity. If only one point of justification were needed for making so important a change in underground conditions, it was surely to be found in the remarkable increase in the number of cases of nystagmus.

# OUR BIG MINES.

## Examinations of their Yearly and Half-Yearly Reports.

(By a Mining Accountant.)

### The Golden Horseshoe Estates Co. Ltd.

Fast fades the golden dream, till all but memory's gone. Sad it is that youth should ever vanish. It has been well said that men think all men mortal but themselves; that all mines must die, all save their own. Mines, like men, grow old and, no longer able to sustain the vigour of their earlier days, fall into the decadence of decay—a fact that is hard to accept, but brooks of no refusal. The Golden Horseshoe, despite its brilliant and glittering past, must yield to this melancholy truth. For some years it has been evidencing signs of the inevitable approach of age; unless the miracle of rejuvenation happens, the end can not be far off. At the present time the margin between the yield from the ore and expense of obtaining that yield is perilously narrow. Each year sees a further impoverishment, and greater difficulty in discovering fresh ore to even partly replace that which has gone. Dividends have ceased; the financial position was already weak before this necessary step was at last taken. An abrupt termination came to the welcome visits that had extended over a period of thirteen years, during which time the sum of £3,075,000 was paid in dividends. This mine has produced 2,030,787 ounces of fine gold, from 2,712,163 tons of ore. The gold production veritably runs into a matter of tons, being 84 tons 12 cwt. 1 qr. 7 lb. 3 oz. (standard Troy).

Contrast the 53,594 ounces of gold, from the mere handful of 16,482 tons of ore, obtained in the year 1899, with the record of the year under review. In this latter period, ended December 31st, 1912, a record tonnage of ore was treated, being 280,868, for a production of 91,223 ounces of fine gold. Since 1902, when 193,677 ounces of gold was won from 122,019 tons of ore, the gold production has steadily decreased, without one solitary check to the downward course, while the tonnage of ore treated has ever mounted higher and higher, except during the year 1910 alone. Were it not for the increasing tonnage, the pay limit would have been reached before now. The plant, with its recent additions, is stated in the report to be working smoothly and economically. But the rate of improvement in the treatment of the ore can not possibly be expected to keep pace with the downward grade of the ore being mined. This being so, the pay limit must soon be reached, if indeed that has not already happened. The prospects of the rejuvenation referred to above may perhaps in some measure be revealed upon what follows. The main shaft was sunk a further 288½ feet during the year under review. The total depth reached was 2529 feet. Plats were cut at the 2240 and the 2360ft. levels. At the date of the general manager's report, Feb. 18, 1913, the plats were finished at the 2480ft. level. The shaft was being sunk to the 2780ft. level as rapidly as possible. During the year attention was paid to strengthening and replacing the shaft timbers affected by the heavy side pressure between the 1000ft. and the 1300ft. levels. As a result of this work the condition of the shaft has improved, and stoppages have not been so numerous. The No. 2 shaft was sunk 261ft. to a total depth of 1552ft. Sinking is being continued. Plats were cut at the 1300ft., 1400ft. and 1500ft. levels, and connected with the workings from the main shaft.

The Golden Horseshoe has four lodes, striking mainly N.N.W., though spoken of as north and south lodes. From W. to E. they are numbered 1 to 4. No. 1 lode so far has been unimportant, and practically no work was done on it during the year. From No. 2 lode 121,875 tons of ore was extracted, averaging 7.9 dwt. per ton. The lode is stated to be opening up well at the lower levels, in the southern portion. Thus, at the 1200ft. level "payable ore" was driven on to nearly 1000ft. south of the main shaft, which adds to the "already good" prospects of this lode at depth. The No. 3 lode yielded 156,890 tons of ore, averaging 7.9 dwt. per ton. The lode, where cut at the 2240ft. level, was 10ft. wide, and averaged 7 dwt. per ton. At the next level below (2360ft.) the crosscut passed through the blank section of a slide, the lode being cut above and below the level; still lower at the 2480ft. level it was exposed for a width of 10ft., the assays averaging 5dwt. below the pay limit. It is explained that in the upper levels this lode is poorer round the main shaft than further north or south. "This is especially noticeable as we drive any distance south in the lower levels." A better result than 5 dwt. is most devoutly to be hoped for. The improvement further south will need to be considerably greater than that indicated in the upper levels.

Undoubtedly the most important lode is the No. 4, and it is upon the discoveries below the present levels that the future of the mine depends. This lode, which has had a wonderful record, passed out of the Horseshoe at the 1000ft. level, and became the mainstay of the neighbouring Great Boulder. But this latter, in its turn, had a reversal of fortune. It was thought eighteen months ago that the No. 4 lode re-entered the Golden Horseshoe at about the 2630ft. level. But subsequent work has shown that it lies within the latter mine at the 2480ft. level. At this level a crosscut from the Edwards shaft (Boulder mine) driven to connect with the main shaft of the Horseshoe, intersected a west branch of No. 4 lode, 10ft. from the east boundary of the latter mine. Where intersected the lode was 2½ft. wide, and the assays averaged 25dwt. A drive was driven 10ft. south, the lode averaging 3ft. wide and assaying 5 oz. 12 dwt. Up to the date of the report, the width and high values were maintained. At the lower level, the 2630ft. level, a crosscut from the Boulder intersected the lode at a point 15ft. within the Horseshoe property. A drive 220ft. south exposed ore of a patchy nature. Patchiness is characteristic of the Kalgoorlie mines, and is more pronounced as depth is reached. At the point where the lode was cut, the average of the assays was 25 dwt. per ton for a width of 7ft.; 100ft. further south 10ft. of the drive assayed 5 oz. per ton for a width of 6ft. The intervening portion of the last 110ft. escape mention. It can plainly be seen what the return of this lode may mean to the Horseshoe. May the deep-level developments fulfil the hopes that have been built upon them. A little ore was extracted from the lode during the year; 2042 tons averaging 19.9 dwt. per ton was the result. Perhaps this was a sweet foretaste of a lot more to come.

The report expresses acknowledgment of the ready assistance and co-operation of the general manager and staff of the Great Boulder in the work of determining the position of this important lode. It also states that, owing to the scarcity of miners, no work was done upon the Golden Treasure leases, which are considered as very promising.

The following table shows the underground history of the last three years:—

| | | Year Ended December, 1910. | 1911 | 1912. |
|---|---|---|---|---|
| Ore raised | tons (2240 lb.) | 257,333 | 269,667 | 280,868 |
| Average assay value | dwt. per ton | 8.8 | 7.98 | 7.412 |
| Footage of development work— | | | | |
| Shaft sinking | | 927 | 460½ | 549½ |
| Driving and crosscutting | | 5,812½ | 5,854½ | 6,762½ |
| Rising and winzing | | 3,314½ | 3,275½ | 2,456½ |
| Diamond drilling | | 390 | 507 | — |
| Total | | 10,444 | 10,097½ | 9,768½ |
| Ore reserves | tons | 803,151 | 804,269 | 714,141 |
| Average grade | dwt. per ton | 9.559 | 8.801 | 8.071 |

The rapid rate of impoverishment is noteworthy. The ore reserves are declining, both in grade and tonnage, despite continued efforts at exploration and development. The details of the ore reserves are stated as follows:—

| | Tons (2240 lb.) | Average Value. Dwt. | Contents (fine gold) Oz. |
|---|---|---|---|
| No. 1 Lode | 7,125 | 6.60 | 2,352.65 |
| No. 2 Lode | 294,520 | 7.18 | 105,700.58 |
| No. 3 Lode | 390,849 | 8.13 | 158,940.03 |
| No. 4 Lode | 21,647 | 19.60 | 21,213.84 |
| | 714,141 | 8.071 | 288,207.10 |

A copious production of decimals characterises this report. No ore was included below the following levels:—No. 1 lode, 100ft.; No. 2 lode, 2000ft.; No. 3 lode, 2120ft.; No. 4 lode, 900ft. level. The general manager, in concluding his report, states: "Although every effort has been made to push ahead as fast as possible with bringing the development work up to date, yet the work has, of necessity, been slower than anticipated, with the result that the higher grade is hardly ready for stoping, and in consequence the returns during the year and the ore reserves have been affected. The mine undoubtedly has a large quantity of payable ore in addition to the reserves, and as the development work progresses the position will continue to improve and the company again pay regular dividends." A prediction that is evidently based on the hopes of the No. 4 lode. Without this lode the prospects are dark, very dark.

Very little information of an interesting kind is given in connection with the mill work. It may be summed up thus:—

| | Tons Treated. | Gold Yielded. Oz. | Net Value of Yield. £ |
|---|---|---|---|
| Milling | 280,868 | 21,036.113 | 89,449 |
| Sand plant | 103,856 | 7,370.652 | 31,342 |
| Slimes plant | 153,456 | 30,666.428 | 130,518 |
| Concentrates | 23,556 | 26,068.108 | 110,853 |
| Retreatment of old slimes | 43,393 | 4,663.039 | 19,771 |
| Cyanide slag, etc. (sold) | 27½ | 1,418.258 | 5,907 |

The extraction was 83.17 per cent., and the average extraction grade was 27s. 7.407d. per ton. The total cost of production was 26s. 11.5d. per ton. (The latter figure is calculated from the revenue account). What this slight margin means may perhaps be seen from the following table, which gives the published working costs. The basis of the costs is not stated in the report, but it evidently is per ton of material handled in each operation. The trend may inspire interesting speculation.

Comparative Table B.—Working Costs as Stated in the Report.

| | Year Ended December, 1910. s. d. | 1911. s. d. | 1913. s. d. |
|---|---|---|---|
| Stoping | — | 10 10.68 | 10 11.215 |
| Milling* | 5 2.33 | 4 9.37 | 4 5.495 |
| Sands plant | 2 11.98 | 2 8.5 | 2 6.68 |
| Slimes plant† | 6 2.2 | 5 9.6 | 5 9.354 |
| Concentrates‡ | 12 11.1 | 11 5.2 | 10 4.401 |

*Milling includes rockbreaking, conveying, crushing, classifying, concentrating, and fine-grinding.

†Slime treatment includes settling, agitating, cyaniding, filter-pressing, and disposal of residue.

‡Concentrate is roasted and cyanided. Slag is sold.

The working costs are as bare as possible. They do not include maintenance, management, and general expenses, nor, of course, are head office expenses taken into consideration. These, in addition to other expenses scheduled below, bear a considerable proportion to the total cost. This total cost, with its component parts, is shown in the revenue account as follows:—

| | | |
|---|---|---|
| Mine development written off | | £45,597 |
| Ore extraction | | 153,559 |
| Ore Reduction— | | |
| Battery expenses | £62,604 | |
| Cyanide expenses | 13,276 | |
| Slimes expenses | 44,345 | |
| Retreatment expenses | 10,205 | |
| Concentrates and slags exps. | 12,959 | |
| | | 143,389 |
| Maintenance | | 2,215 |
| Management and general expenses | | 12,024 |
| Written off plant, machinery, buildings, etc. | | 251 |
| Head office (London) expenses | | 4,594 |
| French duty and expenses | | 337 |
| Income tax | | 2,491 |
| Debenture interest | | 6,000 |
| Bromo-cyanide litigation | | 8,172 |
| Total | | £379,629 |

Mine development was charged to capital, but written off in equal amount. Ore extraction represents the "stoping" in Table B. The re-treatment of old slimes perhaps is not a fair debit to the ore treated, but on the other hand the ore is credited with the gold thus obtained. Depreciation of plant appears altogether inadequate. Debenture interest may not be a correct debit to production, as it is due to a financial arrangement that under improved conditions might be altered without affecting the cost of production. Litigation expenses were heavy, and may not be recurrent. Nevertheless, all the expenses have been included in the total cost of 26s. 11.5d. per ton of ore raised and treated.

Revenue account is credited with bullion, £381,933; slag, £5148; Great Boulder encroachment, £759; dividend on investment, £346; interest on deposits, £857; and transfer fees, £64. A net profit of £10,479 is thus shown. This is cut into by the redemption of debentures, £6200. The outstanding debentures total £93,800, a sum greater than the value placed upon the liquid assets. No dividends were paid, and none can be expected for at any rate some time to come, despite the optimism of the general manager. The chief features of the financial position may be compared with last year's as follows.

Comparative Table C.—Financial History.

| | Year Ended Dec., 1911. | 1912. |
|---|---|---|
| Revenue Account— | | |
| Revenue | £404,172 | £389,108 |
| Expenditure | 322,941 | 332,782 |
| Written off | 50,773 | 45,847 |
| Net profit | 30,458 | 10,479 |
| Dividend | Nil. | Nil. |
| Carry forward* | 31,328 | 35,602 |
| Balance-sheet— | | |
| Capital (300,000 shares of £5 each) | 1,500,000 | 1,500,000 |
| Liquid assets, including stores | 81,084 | 86,144 |
| Liabilities, including debentures | 128,262 | 123,075 |
| Debt | 47,178 | 36,931 |

*Note.—£26,365 brought forward from 1910. In 1911, £25,000 was written off for depreciation, but not shown in revenue account. In 1912, £6200 debenture redemption not shown in revenue account.

## MINING IN NEW SOUTH WALES.

### Orange District.

(From Our Correspondent.)

July 4, 1913.

During the past week smelting operations at the Cadia copper mine have been suspended owing to an insufficiency of fuel, which was attributable to the state of the roads. The supplies of coke are drawn by teams from Orange. It seems a pity that the shire council cannot undertake the necessary repairs to this road, as the development of the Cadia copper mine means much to the district. It is hoped that smelting operations will be resumed on Monday next.

At the Orange Warden's Court on Thursday last, Mr. N. H. Murray, of Sydney, through his agent, Mr. W. Fuller, applied for suspension of the labour conditions for a period of six months in respect to the Mount Bulga copper mine. Mr. Fuller gave evidence to show that the area of the property was 73 acres. From 1st October, 1912, to 30th June, 1913, the wages paid amounted to £3199 3s. 3d., stores cost £350 7s. 10d., and plant £74 16s. 10d. During the lessee's occupation the shaft had been deepened 100ft., and 700ft. of driving done. Ore was stoped out 100ft. in length and 100ft. in height; 1500 tons of ore was raised in two years. All the ore was now underfoot, and further capital was necessary to deepen the shaft and exploit the lode. The deepening of the shaft and other work would involve an outlay of £2000. The Warden adjourned the application to the next court.

### Lithgow District.

(From Our Correspondent.)

Lithgow, July 4.

A break in the very protracted spell of phenomenally wet weather has occurred, and the mining industry is taking on a new lease of activity. The Lloyd Company, at Burraga, has been experiencing some difficulty in getting in sufficient fuel to keep the industry profitably in action owing to the boggy nature of the country through which the teams have to draw wood to the tramway terminal depot. The total ore raised for the last fortnight was 1368 tons. The mills have worked 313 hours, during which period 1255 tons of ore was treated. Though only No. 2 section of the mill has been running for the entire period, the output of the mill was 215 tons 16 cwt. of concentrates of 14 per cent. copper and 89½ tons of picked ore, averaging 13.5 per cent.; 343 tons of concentrates, picked ore, and slags were treated, producing 60 tons of matte, averaging 64.1 per cent. of copper, 14.27 dwt. of gold, and 13.9 oz. of silver per ton.

A well-known Lithgow mining man who has large interests in the Yerranderie silver field, and has just returned to town, states that the mines there are going on very well indeed. The New Burragorang Silver Mining Company has holed through into the Yerranderie workings, an accomplishment which has greatly improved the ventilation generally.

### South Coast.

(From Our Correspondent.)

Wollongong, July 5.

Reports from the gold-bearing country on the South coast state that the excessive rainfall has much impeded operations. A second shaft on Twyford's Find, Mount Dromedary (Tilba) has got the reef as good, if not better, than in the first. No. 2 shaft is 20ft. from No. 7, which raises hopes that the find is more than a patch.

Tanja, in the Bega district, is now getting some attention from prospectors. Prospects of gold have not infrequently been got in that part, but nothing better. You not infrequently encounter in these gold-bearing parts the opinion that at some unreached depth the matrix is to be found.

---

At Ardlethan labour troubles are being encountered. Mr. C. H. Davis, who has lately taken over the management of the Ardlethan Options tin mine, has been endeavouring to bring the wages of the men employed (some 200) down to the award rates, ignoring the agreement between the former manager and the men for higher rates. The men have been receiving 10s. for a 46-hour week, and the rates now proposed are 8s. and 9s. 6d. for a week of 48 hours. Many dismissals have taken place, and miners are being asked to communicate with the union's headquarters in Sydney before accepting employment at Ardlethan.

Some forty applications to enter private property were lodged at Junee last week. An assay of stone from the surface is stated to show payable silver with traces of gold. Stone has been despatched to Broken Hill for treatment.

In the absence of the Minister, a deputation of those interested in the Ardlethan field interviewed Mr. P. Allen, assistant to the Director-general of Public Works, and urged that a light railway about eight miles in length should be constructed to the centre of the field. The estimated cost given for a line capable of taking main line trucks was £1200. Mr. Allen will report to the Minister in due course.

---

## VICTORIAN MINING ACTIVITIES

### Bendigo and District.

(From Our Correspondent.)

The gold production for the week ending July 5th, 1913, amounted to 4578 oz. 17 dwt., including 1022 oz. 2 dwt., the return from the Lansell Proprietary mines during the month of June. The principal producers were:—Lansell's Little No. 180, 603 oz. 13 dwt.; Lansell's North R., W. and Blue, 300 oz. 9 dwt.; South New Moon, 280 oz. 11 dwt.; Central R., W. and Blue, 248 oz. 16 dwt.; Koch's Pioneer, 161 oz. 4 dwt.; Great Northern, 152 oz.; Johnson Reef, 130 oz. 13 dwt.; Catherine Reef, 129 oz. 1 dwt.; Carlisle, 117 oz. 17 dwt.; Princess Dagmar, 114 oz. 7 dwt.; Golden Pyke, 113 oz. 16 dwt.; Ironbark, 114 oz. 10 dwt.; United Hustlers and Redan, 113 oz. 10 dwt.; Spring Gully, 104 oz.; Virginia, 92 oz. Only one dividend was announced, Great Northern distributing £750 at 6d. per share. The company's total disbursements are now £167,200.

Carlisle experienced a temporary falling-off in the weekly gold yield from the extensive spurry deposit associated with the faulting of the Victory back above and below 1140ft. A connection has been effected between the 1140ft. main and the 1200ft. intermediate levels, at 140ft. north of the shaft. This is about 50ft. ahead of where the top slide carried the higher grade stone under the 1140ft. workings as it pitched north. In rising and sinking on the Victory back a good quantity of consolidated quartz and spurs have been traversed, the slide being passed through at 12ft. under 1140ft. It is intended to increase the width of the 1200ft. intermediate by side stoping off the rise, before gaining overhead stopes to reach the better grade stone in the vicinity of the fault. South of this rise there is an assurance of 160ft. in length of payable stone to beat upward to the 1140ft. workings, while an additional length of over 150ft. should be available by continuing the intermediate level along the back before the formation again disappears below the rails. With the object of keeping in close touch with the more auriferous quartz, the 1260ft. level is being pushed ahead. Above 1140ft. an overhead stope is operating on the spurs, showing a little gold immediately over the fault. The second stope has extracted the material up to the fault for a width of 25ft., almost back to the crosscut, which still shows good prospects. A temporary intrusion of country rock has been met in the south stope above the timber, a not infrequent occurrence. In the side stopes a width of over 35ft. of spurs is being taken, a little gold continuing visible along the extreme western limits. During the next few weeks, it will be necessary to suspend these workings on the fault while a plat is formed at about 1040ft. From the latter depth a crosscut will be run out to the Victory back and a rise put up from 1140ft. This connection will enable the systematic filling of the 1140ft. south stopes, which are filled overhead at present.

Koch's Pioneer tribs, Messrs. Cox Bros., cleaned off 20 tons from the east back of the 1900ft. eastern reef, for the splendid yield of 99 oz. 17 dwt. The average, though very high, is considerably below the previous return. To date these tribs have extracted something like £4500 worth of gold from their small block of ground, of which the company received 50 per cent. Operations are conducted from a winze below the north level, at about 600ft. from the shaft and as high as 14 oz. per ton has been obtained. This shoot, like others found along the 1900ft. back, is evidently very local. The company are working similar reefs at 2250ft. and 2650ft. At 2250ft. there is 20in. to 24in. of good looking quartz in advancing the north level to 252ft., but the quality is low. A few colours of gold are seen in driving and stoping in the 2650ft. south intermediate on 9in. of reef.

Catherine Reef have decided to reduce the tonnage by confining stoping to the more auriferous portions of the massive fault formation above 2300ft. With this reduction in costs it is likely that a more satisfactory balance-sheet will be presented later on. The official fortnightly report last week was not reassuring, for it was stated that the stopes in the vicinity of the No. 6 winze were operating in the top of the stone. This means that the major portion of the deposit is already under the end of the main 2300ft. north level. These stopes are taking 10ft. of very inferior stone. Near the No. 5 winze the stoping extends for a width of 25ft., on solid quartz and spurs revealing a colour of gold occasionally. North of the No. 3 winze similar prospects are showing. Between the Nos. 1 and 2 winzes in this direction a little gold is seen in the stopes. From the No. 1 south stope the reef is being taken for 30ft. in width, the leading stope taking 10ft. of quartz. The south level is advanced to nearly 450ft., in 8ft. to 10ft. of well mineralised quartz. The lava and fault are here revealed, "clean" country showing under the break. It is stated that the fault has crossed the centre in this end, the reef being now located in the western beds. This south level has never shown anything of value in driving, though the stopes near the crosscut have occasionally proved payable. In crushing the foundations of the old battery, a substantial gold yield has lately been obtained.

South New Moon eastern spurs in the south stopes over 980ft. have been revealing good gold for the past fortnight; better prospects also showing in the 1060ft. morth spurs. Higher grade yields have consequently resulted and the company are again well on the way toward a 1s. dividend. In advancing the 1140ft. south level there is 5ft. of promising quartz, but no gold is visible. The under stopes gaining north at this depth, however, show a few colours along the course of the east back and fault. At the eastern shaft the Paddy's Gully reef channel has been reached in crosscutting 63ft. west from the 200ft. plat, without finding anything of importance. Tribs., working in the old 440ft. stopes, had the lucrative yield of 27 oz. 5 dwt. from 12 tons.

Nell Gwynne, though not drawing to any extent on the stope where the enrichment of the 740ft. reef was met near the north boundary, were able to provide the profitable yield of 67 oz. 12 dwt. from 231 tons. This places the company in a position to declare another 6d. dividend, which is likely to be made available early in the month. In the south stopes at the same depth, operations have lately been resumed on the upper portion of the formation, which is yielding more satisfactorily than when previously tested, in taking 4ft. to 12ft. of quartz. At 1000ft. the north stopes show 18in. to 5ft. of payable stone. In the opposite direction the bulk of this irregular deposit has pitched underfoot, but will be picked up again at an early date by the 1094ft. south level. This level is in 76ft., on the west back, which carries 3in. to 6in. of quartz.

Specimen Hill revived interest in the old reef in the large 1435ft. centre reef by discovering payable quartz above the north level. The first milling since meeting the improvement yielded 11 oz. 10 dwt. from 32 tons. It is anticipated that a higher average will be shown with the second crushing during the month. The level was formerly extended, but, of late, the company have been breaking across east in search of auriferous spurs, which exist along the McDuff east back in the mines further south. Failing to find anything of value, it was decided to test the old reef where exposed in the back of the level, with the results stated. There is plenty of stone overhead, but the experience on this reef is that the gold shoots are short. Worked in a big way in the mines southward, the reef has paid fairly well and the company have also exploited it extensively on several occasions. It is proposed to drive a crosscut each near the Virginia boundary later, to ascertain whether the eastern spurs exist at this point.

Johnson's Reef 1225ft. east crosscut off the No. 3 shaft on the Derby line exposed a small vein of quartz, with a colour of gold. A subsequent breaking uncovered a small west leg and several spurs, but no gold. The stone appears to be allied to one of the reefs already seen at 1150ft., but it may be connected with a formation under that crosscut. Crosscutting is to be continued and centre should be reached before the expiration of the month. There is still a chance of another cap being intersected. Very little change has occurred in the 1030ft. to 1150ft. stopes, though the return was more encouraging. The Collmann reef in the 1735ft. north intermediate from the No. 2 shaft continues of low value. Some interesting work is just being entered upon from an intermediate level above 782ft., and within 20ft. of the Princess Dagmar boundary. A crosscut is to be extended west, in anticipation of meeting the inverted cap of the reef from which the latter company are now getting good results. A matter of about 30ft. of crosscutting will be sufficient, and in the event of gold-bearing quartz being found, it will greatly improve the prospects of both companies.

New Chum Goldfields have recently found more gold in the east leg of the 1076ft. reef, in advancing the north intermediate. As the main level began to reveal better prospects underfoot at about the same point, the improvement in the intermediate may show a greater degree of permanency than usual. In the next mine, the North Bendigo have paid steady dividends of late from the same reef, but the accumulation of a credit of about £800 by the New Chum Goldfields has been possible by very economical methods of production.

Princess Dagmar increased the output and the average of the yield from the middle reef at 853ft. The whole of the stone came from the level off the north boundary and the leading stope. Driving is now in the inverted cap, which has a spurry character, but carries payable gold. The level should shortly enter clean country with the cap rising south. The leading stope is advanced to where the level is connected with the 867ft. rise and is just entering the rich shoot seen in driving. A rise is shortly to be extended at a short distance south of this point, prior to starting additional stope to further increase the tonnage. This rise will determine how far the higher grade stone extends above the level.

## Castlemaine and District.

(From Our Correspondent.)

Spring Gully had its hopes dashed again, to a certain extent, by the reduced yield for last fortnight. From 213 tons only 66 oz. was received from the battery. The rich crushing of the previous fortnight was drawn chiefly from the neighbourhood of a slide some distance below the fault where previous rich yields were got. Stoping north, the spurs are over 5ft. in thickness, showing coarse gold. The large slate country to the westward was expected by the manager to retain the richness lately disclosed, but this crushing did not bear out the hope. The crosscourse is distant about 650ft. from the present point of working, and as the quartz formations have proved fairly productive as it approaches the big fault, there is hope for the immediate future. The company is spending a fair proportion of its money in exploring work, and previous to the yields reported this week had £676 in hand. No work was done in the winze, where there is a fair width of promising stone along the same break as seen in the north workings. It is intended to connect the winze by rising from the 240ft. south level. The plates were cleaned up early in the previous week for 115 oz. of amalgam, which retorted 38 oz. gold.

The preliminary meeting to form a company and authorise registration of the McDonald's Reef Co., German Gully, Fryerstown, was held at Scott's Hotel, Collins-street, Melbourne, on Monday of last week, when 28,500 out of the total of 30,000 issued were represented. The directors appointed were—Messrs. E. Samuels (chairman), Chas. Wilson (Melbourne), N. Chancellor, G. Kingsley (Bendigo), and T. T. Dunstan (Guildford). It is intended to erect a plant on the mine and at once commence active operations.

Something fresh is reported for the Castlemaine district. It is a long time since anything but gold has been sought, but last week a couple of men named William Curtayne and Bert. Lawrence pegged out and applied for a lease of 100 acres at Harcourt, on Mount Alexander, for the purpose of sinking for tin. The applicants are said to be practical men who are sanguine as to the possibilities of their lease. If it is proved to be tin-bearing, it will mean a lot to the district.

The Campbell's Creek bucket dredge had a fine advance on previous average yields. For a full run of 276 hours, 85 oz. 7 dwt. was lifted. This is 30 oz. in advance of the average.

South Wattle Gully has now got the main drive at the 300ft. level out 315ft. The reef in the face is 18in. wide and dipping slightly to the north. Now rising over the back of the level, and up 8ft. About 2ft. of stone is showing, and gold is expected to appear at any moment. At the 230ft. level the rise from the main drive is up 27ft. A stope has been opened out west from the rise, stone 8in. wide is showing fair gold.

## Maldon.

(From Our Correspondent.)

The contractors at the South German have started to extend the intermediate level north below 1750ft., where the stone looks well. Baxter and party are breaking stone both over and under the same level, and are crushing. Grigg and party are operating below No. 5 and 6 levels east, and have crushed 154 tons for 49 oz. 12 dwt. Hansen and party sent 59 tons up from the 2000ft. level south for a yield of 14 oz. 9 dwt., and Merlo and party, who are also working at 2000ft. south, crushed 70 tons for 10 oz. 17 dwt.

During the past fortnight Derby United has extended the 680ft. crosscut east from the main level to 37ft., the spur trending eastward and showing gold. The intermediate level south of the rise in the reef channel is heavily mineralised. The 550ft. level has been cleared and repaired for a distance of 200ft., and ore will be sent to the battery from that point. At 470ft. level the crosscut west of the main level is being extended, the spurs in the end carrying gold in dish trials. The half-yearly meeting was held last week. Mr. T. B. Brooks (chairman) presided, and there was a good attendance of shareholders. In moving the adoption of the reports, the chairman said they had commenced work in the upper levels at the south end of the lease in the Western Cymru ground, where there were large formations in new country, and if the stone proved payable the battery could be kept going for a long time. Mr. Rewell, who inspects the mine regularly, said he hoped that something payable would be met in the crosscut east at 700ft. below the floor they had met in the rise. At 550ft. there were thousands of tons of ore in the Old Western reef, and this, with modern treatment, should prove payable if a thorough trial were given it. The directors' fees were fixed at £26 for the half-year, and Messrs. Brooks, Bowe, Calder, Rewell and Chisholm were re-elected. The board were empowered to deal with the 4785 forfeited shares in their hands, provided shareholders were given the preference of taking them up. The receipts (including an overdraft of £1945) totalled £6342. Battery and cyanide produced £2277 worth, and tributers got £3023; calls, £1299. The expenditure used up all the income, the chief items being—Wages, £2237; tributers, £461; stores, £488; firewood, £471.

## Daylesford.

(From Our Correspondent.)

There seems every likelihood of the old Lord Tennyson mine, which has lain idle for a long time, being again the scene of active operations in the near future. It is situated on the Abundance line of reef, on which, further north, the Olive Branch Company are centreing their operations at the present time. In the vicinity of the proposed activity some very good results have been obtained by several distinct parties, whose crushings have varied from ½ oz. to 1 oz. 3 dwt. Much of the dirt was got at a depth of from 8ft. to 10ft. It is still confidently stated that the north and south ends of this lease carry large bodies of formation that will average from 5 dwt. to 7 dwt. There appears a desire in some quarters to give these old lines of reef a further trial. Many hereabouts have been long left in a comparatively neglected state, and, if worked in something like a systematic fashion, with the appliances of to-day, it is not unlikely that others of our long idle lines of reef may turn up "trumps," as the Nuggety Ajax line has done.

The Frenchman's Reef have been slacking hands, the good quality stone which was followed south in the intermediate level having made under and that showing in the face not having kept up its value. The bottom level drive has not yet gone far enough south to meet this formation.

The Central Ajax continues to keep up its encouraging appearance and the makes followed at the various levels are maintaining their size and value.

This month should see the additional milling plant about complete, and larger quantities of ore being run through to swell the August return.

The North Ajax stone going out northwards is not of quite so good a quality as it was. In the end, going south, it continues of payable value.

The lode cut in the William Tell north drive from the crosscut is now some 3ft. wide of promising appearance, showing gold. The stopes are producing stone enough of decent average quality to keep the battery travelling full time.

The New Cornish are not crushing as much as usual—an indication that milling ore is not available.

---

# MINING IN WESTERN AUSTRALIA

(From Our Correspondent.)

Kalgoorlie, June 30.

The last 23ft. driven north at the 100ft. level of the Paringa on Geach's lode assayed 40s. per ton over a width of 7ft. The face of the drive is in ore worth 86s. per ton. The total distance driven on the lode is now 105ft., and the average value 87s. 8d. per ton. At the 200ft. level the drive north has been extended 49ft. in barren country, against 76ft. at the 100ft. level. The ore shoot should be met with in the next fortnight.

Mr. W. R. Grant, the manager of the recently floated Siberia Consols, has already made a start to open up the mine, and seven men are on the pay-sheet. The deepest workings are at 180ft., where some rich specimens were found in driving across the lode. The water-level is just below this level, and a start will shortly be made to sink the shaft another 100ft. or so, and a mill will be installed if sufficient water is got. This is the only way to properly test the lode, as ordinary sampling is found to be very erratic, and assays vary from dwt. to oz., as it did on the Victorious at Ora Banda, a dozen miles away by road, and less as the crow flies.

After a long spun-out trial, involving thousands of pounds for legal expenses, Mr. Justice McMillan has delivered his judgment in the case of the bromo-cyanide patents for the treatment of mine residues. The holders of the two patents in question are the London and Hamburg Gold Recovery Co. Ltd., and the nominal defendants, the Golden Horseshoe Estates, Ltd., as representing the Chamber of Mines. The Sulman-Teed patent was held to be invalid, as it was proved it was useless for the recovery of gold till Dr. Diehl's experiments demonstrated that the use of lime was a mistake, and rendered the process abortive. On the other hand, the Goepner-Whitter patent for the preparation of bromo salts was a new and successful invention, and the patent was, therefore, valid. Both sides to the dispute have appealed, and the case will probably eventually be dragged to the Privy Council.

Another case that will be before the Courts shortly is the one being brought by the Merrill Metallurgical Co. of San Francisco, the holders of the Moore vacuum filter patent press, against users of every other kind of vacuum press. The Golden Horseshoe Estates, Ltd., will be the nominal defendants in this case also. The Moore press was tried first on the fields by the Great Boulder Perseverance in 1904. In 1906 the Cassell press was tried almost simultaneously on the Sons of Gwalia and Gwalia Consols mines, and has since then treated two or three million tons on the fields, the Lake View Consols alone having treated, from May, 1908, to date, 600,000 tons for a return of £100,000. The only other press that has been tried extensively on the fields is Ridgway's, which has been in use on the Great Boulder for 5 or 6 years.

The grade of ore treated by the Oroya Links has been gradually declining, and the last return averaged only 19s. 6d. per ton, the profit being only £677. The rich Rutter ore shoot, which helped the returns last year, has been depleted, and the bulk of the ore now comes from the erratic Eclipse mine. The company has acquired an option on the adjoining Levant lease, which contains the northern extension of the Eclipse lode. This lease has many shafts on it, but nothing payable could be found there till recently a lode, 8ft. wide, carrying fairly good prospects, was located by prospectors, and this may help to prolong the life of the company.

Dr. Malcolm MacLaren has completed his inspection of the Great Fingall mine, and is now engaged on the Fenian, at Meekathara. This mine is still owned by prospectors, and is now being opened up at No. 8 level, a depth of 727ft. The ore shoot at No. 7 level is the richest in the mine, and runs from £7 to £22 for the 100ft. driven. At present a Commonwealth generator and two Kynoch gas engines are being installed on the mine, and £10,000 will be spent on new equipment. The mine has produced £392,000 from 95,200 tons, and paid £176,165 in dividends. After completing his examination of the Fenian, Dr. MacLaren will report on the Sons of Gwalia, and will then make exhaustive examinations of the chief Kalgoorlie-Boulder mines. It is three years since Dr. MacLaren's last visit to this State.

---

# TASMANIAN MINING.

## Mount Lyell District.

(From Our Correspondent.)

Queenstown, July 4.

Operations at the Mount Lyell Company's various mines are proceeding uninterruptedly, and the aggregate output for the current four-weekly period, which closes on July 9, is pretty certain to reach well over 20,000 tons, the highest since the disaster in October last.

The whole output from the North Lyell mine, with the exception of a very small tonnage from a couple of stopes at the 400ft. and 500ft. levels, is being won from the 850ft. and 1000ft. levels, and under existing circumstances it is hard to maintain a production of 1200 tons a week. The work of cleaning-up and repairing at the 1100ft. level is, however, pretty well completed, and it is anticipated to start regular orebreaking at this level at the beginning of next week. With the three big stopes at this level in producing order, the output will of course be appreciably increased, but a good deal of dead work has yet to be done before the bottom level gets back to its old productive capacity. This, naturally, has been the case in connection with all the levels, and, considering the extensive and difficult character of the dead work which has had to be effected since the different levels were drained, the wonder is that the management, in such a short time, has been able to get the mine into a condition which allows of an extraction of 1200 tons a week. The work of getting some of the stopes thoroughly mullocked up before starting to break ore is still in hand, and a lot of labour is employed in this direction. The output of ore for the current month, although it will be somewhat higher than that for last month, which was 4118 tons, is not likely to reach over 5000 tons, as the end of the period will arrive by the time ore-breaking at the 1100ft. level has been fairly commenced. But, even with this level in productive order, it will take a good while yet to get the output of the North Lyell mine back to its original standard of between 9000 and 10,000 tons a month.

At the Mount Lyell mine the output of pyrites is only limited by the tonnage of North Lyell ore available, and there will be no difficulty in increasing the production from this mine at any time or to any extent required. The work of cutting the main galley through the South Lyell ore body at No. 8 level, where the two mines are connected, is in active progress, and it will not be long until stoping operations on the South ore body, the production from which will be merged into that from the Mount Lyell mine, are in full swing. It is understood that the metal contents of the South Lyell pyrites are of practically the same value as those of the Mount Lyell pyrites, although in days gone by, when the South was being worked as one of "North Lyell group" of mines, those interested in the latter used to say it was worth three times as much.

At the Lyell Comstock ore breaking continues in progress at four levels and the open cut, the output, with one shift employed, being kept at about 600 tons a week. At present there is not any indication that this output will be increased for some time to come, and it appears to be generally understood that the tonnage mentioned is just about as much as they care about handling at the reduction works for the present. And, any way, it is pretty certain that for the next few months, at least, the attention of the management will be concentrated upon increasing production from the North Lyell mine, as the supply of either Mount Lyell or Lyell Comstock material is, under present conditions, only a secondary consideration.

Regarding the Crown Lyell property recently acquired by the Mount Lyell Company, nothing is being done as yet beyond housing the plant; the buildings have been allowed by the Crown Company to go to ruin and the machinery be exposed to the destructive influences of the weather. So far, no official intimation has been made as to what the intentions of the Mount Lyell Company are in regard to the future working of the Crown, but it is very probable that as soon as circumstances allow a start will be made to deepen the Crown shaft. This has already been sunk to a depth of about 600ft., which corresponds to a depth of about 540ft. at the North Lyell shaft. Connection between the two shafts was established years ago by the old North Lyell Company by means of a drive from the 300ft. level of the North Lyell mine, and, in those days, this drive served as a drainage outlet for the water which was encountered in sinking the Crown shaft below the 400ft. level. It is very likely that the Mount Lyell Company will deepen the Crown shaft to a depth which will correspond with the 700ft. level of the North Lyell mine and connect with the workings of the latter at this depth. The distance between the two shafts is approximately only 300ft., and as the No. 16 stope workings in the North Lyell mine, which are trending towards the Crown shaft, have been extended some 200ft. from the North Lyell shaft, the distance to be driven to connect the Crown Lyell shaft at a depth of about 160ft. below its present level with the 700ft. level of the North Lyell workings would not be much more than 100ft. The work, therefore, would not entail any great expense, and with such a connection made there would be a permanent second exit established in the North Lyell mine from the 700ft. level to the surface, and this might in the future prove a valuable acquisition to the mine.

# THE COAL MINING INDUSTRY.

## New South Wales.

### Northern District.

(From Our Newcastle Correspondent.)

The Colliery Employes' Federation of the Northern District, which represents all the miners in the Newcastle and Maitland districts, is not satisfied with the report of Inspector Tennant to the Mines Department of the State, on the introduction of Russians to Richmond Main colliery and on their fitness to do the work to which they have been put in the shaft. At the delegate board meeting of the federation this week, in Maitland, it was decided to make a further protest against the employment of the Russians, and also to inquire whether the provisions of the Aliens Restriction Act had been complied with in respect of the admission of the men to the State. The view taken by the delegates of the miners is that if a few foreigners are allowed to come in without protest, the mine-owners may see advantage in introducing large numbers of these men, to the detriment of the Australian miner; for it is contended that if once a large body of Russian or other workmen came in, the tendency would be, as in America, to reduce wages for the work which those men would be able to do; and in the discussion on the matter, it was pointed out that the employment of foreigners, even though they be intelligent men, is fraught with danger to the miners and the mine, as they cannot grasp quickly and clearly the meaning of orders given verbally, or even of printed notices. In America mine managers complain of the worry and responsibility cast upon them by having men of different nationalities employed in the mines, and the object of the federation is to prevent the bringing about of a similar state of affairs here.

Nothing further has been done in respect of the appointment of a Wages Board for the hearing of disputes between the miners and the colliery proprietors in the Newcastle and Maitland districts. The representatives of the owners and of the men were appointed last Friday by the President of the Arbitration Court. It was mentioned then that Mr. Hibble, who has been chairman of the board dealing with workers in pits who are not miners, had resigned. It appears now that this step has been taken by Mr. Hibble, and the men and the owners are casting about for another chairman. In this respect, more deference has in the past been paid to the miners than to other bodies of workmen, for the latter have to take the chairman appointed for their industry, whereas the miners have expected to have the selection of their own chairman. Whether it will be so in cumstances, it is probable that either his Honor Judge Scholes or Mr. A. R. Watt, barrister-at-law, will be chairman of the board. When it meets there will be some interesting developments. The miners have had the idea that all they have had to do is to get a board, and that tribunal will at once enter upon the hearing of their claims. But the fact is that the proprietors have a long list of claims, and they are ready to file them before the board immediately it is constituted; and so it may be that we shall have the spectacle of a board constituted at the desire of the miners having its time taken up for some weeks, or even months, in the consideration of claims put forward by the colliery proprietors. That will certainly not suit a large body of the men, and there will be a good deal of grumbling, if not some evidences of open revolt, when those who are expecting the board to give awards by the peck measure find that they have to wait their turn, and that other men have rights and privileges to be conserved.

Stoppages have occurred again this week at some of the Newcastle mines, a cause of trouble at Seaham Colliery being the fact that two men had been suspended for boring beyond the specified depth. However, the trouble at Stanford Merthyr, over the time to be allowed for the men to have a meal while working, has been got over, and the men have resumed work on the understanding that the officers will do their best to have the matter brought before the board which is to deal with mining disputes. Other pits that were idle have also resumed work, but the men at Lambton B Pit and Stockton-Borehole Colliery are still out on strike as a protest against the conditions existing in those mines, and which they contend are not fair to them. The management of these mines, on the other hand, say that there is nothing of which the men can justly complain. The federation is making contributions to the wives and children of the men.

The output of coal from the Maitland and Newcastle collieries for the month of June, notwithstanding the trouble over loading of vessels and the running of trains, was 403,000 tons, as against 361,000 tons for June of last year. Of the total quantity exported last month, 227,000 tons went to Commonwealth and New Zealand ports, and the balance oversea. This is a satisfactory feature of the Newcastle trade of last year, and mine-owners are looking for the day when they will be able to dispose of the whole of the products of their pits within the Commonwealth and to New Zealand. The total output for the present year promises to largely exceed that of any previous year.

### Southern District.

(From Our Wollongong Correspondent.)

Trade for coal during the week past showed great briskness, which here is ascribed to the stoppages in Newcastle district. The demand for southern coal has for some years been such as to keep the mines of the district in three parts to full work. We here fondly believed that to be due to the special qualities of southern coal; maybe it is quite as much, if not more, due to the unreliability of the northern district.

The report in the daily press of the developments in the North Bulli mine have somewhat stretched the facts in stating that the new section of seam was 7ft. thick. It averages about 4ft. 9in., which is an improvement upon what the colliery has been working since it was begun. The installation of new machinery, operating with the increased bulk of seam, provides for a much increased output. As the Adelaide Steamship Co. have a considerable interest in the mine, there should be an assured place for a good deal of the output.

The machinery for the New Bulli Colliery, for such it will be, which has been ordered from England, is beginning to arrive. There is promise when this new colliery is in working order of its becoming one of the larger producers. Thus, in another, the Southern district will be of much increased importance as compared with five years back as a supplier of coal.

## Victoria.

### Powlett River District.

(From Our Wonthaggi Correspondent.)

The settling of the new working agreement, which is to take the place of those which have been in force in the State Mine for the past 12 months, appears likely to be accomplished without the serious trouble arising which was generally anticipated. Some weeks ago the miners' representatives submitted to Mr. Broome, the general manager, a draft of the terms they were prepared to accept. A conference with Mr. Broome was then arranged, and it lasted for no less than eight days. As the outcome of the negotiations, it was agreed between the parties that the new agreement should be based on uniform rates for hand and machine mining throughout the whole mine instead of different rates for different sections as has been the case in the past. The result of the conference was that the following terms and rates were submitted to a special meeting of the V.C.M.A. held on Saturday and Sunday.

The union officials who had taken part in the conference with Mr. Broome, advised the men to accept the terms offered, which were on the whole a decided improvement on those under which they had been working.

The whole of the conditions were discussed at great length, and the meeting did not conclude until late on Sunday evening. Most of the terms were agreed to as being satisfactory. The contract rates offered for undercutting coal with machines occupied most of the time, as up to the present this work has been done on shift rates. Members thought that 4d. per ton in bord and pillars, and 3d. per ton on long walls was not sufficient. The officers stated that Mr. Broome had informed them that that was what it was costing to cut the coal on shift rates. It was decided that the rates be referred back to the management and increases asked for.

The other amendments to be asked for are:—(1) That brushers have a general cavil quarterly, and receive wet pay. (2) That payment be made for laths hitched into the seam. (3) Miners sent out on wheeling be paid the average of the pit for the first three days while so employed. (4) That wheelers receive wet pay for bad or wet roads. (5) That shiftmen be supplied with coal at the same rate as miners, viz., 2s. 6d. per skip. (6) That the term of the agreement be for 2½ years.

These amendments will be placed before Mr. Broome, but are not likely to delay the coming into operation of the new agreement on Thursday, the 10th inst. By all sections the rates and conditions of the new agreement are considered to be very fair and liberal, and should ensure industrial peace (if anything can) in Wonthaggi.

The two men Enever and Coleman, over whose suspension the recent strike took place, have been given work again at the mine. Mr. Broome, in communicating his decision to the V.C.M.A., stated that he had decided to offer them employment not in the mine but on the surface, on probation, in order that they might have a chance to prove by their willingness to obey instructions and show by general good behaviour that they were fit to be re-employed in the mine. The instructions of the mine officers had to be obeyed; but in the case of these men he had been influenced by the fact that their case had been prejudiced by the stoppage of the mine, for which he was satisfied they were not responsible; that they were married men with their families in Wonthaggi; and that they had been working in the mine from its commencement.

# BENDIGO SCHOOL OF MINES.

A grant of £1050 was asked for by representatives of the council of the Bendigo (V.) School of Mines, who were introduced by Mr. Tunnecliffe, M.L.A., as a deputation to the Minister of Education last week. The deputation stated that the sum was required for the proper equipment of the school. In the engineering department, which was badly in need of new equipment, half of the lathes were old, and the number was insufficient for the requirements of the students. An expenditure of £325 would be involved in this direction, and £500 should be expended on the electrical engineering branch, for at present it was so ill equipped that while the students were taught theory, they learnt very little in pracice. A sum of £85 was required for the physical laboratory, and £140 for the four new blackboards needed for the jurior technical school. In addition, the deputation asked for a contribution of £1100 toward the cost of maintenance.

Sir Alexander Peacock expressed himself in sympathy with the deputation, and agreed that the proper equipment of the rooms was essential for the conduct of the work of the school. It was a question of finance, which he would examine thoroughly before determining on what should be done.

## THE BENDIGO FIELD.

Mr. W. Baragwanath, geological surveyor, has submitted a long report on the Pearl and adjoining mines, Bendigo, to the Victorian Minister for Mines (Mr. Billson).

Mr. Baragwanath states that in the mine and for several miles southwards two well-defined axial lines—the New Chum and the Sheepshead—occur, while a considerable diversity of opinion exists both as to direction and continuity northward. He is of opinion that the Sheepshead line maintains a straight course, but with a change in pitch, while the New Chum line swings around, making a more northerly course, and that these lines unite and continue as the extension of the Sheepshead. The area held by the Pearl company consists of a number of leases, aggregating nearly 160 acres; and within it are three well-known axial lines—Nell Gwynne, New Chum, and Sheepshead—with lengths of 44, 30, and 36 chains respectively. The extreme width between the eastern and western lease boundaries is 48 chains. At present operations are confined to the main and south shafts. In the former driving and rising are being carried on to locate the continuation of a mass of spurs worked nearly twenty years ago; and in the south shaft a winze is being sunk on the Sheepshead line of centre country. With the exception of long crosscuts—a feature not common on the field—no long driving has been undertaken. Northwards, from the main shaft especially, further work is advocated, particularly at lower levels. For instance, at the No. 13, the continuation of the present level northward, with a rise at say 200ft., would serve to prospect a large untried part of the mine. Encouraging results here would perhaps lead to the continuation of a prospecting policy away from old ground, and in the vicinity of the main shaft.

A number of well-defined backs occur throughout the mine; only one, however, the "Pearl" back, has attracted attention. This is traced through to the south shaft; and serves as a definite zone or horizon. Further interests attaches to this back in consequence of the auriferous character of some quartz in its vicinity, between the 1000ft. and 1500ft. levels. As regards quartz development, apart from the numerous backs, large bodies of spur were met with in the strata below the Pearl back and to the north of the shaft, where a faulted belt of country occurs. The spurs were payable over a length of about 200ft. by about 300ft. in height, viz., from above 1300ft. to above 1000ft. from the surface. At present prospecting is being carried on from an intermediate level 105ft. above the No. 11 level. A north drive along the course of the lava, passing through a number of small faults, was designed to locate the supposed continuation of the spurs, which are regarded as being cut off by a fault.

---

(From our Bendigo Correspondent.)

When Mr. E. J. Dunn, former director of geological survey in Victoria, issued his valuable work on the Bendigo goldfield some years ago, he refrained from fixing the position of Sheepshead line of reef beyond California Gully. The surface exposures were indecisive north of this point, and no mining operations had been undertaken along the supposed strike of the line to ascertain whether the anticlinal fold existed. This important reef channel is a well formed anticline through the central portion of the city and southward, but it has never been satisfactorily accounted for through the northern area of Eaglehawk, though there are indications of a similar folding recurring to the north of Sailors' Gully. With the mining activity that followed on the discovery of rich stone in the Central Red, White and Blue Company's lease some three years ago, there was a rush to acquire holdings embracing the supposed course of the Sheepshead line of reefs north of California Gully. The Pearl company was the furthest north, at that time, on this fold, which is here regular throughout the lease. The New Victoria Catherine, New St. Mungo, and United Devonshire then tacked on by pegging the ground to eastward of their original holdings on the New Chum line. In view of the indecisive character of Mr. E. J. Dunn's memoirs on the field respecting the continuation of the line under review, the two latter companies commissioned Mr. H. S. Whitelaw, the officer until lately in charge of the Bendigo camp of underground survey, to make a report on this particular section. Mr. Whitelaw experienced no difficulty in picking up the synclines to east and west of the Sheepshead anticline, near the Pearl north boundary. Beyond this, the synclines showed a decided tendency to converge through the New Victoria Catherine; encroaching even more rapidly on the position of the anticline in the New St. Mungo area, apparently culminating in the squeezing out of the latter before reaching the United Devonshire holding. With these data as a guide, the New Victoria Catherine sank a shaft to 420ft., starting at about 80ft. or 90ft. east of where the anticline should come through, the New St. Mungo carrying out similar work nearly midway between the synclinal folds to a depth of nearly 300ft., while the United Devonshire put a shaft down to 265ft., as near to their eastern boundary as possible. A west crosscut to 127ft. by the New Victoria Catherine, from the 420ft. plat, has exposed contorted bedding from 80ft. to the end, with eastern dip predominating. Failing to find any other folding to represent the Sheepshead reef channel, and being short of funds, operations have just been suspended. Though the New St. Mungo found a considerable quantity of mineralised quartz, the official reports did not clearly indicate if the anticline existed. The United Devonshire east shaft was obviously started in the eastern beds of what has always been regarded as the New Chum line, and consequently failed to reveal any folding. More recently a crosscut has been extended to over 500ft. east from the 1250ft. plat at the main shaft, traversing eastern beds throughout. With this additional data, Mr. Whitelaw's successor, Mr. W. Baragwanath, has re-surveyed this section of the field. He has formed the opinion, expressed in a recent special report, that the Sheepshead anticline gains westward throughout the New Victoria Catherine lease, ultimately taking up the position ascribed to the New Chum line of reefs through Devonshire Gully. This theory is not supported to any extent by the evidence, though a double arching of the New Chum anticline to the west of the New St. Mungo main shaft would not give that impression at the first blush. This double folding, however, is not unusual, and does not extend to great depths at this point. There is apparently an unbroken continuity in the conformation of the New Chum reef channel, despite the double folding; and the more feasible explanation of the locale of the Sheepshead centre country is that the latter gradually rolls out toward the western syncline. The contorted bedding in the New Victoria Catherine 420ft. crosscut is, therefore, probably all that remains of the anticlinal folding known as the Sheepshead reef channel southward.

---

## BRITISH AUSTN. OIL CO. LTD.

Following is the report by Mr. Robertson Lawson to the shareholders of the British Australian Oil Company, Limited, on his visit to Australia:—

In accordance with the urgently expressed desire of the majority of the Board of Directors, confirmed unanimously by the shareholders at the annual general meeting held on 13th December, 1912, I left London for Australia on Christmas Day last, and reached Sydney on 28th January, 1913. I spent over seven weeks in Australia, making a thorough investigation into the whole position of the company there. I have now submitted to the board of directors a lengthy and detailed report on my visit, but as that report is much too long to be communicated to the shareholders in full, and also contains a large amount of information dealing with the internal affairs of the company which it would be inexpedient to publish in extenso, I have, at the directors' request, prepared a short summary of my report and the conclusions arrived at by me, which I subjoin herewith. At the annual meeting held on 13th December last the chairman informed the shareholders that Mr. Ronald Johnstone had cabled to the effect that, after going into everything most fully, he found there was nothing left to be desired as to the condition of the mines, the equipment of the works, and products generally, but that he considered the sales department should be conducted on different lines. In view of this very definite statement, and for the other reasons given to the shareholders, the board entrusted Messrs. Ronald Johnstone and Son with the full control of the business in Australia as from November last. Mr. Johnston Smith, the colonial secretary, having declined to work under Messrs. Ronald Johnstone and Son, resigned his position with the company. On my way to Australia certain communications passed between Messrs. Ronald Johnstone and Son and the board, which included a cable from Messrs. Ronald Johnstone and Son, dated 2nd January, 1913, to the effect that their intention was to erect only one new bench of retorts, whilst the remaining money, which had been intended for the third bench of retorts, would be used for additions required at the refinery, etc. They further summarised the result of their two months' management in a letter dated 21st January, 1913, to the directors, in which they claimed to have made certain substantial sales of the products at higher prices than those which had been obtained previously. I was placed in possession of copies of these communications on my arrival in Sydney. As a result of my exhaustive examination, I now summarise the real position of affairs in Australia to be as follows:—

1. The Mine.—The company possesses a large area of shale-bearing land, but at the present moment the mine, so far as I can ascertain, is not sufficiently developed to meet the requirements of even one bench of retorts, and, moreover, instead of working on an average gallonage of 76 gallons to the ton, the average, from the time the company commenced operations down to the date on which the works were closed down, has been less than half that gallonage. Yet, so recently as on 11th December, 1912, Messrs. Ronald Johnstone and Son cabled to the board that "mine is opening up splendidly, ample reserves shale." The position about that time, as disclosed by the mine manager's reports to Messrs. Ronald Johnstone and Son, and their own correspondence with him, clearly showed that there had been, and still was, great difficulty in getting from the mine as then developed an adequate amount of even 30-gallon shale to keep one bench of retorts going. When I arrived there was practically no reserve of shale at the Bing.

2. The aerial ropeway, by which the shale is transported from the mine to the crude works at Murrurundi, is a wonderful piece of engineering, though it has yet to be proved that it is capable of transporting the full amount of shale required to feed three benches of retorts.

3. The crude works at Murrurundi are admirably laid out, though, in my judgment, a considerable sum of money has been spent in outlay for which there was no justification, at all events until the company had reached the position of earning substantial profits.

4. The Refinery.—The company possesses a valuable asset in the land and refinery at Newcastle. The directors and shareholders were informed many months ago by Messrs. Ronald Johnstone and Son that the refinery had been erected, equipped and completed in a most up-to-date manner, and was capable of treating the production of three benches of retorts. I believe that one of the many troubles which have beset the company during the past few months was that in several important particulars the refinery was not sufficiently equipped to handle efficiently the products of even one bench of retorts, and I am advised that it will be necessary to spend at least an additional £16,000 before the refinery can be said to be complete for the handling of the output of two benches of retorts.

5. Management.—Dealing with the general administration of Messrs. Ronald Johnstone and Son during the last twelve months, I can only express myself as dissatisfied with it. We had been over and over again assured that Mr. Gray—Mr. Johnstone's partner in Australia—spent most of his time at the various works, only spending his weekends in Sydney. Instead of that, I found that he had made Sydney his head-quarters for a long period, and from enquiries which I made in Australia I believe that his visits to the mine were few and far between. and that his visits to the crude works and refinery were spasmodic.

6. Sales Department.—I have come to the conclusion that this department has been very seriously handicapped from the very beginning. By the delay in producing and delivering the products at the commencement of commercial operations after large contracts had been entered into for the sale of the products of the company; the questionable quality of certain of the products at the commencement and subsequently; the fact that only a comparatively small production of the readily saleable products was available, owing to the difficulty in getting the output from the mine and crude works increased, and also on account of the non-completion of the refinery works, as I have already indicated; a substantial proportion of the products being of the heavier grade of oils, which were certainly not up to the market requirements in regard to color; and the large cost of production as against the original estimates of such costs. It is obvious that with such a small production, alongside the heavy working expenses—on which there would have been practically no addition had the yield been twice what it has been during the past few months—the business could not be run at a profit until the output had been materially increased. After eliminating, therefore, all the personal differences of opinion which surrounded this side of the question, I have had no hesitation whatever in coming to the definite conclusion that the sales department is not responsible for the present state of affairs. The claim of Messrs. Ronald Johnstone and Son to have sold a substantial quantity of the products at increased prices during their two months' management is not in my opinion borne out by the actual facts as disclosed by the books of the company.

The agreement with Messrs. Ronald Johnstone and Son expired at the end of March. I declined to discuss with them any renewal of the agreement until I had completed my examination in Australia. On that account, and also because Messrs. Ronald Johnstone and Son took exception to the method adopted by me in my investigations generally, they informed me that they would have nothing further to do with the company, and accordingly both partners, Mr. Johnstone and Mr. Gray, left for England very shortly after my arrival, claiming, as they did, that their agreement should expire in London and not in Australia. I immediately took steps to reduce the running expenses in every way possible, and also took advantage of the strike of the workers—with whom the company had no dispute, but who wished the company to coerce a small minority of their number to join a new union to have the retorts closed down pending my return to London to place the whole facts before the directors and shareholders, and a scheme for the re-arrangement of the finances of the company.

**The Future.**—After this very brief summary of the actual position, it now devolves upon me to indicate what, in my judgment, should be done immediately:—(1) The mine must be vigorously prospected and opened up. This ought to have been done months ago, and I took steps to have further tests made with a view to having the mine systematically developed as quickly as possible, when the fresh capital is made available. (2) Pending the proper development of the mine, it would of course be unwise to recommence work at the Crude Oil Works, but in the meantime the erection of the first of the two new benches of retorts is being vigorously carried out, and I believe this new bench should be completed by the end of next month. In this connection I may say that with the object of preserving the company's interests in every way, I was able to secure an option on a property not very far from Murrurundi, which it is believed contains extremely rich shale, so that, should there be any undue delay or difficulty in getting sufficient supplies of rich shale from Murrurundi and the new property referred to opens up satisfactorily, a sufficient supply of rich shale would be available for the retorts in the near future.

I have made all arrangements for the proper supervision and management of the various works during the present interregnum. I am certain that the whole business in Australia can be conducted in future at a substantially lower cost than it has been hitherto, and, as there can be no doubt about markets being sufficient to absorb much more oil of all grades than we are likely to produce, success depends entirely upon our ability to make good oil cheaply and in large quantities. On the completion of the extensions this will present no difficulties, given ample reserves of shale of greater richness than we have so far been working.

## N.S.W. METALLIFEROUS MINING BOARD.

### Declines to Vary Award.

The claims of the Amalgamated Miners' Association for a variation of the award of the 28th June last, which has still a year to run, have in the main already been dealt with by the Metalliferous Mining (consolidated) Board. The claims included a 44 hours' week, increased wages and overtime, and preference. After the board had visited Grahamstown, Cobar, Carcoar, Hillgrove, Tingha, Emmaville, Adaminaby (Kyloe mines), Orange, Burraga and Tungsten the case for the union was closed and Mr. Nathan, on behalf of the Mine-owners' Association, again submitted the point that the union had offered no evidence to justify the Board in varying the award of the 28th June, 1911, and quoted lengthy judgments of Mr. Justice Heydon and Judge Scholes, in which it was laid down that awards were made to stand and should not be interfered with unless it could be proved that some radical change in working conditions, the cost of living, or of some such nature as would involve grave injustice to either party had taken place since the award was made. Mr. Justice Heydon had gone so far as to say in one of his judgments that he did not think an increase in the cost of living was ground for the variation of an award in cases where the men were getting more than a living wage. Last week the Board's reserved decision upheld Mr. Nathan's objections and declined to interfere with the existing award, except in so far as the lowest paid men were concerned—that is to say, those receiving 8s. and 8s. 6d. a day. In regard to these men, the chairman of the Board asked the Mine-owners' Association for further evidence as to the cost of living, and the board adjourned to the 15th inst. Another claim to be dealt with also is that the combined operation of stoping and rising be paid for at rising rates. The last award made an increased rate of 4d. per shift on rising work, but previously no distinction was made.

## PAPUAN DEVELOPMENT.

An increased vote will probably be placed on this year's Estimates for the development of the Papuan territory, as a result of a recent conference between the Federal Minister of External Affairs, Mr. Glynn, and Judge Murray, Lieutenant-Governor of Papua.

Referring to such a contingency, the Minister said: "I availed myself of the presence of the Lieutenant-Governor in making a direct study with his aid of the conditions of Papua, the stage of development which it has reached, and what, on his experience and departmental information, is required to be done. The prospects seem hopeful, and in particular the probability of oil being found is rather reassuring. The best expert is being obtained through the agency of the Imperial Government to advise upon methods of development and possibly of further exploration. All these matters may require additional expenditure, and what may be asked for will probably be justified by the conditions and the prospects."

Judge Murray suggested to the Minister that it might be desirable to consider whether a railway should be built from Port Chalmers, on the Papuan coast, to the locality where the oil has been discovered. The line would be about fourteen miles in length. In addition to its value for the transport of men and materials, it would open up a considerable area of land for tropical agriculture. If the oil developments should equal expectations it may be decided to lay extensive pipe lines and bring the chief supplies to the coast in that way.

Mr. Glynn is giving consideration to the various factors involved in a successful foundation of the industry. It is likely that a survey of a railway to the field will be authorised if additional reports are of a confirmatory and reassuring character.

## THE BISULPHITE PROCESS.

The bisulphite process, as practised at the works of the British Metals Extraction Co., Ltd., at Llansamlet, Wales, was described at the last annual meeting of that company. The ore, after pulverisation, is roasted in mechanical furnaces, the sulphurous anhydride being conveyed from the roasting furnaces to the extraction towers. The roasting is done very slowly, 24 hours being required to finish a charge. The roasted ore is conveyed to the top of a specially designed tower where a weighed amount is mixed with a weighed amount of water, so as to form a thin pulp. This pulp descends through the tower, meeting the sulphurous-anhydride gas coming up. The agitation produced by the interior construction of the tower brings about such an intimate and effective contact of the pulp with the sulphurous anhydride that by the time the pulp reaches the receiving tanks at the bottom of the tower nearly 90 per cent. of the zinc has been extracted. The solution of zinc bisulphite is drawn off into an apparatus, wherein it is heated, precipitating zinc monosulphite. The latter is calcined, yielding zinc oxide, which goes to spelter furnaces, the Villiers works having been purchased for smelting it. In that works spelter assaying 99.85 per cent. zinc is produced, no special difficulty on account of the volume of the oxide or other factors being experienced. This spelter is said to fetch about £4 per ton more than ordinary spelter. The extraction of zinc in the bisulphite process proper is said to be from 84 to 89 per cent. in the case of the better roasted charges. In the treatment of ore containing 28 per cent. zinc, the residue, which goes to the lead smelter, contains about 8½ per cent. zinc.

## REPORTS OF COMPANIES AND CORPORATIONS.

### Broken Hill South (N.S.W.).

The returns of the Broken Hill South Co. for the last two milling periods were:—

| | *31st May. | 28th June. |
|---|---|---|
| Crude ore treated, tons .. .. | 27,960 | 27,660 |
| Assay value— | | |
| Lead, per cent. .. .. .. .. | 14.2 | 15 |
| Silver, oz. .. .. .. .. .. | 6.3 | 6.9 |
| Zinc, per cent. .. .. .. .. | 13.7 | 14.2 |
| Concentrates produced, tons .. | 4,548 | 4,554 |
| Assay value— | | |
| Lead, per cent. .. .. .. .. | 68.7 | 70.2 |
| Silver, oz. .. .. .. .. .. | 22.3 | 24.4 |
| Zinc, per cent. .. .. .. .. | 6.9 | 6.8 |

*Four weeks.

### Mount Morgan (Q.).

The following are the Mount Morgan returns for the last two months:—

| | *May. | †June. |
|---|---|---|
| Smelters— | | |
| Copper ore, tons .. .. .. .. | 15,640 | 16,648 |
| Many Peaks ore, tons .. .. | 6,271 | 6,457 |
| Blister Copper, tons .. .. | 662 | 631 |
| Copper contents, tons .. .. | 655 | 625 |
| Gold contents, oz. .. .. .. | 9,169 | 8,203 |
| Estimated value blister (copper at £60) .. .. .. .. .. | £<br>77,883 | £<br>72,018 |

*Approximately 79 tons copper and 46 oz. gold obtained from Many Peaks ore, also 20 tons copper and 893 oz. of gold from secondary products.

†Approximately 72 tons copper and 45 oz. gold obtained from Many Peaks ore, also 5 tons copper and 196 oz. gold from secondary products. Return for 29 days; reduced output due to accidents to turbo-generators.

### Broken Hill Proprietary (N.S.W.).

The following is a comparison of the refinery products of the Broken Hill Proprietary Company for the last two four-weekly periods:—

| | June 4. | July 2. |
|---|---|---|
| Own ores, silver, oz. .. .. | 171,849 | 325,740 |
| Do. do., lead, tons .. .. | 2,572 | 5,393 |
| Purchased ores, silver oz. .. | 182,491 | 68,746 |
| Do., lead, tons .. .. .. .. | 4,195 | 2,012 |
| Antimonial lead, tons (estimated) .. .. .. .. .. .. | 94 | 58 |
| Zinc concentrates, tons .. .. | 7,115 | 6,634 |
| Containing silver, oz. .. .. | 91,540 | 85,567 |
| Do., lead, tons .. .. .. | 529 | 488 |
| Do., zinc, tons .. .. .. | 3,281 | 3,054 |

## COAL COMPANY'S AFFAIRS.

The affairs of the Collie Scottish Co-operative Colliery Company Limited, Collie, were before the Supreme Court in Perth last week, on a petition for winding up by the Western Australian Bank, which has advanced £2000 on a second mortgage, there being a first mortgage of £4100, also unsecured sums to carry on the working.

Petitioner asked for the appointment of a liquidator, promising to make wages advances to him so that the coal lease might be kept working in the expectation that the realisation of the assets will more than cover the liabilities.

A new feature of the case was the appearance of counsel for a working miner, who took shares in the company when registered in 1911, with a capital of £25,000 in £1 shares.

Counsel alleged that the vendors of the leases, Splatt and Wall, were guilty, under the criminal code, of fraud and concealment, in flotation, and that their solicitor was liable for false statements made. Counsel did not oppose the liquidation order, but asked that the liquidator be directed to investigate and report upon "the disgraceful jobbery of the flotation." He further alleged that the estate of the surviving vendor, Splatt, was in liquidation, and that Splatt himself had gone to the eastern States.

The court appointed Mr. M'Gibbon provisional liquidator, and directed him to furnish a report on the flotation charges.

## THE GENESIS OF LIFE.

By Professor James Park.

The problem of the origin of life is still unsolved. We do not even know when life first appeared on the earth nor what form it took. If we are right in our conception of the earth as a cooling satellite of the sun, we are probably not far from the truth in believing that when life first appeared, the conditions and environment were such as to render its perpetuation difficult and precarious. Perhaps the first ray of life glowed feebly for a time, flickered, died, and became re-kindled many score of times before it eventually succeeded in establishing itself in the saline waters gathered in the hollows of the still steaming crust.

The first assemblage of life of which we have any knowledge appeared in the Cambrian epoch. It comprised representatives of most of the great groups of marine invertebrates, and burst on the geological horizon with the suddenness of a meteor in a September sky. From what we now know of biological processes, it is obvious that this highly-specialised congerie of life was preceded by a long pre-Cambrian ancestry, of which no certain trace has yet been found.

It is probable that the primordial germs of life were tiny nuclei of jelly-like colloidal matter possessing no more conscious motion than the "Brownian dance" of motes in a beam of sunlight. As time rolled on, the stream of life gradually increased in volume by the continual accession of more and more complex forms, eventually culminating in the advent of man. We can easily conceive that this stately procession of life could only come into existence as the result of increasing food-supply, increasing sunshine, wider seas, and more settled climatic conditions.

The primitive forms came into existence when the conditions of life were adverse. As the conditions became more and more propitious, higher and higher forms appeared. The primitive and higher types are still coeval.

The highly organised forms are more sensitive to climatic and other changes than the hardier Radiolarians and other lowly types. Hence, as the earth becomes decadent and the conditions of life less and less favourable, the first types to disappear will be those that were the last to come into existence; and the last to survive will be the simple primordial forms. In other words, life will disappear in the inverse order of its appearance.

# ENGINEERING AND ELECTRICAL SECTION

Australian
General Electric Co.
217 Clarence Street, Sydney.
Tel.—Central, 3495, 4397; City, 2381.
"Penfold House," Cr. Queen and Little Collins Sts., Melbourne.
Tel.—Central, 2647.
Representing—
GENERAL ELECTRIC CO., U.S.A.
The
BRITISH THOMSON-HOUSTON CO. LTD., of Rugby, England.
The GUARANTEE of EXCELLENCE on GOODS ELECTRICAL

## SYDNEY CITY COUNCIL.

At the last meeting of the Sydney City Council the following recommendations of the Electric Lighting Committee were adopted:—That extensions of electricity mains be authorised as follows:—(a) Connecting up various short lengths of distributing cable while the ground is open on the south side of Oxford-street for the laying of high tension line to supply the Agricultural Society, already authorised by Council. Estimated cost, £510. (b) Drummoyne, at Park-road, Five Dock, from Ramsay-street along Fairlight-street to Park-road. Estimated cost, £125. No guarantee required. (c) Drummoyne, from Fairlight-street along Ramsay-road to Great North-road and along Great North-road to Garfield-street. Estimated cost, £115. No guarantee required. (d) City, on eastern side of Circular Quay, to supply increased demand.—New main. Estimated cost, £175. (e) Marrickville—Frazer-street from Livingstone-road to Canterbury-road—New main to improve pressure. Estimated cost, £325.

That with regard to the question of providing for the construction of watertight bunkers on land adjoining the Power House, recently acquired by the Council, capable of containing 6000 tons of coal as an emergency stock, at an estimated cost of £15,000 (withdrawn from Council of 3rd June, 1913), in view of a further report by the City Electrical Engineer dated 18th June, 1913, stating that in his opinion the expenditure of the amount necessary to provide the bunkers mentioned is inadvisable, but he does not know of any other way to comply with the Council's resolution that five weeks' supply of coal must be held at the Power House as emergency stock, provision be not made for increased storage at the Power House this year, but that the mtater be brought before the Electric Lighting Committee again for consideration, early next year.

That the City Electrical Engineer be authorised to arrange for deliveries during the next four months of different kinds of coal from different firms in quantities of not more than fifty tons for the purpose of making practical tests in use in connection with the contract for supply of coal, subject to the condition that the price to be paid shall not exceed the price at present paid to the contractors, Messrs. B. Byrnes Ltd—11s. 3d. a ton.

That authority be given for the execution of agreement for the supply of electricity by the Council to the Clr's Point Workshops, Abattoirs and State Bricks, submitted by the Public Works Department, and approved by the City Electrical Engineer and City Solicitor.

That with regard to the question of licensing firms, and individuals carrying out electric installation work for connection with the Council's mains, in accordance with a report by the City Solicitor dated 10th June, 1913, on a scheme submitted by the City Electrical Engineer, the Council approving of a board consisting of one representative from each of the following bodies:—The supply authorities, the firms carrying out installation contracts, the Fire Underwriters' Association, the Electrical Workers' Trade Union, the Electrical Association of New South Wales, being constituted as a board of reference only, and that the Council make by-laws to the effect that connection with the Council's mains will not be permitted in cases where the installations be not approved or where such installations have been carried out by firms or persons not approved by the Council, and that, following on this, the Council decide that where a person or firm has been recommended by the board of reference as competent to carry out the work, this recommendation shall be sufficient evidence for the Council to give its approval to such firm or person.

That Mr. H. A. Johnstone be relieved of his contract for the supply of castings and his deposit amount lodged with tender be forfeited, the next lowest tenderers, Messrs. Gordon Marr and Sons, be asked if they are prepared to take up the contract at their tender price for items No. 3920 and 3942, in the schedule; Victor Motor Co. items 3967, 4118, 4153 and 4154, and Mr. A. Thompson for item 3982.

That in connection with repairs to one of the fifteen 100 k.v.a. transformers delivered by the Australian General Electric Company, for use by the Council until they could be replaced by other transformers exactly in accordance with the Council's specification, believed to have been damaged by a lightning flash, and not through any defect in the transformer itself, approval be given for payment to the Australian General Electric Company of the actual cost of making good, such amount not to exceed ninety pounds.

That approval be given for the payment to Messrs. Dick, Kerr and Co. of a sum of £56 12s. for lagging for the pipes in connection with the generating set last supplied by Messrs. Dick, Kerr and Co., such amount to be paid for as an extra on their contract.

That eighteen additional lamps be provided for the lighting of Drummoyne, as requested by the Drummoyne municipality, at an estimated cost of £265.

That the overhead mains, poles, crossarms, insulators, and all copper conductors not forming part of a generating set or motor or part of a switchboard, transformer, meter, or other specific piece of apparatus, belonging to the Redfern Council, be taken over by the City Council at the price of £900.

That an additional main steam stop valve be purchased and fixed at the Power House of the same kind as those already in use, i.e., made by Messrs. J. Hopkinson Ltd., of Huddersfield, England, and that such stop-valve be purchased from the agents for this firm in Sydney, Messrs. Noyes Bros., provided they are prepared to supply the valve at the Power House duty free, at a price not exceeding £67.

That in connection with the contract with Messrs. N. Guthridge Ltd. for the supply, delivery and erection of a motor convertor at the Town Hall Substation, approval be given for the erection of the machine by the Council, subject to the following:—

(a) The Company pays the Council the amount of wages spent by the Council on the erection of the machine, with 10 per cent. added to cover office charges.

(b) The Council makes no charge for time of supervising officers.

(c) The contractor provides the Supervising Engineer, under whose instructions the Council's men will work.

(d) The contracting firm is relieved of none of their responsibilities and liabilities under the contract, and the Council undertakes no responsibilities or liabilities other than those which it has undertaken by signing the contract as it stands.

That works be carried out at sub-stations as follow:—

(a) Town Hall Sub-station.—Connection to switchboard of motor generator now being installed. Estimated cost, £235.

(b) Burwood.—Webb-street Sub-station No. 51, Cheltenham-street.—Erection of building to house transformers and switchgear for supply to Croydon Brickworks. Estimated cost, £300; equipment of Sub-station, estimated cost, £75.

(c) Botany, at William-street.—Laying conduits in floor of new Sub-station to carry cables. Estimated cost, £7 15s.

(d) Marrickville, Livingstone-road Sub-station.—Laying conduits in floor to carry cables. Estimated cost, £15 8s. 5d.

It was reported that reports had been received from the City Electrical Engineer submitting estimates for carrying out portions of the work in Canterbury and in Randwick, which the City Council had undertaken to do, as follows:—(a) Canterbury—Underground high tension mains in Marrickville, £5279 19s.; high tension overhead mains in Canterbury, £5346 17s. 6d.; low tension overhead mains with lamps, brackets, etc., for street lighting, £17,599; erection equipment and connection of one Sub-station and four pole transformers and contingencies, £1794 3s. 6d.; total, £30,020. (This includes laying mains in Marrickville, which though they may be used to assist in supply in Marrickville would not be laid as they will be if it were not that a supply had to be given in Canterbury.). (b) Randwick — Underground high tension mains, £7533 15s. 4d.; overhead low tension mains with lamps, brackets, etc., for street lighting, £14,607 9s. 2d.; erection and connection of three pole transformers and contingencies, £858 15s. 6d.; total, £23,000.

---

## MUNICIPAL ELECTRICAL CONFERENCE IN LONDON.

(From Our Correspondent.)

The programme of the meeting of the Municipal Electrical Association meeting, which opened in London on June 17th, has already been referred to in these pages. Prime movers, electric vehicles, electric cooking and heating, have been among the subjects under notice, as well as a paper by Mr. J. Christie, of the Brighton electricity undertaking, on "Air Filtration, Cooling and Ventilating of Electrical Machinery."

Dr. S. Z. de Ferranti, in introducing the subject of prime movers for electric power, said that today the steam turbine was in possession of the field, while gas and oil engines were looked upon as likely alternatives. He did not agree with the view of many people that it was only prejudice, or the fear of doing something new, that prevented engineers from using the two latter methods for generating their power. He believed that engineers were using the only means at present economically available for the work they had to do. Electricity was being produced on a larger scale every day, and it appeared that in order to obtain the full benefits of electric working current must be produced in large stations supplying extensive areas embracing all classes of demand. Dr. Ferranti considered the question of prime movers from the point of view of the comparatively large generating station. Reliability and low costs as regards capital running and maintenance are essential qualities. The ground briefly covered by the author was as follows:—Nature of fuel consumed, its availability and cost; amount of fuel consumed per unit generated; stand-by losses; labour involved in running; cost of upkeep of plant; capital cost of plant; size of units, simplicity or complication; reliability and proved capacity for work required. The very fact that oil was so greatly in demand for automobile, navy and mercantile marine purposes put it out of the question for general power production. Coal must be our fuel where operations are carried on on a large scale, so our plant should be coal-burning, the plant being made suitable for the fuel and not the fuel found to suit a particular form of machinery. Turning to the question of the percentage of the heat in the fuel turned into current, the speaker said that a good steam turbine and boiler plant to-day would give back 15 per cent. of the energy of the fuel as electricity. An efficiency as high as 18½ per cent. had actually been obtained in practice, but it was probable that developments in this class of machinery would result in an efficiency of 25 per cent. in the near future. In regard to the gas engine the efficiency, considering both the machine and the gas producing plant, was probably between 20 and 22 per cent. With this process bye-product recovery should be worked, and although it appeared evident that in the future all coal must be gasified and its bye-products recovered, it did not seem that present knowledge enabled it to be done at sufficient profit for it to be generally adopted. The oil engine represented the highest efficiency yet realised, and it might be taken at between 28 and 30 per cent.; this engine had practically no stand-by losses. In the gas engine there is producer loss, and in the turbine the boiler loss, these varying very much with the nature of the load; with well designed and run plant and good load factor, they may be reduced to a small quantity. Both the oil and gas engines are badly handicapped in relation to the steam turbine by their incapacity for dealing with overloads, which the station must always be in a position to meet. To-day the turbine installation is undoubtedly the best with regard to labour involved in running and maintenance, but it is hard to make a direct comparison, as the number of generating units with either gas or oil would be so great. It is certain, however, that the simplest plant will always have the advantage, and where one is purely rotary and the other reciprocating there can be no question at all. In respect to capital cost the turbine is also much the best. The size of the units on this system compared with others is perhaps the greatest determining factor in the case. Reliability of operation is, of course, vital, and here the turbine scores on account of its great simplicity, and because in working its parts are not subjected to either high or uncertain stresses. Looking at the question of plant selection in the light of possible future developments, Dr. Ferranti said he could not help thinking that as long as engines were used the rotary principle would be followed. "For the moment the steam turbine system will be perfected so as to improve its efficiency and fuel consumption; later on, when the turbine can be made of the internal combustion type, better economies still will be obtained."

(To be continued.)

## BRITISH AND EUROPEAN DEVELOPMENTS.

(From Our Correspondent.)

London, June 6.

The spirit shown by the members of the "Point Fives Club" will undoubtedly do much to help forward the electric heating and cooking business, by keeping the importance of low charges constantly to the fore. But the club does not by any means confine its attention to the question of charges, however much its title may convey that impression. It has discussed many other points in connection with the pushing of electric supply business, and as recent references in this column have shown, the suitability of apparatus for domestic service has been regarded as of almost equal importance to reduced rates to consumers. During the forthcoming meetings of the Incorporated Municipal Electrical Association in London, a gathering will be held under the club's auspices, at which Dr. S. Z. de Ferranti, past president of the I.E.E., will open a discussion on cooking and heating, and in that connection special interest attaches to a report which has just been issued, stating the attitude of the "Point Fives" toward the standardisation of electric cookers. Not many weeks ago one prominent electrical engineer, engaged in electric supply business in the provinces, pointed out that for various reasons it was premature to talk about standardising apparatus of a class which was constantly developing, and had not by any means reached finality. The club has lately debated the question of standardisation of cookers, and has drawn up a number of "points" for consideration at later meetings, while the subject of standardisation of tariffs also stands deferred. In regard to the former the club announces its unanimous agreement as stated below. It disclaims any desire to hamper the development of cooking apparatus by attempting, at this early stage, to standardise details, but it puts forward for the benefit of manufacturers a number of general preliminary principles which, as a result of experience with various types of apparatus, are believed to be of considerable importance. These are as follows:—(a) That domestic and other cooking ranges (consisting of over, grill and hot plates) should have each sub-circuit separately fused, and each protected by a switch. The oven should have two or more circuits. (b) That switches and fuses be placed in such a position that they cannot become unduly heated, that they cannot be damaged by liquids being split over them, and that they are easily accessible. (c) That provision should be made for efficiently and thoroughly earthing all apparatus. (d) That cooking ranges be fitted with at least one indicating device (separately fused), which will clearly show whether any circuit is turned on. (e) That manufacturers and designers should endeavour to develop a hot plate which will work satisfactorily at a red heat.

At the Institution of Mining Engineers meeting in London yesterday, Mr. B. Welbourn brought forward for the first time in the institution's experience the claims of aluminium as an alternative to copper for use as an electrical conductor, with special reference to mining work. He held that every case should be treated on its merits, but he urged the importance of the matter, seeing that the transmission of the current might account for 50 per cent. of the cost of the electrical equipment of a mine. Mr. Welbourn stated the annual production of copper as about 1,004,485 tons, and of aluminium approximately as 60,000 tons, but he admitted uncertainty as to the figures for the United States included in these totals. Aluminium had obviously not made any serious impression on the use of copper for electrical work up to the present. It is thought that only about 15 per cent., or, say, 10,000 tons of all the aluminium produced is so used, and this, Mr. Welbourn says, is only equivalent to 20,000 tons of copper. Further plants are now being constructed, which will increase by 50 per cent. the present output of aluminium within the next two or three years, and as improvements in manufacturing methods are likely to reduce the cost of production, a reduction in the selling price should follow, and result in a considerable increase in its use for electrical work, unless a corresponding reduction is made in the price of copper. The author went on to discuss in some detail the properties of copper and aluminium comparatively. At one point in his paper Mr. Welbourn quoted a number of important cases in which cables with aluminium conductors had been working satisfactorily in England. Thus, the Manchester Corporation Electricity Department has over 11,000 yards of single-core paper-insulated lead-sheathed cable in use, chiefly of 1.66 square inch area, at varying pressures up to 600 volts, as direct current traction and lighting feeders. Some of this cable has been in use for nearly four years. The Bolton Corporation Electricity Department has had 1440 yards of single-core, 1.66 square inch paper-insulated, lead-sheathed cable in use as low and medium pressure direct-current feeders for over three years. The Metropolitan Electric Supply Co. Ltd., London, has in use about 6000 yards of 0.83 square inch medium-pressure concentric and triple concentric paper-insulated lead-sheathed cable. Mention was also made of places in Europe (France, Germany and Switzerland), where extensive use was made of these cables in the streets. Mr. Welbourn referred to a list of places in which over 800 miles of cable are employed at voltages varying from 240 to 60,000 (single-phase). The City of Zurich alone has 238 miles, while in Paris the General Omnibus Co. has in use armoured single-core tramway feeder-cables involving the use of 300 tons of aluminium, and has on order cables amounting to a further 300 tons. The paper contained a comparison of prices of insulated copper and aluminium cables at market values prevailing in March, 1913. Later sections covered the question of jointing of conductors, and the suspension of lead-covered cable on overhead lines. Referring to the arguments frequently used against the use of aluminium, he said that one of these was that it had an uncertain scrap value. It was quite true that at one time there was a difficulty in selling scrap aluminium, "but now there is none." "Clean, commercially pure aluminium scrap, as obtained from cables or from overhead lines, can readily be sold at about £22 per ton below the market price of aluminium wire bars, whereas the price of clean electrolytic copper scrap is about £6 per ton below the price of wire bars. Mr. Welbourn said that he knew of three cases in which aluminium conductors were erected in the United Kingdom during the past ten years, with unsatisfactory results, and he had been at some pains to investigate them. He was of opinion that these failures were solely due to (a) inferior metal and insufficient knowledge of working it at the time—these causes no longer exist; (b) inexperience in erection—there is now sufficient experience to draw upon, so there need be no fear of difficulties from this cause. Let us state the author's brief conclusion of his study of the whole matter:—

(1) Up to the present, aluminium has not made any serious impression on the use of copper for electrical work in the United Kingdom, but it is coming increasingly into favour.

(2) The initial difficulties in regard to the purity of aluminium, methods of working it, etc., have been overcome, and it can be safely used, as a conductor on an equal footing with copper.

(3) For mining work in the United Kingdom, at the present prices of copper and aluminium, insulated cables with copper conductors and for all pressures are the cheaper, while, for overhead lines, aluminium conductors are the cheaper.

(4) Paper-insulated lead-sheathed cables are cheaper than bitumen-insulated cables, whether the conductors be of copper or of aluminium.

(5) Both copper and aluminium conductors can be efficiently jointed by well-proved methods.

Schemes have been brought forward by two of our old-established electrical manufacturing companies, which have been fighting against difficulties for years past, for reconstruction or capital rearrangement purposes. I refer to Crompton and Co. Ltd., of Chelmsford, and the Edison and Swan United Electric Light Company Ltd. Additional working capital is required by both of them. In the words of the Crompton circular: "The demand for electrical machinery and appliances is increasing and prices are rising; consequently the present appears to be a favourable opportunity for placing the company in a position to take advantage of the improved trade conditions."

A question asked in the House of Commons concerning the recent breakdown at the London County Council's power station at Greenwich, elicited the information that the occurrence was due to a cotter falling out of the high-pressure piston rod of one of the engines, and not at all due to overloading the machinery, as had been said in some quarters.

An original communication on the nature of electric fatigue has just been accepted by the Institution of Electrical Engineers for publication. The author (Mr. W. Holttum) gives particulars of tests carried out at the Applied Electricity Laboratories at Liverpool University. The apparatus employed is described, and the deductions arrived at on the results obtained have led the author to the following conclusions:—(1) That fatigue due to electric stress alone is almost negligible for ebonite and presspahn until the point of breakdown is approached, the greatest amount measured for ebonite being 2 per cent. of the initial instantaneous strength. (2) That the least pressure which will cause breakdown if applied continuously is about 80 per cent. of the lowest measured value to which the instantaneous strength can be reduced by fatigue. Mr. Holttum says that the conclusion of greatest practical importance that can be drawn from the tests is that the dielectric strength of ebonite for sudden stresses lasting for a fraction of a second is only some 28 per cent. greater than it is for long-continued stress, and that any ebonite used for insulation purposes should be designed for the greatest pressure which may occur as though that pressure were continuous.

Interest in the Marconi wireless inquiry has been revived, first by the hearing of Godfrey Isaacs' prosecution of Cecil Chesterton, which is now in progress at the Old Bailey, and, secondly, by a resumption of the sittings of the committee. In regard to the former not anything need be said beyond the remark that a strong effort has been made to discredit the brother of Sir Rufus by bringing up a good deal of evidence regarding other companies with which he was connected prior to his association with the Marconi Company. Respecting the proceedings of the committee, information leaks out almost daily, showing what a discord there exists in this happy family—was there ever a committee which had such differences? There are statements published regarding a draft report by the chairman which they cannot agree to, other reports by individual members on behalf of a section of the committee, and of a probable calling of a new financial or stockbroking witness, notwithstanding that the stage for the preparation of reports is reached. What will be the upshot of it all? All that can be said now is that there is a prospect of pretty lively proceedings in the House when the matter next gets there—if it ever does!

Yesterday the managers' section of the Municipal Tramways' Association met at Sunderland, and after hearing an account of the local tramway system by the manager, they discussed the interim report of the Rail Corrugation Committee. To-day they are discussing a paper by Mr. C. J. Spencer, of Bradford, on "Petrol and Trackless Trolley Vehicles," and one by Mr. J. W. Hame on Standardisation of Specifications for Tramcar Equipments. Next week, as already announced, the other association —which is more of a company association than municipal, though really it is a combined affair, embracing both classes (The Light Railways and Tramways' Association)—meets at Blackpool.

## SYDNEY UNIVERSITY.

The Mechanical Engineering Department of the Sydney University, which has for some time had a good gas engine laboratory equipped with proper apparatus for demonstration and investigation work, is now turning special attention to petrol engines and heavy oil engines of the Diesel type. A large Diesel engine has just been installed, together with appliances for measuring the "load," and the plant will constitute an efficient testing set. A fine petrol laboratory is about to be installed to enable demonstrations to be given in working and testing this class of engine and also to permit of research work in connection therewith. Two engineering travelling scholarships were granted some time ago for the purpose of assisting the holders to study the internal combustion engine abroad. Mr. H. J. Swain, the holder of one of these, has now been appointed lecturer-in-charge of the Mechanical Engineering Department. Mr. Swain, who spent three years in Professor Hopkinson's gas engine laboratory, at Cambridge, has been asked by the Senate of the University to deliver 25 lectures and demonstrations on petrol engines and modern research concerning them to the third and fourth year students.

Last year a system of honorary lectureships in mechanical engineering was instituted. The first of the engineering lecture courses was given by Mr. J. G. Burnell, now mechanical engineer for the Victorian Irrigation and Water Supply Commission, his subject being modern irrigation work. It is hoped that the next lecture series will be given by Mr. G. A. Julius, C.E., upon large gas-room practice and the modern development of the gas engine.

Unfortunately it has not been possible to arrange for geological lectures this year, as Professor David is too busy for extension work, Professor Woolnough has been appointed to the Western Australian University, and other members are fully occupied with the increased work falling upon them, owing to Professor Woolnough's departure.

## ENGLISH AND FRENCH ELECTRICAL ENGINEERS' MEETING IN PARIS.

(Concluded from Issue of July 3.)

Railway Electrification Problems in the United States.—Monsieur H. Parodi, under this title, introduced a consideration of the various aspects of the problem in those American cases, where the substitution of electric traction for steam traction appeared to be justified on grounds of safety or economy. He confined himself to work done and results obtained—financial and otherwise—the investigation being divided into three sections:—(1) suburban railways, (2) main line services, (3) mountain railways. The principal characteristics of the steam railway services in the United States were pointed out, and M. Parodi then considered the essential differences which appeared to exist between American and European methods of working, as well as the different conditions of traffic.

Electrification of the Chemin de Fer du Midi.—The paper on electrification schemes for this railway was read by Monsieur Jullian. He said that the desirability of electrifying a network of steam railways depended only on the conditions prevailing in each separate case, and on the financial result to be expected from the operation. The difficulties of the problem were economical, rather than technical, and the principal question on which engineers were in actual disagreement—viz., the nature of the current to be employed—derived its principal interest from the economic results which could be anticipated with the systems at present available. The author briefly considered the circumstances which led up to the electrification of the Chemin de Fer du Midi, and then dealt with the technical arrangements for carrying out the work. The current used for the working lines is single-phase, at 16 periods and 12,000 volts. The frequency named was chosen in order to secure the best working conditions for commutator motors of the series type. The pressure was fixed at 12,000 volts for economic reasons; it is sufficiently high to allow the sub-stations to be spaced sufficiently far apart, but it is not high enough to lead to appreciable insulation difficulties. It is intended to distribute energy by means of single-phase current at 60,000 volts. The alternators will generate at 6000, transformers raising it to 60,000, with substations stepping down to 12,000 volts for supply to the overhead conductor. "The distribution by means of simple A.C. is justified from the standpoint of economy. S.P. generators cost, it is true, much more than three-phase generators, but, on the other hand, the H.T., S.P. equipment at the power station, including the transformers, is cheaper than the three-phase equipment. The S.P. transmission line, containing only two wires, costs less than the three-phase line. Finally, and most important, the substations contain static transformers only. Taken altogether, the advantage appears to be on the side of single-phase distribution." Monsieur Jullian entered in some detail into an account of the electrical equipment of the track, the generating stations and substations, and the rolling stock. In conclusion, he described what had had to be done to avoid the difficulties due to the proximity of the telegraph and telephone lines. It was endeavoured to find a solution of the problem by the use of apparatus capable of neutralising the effects of the disturbing currents. Among those which were considered, that of M. Girousse had proved successful in the protection of Morse apparatus, as had been demonstrated by official tests. The company is about to apply these protectors, in the first place, to the railway station apparatus on the line from Perpignan to Villefranche, and will bring them into general use, if required, on the whole of the electrified section. The French Post and Telegraph Administration has decided to install this apparatus in such offices as are affected by the traction current. In order to ensure satisfactory working of the telephone, the Administration is about to replace ordinary insulators by others of greater insulation resistance, to transpose the two lines every 300 or 400 metres, and to insert transformers between the lines and the receiving apparatus. This last arrangement, the object of which is to save users from dangerous or, perhaps, only disagreeable shocks, has the drawback of weakening the sound of the voice; it is the same fault which hitherto has prevented the use of protectors for telephonic apparatus. Nevertheless, experiments with these protectors have not been given up. Mons. Jullian said that the Compagnie du Midi would probably have to pay the cost of all this work. This would not prevent it from trying all suitable means for rendering the traction current as harmless as possible to telegraph and telephone lines. For this purpose the company contemplated the addition to the alternators, and to the motors of arrangements for damping the high harmonies, to which the disturbing phenomena should be attributed to a large extent. The company's engineers have no doubt that all these difficulties will be overcome, together with those which will subsequently appear in the development of so large a system, "but they are no longer in doubt as to the success of the undertaking." The author said that from the account given by him it was clear that the electrification of a large railway system was to be undertaken by the Compagnie du Midi, under conditions as advantageous as possible; and he hoped "That this experiment would bring out many points of great value, which would aid the solution of questions that are so intimately connected with the future of railways."

Continuous Current Series Transmission.—Mr. J. S. Highfield contributed a third paper on the transmission of electrical energy by continuous current on the series system; he mentioned the difficulty of adding very much to what he had already written on the subject, and said that he had taken advantage of the discussions on his previous papers read in 1907 and 1912. He proceeded to deal with the question mainly from the standpoint of long-distance transmission, after having indicated other possible uses for the constant continuous current machinery. A short technical description of the Thury system was given, the plant and apparatus being mainly those used by him in the Western area of the Metropolitan Electric Supply Company in London. A study of general considerations and costs was followed by the following statement of Mr. Highfield's conclusions, according to present knowledge, concerning the advantages of the system:—

(1) The cost of the line is less than the cost of a line of similar capacity for A.C., more particularly where underground transmission is desirable.

(2) By the use of the earth as one of the conductors a very large saving in the cost of the line can be made, a saving which is not possible with A.C.

(3) The switchgear and switching operations are very simple.

(4) The operation of several stations in series is less difficult than the operation of several stations in parallel.

(5) The uniform section of the cable permits of an increase in load, supplied at first from one point, to be readily provided for at the other suitable points on the line by other stations, without adding to the cable system.

(6) The very efficient speed regulation of the motors.

An appendix to Mr. Highfield's paper contained a short account of the experimental work undertaken before it was decided to use the earth as a standby conductor on the western area system.

Mechanical Devices in Telephone Exchanges.—Mr. W. Slingo's paper on the application of mechanical devices to the assistance of manual operating in telephone exchanges was discussed on Saturday, May 24th, the closing day of the conference. Mr. Slingo said that the British Post Office had been considering for some time past the question of the extent to which mechanical switching devices could be brought to the aid of operators in dealing with the traffic of ordinary manual exchanges. The most promising developments appeared to be these:—(a) Apparatus for evenly distributing traffic over a number of operators' positions; (b) A device for improving the transmission conditions on "B" positions where more than one call wire was terminated; (c) Equipment for selecting and isolating call-wire circuits in cases where several call-wires were used for operating a very large group of junction circuits. The author said that on groups of outgoing call-wires between very busy exchanges much trouble had been experienced as a result of (a), confusion during busy periods owing to one operator interrupting another in their desire to dispose of the traffic; and (b), delay experienced by the "A" operators in finding a slack call-wire at such periods. Both of these troubles resulted, he said, in reducing the load efficiency of the "A" operator and increasing the liability to wrong numbers. An automatic call-wire selecting equipment had been installed at the Central Exchange, London, which had for its object the selection and isolation of a call-wire when one was required by an "A" operator. There were 10 call-wires in the group affected, and they were, before the introduction of the new conditions, operated from 10 call-wire keys, the circuits of which were multiplied over 160 "A" positions. When the selecting equipment was introduced the 10 keys per position were replaced by 1 key per position. The paper contained a number of illustrations describing this equipment and a brief statement of the general facilities and technical details of selective mechanism, alarm signals, operation of circuits, etc. The experimental equipment described by Mr. Slingo was installed for the British Post Office by Messrs. Siemens Brothers and Co. Ltd.

There is one other technical feature of this very successful visit that should be mentioned—i.e., an interesting lecture on luminescent neon tubes, which was given by M. Georges Claude, who added greatly to the value of his contribution by experimental demonstrations and projections. He explained to the audience how his own process of separation of the elements of the air by liquefaction enabled him to get neon as a plentiful industrial product. He has worked on the production of luminescence. While neon possesses remarkable properties, it unfortunately does not contain blue lines, but it makes light extraordinarily easily. This property is due to the fact that neon is very easily permeable to electric discharge; in place of 1000 volts to traverse air, only 13 volts is needed in the case of neon. Difficulties have been met in using it for luminescent purposes. Neon is very sensitive to the presence of the smallest quantities of other gases, which, indeed, entirely annihilate it. It is insufficient, therefore, to fill the tube with very pure neon, as impurities escaping from the electrodes on the passage of the current prevent neon vibrating. Monsieur Claude's process of dealing with this difficulty utilises the remarkable action of charcoal absorbing gases with the greatest energy when strongly cooled. Neon is purified in the tube itself during the passage of the current by means of charcoal cooled by liquid air, which removes impurities and leaves neon. The tubes had only a very short life, however, which resulted in the absorption of neon by the volatilisation of the electrodes by the current. By increasing their surface sufficiently M. Claude has decreased this absorption, so that it is nearly stopped and the life of the tube is greatly extended, as he said, beyond that of incandescent lamps. The advantages of this tube in comparison to Moore nitrogen tube were stated to be—the necessary difference of potential is three times less, making greater safety; the c.p. is greater, 200 candles per meter in place of 60, with much shorter, cheaper and easily made and fitted tubes; a better efficiency—i.e., 0.6 watt per candle, instead of 1.7. The lecturer later alluded to the experimental work of Broca and Laporte, showing the physiological excellence of the neon light. Unfortunately it is too red, but it is now possible to correct this by mercury light, which is very rich in red radiations. M. Claude has devised correcting tubes that are ordinary neon tubes containing mercury, these tubes being laid near the neon tubes working with the same current. The correction obtained is excellent, and the different colours are respected; a very agreeable illumination can be obtained at 0.8 to 0.9 watt per candle. Ordinary applications need a white light, but red light is convenient for such purposes as luminous publicity, where a dazzling light is considered to give a better result. In this way, said M. Claude, with M. de Beaufort tubes of small diameter, neon lighting could be used in any form required for luminous advertisement, and such like signs.

---

## MOTOR V. HORSE.

### The Watering of Melbourne's Dust.

The Melbourne City Council continued its adjourned discussion last week on the relative merits of motor and horse-drawn vehicles for street watering purposes. A report showing the advantages of each system had been presented by the city surveyor on Monday. It was published in the "Mining Standard" of Thursday, and recommended that under present conditions motor watering carts should not be purchased. The order of the day under which the report was presented asked that tenders be invited for two five-ton motor lorries, with metal tyres; one one-ton motor lorry with rubber tyres, and one run-about motor car.

Cr. Treadwell said it was not a matter of cost in street watering; it was a matter of celerity. During the summer months a water cart should travel quickly enough to keep the dust down along our roads. The horse-carts were worked at a shade under 2s. per mile, the petrol waggons at a fraction under 1s. 9d. per mile, and the electric waggons at about 1s. 6d. a mile, so that on the question of expense and speed the horse vehicles were outdone. The city surveyor had always been against mechanical traction, but nevertheless he thought the council should adopt it.

Cr. Davey said there should be some better means of watering the Sydney and St. Kilda roads than the present. On a hot summer's morning, when the dust was sweeping along them in clouds, it was seldom that two watering carts could be seen along the whole length of the St. Kilda-road. They might as well have a man at work with a watering pot. The Sydney City Council highly approved of motor-driven watering vehicles, and in Adelaide there were eleven or twelve of them at work. The Adelaide people concluded some time ago they were far cheaper and more efficient. If the council did not purchase four of them it should get two, and without delay, so that the summer might be provided for. If they got motor vehicles South Melbourne might work in unison with Melbourne in watering the St. Kilda-road. The council had been going to spend £4000 for motor watering vehicles; now he was surprised to find the money was to go on motor vehicles of another kind, and watering was to be neglected. It had been said the horse vehicles should do certain work. That work was not done; the horses were too slow, and even the drivers did not exert themselves. He moved an amendment that the order of the day be referred back to the committee, and an instruction be given that the committee should purchase two motor-driven watering vehicles of from 1000 to 1500 gallons capacity. If this was done the effectiveness of such vehicles could be tested, with a view to purchasing more.

After some discussion, the order of the day, as amended by Cr. Davey, was agreed to.

## GISBORNE STORAGE BATTERY CARS.

Gisborne (N.Z.) is installing the Edison Storage Battery Car system, and already has two cars in operation on a mile of track. Six weeks' running shows the cars are costing 2d. a mile to run, as against 5d. in Christchurch, where the overhead wire system obtains.

Each of the Gisborne cars is driven by two 10-h.p. motors, drawing power from 100-cell batteries, which store energy for 85 miles, practically a day's running. The power is generated by Diesel crude oil engines, which are also used for lighting the town. Mr. Lysnar, an ex-Mayor of Gisborne, who interviewed Mr. Edison in New York, before Gisborne embarked on the undertaking, recently made a comparison between the storage system at Gisborne and the overhead electric tramways in Christchurch, both flat towns. He gave the Christchurch running cost as 5d. a mile, and said that Mr. Edison had promised a cost of 2½d. a mile, which had been bettered in the experience at Gisborne. The ordinary electric tramcar weighed 12 to 18 tons; the storage car in use at Gisborne, 4½ tons. Mr. Edison was prepared to guarantee that storage batteries would do for three years 90 per cent. of the work he said they were capable of doing, and at the end of three years they would require the renewal of the positive plate of the battery, which he undertook to provide at half its original cost, and then they would be good for another three years.

''The cars,'' continued Mr. Lysnar, ''can be speeded to any pace, but the Gisborne cars are speeded for 15 miles an hour. They are charged to run 85 miles on the one charge, and in Gisborne the other day, in order to test this, they ran one of the cars to a standstill, and it ran fully 85 miles before it stopped, thus proving Mr. Edison's figures as being absolutely reliable. These cars are designed to seat 26 persons, but in crush traffic they are capable of carrying 70. Another strong feature in the car is that they are very silent in running. Regarding the initial cost, Mr. Edison claimed that it would save 35 to 40 per cent.

''In Gisborne, the system is not running to anything like full advantage yet, as there is only a mile of track open in the business part of the town. While this is the most trying traffic for testing purposes, and not generally regarded as the most profitable, the figures show that the scheme should be practically self-supporting from its inception. There are only two cars running, and they are earning from about £6 to £17 a day. If an average of £8 a day be taken for six days in the week, it gives a total of £2496 for the year. There are five men engaged—four men driving the cars, and one on the track and cleaning—which, at, say, £3 10s. a week, would come to £910 a year. The cars do not cost £1 each per day to run, but allowing it at that, this would come to £626 for the year. Add to this the interest (4 per cent.) and sinking fund (½ per cent.) which on the Gisborne loan of £25,000 amounts to £1125. This makes a total of £2661 on the disbursement side, as against the receipts of £2496, a difference of, roughly, £165. When it is considered that the rails, etc., were purchased for seven miles of tramline, and are, of course, lying idle, it shows a record that I suggest could not be shown by any overhead system.''

The Gisborne system is to be extended to the residential part of the town, and more rolling-stock will be obtained. If an extended trial confirms present calculations, other towns with the ambition for improved communications will endeavour to profit by Gisborne's initiative.

## LITHGOW INDUSTRIES.

(From Our Correspondent.)

Lithgow (N.S.W.), July 4.

During the past week or ten days a period of comparative slackness has been experienced at Lithgow Iron and Steel Works. Practically, only the 18-inch mills have been in operation, the "guide" mill having been suspended early in the week in consequence of the men declining certain proposals put to them by Mr. C. H. Hoskins. This embodied a demand that the two men who had hitherto tended the two furnaces associated with this particular mill should in future work three furnaces instead of two. It was eventually agreed between the management and the men that the three furnaces proposal should be tried for two or three weeks, and if at the end of that period either side was dissatisfied, the matter should be referred to the Ironworkers' Wages Board. Consequently the mills are again revolving. On Wednesday the gearing of the "live" rolls in the big rail mills broke, and, as a result, this section of the industry was put out of commission. It is expected that everything will be fixed up ready for a fresh start about the 7th inst. The 30-ton steel furnace, which was off for repairs for some days, has been relighted and is now in full blast. The large 50-ton steel furnace is practically completed, though the gas converters in connection with the furnace require some adjustment before everything will be quite ready to light up. This steel furnace is really dependent upon the second blast furnace, now approaching completion, and is not likely to be fired until the furnace is started.

Senator Pearce, late Minister for Defence, in a farewell statement, referred to the small arms factory as having cost £149,000 to establish and equip. The number of men employed is 282, and the wages total about £3000 monthly.

## MISCELLANEOUS.

In connection with the Federal Engine-drivers' claims in the Arbitration Court the Court has finished taking evidence in Melbourne and will sit in Sydney, probably at the beginning of August, to take evidence in New South Wales.

* * *

The N.S.W. Commissioner of Railways has placed orders for eighty locomotives with English firms, the cost of which, landed in Sydney, will be £490,000. Fifty of these are to be of the ''T'' class, and will cost, landed in Sydney, £6800 each. They will be supplied by the North British Locomotive Company Ltd., whose Sydney representative is Mr. J. G. Gilbert Lodge. Four engines are to be delivered by January next, and an additional six before the end of February. The balance, thirty engines, will be of the ''S'' type, costing probably £5000 each, are to be manufactured by Messrs. Beyer, Peacock and Co., of Manchester, and it is unlikely, owing to pressure of orders from other sources, that any of these can be delivered before April.

* * *

The Sydney City Council has reduced the price of electricity in Redfern to that obtaining in the City, and announces it has 7000 h.p. of plant in reserve.

* * *

George Alfred Mackrell obtained a verdict against the India Rubber, Gutta Percha and Telegraph Works Company Ltd. for injuries received through a ladder slipping whilst he was engaged in the work of laying street cables for the company at Narrandera, N.S.W. A stay of proceedings was allowed on the application of the company's counsel.

* * *

The following is from the Iron and Coal Trades Review for May 23:—Several months ago representatives of the Broken Hill Proprietary Company Ltd, of Australia, were in the United States securing data and figures concerning the erection of a blast furnace, open-hearth steel plant and structural-steel and merchant-bar mills in New South Wales. The company has now placed contracts for the erection of a blast furnace, structural and merchant mills. The contract for the blast furnace has been placed with the William B. Pollock Company, Youngstown, Ohio, and the Mesta Machine Company, Pittsburgh, has received an order for three high-speed blowing engines. These will have 44in. steam cylinders, 84in. draw heads, 50in. stroke, and be built for a maximum pressure of 30 lb. and a maximum speed of 80 r.p.m. The engines will be equipped with the new air valves recently put on the market by the Mesta Machine Company, these being an important factor in the award. Work on the construction of the engines has already started at West Homestead, Pa., and they are expected to be finished and shipped in the latter part of this year. The contract for the engines was secured by the Mesta Machine Company in competition with British, German and other makers, and is yet another instance of Australian orders being placed with foreign firms.

* * *

Conferences are being held by the Melbourne suburban Councils on the question of providing electric refuse destructors, the local authorities being spurred into activity by the Health Department. Nothing definite has yet been done, but it is probable that a scheme of co-operation by which central destructors will be erected, will be arrived at.

* * *

The last report of the Manchester Corporation tramways, which are, perhaps, the most up-to-date in the Empire, contains instructive reading for Australians in general. The year covered is that ended on 31st March, 1913. Within that period there were several experimental reductions in fares and extensions of the distances which could be travelled for one penny and threehalfpence. There were also increases in wages and larger working expense per car mile. Yet, notwithstanding these inroads on the receipts, so large has been the patronage of the electric cars that the traffic revenue rose in twelve months from £845,460 to £876,022, an increase for the year of over £30,500. After paying working expenses, interest on capital, debt redemption instalments and contributions to street improvements, the Manchester Corporation had a net profit of £196,351, which has been disposed of as follows:—Grant in relief of rates, £100,000; reserve, renewals and depreciation fund, £96,351. The capital sunk by Manchester's Corporation in trams is £2.100,000, and there are 950,000 people scattered over routes measuring 188 track miles; 630 cars are employed. Of 187,675,183 passengers carried last year, 7 per cent. were persons paying halfpenny fares and 66.05 per cent. persons paying penny fares.

* * *

A conference of representatives from Fitzroy, Northcote, and Preston (V.) Councils has decided that each Council be asked to contribute £50 towards the cost of a report on a proposed electric tramway line along St. George's-road, Northcote, from the Fitzroy terminus, to Preston.

* * *

With regard to the "one-man-one-car" dispute between the Ballarat (V.) Electric Tramways Company and its motor men engaged on the northern lines in the City, Mr. A. M. Stewart, Registrar of the Federal Arbitration Court, has concluded his inquiries and has returned to Melbourne. It is stated that prior to leaving Ballarat, Mr. Stewart indicated what he intended to do. He is expected to approve of the principle being applied to the cars on the Drummond-street north and Lydiard-street lines, on the Sebastopol line, and on that portion of the gardens line between the gardens loop and the car sheds loop. The company also desired to run "one-man" cars on the Mount Pleasant and Orphanage lines, but to that Mr. Stewart was opposed. On the question of extra pay to the men running those cars, it is understood that he did not agree with either the company or the union.

* * *

The Perth (W.A.) electric tramway system was this week taken over by the Government from the company.

* * *

The monthly meeting of the Electrical Association of N.S.W. was held on Friday last, Mr. A. E. C. Burgess occupying the chair. Mr. O. U. Vonwiller read a paper on the Electron Theory of Metallic Conduction, dealing with the structure of matter, the ''gas'' theory of electrons in metal and the genesis and history of free electrons in metal.

* * *

Our Lithgow (N.S.W.) correspondent writes:—Mr. De Burgh, chief engineer for water supply and sewerage, visited Katoomba a few days ago, and conferred with the Mayor and aldermen on the subject of electricity and its generation for town purposes. It is stated that the engineer did not hold out much hope for the water-power scheme proposed, as the capital cost would be too great if provision were made sufficient to cope with dry seasons. Other schemes will, however, be considered and laid before the Council at an early date.

* * *

Our Wollongong (N.S.W.) correspondent writes:—"The Wollongong council are in something of an embarrassment regarding town lighting. For some years the council has been in the preliminary stage of negotiating with the gaslight company for the acquisition of their plant. Now, the recently formed Wollongong Electric Power Co. is offering an installation to take the place of the gas on a ten-years' contract, at the end of which term the council to have the rights of purchase. Some consider the electric light to be the light of the day. It has been pointed out, also, that in its water supply, which has a great fall, there is power enough to supply current for the lighting of the town, for a tram system, and for driving a stone-crushing plant.

* * *

M. L. Martel, in an article that is appearing in the "Bulletin de l'Industrie Minerale," furnishes an interesting account of the use of steel-pointed drills. The recent application of granules of steel instead of diamonds has shown that in many instances they offer advantages over old methods of boring. The principal advantage of steel granules is in the matter of cost, facility in obtaining bores of large diameter, and boring very hard rocks—such as corundum. It is in hard, broken rock that this method of drilling displays its superiority over the diamond drill. The difficulty with steel-pointed drills appears when the boreholes are far removed from verticality. Under favourable conditions the granules have penetrated 52ft. in 24 hours, but generally, in ordinary ground and moderate depth, the daily advance is from 16 to 20ft. This mode of boring seems destined to be extensively employed.

# Tenders Invited and Accepted

**It is particularly requested that the information regarding contracts open, and the successful tenderers, be forwarded to The Editor not later than Monday of each week.**

The following contractions are used throughout:—S—supply; D—delivery; M—manufacture; C—construction; E—erection; P—purchase; I—installation; R—removal. Where no contractions appear, supply and delivery is understood. The date at the beginning of each paragraph refers to the closing of tenders.

## INVITED.

### Commonwealth.

Specifications, tender-forms, etc., for tenders invited for the Postmaster-General's Department of the various States under this heading may be had as follows:—Victoria—Various State G.P.O.'s. New South Wales—Departmental Stores, Sydney, and various G.P.O.'s in other States. South Australia—Adelaide, Melbourne, Sydney and Brisbane G.P.O.'s. Western Australia—Departmental Stores, Perth, and various G.P.O.'s in other States. Queensland—Various State G.P.O.'s. All States—Various G.P.O.'s. If the Specifications, etc., may be had elsewhere in addition the places will be given in parentheses.

POSTMASTER-GENERAL'S DEPARTMENT, Melbourne.—15th July.—Telegraph and telephone material (switchboard parts), as per schedule No. 878.

15th July.—Galvanised-iron piping and fittings, as per schedule No. 886.

15th July.—33 tons of sulphate of copper for the State of New South Wales, as per schedule No. 955. Preference will be given to tenders which guarantee early delivery of the material.

15th July.—Relays, as per schedule No. 958.

22nd July.—Batteries and battery material, as per schedule No. 881.

22nd July.—Wire (silk covered), schedule No. 884.

22nd July.—45 lb. wire (silk covered), as per schedule No. 883.

22nd July.—10,000 porous pots, as per schedule No. 882.

22nd July.—Ironwork, as per schedule No. 891.

22nd July.—Telephone switchboards, as per schedule No. 899

22nd July.—Telephone switchboard cable, as per schedule No 856.

22nd July.—Telephone switchboard cable, as per schedule No. 857.

22nd July.—Sundries, as per schedule No. 892.

29th July.—Detectors, keys, staples, tongs and rosettes for table telephones, as per schedule No. 901.

29th July.—Sundries, as per schedule No. 893.

29th July.—Coach screws and spikes, as per schedule No. 904.

19th August.—105 miles of paper-insulated, lead-covered cable, as per schedule No. 906.

26th August. — 460 coin-collecting devices, electrically controlled, as per schedule No. 916.

16th September.—S., D., E., and I., at the Telephone Exchange, Collingwood, Victoria, of a common battery switchboard, as per schedule No. 860, or an automatic, or semi-automatic, switchboard, as per schedule No. 859

16th September.—Galvanised-iron piping and fittings, as per schedule No. 951.

23rd September.—Sulphate of copper, as per schedule No. 956, in the undermentioned quantities:—New South Wales, 140 tons, Victoria, 25 tons, Queensland, 55 tons, South Australia, 20 tons, Western Australia, 60 tons.

23rd September.—500 letter-box fronts, small size, as per schedule No. 957.

23rd September.—General stores, for a period of two years, from the 1st July, 1913, to the 30th June, 1915, as per schedule No. 913.

7th October.—S. and I. of electrically-driven machinery for operating pneumatic tube services, Central Telegraph Office, Melbourne, as per schedule No. 900. (See advertising columns.)

14th October.—S. and E., at the Telephone Exchange, Melbourne, of a common battery multiple switchboard, as per schedule No. 868.

4th November.—D. and E. of eight automatic telephone switchboards at the Ascot, Canterbury, Malvern, Cheltenham, Footscray, Oakleigh, Sandringham, and Williamstown Telephone Exchanges, as per schedule No. 953.

POSTMASTER-GENERAL'S DEPARTMENT, Sydney.—16th July (extended from 9th July).—Eight multiple magneto incoming junction line switchboards, with associated equipment, as per schedule No. 205.

16th July.—60 letter and newspaper boxes combined, and 80 letter boxes, as per stores schedule N.S.W. No. 316.

16th July.—100,000 tin slides and 100,000 seal cups, as per stores schedule N.S.W. No. 317.

30th July.—S., D., and E., at the Telephone Exchange, Sydney, of two sections of switchboard, common battery multiple, to form an extension to the existing common battery switchboard at the Telephone Exchange, Sydney, as per schedule No. 264.

20th August.—575 detectors Q. and I., as per stores schedule N.S.W. No. 322.

27th August.—(1) Telephones to stores schedule N.S.W. No. 301; (2) switchboards to stores schedule N.S.W. No. 302; (3) lamps, electric, incandescent, to stores schedule N.S.W., No. 304.

POSTMASTER-GENERAL'S DEPARTMENT, Perth.—16th July.—S. and D. of wire, bronze and copper, to W.A. schedule Nos. 260, 267, and 273.

23rd July.—S. and D. of switchboards and parts, telegraph and telephone instruments, to W.A. schedules Nos. 254, 255, and 256.

30th July.—S. and D. of switchboard cable, to W.A. schedule No. 275.

30th July.—S. and D. of steel towers, battery material, wire and iron work generally, to W.A. schedules, Nos. 259, 262, 263, 268, and 269.

6th August.—S. and D. of insulators, telegraph and telephone material, and iron poles, to W.A. schedules, Nos. 258, 261, and 264.

6th August.—Cable, lead-covered, paper-insulated—telephone.

6th August.—Screws, coach.

POSTMASTER-GENERAL'S DEPARTMENT, Brisbane. — 30th July.—Cable, as per stores schedules Nos. 254 to 260 (omitting 258); wire, copper and accessories, as per stores schedule No. 267; wire, covered, as per stores schedule No. 268.

30th July.—Battery, glassware, as per stores schedule No. 252; battery material, chemicals, etc., as per stores schedule No. 253; conduits, earthenware, as per stores schedule No. 261; crossarms and spindles, wood, as per stores schedule No. 262; wire, steel strand, as per stores schedule No. 270.

27th August.—S., D., and E. at the Telephone Exchange, Brisbane, of five sections of switchboard, common battery, multiple, and other equipment to schedule No. 243, specification No. 458.

10th September.—Telephone Exchange, Brisbane, nine sections of a trunk line switchboard, to schedule No. 244, specification No. 461, and the general conditions, drawings, etc., attached thereto.

24th September. — Ironwork, as per stores schedule No. 264; pipes, cast iron, as per stores schedule No. 265; poles, iron, etc., as per stores schedule No. 266; wire, G.I., as per stores schedule No. 269.

POSTMASTER-GENERAL'S DEPARTMENT, Adelaide. — 16th July.—Telegraph and telephone material, schedules Nos. 277 to 286.

23rd July.—600 coppers for gravity cells, as per schedule No. 302.

13th August.—Telephone parts, as per schedule No. 292, and switchboards, as per schedule No. 293.

DEPARTMENT OF HOME AFFAIRS (Works Director, Victoria).—21st July.—S. of laundry plant to Captains' Point, for the Naval College, Jervis Bay, N.S.W.

DEPARTMENT OF HOME AFFAIRS.—Federal Capital Power Plant. — 14th July.—Tools for power transmission lines.

15th September.—S. of sect. 1, main powerhouse switchgear; sect. 2, switchgear for Diesel engine plant.

DEPARTMENT OF HOME AFFAIRS.—Kalgoorlie-Port Augusta Railway.—23rd July.—7ft. wheel lathe, single-ended punch and shears, 10 cwt. portable cupola, 5 cwt. steam hammer; (alternatively) 5 cwt. belt-driven pneumatic hammer.

29th July.—M., in Australia, S., and D. of car bodies for construction train; M., in Australia, S., and D. of car bogies for construction train.

2nd September.—M., S., and D. of 80 lb. steel rails and fishplates; M., S., and D. of iron dog spikes and steel fishbolts and nuts for 80 lb. rails.

DEPARTMENT OF EXTERNAL AFFAIRS. — Port Augusta to Oodnadatta Railway. — 22nd July.—M., S., and D. of 4 wheel brake vans (3ft. 6in. gauge).

DEPARTMENT OF EXTERNAL AFFAIRS. —Pine Creek to Katharine River Railway.—19th August.—S. 80 lb. steel rails and fishplates; sleepers, (a) steel (b) timber (Powellised); iron dog spikes and steel fishbolts and nuts for 80 lb. rails.

DEPARTMENT OF TRADE AND CUSTOMS. —26th August.—S. and D. of eight (8) automatic flashing lights.

DEPARTMENT OF DEFENCE.—16th July. —S. of sand-blast plant complete, delivered ready for erection at Cockatoo Island, N.S.W. (See advertising columns.)

28th July.—Period of supply, from 1st July, 1913, to 30th June, 1916—Metals, cord, tubing and wire cloth, for the Commonwealth Small Arms Factory, Lithgow, N.S.W.

25th August.—S. and E. of an oil storage tank at Garden Island, Sydney. (See advertising columns.)

### Victoria.

VICTORIAN RAILWAYS.—10th July.—S. of 12 wrought-iron shoes, etc., for platelayers' levers.

**P. & O.** COMPANY'S ROYAL MAIL STEAMERS
FOR MARSEILLES, PLYMOUTH, AND LONDON.

Leave Sydney on the subjoined dates, calling at usual ports.

FIRST AND SECOND SALOON ONLY.

| Steamer. | Tons. | Commander. | Noon. | Melb., 3 p.m. |
|---|---|---|---|---|
| MOLDAVIA | 10,000 | Gordon | July 12 | July 15 |
| MALOJA | 12,500 | Weston | July 26 | July 29 |
| MONGOLIA | 10,000 | Llewellyn | Aug. 9 | Aug 12 |

PASSAGE MONEY TO LONDON—
Single, £41 16s to £82 10s.
Return, £69 6s. and £123 4s.

Return Tickets between Inter-State Ports are available for return by Orient, Messageries Maritimes, and N.D.L. steamers having room.

SPECIAL HOLIDAY RETURN TICKETS to COLOMBO are now issued, available for two months. Fares from Sydney, £45 2s. first saloon, and £31 18s. second saloon.

A. GORDON WESCHE, Superintendent IN AUSTRALIA, 63 Pitt-street, Sydney.

**The COLONIAL MUTUAL FIRE Insurance Company Limited.**

Principal Office: 60 MARKET-ST., MELBOURNE

Branches in all the States.
Transacts Fire, Guarantee, Employers' Liability, Marine, Burglary, and Plate Glass, Accident, Workers' Compensation and Live Stock Insurances.

Send for Prospectus.
W. TUCKER, General Manager

**Harringtons LTD**

**ANALYTICAL & METALLURGICAL DEPT.**

Lowest fees for all kinds of Assay, Analytical, and Metallurgical work.

Expert Advice on Ore Treatment, Bullion Refining, Smelting, etc., etc. Directed by a qualified Analyst from Messrs. Johnson and Sons, London; Assayers to Bank of England; H.M. Mint, The Council of India, etc.

**HARRINGTONS LTD.**
**386 George Street, Sydney.**

**Osborn's Truck Wheels & Axles**

**Osborn's Mushet High Speed Steel, Twist Drills, Mining Steels, Crusher Jaws and all classes of Castings.**

Samuel Osborn & Co. Ltd., Sheffield, are Standard Makers.

**Gibson, Battle & Co. Ltd.**

**535 Kent St., Sydney.** **496 Collins St., Melbourne.**

S.A. Agent: C. C. Deland, Victoria Square, Adelaide.

NORD DEUTSCHER LLOYD
REGULAR SERVICE TO EUROPE.
REDUCED FARES TO LONDON.
TO MANILA, CHINA AND JAPAN.
Via New Guinea and Yap.
Fares to Hong Kong, £40; II., £26.
Full particulars will be sent on application to—
LOHMANN AND CO., General Agents,
7-9 Bridge-street, Sydney.
Ostermeyer, Van Rompaey and Co., Melbourne; H. Muecke and Co., Adelaide; L. Ratazzi and Co., Fremantle; Thos. Brown and Sons Ltd., Brisbane.

The Mount Lyell Mining & Railway
CO. LIMITED.
Purchasers of Ores containing Copper, Gold and Silver. Rates obtainable on application to the Secretary
Manufacturers of Coke for Smelting and Foundry Purposes, Acids, Etc.
HEAD OFFICE—
30 QUEEN-STREET, MELBOURNE.
D. G. LUMSDEN,
Secretary.

THE
-PACIFIC CABLE BOARD-
Cablegrams should be Marked
"VIA PACIFIC."
(Not Charged for.)

The quickest and most accurate route for Cablegrams from Australasia to United Kingdom, Canada, United States, Germany, New Zealand, and Pacific Islands.
This route is owned by Great Britain, Australia, New Zealand, and Canada. Australia being the largest part owner (having one-third interest), the public are urged to support the National Cable.

RATES—

| | Ordinary. | Deferred. |
|---|---|---|
| UNITED KINGDOM | 3/- | 1/6 |
| GERMANY | 3/- | 1/6 |
| CANADA | 2/4 | 1/2 |
| UNITED STATES | 2/4<br>to 2/8 | 1/2<br>to 2/4 |
| NEW ZEALAND | 4½d. | Nil |
| FIJI | 8d. | Nil |

DEFERRED RATES (IN PLAIN LANGUAGE ONLY) have now been arranged to most Countries where ordinary rate exceeds 10d. per word.
Enquiries for further information, pads of cablegram forms, maps and tariff cards, address to—
The Superintendent, SOUTHPORT, QUEENSLAND;
The Officer in Charge, 408 Collins-street, MELBOURNE, telephone 2588;
The Officer in Charge, 42 Hunter-street, SYDNEY; telephones, City 1346, City 3684;
J. Milward, Manager in the Pacific, 64 Pitt-street SYDNEY; telephones City 1346, City 3684.

10th July.—S. of 6 Jim Crows or rail benders.
10th July.—Special coarse sand, rolled steel joists, W.I. gratings and frame.
10th July.—Double La Post paper, high-speed tool steel, Yorkshire iron, mild steel channels and joists, mufflers, for oil engine; nickel wire, lamp bracket irons, telephone cords and plugs, electric light cable.
11th July.—Hydraulic jack.
14th July.—C.I. retention valves.
14th July.—Ratchets for Trewhella jacks.
14th July.—Spiral steel riveted pipe.
15th July.—Black iron strips.

16th July.—S. and D. of rolled steel joists, etc., for bridges on the Bairnsdale to Orbost railway.

16th July.—M., S., and D. of petrol tanks and metal cases, with wood frames.
16th July.—Blacksmith's forge, Morse twist drills.

23rd July.—M., S., and D. of one hydraulic flanging press.

23rd July.—S. and D. of girders and superstructure for one railway and cable tramway crossing complete, for Plenty-road crossing, Queen's-parade, North Fitzroy.
30th July.—S. and D. of one electric-driven motor lorry chassis.
30th July.—Balls and ball races for 70ft. turntables.
4th August.—Electrification of the Melbourne suburban railways—(a) circulating water and sump pumps, with motors; (b) air and water extraction pumps and motors; (c) surface condensers, hot wells, piping, and sundries.
6th August.—Steel channel bars.
13th August.—Best steel boiler plates for steel cranes, boilers, etc.
13th August.—30,000 lineal feet of wrought-iron steam pipe, 1in. diameter.
20th August.—M., S. and D. of (a) lathe, (b) sawing machine, (c) chisel mortiser, (d) cut-off machine, (e) moulding machine.
27th August.—Hollow chisels and bits.
3rd September.—S. of three petrol engines and pumps for use at Newport Workshops. (Fresh tenders.)
3rd September.—Steel faced machine knives.
1st October (extended from 10th September). Neutral track relays.
VICTORIAN RAILWAYS COMMISSIONERS. —State Coal Mines.—14th July.—S. of switchboards, centrifugal pump, galvanised steel wire rope, high-speed crank chamber oil.
13th August (extended from 25th June).—S. of electrical equipment.

## New South Wales.

PUBLIC WORKS DEPARTMENT. — 14th July. — I. electric goods, No. 3, new parcels office, Central Railway Station, Sydney.
July 10.—68 approved metal shutters, including all fittings.
14th July.—I. electric passenger lift, No. 1, at new parcels office, Central Railway Station, Sydney.
11th August.—Steel bridge for Macleay River, Wauchope, to Kempsey section, North Coast railway. (See advertising columns.)
11th August. — Steel bridges for Hastings River and flood channel, Wauchope to Kempsey section, North Coast railway. (See advertising columns.)
11th August.—25 five-ton steel gantry cranes. (See advertising columns.)
3rd September.—Efficient steam tugs for use at Bellinger River and Cape Hawke, from 1st November, 1913.
RAILWAY DEPARTMENT.—6th August.—S. of one live steam feed water-heater for Ultimo power-house. (See advertising columns.)
20th August.—S. of a pneumatic ash handling plant for White Bay power-house. (See advertising columns.)
15th October.—S. of 13 direct-current motors. (See advertising columns.)
SYDNEY HARBOUR TRUST.—14th July.—S. and D. of wrought-iron and mild steel work for wharf and general repair work for year ending June 30th, 1914.
METROPOLITAN WATER AND SEWERAGE BOARD.—14th July.—Contract 1080, construction 6126 lineal feet stoneware and cast-iron pipe sewers, Balmain, low level (fresh tenders). Contract 1160, 7395ft. concrete pipe sewers, North Sydney. Contract 1191, 689ft. concrete pipe sewers, Waverley. Contract 1192, 2016ft. concrete pipe sewers, North Sydney. Contract 1193, 3499ft. stoneware and concrete pipe sewers, North Sydney.
21st July.—S. of 4½ miles of 28lb. or 30lb. "T" rails. (See advertising columns.)

## South Australia.

SUPPLY AND TENDER BOARD. — 15th July.—S. and D. of best mild steel.
15th July.—S. and D. of 500 bars bright drawn hexagon steel.
15th July.—S. and D. of cold-reeled mild steel bars.
15th July.—S. and D. of solid drawn copper tubes.
22nd July.—S. and D. of chain iron.
RAILWAYS.—15th July.—C. of 8 bogie passenger brakevans, 5ft. 3in. gauge.
15th July.—C. of 17 bogie goods brakevans, 5ft. 3in. gauge.
15th July.—C. of 30 sheep vans, 3ft. 6in. gauge.
15th July.—C. of 30 sheep vans, 5ft. 3in. gauge.
15th July.—C. of 15 cattle vans, 3ft. 6in. gauge.
22nd July.—C. of 30 or 50 bogie waggons, 5ft. 3in. gauge.
WORKS AND BUILDINGS DEPARTMENT. —16th July.—I. electric light, Military Headquarters, Keswick.
IRRIGATION AND RECLAMATION WORKS DEPARTMENT. — 14th July.—10in. diam. centrifugal pump; 11 gate valves; 27 fire hydrants; 40 water meters; 120 cwt. lead, and about 16¼ tons of cast-iron bends, outlets, collars, and surface boxes.

## Western Australia.

GOVERNMENT TENDER BOARD.—31st July.—3520 pairs of fishplates for 46¼ lb. material.

## Queensland.

RAILWAYS DEPARTMENT.—15th July.—M. and S. of steel super-structure bridge over Pioneer River.
15th July.—S. of one 120ft. steel super-structure (one span), Caboolture River bridge.
29th July.—S. of steel superstructure for three 149ft. 6in. spans for widening Bremer River bridge.
26th August.—General supplies for the years 1914 and 1915, for the Southern and Central Divisions.
PUBLIC WORKS DEPARTMENT. — 18th July.—Steel super-structure of two spans of 120ft. each on one cast-iron pier, and concrete abutments for new bridge over McIntyre River, Goondiwindi.
TREASURY DEPARTMENT.—29th October. —C. and E. of central sugar mill at Babinda Creek, North Queensland.

## General.

CITY OF MELBOURNE.—15th July.—S., D., and E. of a steam or suction gas plant, for the City Council's quarries, Clifton Hill.
18th July.—Insulated copper cables.
1st August.—P. of scrap electric lead, accumulator materials, etc.
MUNICIPAL COUNCIL OF SYDNEY.—7th July.—Arc lamp carbons.
MUNICIPALITY OF NORTH SYDNEY. — 29th July.—S. and E. of refuse destructor, capable of dealing with 200 to 250 tons per week.
CITY OF TOOWOOMBA (Q.) (extended indefinitely from 1st March).—Following plant:—(1) S. and E. of pumping plant of 25,000 gallons per hour capacity; (2) 10in. cast iron water pipes; (3) valves, special castings, etc. Tenders must be in accordance with specifications and conditions of tenders, copies of which may be seen, and tender forms obtained, at the offices of the town clerk, Sydney, Melbourne, Brisbane, and Toowoomba.
CITY OF CAULFIELD (V.) (F. Jowett, Town Clerk).—23rd July.—P. of old tramway rails and fishplates. (See advertising columns.)
LEICHHARDT BOROUGH COUNCIL (N.S.W.) (T. H. Hargreaves, Town Clerk).—19th July.—I. of electric light in town hall.
SHIRE OF KARKAROOC (V.) (Chas. A. Chamberlain, Shire Secretary). — 15th July.—S. and E. of two 15-ton weighbridges, one at Pullut railway station, one at Gama railway station.
SHIRE OF BRAYBROOK (V.). (Walter J. Andrew, Shire Secretary, Sunshine). — 18th July.—S. of portable stone-breaker, and power for driving same.
SHIRE OF KYEAMBA (N.S.W.) (C. L. Daley, Shire Clerk).—17th July.—S. of 8h.p. portable engine.
METROPOLITAN GAS COMPANY (V.) (A. E. Bradshaw, Subst. Secretary, Melbourne).—11th September.—P. of a total fixed quantity of 1800 tons of sulphate of ammonia, to be produced by this company during the twelve months ending 31st August, 1914.
GREAT LANGI LOGAN GOLD MINES CO. N.L. (W. Bruce Fox, 123 Queen-street, Melbourne).—S. of 80,000 super. feet of sawn timber.
MITTA MITTA BUCKET DREDGING CO. N.L. (A. J. Peacock and Jas. Warne, liquidators, 339 Collins-street, Melbourne). — 21st July.—P. of plant, etc.

GISBORNE WATER WORKS TRUST (H. M. Hussey, Secretary, Gisborne, V.). — 25th July.—S. of 4in. C.I. pipes, valves, lead and yarn, and special castings.

MELBOURNE AND METROPOLITAN BOARD OF WORKS (Geo. A. Gibbs, Secretary).—11th July.—S. and D. of crane, winches, and lifting gear, for screens at service reservoirs.

Dunlop Mining Goods
Are now used with satisfaction in most of the Leading Mines of Australasia — Their QUALITY & WEAR are UNSURPASSED
Tenders & Samples submitted
Correspondence Invited
Send for Illustrated Catalogue
The DUNLOP RUBBER Co. of AUS. Ltd.
108 Flinders St. MELBOURNE.
& ALL STATES
Dunlop Rubber Belting
Is more efficient than Leather belting for Outdoor & Wet Work.
Sample & Price on application

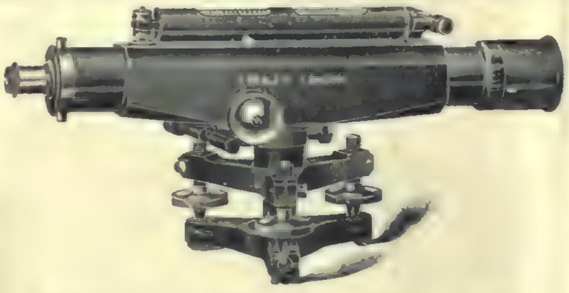
Note this on every belt.
Be sure you get
"DICK'S"
We know there are numerous imitations. Dick's maintains its high reputation for strength and efficiency. Every belt guaranteed. Sole agents:
JAMES HARDIE & CO.
Melbourne and Sydney.

**W. F. Stanley & Co. Ltd.,**

**Scientific Instrument**

makers, are recognised by all users as being foremost in their craft the world over. They have appointed us as the **N.S.W. Sole Agents**, and we are selling their manufactures at their **English Catalogue Prices**, plus only 15 per cent. Customs and importing expenses. Our stock is now the largest one in Australia, and embraces all the latest improvements in instruments. Write for catalogues.

**FAIRFAX & ROBERTS LTD.,**
Vice-Regal Opticians.
**23 and 25 Hunter-street, Sydney.**



Levels, Theodolites, Mining Dials, Drawing Instruments, Papers and Inks, etc., etc.

11th July.—S. and D. of one Venturi meter for 36in. diameter pipe, with tube, pressure pipe, and recording apparatus complete.

29th July.—S. and D., at the Metropolitan Farm, Werribee, of two steel wire plough ropes.

METROPOLITAN WATER AND SEWERAGE BOARD, Brisbane (Q.) (Geo. Johnston, Secretary).—31st July.—41,000 casks Portland cement, under contract No. 10, 1913; and 41,000 casks Portland cement, under contract No. 11, 1913

MUNICIPAL TRAMWAYS TRUST, Adelaide (W. G. T. Goodman, Chief Engineer and General Manager).—15th July.—M., S., and D. of steel rails.

29th July.—S. and D. of bonding material.

19th August.—M., S., and D. of steel poles.

Specifications relating to the S. and D. of copper cable and wire may be obtained on application to W. G. T. Goodman, Engineer and Manager. Tenders will be invited at 48 hours' notice, at a later date, and specifications are now issued to facilitate prospective tenderers obtaining quotations.

O.K. COPPER CO. N.L. (in liquidation) (Sidney Cornish, 23 Brookman's Building, Adelaide, S.A.)—21st July.—P. of large traction plant; also smelting converter and mining plants, buildings, stores, etc., estimated to have cost £75,000 comprising engineering plants, 30-ton weighbridge, 4 Babcock boilers, also number of engines of mines, smelter and converter plants, air compressor, pumps of various descriptions; also 9 traction engines, number of trailers, together or separately; also large quantity of stores and sundries. The whole mine and plant as a going concern, or the mine, including all leases, the whole of the plant in one lot; any article of machinery and plant separately.

BROKEN HILL PTY BLOCK 10 CO LTD. (O. B. Ward, General Manager, Broken Hill).—15th July.—S. and D. of all mine requisites for 12 months from 1st August next.

FRANKLIN COPPER AND LEAD MINING SYNDICATE N.L. (in liquidation) (A. G. Kauber, 29 National Mutual Buildings, King William-street, Adelaide, S.A.).—28th July.—P. of various mining machinery and tools.

CUMBERLAND GOLD MINING CO. N.L. (in liquidation) (N. S. Gunnersen, 6 and 7 Brookman's Building, Grenfell-street, Adelaide, S.A.).—P. of assay balance, etc.

NEW WYLIE CREEK DREDGING CO., 16 O'Connell-street, Sydney.—14th July.—P. of dredging leases, sluicing plant, dam, etc.

THE PLACER TIN MINING CO. N.L. (J. V. M. Wood, F.C.P.A., incorporated accountant, official liquidator, official assignee, etc., 34 Queen-street, Melbourne).—21st July.—Dredging plant of the above, situate at Germanton, New South Wales, comprising a Standard mining dredge, by Thompson and Co., Castlemaine, with all improvements; compound engine (dry-back marine type), dredge boiler, connections, fittings, nozzles, etc.; also electric lighting plant with lamps and fittings complete; substantial oregon pontoon, and quantity of plant, stores, etc.

ST. PAUL'S CATHEDRAL, Melbourne (V.).—19th July.—I. of electric lighting and power.

H. W. AND F. B. TOMPKINS, F.R.V.I.A., 115 Elizabeth-street, Melbourne (V.).—Steel frame construction, three electric passenger elevators, and one electric goods elevator. (See advertising columns.)

ROSS AND ROWE, Architects, Equitable Buildings, Sydney.—S. and E. of steel work in extension to Balmain electric light and power station.

MUNICIPALITY OF CLAREMONT (W.A.).—14th July.—S. and E. of a complete producer gas electric light plant.

CITY OF CHRISTCHURCH (N.Z.). — 7th August.—S. and E. of a 13-panel E.H.S. switchboard.

TE AWAMUTU WATER SUPPLY (N.Z.).—21st August.—S. of cast-iron pipes and fittings; spiral steel pipes and fittings; drawn steel-tubes and fittings.

## ACCEPTED.

### Commonwealth

DEPARTMENT OF HOME AFFAIRS. — Kalgoorlie-Port Augusta Railway.—8 car under-frames, at £322 each, £2576—F. E. Barbat and Sons Ltd.

Boring for water on West Australian section, 56s. 9d. per foot, £11,300 (estimated) — Davis, Hankinson and Co.

DEPARTMENT OF DEFENCE.—Military Forces of the Commonwealth. — 34 limbers, Q.F., 18-pr., carriage, Mark II., complete, £209 each; 98 waggons, ammunition, Q.F., 18-pr., Mark II., complete, £220 each; 98 limbers, ammunition waggon, Q.F., 18-pr., Mark II., complete, £206 each—G. H. Olding, Sydney.

### Victoria.

VICTORIAN RAILWAYS. — Purified coke, 70 tons, at £2 12s. 6d. per ton—The Melbourne Steamship Co. Ltd.

Mild steel obtuse angles for "U" trucks, at £11 per ton, delivered at Spencer-street railway station—The Lion Rolling Mills Pty. Ltd.

Loose drum haulage winches fitted with improved post type brakes for State coal mines, at £196 5s. each—Horwoods Foundry Co.

White lead in oil, at £33 5s. per ton—E. L. Yencken and Co. Pty. Ltd.

One Batch concrete mixer, with petrol motor, at £225 each, delivered at Spencer-street railway station—Carolin Machinery Co.

Steel blooms for crank pins, 6¼in. diameter x 1ft. 6in., at £14 10s. per ton—Noyes Bros.

Tarpaulin canvas, at 1s. 3 5-8d. per yard — Robertson and Moffat Pty. Ltd.

Wheels, brackets, etc., for rope road curves, for the State coal mines—Item No. 1, cast-steel rope wheels, at £5 13s. 11d. each; item No. 2, spare liners (in sets of 3), at 15s. 4d. per set; item No. 3, brackets (complete), at £1 14s. 8d. each—The Steel Co. of Australia.

Cast-steel wheel centres for 20 "DD" engines and 500 "I" trucks—81 cast-steel wheel centres (leading and trailing), to drawing No. 55, as specified, £13 13s. 5d. each; 41 cast-steel wheel centres (driving), to drawing No. 55, as specified, £14 3s. 11d. each; 82 cast-steel wheel centres (bogie), to drawing No. 54, as specified, £5 10s. 5d. each; 164 cast-steel wheel centres (tender), to drawing No. 56a, as specified, £2 7s. 3d. each; 2000 cast-steel wheel centres (trucks), to drawing No. 56a, as specified, £2 7s. 3d. each —Noyes Bros.

Forgings for new 15-ton "I" class trucks—Item No. 2, shunter's chain eye-bolts and nuts, at 10d. each; item No. 4, body brackets (footsteps), at 3s. 9d. each—W. Lutge.

Block tin—1 ton 2 qr. 18 lb., at £207 5s. per ton—Alex. Fraser Pty. Ltd.

Purchase of Pintsch gas mantles, £465 — Pintsch Patent Lighting Co.

Purchase of Pintsch gas mantles, £495—A. Adams and Co.

Purchase of 10 type numbering machines, £92 10s.—R. Collie and Co.

Purchase of 1 set of best steel boiler plates for "DD" engines, £51 5s.—Noyes Bros.

### New South Wales.

PUBLIC WORKS.—S., D., and E. and testing of friction hoists for the beef house at New Public Abattoirs, Homebush, £3140 — Hartley and Doyle, Sydney.

C. and D. of steel and cast iron work for tank for Broken Hill Water Supply, contract No. 7/12-13, £343 10s.—S. Perry, Adelaide, S.A.

### Western Australia.

RAILWAYS DEPARTMENT. — (Direct purchase).—20 accomg. cranks, low studs, 14s. 6d. each; 40 flat adj. cranks, low studs, 16s. 6d. each; 55 plain cranks, 10 x 10, low studs, 14s. 6d. each; 400 1¼in. plain joints and pins, 2s. 6d. each—McKenzie and Holland.

1000 C.I. roller frames, £24 9s. 7d. per 1000; 250 C.I. rollers, £14 1s. 3d. per 1000—McKenzie and Holland.

6 tons 5 cwt. 2 qr. 11 lb. mild steel flats, in bars, £53 7s. 6d.—William Padbury.

7 tons 2 cwt. 2 qr. 2 lb. mild steel, £62 11s. 9d.—William Padbury.

2 tons 11 cwt. 1 qr. 19 lb. spring steel, £30 8s. 10d.—William Padbury.

38 cwt. 0 qr. 17 lb. Yorkshire iron, £21 16s. 5d. per ton—William Padbury.

3 tons 9 cwt. 2 qr. 27 lb. Yorkshire iron, £21 16s. 5d. per ton—William Padbury.

One water level indicator outfit, £26 15s.—W.A. Mining and Agency Co.

12 sheets, Calmon's asbestos, 1-16in., 121 lb., 4s. 6d. per lb.—Chas. Atkins and Co.

423ft. asbestos pipe covering, £33 3s. 9d.; 7 1½in. bends, 10d. each; 4 6in. bends, 2s. 2d. each; 1 5in. bend, 1s. 11d.; 3 4in. bends, 1s. 5½d. each; 3 2½in. bends, 1s. 0½d. each—Couche, Calder and Co.

400 Adlake founts, 1s. 3d. each; 400 Adlake round flame burners, 1s. 6d. each; 400 Adlake metal reflectors, 1s. 6d. each; 50 Adlake point indicator lamps, 25s. 6d. each; 1 Adlake point indicator lamp, special, 30s.—Davis, Hankinson and Co.

8 telephonettes, 70s. each—General Electric Engineering Co.

3in. uniform meter and connections, £43 6s.—Geo. Kent Ltd.

20 cwt. Hex. coachscrews, 5 x ¾, 27s. 6d. per cwt.; 112 lb. copper wire, 16 B.W.C., 1s. 1¾d. per lb.; 1 gross 3-8in. Hex. bright tapped nuts, 7s. a gross; 30 cwt. Ewb. nails, 6in., £23 7s. 6d. per ton; 250 sheets ripple iron, 10ft. x 26 G., 2 tons 2 cwt. 2 qr. 14 lb., £21 17s. per ton; second-hand, double-cylinder, double-geared steam winch, £80; lamp cotton, 112 lb., 1s. 2d. lb.; 5 cwt. 0 qr. 14 lb. Italian gasket packing, 81s. per cwt.; 100 sheets E.P. copper, 4 x 2 x 26 G., 711 lb., 3s. 3½d. lb.—McLean Bros. and Rigg.

12 pcls. H.S. tool steel, 4¼ x 1, each 16in., 2 cwt. 2 qr. 6 lb., 1s. 7d. lb.; 1 pcl. H.S. tool steel, 6 x 1, 6ft., 1 cwt. 0 qr. 24 lb., 1s. 7d. lb. —William Sandover and Co.

W.E. magnetos, generators, No. 48a, standard type magnet, 24, 26s. 6d. each; 12 W.E. induction coils, No. 13, 2s. 3d. each; magneto ringers, 2500 ohms, without gongs, W.E., No. 32, B.G—24, 10s. 7d. each — Unbehaun and Johnstone

212 bars M.B. Yorkshire iron, in 53 bundles, 4 tons 0 cwt. 3 qr. 21 lb., £22 2s. per ton—G. Wills and Co.

100 gross yds. lubricator wicking, x 3in. wide, 15s. 2¾d. per gross—Alfred Adams and Co.

50 drums residual oil, £90 17s. 1d.—British Imperial Oil Co.

Ingot tin, 99 per cent. purity, 1 ton 0 cwt. 0 qr. 20 lb., £236 per ton—Denson, Vautin and Co.

2 tons 15 cwt. 3 qr. 51 lb. Hex. head bolts and nuts, £48 17s. 11d.—Denson, Vautin and Co.

35 cwt. wire nails, £29 10s. 8d.—T. Eilbeck and Son.

4 cwt. 1 qr. 7 lb. "New Capital" high-speed steel, in bars, £32 6s. 10d.—Eagle and Globe Steel Co.

2976ft. gas pipes, £154—Geraldton Municipal Gas Works.

2 only No. 2 "Little David" drills, complete, Nos. T02358 and T02354, £31 17s. 3d.—Ingersoll Rand Co.

### Queensland.

RAILWAYS DEPARTMENT.—Steel superstructure for the bridge over the Condamine River, £950—Joseph Westwood and Co. (London).

S. of five spans steel super-structure, Yable Creek bridge, on the Keefton to Imbil railway, £1362 16s.—Joseph Westwood and Co. (London).

. 5000 spiral bearing springs, £463 10s. 10d.—Federal Spring Works, Melbourne.

### General.

CITY OF MELBOURNE.—Reactance coils for 4400kw. turbines, £963, c.i.f., Melbourne—Siemens Bros. Dynamo Works Ltd.

Purchase of scrap material at the electric Supply Station at schedule rates named in tender—Items 3, 5—John Danks and Son Pty. Ltd.

Items 4, 6, 7, 8, 11, 12—The Moreland Smelting Works Pty. Ltd.

Item 2—W. McLean and Co.

Item 1—John McIlwraith and Co. Pty. Ltd.

Item 10—W. Forbes.

Item 9—J. E. Stone.

MUNICIPAL COUNCIL OF SYDNEY. — Rubber insulated cable, £551 5s., with an allowance of 0.175 per cent. in the price up or down for every £1 per ton rise or fall in the market price of copper, and 1.05 per cent. in the price for every 1d. per pound rise or fall in the market price of rubber between the 23rd inst. and the date of receipt of notification of the acceptance of the tender—Noyes Bros.

Lead caps for wood poles, at schedule rates—John Danks and Son Pty. Ltd.

SHIRE OF DUNDAS (V.). — Road-making plant, including a traction engine, a portable engine, a stone-crusher, spawl elevator, six waggons, waggon mechanism, scarifier, grader, and water cart, £3331 17s. 6d.—A. Leplastrier and Co., Sydney.

HUNTER RIVER DISTRICT SEWERAGE BOARD.—Ledge pump, £52—Simpson Bros. Vacuum pump, £86—Morrison and Brearley, Newcastle (N.S.W.).

## DIVIDENDS OF MINING COMPANIES.

The following dividends and bonuses of mining companies in Australia have been declared and are payable on the dates mentioned:—

July.

14th.—Diamond Creek, 6d., £875.
17th.—Cathcart Central, 2s., £5000.
17th.—Tongkah Compound, 1s., £2500.
18th.—Williams' Fancy, 1s., £1200.
22nd.—Tongkah Harbour, 2s. £25,000.
24th.—Associated Gold, 6d., £12,500.
24th.—Ivanhoe, 3s. 6d., £35,000.
McGregor-Cloucurry (final £18 18s. 4d. per 100 shares).

## INDUSTRIAL.

Messrs. Cameron and Sutherland, second-hand machinery dealers, of Melbourne, Sydney, etc., have published a profusely illustrated catalogue of their extensive stock, a copy of which has been forwarded to us.

## TRANSCONTINENTAL RAILWAY.

A shortage of water will be one of the most formidable problems which the officers of the Home Affairs Department will be called upon to solve in connection with the construction of the transcontinental railway. Extensive boring operations are now to be commenced, however, so that such supplies as may be discovered can be made available as the line is pushed ahead On Saturday it was announced that a contract had been let to Messrs. Davis, Henkinson, and Company for putting down bores on the West Australian section of the line, at the rate of 56s. 9d. per foot, involving a total estimated expenditure of about £11,300. Eight car underframes, for delivery at Port Augusta, are to be constructed for use on the line by Messrs. F. E. Barbat and Sons Limited for £322 apiece, or a total of £2576.

## FROM FOREIGN SOURCES.

(Specially Translated for the "A.M.S.")

A novel apparatus for electric insect extermination has recently been brought out by a Strassburg firm of makers of electrical appliances. The apparatus kills flies and other troublesome insects, such as mosquitoes, wasps, etc., by electric shocks. Two bare metal wires are wound in spirals, at an extremely slight distance from each other, on an insulated prismatic or conical frame. These two bare metal wires are connected, on the one hand, with the two wires of the existing electrical connection, and are consequently permanently under its electric tension. On the other hand, the wires are not connected with each other, and therefore no current will circulate, which means that no current will be consumed. This constitutes the principal advantage of the apparatus: it remains permanently without current, and consequently there is no working expense. The insects are attracted by some suitable substance, such as sugar water, beer, and the like, or by the light of those apparata, which serve at the same time as lamps, and finally by the glittering metal parts of the apparatus itself. As soon as the insects, in order to reach the fluid or light, touch two of the bare wires with opposite electric charges, they will fall down as if struck by lightning, either dead or stupified, into a vessel filled with the fluid, which is used as a bait. This fluid and the insects which have accumulated in the vessel must of course be emptied from time to time. The apparatus is made in various shapes and styles, either solely as a fly-catcher or as a lamp and insect-catcher combined. It is connected just like an ordinary incandescent lamp.

Current interruption is not effected suddenly with the oil switch; on the contrary, the current is maintained for a certain length of time, for instance, in the case of alternating current, generally for half a period at the last, whereby a certain amount of electric energy is in circulation. This warmth, or chemical energy, is produced within such a brief time and in such a limited space that it causes the adjoining portion of the fluid (oil) to evaporate or to decompose into a combustible gas. This results in a sudden high pressure. The oil stand is generally placed at a good height over the electric arc, to prevent the oil vapours at a combustible temperature coming into contact with the air, or the glowing particles which are thrown off from the electric arc causing ignition. But a large height, that is quantity, of oil greatly contributes to the increase of pressure already alluded to, because a sufficient acceleration cannot be suddenly imparted to it. The fundamental idea of an idea recently patented by the Allgemeine Elektricitaets-Gesellschaft, of Berlin, consists in fitting auxiliary chambers filled with air or some gas, and which are in direct communication with the switch chamber near the electric arc, or preferably at its side. The switch chamber is formed by a tube with walls, which is open at the bottom, and which is inserted into another tube with outer walls, and closed by a bottom piece. The auxiliary chamber is placed between these two tubes, being filled to a certain height with oil, and connected with the actual switch chamber by a ring-shaped channel piece. The upper part of the chamber is filled with air. The height of the oil from the contacts to the outer edge of the wall must not be too great to avoid impeding the movement of the oil to any considerable extent, nor should it be too small, in order to prevent the oil vapours passing into the chamber. Any danger of an explosion in the chamber can be avoided by using an indifferent gas. The action of the switch is as follows:—When switching off a large capacity, a quantity of gas will be formed by the electric arc, which exercises a pressure on the surrounding oil. The oil, however, will partially escape into the auxiliary chamber, by compressing the gas contained therein. If the gas is compressed, for instance, to one half its original volume, the pressure will only be about double. Even at a moderate pressure, therefore, space will be formed for the electric arc gases. As soon as the pressure equipoise between the switch chamber and the auxiliary chamber is completed, the fluid which has passed into the auxiliary chamber, under the influence of the gas pressure, will recede and drive the gases and vapours which have risen in the meantime, in consequence of its buoyancy, from the switch chamber. Apart from the reduced increase in pressure, the new switch therefore offers the advantage that the expulsion of the oil is either kept within limits or entirely prevented by the retarded outlet of the gas. A safety valve fitted in the auxiliary chamber will first let the gas escape on the occurrence of a pressure, and this will also escape much quicker, owing to the slight amount of friction in the valve, than if fitted on the fluid chamber, as in the case of ordinary oil switches, where the valve offers considerable resistance to the passage of the oil.

It was at Hamburg that, in the year 1888, there was to be found the largest crane in the world of the period, and to-day it is again a Hamburg ship-building yard (Messrs. Blohm and Voss) that can claim to own the largest crane. The development of crane-building during the last quarter of a century has been extraordinary. Germany has been leading in the building of cranes for heavy loads, since she has supplied the great majority of the 140 giant cranes existing in all parts of the world. More than 70 of these have alone been constructed by the Deutsche Maschinenfabrik A.G., of Duisburg, which has also built this latest giant crane. The first task which awaits it is the completion of the 56,000-ton Vaterland, the sister ship of the Imperator, which was recently launched. The new leviathan lifting implement has been built after the type of the derricking hammer cranes, and has a maximum lifting capacity of 250 tons. The forward arm of the jib, which is over 315ft. in length, can be turned up in order to still comply with every demand if the height of vessels is further increasing. When the jib is completely raised, its point reaches the enormous height of more than 328ft. above water level. The crane, which is entirely worked by electricity, has two independent lifting appliances, viz., a crab, which can carry its maximum load of 250 tons to a distance of 113ft., and 110 tons to a distance of 175ft. from the centre of the crane, and a revolving travelling crane of 20 tons lifting capacity, which can run the whole length of the top of the main jib. This auxiliary crane can lift a load of 10 tons even at a distance of 240ft. from the turning centre of the large crane. Consequently, it can serve an area of nearly 182,993 sq. ft., having a diameter of over 482ft. The crane is worked by two men only. The driver of the large crane is accommodated in a steering cabin arranged under the load arm of the jib. In order that work may proceed safely at night, a searchlight is fitted in the steering cabin near the driver's place, by means of which the spot where the work is to be carried out can be brilliantly illuminated.

---

## Commonwealth of Australia.

Postmaster-General's Department,
Melbourne, 4th July, 1913.

TENDERS will be received at the office of the Deputy Postmaster-General, Melbourne, until 3 p.m., on the 7th October, 1913, for the Supply and Installation of Electrically-driven Machinery for operating Pneumatic Tube Services, Central Telegraph Office, Melbourne (Sch. 900). See Commonwealth Gazette, 5th July.

AGAR WYNNE,
Postmaster-General.

(1223)

---

Department of Defence,
Melbourne, 30th June, 1913.

### TENDERS FOR SAND-BLAST PLANT REQUIRED AT THE COMMONWEALTH NAVAL DOCKYARD, COCKATOO ISLAND, SYDNEY.

TENDERS are required for the supply of Sand-Blast Plant, complete, delivered ready for erection at Cockatoo Island, New South Wales.

Full particulars may be obtained upon application to the General Manager, Commonwealth Naval Dockyard, Cockatoo Island, Sydney.

Tenders to be received, addressed to the Director of Navy Contracts, Navy Office, Melbourne, or to the Director of Navy Contracts, care General Manager, Commonwealth Naval Dockyard, Cockatoo Island, Sydney, and marked "Tender for Sand-Blast Plant," not later than 16th July, 1913.

The lowest or any tender will not necessarily be accepted.

E. D. MILLEN,
Minister of State for Defence.

---

Department of Defence,
Melbourne, 23rd June, 1913.

### ROYAL AUSTRALIAN NAVY.

### TENDERS FOR THE SUPPLY AND ERECTION OF A FUEL OIL STORAGE TANK AT GARDEN ISLAND, SYDNEY.

TENDERS will be received, subject to the conditions of tendering, until Twelve noon on Monday, 25th August, 1913, for the supply and erection of an Oil Storage Tank at Garden Island, Sydney.

Drawings and Specifications may be seen at the office of the Director of Navy Contracts, Navy Office, Melbourne, and at the Naval Staff Office, Sydney, Brisbane, Largs Bay (S.A.), Fremantle, and Hobart.

Copies may be obtained on payment of a deposit of £5 each, which will be refunded on receipt of a bona-fide tender and the return of the documents.

Tenders to be endorsed "Tender for Oil Storage Tank" in top left-hand corner of the envelope, and addressed (if by post, prepaid) to the Director of Navy Contracts, Navy Office, Melbourne, or to the Director of Navy Contracts, care District Naval Officer, Naval Staff Office, Sydney, Brisbane, Largs Bay (S.A.), Fremantle, or Hobart, as the case may be.

The lowest or any tender will not necessarily be accepted.

Tenders are to be in all cases on the printed forms, which can be obtained as above.

E. D. MILLEN,
Minister of State for Defence.

---

### COMMONWEALTH PUBLIC SERVICE.

### VACANCIES (2) FOR ASSISTANT EXAMINERS, PROFESSIONAL DIVISION, PATENTS OFFICE.

APPLICATIONS are invited for the above positions. Applicants must possess at least three of the following qualifications, those marked (1) and (2) being compulsory, and must, if required, submit themselves for examination in subjects (3) and (4).

(1) A first-class secondary education.
(2) A general knowledge of either Mechanical or Electrical Engineering.
(3) Experience in the preparation of drawings of machinery.
(4) Ability to classify, index, and write abridgments of patent specifications.

Salary, £204 per annum.

Applications, accompanied by copies of testimonials, must be lodged with the Commonwealth Public Service Inspector, Gloucester House, Market Street, Melbourne, not later than 12th July, 1913.

D. C. McLACHLAN, Commissioner.
W. J. CLEMENS, Secretary.

## Government Notice, (V.).

VICTORIAN RAILWAYS COMMISSIONERS.

STATE COAL MINES.

SWITCHBOADS AND CENTRIFUGAL PUMP.

TENDERS (endorsed, "Tender for ——") to be addressed to the General Manager, State Coal Mine, Wonthaggi, and delivered at his Office at Wonthaggi, not later than 12 noon of Monday, 14th July, are invited for the supply of the following material:—

**Switchboards, Centrifugal Pump.**

Particulars and forms of tender, at the Melbourne Office of the State Coal Mines, Robb's Buildings, Collins-street, and at the Office of the General Manager, Wonthaggi.

No tender will necessarily be accepted.

G. H. BROOME,
General Manager.

---

## CITY OF CAULFIELD.

SALE OF OLD TRAM RAILS, &c.

TENDERS are invited for the purchase of about 80 tons of OLD TRAMWAY RAILS and FISH PLATES, the whole not having been used much. The rails are each about 26ft. long, and weigh approximately 485 lb. Tenders at per rail to be delivered to me not later than 4 p.m. on Wednesday, the 23rd July, next. The highest or any tender will not necessarily be accepted.

F. JOWETT, Town Clerk.

Caulfield, 24th June, 1913.

---

## GILLIES SULPHIDE CONCENTRATING MACHINE LIMITED (In Liquidation).

Tenders will be received up to noon on 31st July, 1913, at my office, Broken Hill Chambers, 31 Queen-st., Melbourne (where full particulars can be obtained) for the purchase of the Company's Commonwealth patents, Nos. 309, 815, 1014, 3633, and 4536, for apparatus for the treatment of sulphide ore. C. E. PACKER, Liquidator.

---

## AMALGAMATED ZINC (DE BAVAY'S) LIMITED

Notice is hereby given, that a DIVIDEND (the twelfth) of one shilling and sixpence per share on all shares in the capital of the abovenamed company has been DECLARED, due and payable at the registered office of the company, No. 360-6 Collins-st., Melbourne, on Saturday, the ninth day of August, 1913.

Dividend warrants will be posted direct to shareholders.

Transfer books and share register will be closed from Wednesday, the 30th day of July, until Saturday, the 9th day of August, 1913.

By order of the board.
HAROLD L. SHACKELL,
Melbourne, 3rd July, 1913. Assistant Secretary.

---

## CYANIDE MANAGER, ASSAYER AND CHEMIST,

(12 Years' South African Experience)

Desires position. Excellent testimonials.

GILLIES,
G.P.O., Box 434,
SYDNEY.

---

## NEW PREMISES IN BOURKE-ST., MELBOURNE.

For S. MYER, Esq.

TENDERS are invited for the following:—

Extensive BUILDINGS in STEEL FRAME CONSTRUCTION, covering an area of 68ft. by 246ft., and 6 stories in height.
3 ELECTRIC PASSENGER ELEVATORS.
1 ELECTRIC GOODS ELEVATOR.

Plans, specifications and all particulars may be obtained from the office of the architects,

Messrs. H. W. and F. B. TOMPKINS,
F.R.V.I.A.,
115 Elizabeth-street, Melbourne.

---

## Government Notice (N.S.W.).

New South Wales Government Railways,
Office of the Chief Commissioner,
Sydney, 5th July, 1913.

TENDERS will be received at this Office until 12 o'clock noon on the dates specified for the undermentioned works, etc., viz.:—

WEDNESDAY, 6th AUGUST, 1913.—The Supply of One Live Steam Feed Water Heater for Ultimo Power House. Specification No. 397 (price, 2s. 6d. each).

WEDNESDAY, 20th AUGUST, 1913.—The Supply of Pneumatic Ash-handling Plant for the White Bay Power-house, to Specification No. 415. Copies, 5s. each.

WEDNESDAY, 15th OCTOBER, 1913.—The Supply of 13 Direct-Current Motors to Specification No. 412 (price, 2s. 6d.).

All specifications can be obtained at the Electrical Engineer's Office, 61 Hunter-street, Sydney.

Tenders are to be endorsed, "Tender for Water Heater," or as the case may be.

The Chief Commissioner does not bind himself to accept the lowest or any tender.

By order,
J. S. SPURWAY,
Secretary.

---

"MINES INSPECTION ACT, 1901."

EXAMINATIONS of Candidates for Mine Managers' Certificates of Competency, in terms of the above Act, will be held at

SYDNEY, BROKEN HILL, AND COBAR, on WEDNESDAY, THURSDAY, and FRIDAY, 3rd, 4th and 5th SEPTEMBER.

Applications must be received one calendar month prior to the date of examination; those arriving late will not receive consideration.

Forms and full particulars are obtainable from the undersigned.

E. F. PITTMAN,
Under Secretary and Chairman of
(5a4) the Board of Examiners.

---

Department of Public Works,
Sydney, 5th July, 1913.

TENDERS FOR MACHINERY, ETC.

TENDERS, specified below, will be received at this Department until 2 o'clock p.m., on the date mentioned:—

MONDAY, AUGUST 11, 1913.

Manufacture, etc., of Steel Bridge for Hastings River and Flood Channel, Wauchope to Kempsey section, North Coast Railway.

Manufacture, etc., of Steel Bridge for Macleay River, Wauchope to Kempsey section, North Coast Railway.

Manufacture, etc., of 25 5-ton Steel Gantry Cranes, for Railway Station Yards. (Fresh Tenders.)

Further particulars may be obtained from N.S.W. "Government Gazette."

(6a7) ARTHUR GRIFFITH.

---

METROPOLITAN BOARD OF WATER SUPPLY AND SEWERAGE,
341 Pitt-street,
Sydney, 4th July, 1913.

T RAILS.

PETTY TENDERS, addressed to the undersigned, will be received at this Office until 2 p.m. on MONDAY, 21st July, 1913, for Supply of 4½ MILES OF 28lb. or 30lb. T RAILS, delivered F.O.R. Darling Harbour within 4 months. The nature of the Tender must be endorsed on the envelope.

Further particulars may be obtained at the Office of the Compt. of Stores.

WILLIAM HOLMES,
(6L3) Secretary.

---

## THE PIONEER TIN MINING CO. LIMITED.

NOTICE is hereby given that a dividend (the twenty-third) of sixpence per share has been declared, payable on Monday, 21st July, 1913. Transfer books will be closed on Monday, 14th July, 1913, for purposes of this dividend. By order of the board.—JOHN F. WAY, Secretary, 34 Queen-st., Melbourne, 3rd July, 1913.

---

## THE RENISON BELL PROSPECTING AND MINING COMPANY, NO LIABILITY.

NOTICE OF DIVIDEND.

Notice is hereby given that a DIVIDEND (the Sixth) of Sixpence per share has this day been DECLARED on all shares in the abovenamed Company, and will be PAYABLE at Hobart on Thursday, July 24, 1913. The transfer books of the said Company will be closed from the 14th to the 24th inst., both days inclusive. By order of the Board, J. SMITHIES, Manager.

Hobart, July 1, 1913.

---

## WILLIAMS' FANCY G.M. COMPANY.

(Berringa) NO LIABILITY.—A DIVIDEND (the 40th) of sixpence a share, with a bonus of sixpence a share, has this day been declared Payable at the office of the company, Lydiard-street, Ballarat, on Wednesday, the 16th day of July, 1913. Transfer books will close on Saturday, the 12th, at 12.30 o'clock p.m. S. STRETCH, Manager.

Ballarat. 4th July, 1913.

---

## GT. LANGI LOGAN GOLD MINES CO., No Liability.

SUPPLY OF SAWN TIMBER.

TENDERS are invited for the Supply of about 80,000ft. super. of Sawn Timber, various sizes and lengths, suitable for shaft timber. Specifications and conditions of contract can be seen at the Office of the Company, 123 Queen-street, Melbourne. W. BRUCE FOX, Manager.

---

## BOURKE'S HILL TIN SLUICING CO., No Liability, Emmaville, N.S.W.

A DIVIDEND (the 12th) of Sixpence per share has been declared in the above Company, PAYABLE at the Registered Office, 125 Queen-street, Melbourne, on Tuesday, 22nd July, 1913.

JAMES MACKAY, Manager.

---

## BARRIER WHARF LIMITED.

NOTICE OF DIVIDEND.

NOTICE is hereby given that a Dividend at the rate of 10 per cent. per annum, and a Supplementary Dividend at the rate of 5 per cent. per annum, has been declared on the issued capital of the Company for the half-year ended 31st May, 1913, due and PAYABLE at the Registered Office of the Company, Collins House, Collins-street, Melbourne, on Thursday, the 24th day of July, 1913. Dividend Warrants will be posted to shareholders. Transfer Books and Share Register will be Closed from the Tuesday, the 15th day of July, 1913, until Thursday, the 24th day of July, 1913, both days inclusive. By order of the Board,

HAROLD L. SHACKELL, Acting Secretary.

---

## ALFRED RONALDS.

Will the relatives and friends of the late Alfred Ronalds (author of Ronalds' "Fly-Fisher's Entomology") please communicate with—

Critchley Parker,
"Mining Standard,"
Melbourne or Sydney.

---

The following method is recommended by Mr. Dowsett, of the Brakpan mill, Johannesburg, South Africa, for determining whether or not zinc is precipitating properly: Take 1 litre of unprecipitated cyanide solution and transfer it to a large bottle. Add 3 drops of a saturated solution of lead acetate and, after shaking, add 0.75 gm. of zinc dust and shake again. Add 20 ccms. more of the lead acetate and shake for 30 seconds. Pour the solution into an evaporating dish and, after allowing the zinc to settle, decant off the clear solution and dissolve the zinc with about 10 ccms. of aqua regia. Boil the solution down to about 4 ccms. Allow the lead chloride to settle and then pour the solution into a test tube. Cool and add 2 drops of stannous chloride. The amount of gold present may be determined by the colour imparted to the solution by the reagent. A very light colouration indicates the presence of 0.02 dwt. A slight yellow means 0.03 dwt.; a slight pinkish yellow, 0.04 dwt.; a strong pink, 0.05 dwt.; a purple of Cassius, 0.08 dwt. The method is equally applicable to the testing of zinc shavings.

LIQUID FUEL for Diesel & all Crude Oil Engines.
"SHELL" SPIRIT, "SHELL" BENZINE, LUBRICATING OILS AND GREASES.
Prices and particulars on application to
THE BRITISH IMPERIAL OIL CO. LTD. Adelaide, Brisbane, Fremantle, Melbourne, Sydney and New Zealand

**SOUTH** THE AUSTRALIAN GAS RETORT & FIRE BRICK MANUFACTURING CO., TOORAK ROAD, SOUTH YARRA— For Fire Clay goods for all purposes. Send for Catalogue. **YARRA**

**SHAW'S Steel Wire Ropes**
**FOR ALL MINING PURPOSES.**
Large Stocks always on hand at HEAD AUSTRALASIAN DEPOT
**JOHN SHAW Australia, Limited,**
**445 KENT STREET, SYDNEY.**
*Victorian Agents: Welch, Perrin and Co., and Inglis, Smith and Co.*
*Brisbane: Engineering Supply Co. of Australia Ltd.*

**"INGREY"**
**PATENT WEIGHING & RECORDING MACHINES**
ARE
Installed in H.M. Dockyards.
Certified by the Board of Trade.
Accurate and Reliable.
Automatic in action and
Pay for themselves in a year!
**H. A. HARVEY & CO. LIMITED, LONDON.**
Australian Representative — LASCELLES PARRINGTON & BRACHE,
London House, 97 Elizabeth Street, Melbourne.
New Zealand Buildings, Pitt Street, Sydney.

## ALLOYS OF COPPER.

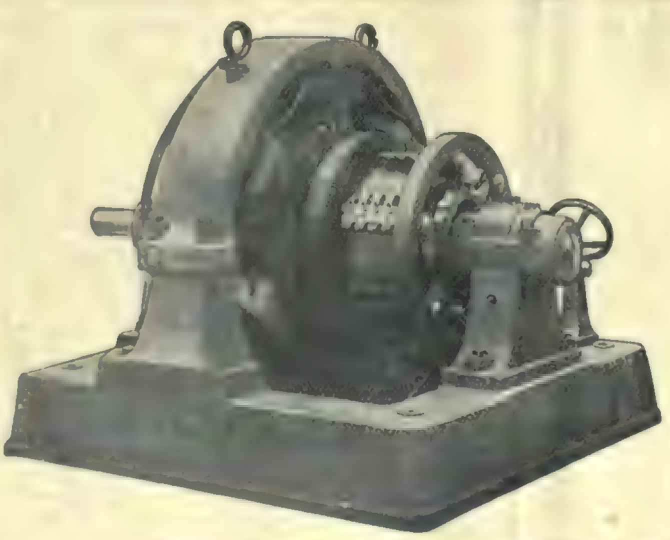
M. Guillet, in the "Technique Moderne," observes that copper, as such, possesses only a relatively contracted market, but that when its alloys are considered its sphere of usefulness is vastly extended. The most important alloys of copper employed in the industries are, in order of importance, as follows:—Brasses—alloys of copper and zinc, employed as castings, in sheets, bars, wire, cartridges, etc.; bronzes—alloys of copper and tin, especially used in castings, but also for sheets and wire; alloys of copper with nickel, and of copper with nickel and zinc, which are successful on account of colour and malleability; aluminium bronzes, which are easily forged. The alloy of copper and silicium is specially for wire-drawing. Copper alloyed with manganese is made into fire bars. The alloys of copper and arsenic are often substituted for pure copper where high temperatures have to be resisted. Special alloys of a more complex character are obtained by the addition of substances which modify their properties and extend their employment.

In their last official report as chemists to the American Institute of Metals, Messrs. A. D. Little, of Boston, mention three new alloys among the various items of recent progress in the metal industry. A French patent has, it appears, recently been issued covering the production of two types of alloys from copper, zinc and silicon, which are claimed to possess great tenacity, resistance to acids and alkalies, and to be capable of rolling into finished shapes. Another new alloy has been patented by the Ajax Metal Co. This is composed of iron, nickel and copper, which is claimed to be non-corrosive, malleable, of great tensile strength, and capable of being rolled, drawn, or cast. A new type of pyrophoric alloy has been patented in Germany which consists of the addition of 5 per cent. metallic cerium to an alloy of manganese and antimony. The inventor claims excellent pyrophoric properties from this alloy, which is essentially different from the other alloys of this type in which cerium is the main source of the pyrophoric characteristics.

---

A London cablegram says the shareholders of New Zealand Oilfields Ltd. have appointed a committee of investigation into the company's affairs. Consideration of the issue of 500,000 profit-sharing preferential shares of 2s. each is postponed.

**Phoenix Dynamo Mfg.**
**CO'S.,**



40KW. 240 VOLTS, 210 R.P.M. COMPOUND WOUND GENERATORS FOR DIRECT COUPLING. WE CAN GIVE IMMEDIATE DELIVERY.
**W. G. WATSON & CO. LTD.,**
Electrical Engineers and Contractors, etc.
SYDNEY—279 Clarence Street, and 426-430 Kent Street.
SOLE REPRESENTATIVES.

**The Australasian Joint Stock Companies' Year Book,**
**1913.**
*By* ROBERT LUCAS NASH,
*Financial Editor of Sydney "Daily Telegraph," Author of "Investors' Sinking Fund and Redemption Tables," "Profitable Nature of Our Investments," Eight Editions of "Penn on the Funds" (London), etc.*

**A COMPLETE OFFICIAL RECORD** of Government Finance, The Government Debts, Corporation Loans, Banks, Insurance Companies, Gas and Water Companies, Shipping Companies, Trading and other Companies, Dairying Companies, Coal and Shale Mining Companies, Gold Mining Companies in New South Wales, New Zealand, Queensland, South Australian and Northern Territory, Tasmanian, Victorian, Western Australian Silver, Copper, and other Mines, also a

**DIRECTORY OF MINING SECRETARIES AND LEGAL MANAGERS.**

Each of the previous seven editions has grown substantially, and the last edition gave a record of £568,146,000 of capital invested, and of £26,120,000 interest and dividend payments in the year.

But on this occasion, the **EIGHTH EDITION** will record an expansion in joint stock enterprise quite unprecedented. The Australian capital dealt with (including the London contributions thereto) will be between £600,000,000 and £700,000,000 (six hundred millions and seven hundred millions), and the dividends and interest payments for 1912 exceed £30,000,000 (thirty millions), while no less than 2500 (two thousand five hundred) new companies are added to the enumeration, and the new issues by the older companies have been enormous. The dimensions of the volume are, of course, greatly extended.

**THE AUSTRALASIAN JOINT STOCK COMPANIES' YEAR-BOOK** is the only work giving such a record, and the vast growth of joint stock enterprise throughout these States and colonies renders it an indispensable book of reference.

As regards **PUBLIC COMPANIES**, the work addresses directors and leading officials, capitals, dividend paid, and much historical and current detail, such as date of registration, reserve funds, the latest accounts, bankers, and numbers of shareholders.

The **DIRECTORY OF SECRETARIES AND LEGAL MANAGERS OF MINING COMPANIES** at the end of the book is a special feature which has proved of material service to a large body of subscribers.

*Price, 10/6; by post throughout the Commonwealth, 10/8. Contains approximately 600 pages Demy Octavo (9 x 6). Obtainable from your bookseller or direct from the publisher—*

*Critchley Parker,*
*Mining Standard,*
*12 O'Connell-st., Sydney. 376 Flinders-lane, Melbourne.*

## CONTENTS.

THURSDAY, JULY 17.

EDITORIAL—
Company Law .. .. .. .. .. .. .. .. 41
The Post Office .. .. .. .. .. .. .. 41
Leaderettes .. .. .. .. .. .. .. .. .. 42
News and Notes .. .. .. .. .. .. .. 42
Personal .. .. .. .. .. .. .. .. .. .. 43
Investor's Column—
Junction North (N.S.W.) .. .. .. 43
Caledonian Colliery Ltd. (N.S.W.) .. 43
Cathcart Central (V.) .. .. .. .. 43
Metal Quotations .. .. .. .. .. .. .. 44
Rock Crushing Tests .. .. .. .. .. .. 44
Rand Mines Steam and Electric Winding .. .. .. .. .. .. .. .. .. .. .. 44
Mining in New South Wales .. .. .. .. 45
Victorian Mining Activities .. .. .. 45
Labour Disputes .. .. .. .. .. .. .. 47
Tasmanian Mining .. .. .. .. .. .. .. 47
Mining in Western Australia .. .. .. 48
Queensland Mining .. .. .. .. .. .. .. 48
Publications Received .. .. .. .. .. 48
The Coal Mining Industry .. .. .. .. 49
Mineral Returns .. .. .. .. .. .. .. 49
Mining Inventions .. .. .. .. .. .. .. 49
S.A. Radium .. .. .. .. .. .. .. .. .. 49
Mt. Lyell M. and R. Co. .. .. .. .. .. 49
Royal Mint Returns .. .. .. .. .. .. 50
Reports of Companies, etc. .. .. .. .. 50
The Brokers' Conference .. .. .. .. .. 50
Royal Humane Society .. .. .. .. .. 50
The Form of the Earth .. .. .. .. .. 50
Further Notes on Broken Hill Treatment Methods .. .. .. .. .. .. .. .. 51
British and European Developments .. 52
Lithgow Industrial Items .. .. .. .. .. 52
The Alignment of Machinery .. .. .. 53
Victorian Railway Revenue .. .. .. .. 54
N.S.W. Engine-drivers' Examinations. 54
Cost of Trade Disputes .. .. .. .. .. 54
Municipal Electrical Conference in London .. .. .. .. .. .. .. .. .. .. 54
Miscellaneous .. .. .. .. .. .. .. .. 55
Tenders Invited and Accepted .. .. .. 56
The Dowser's Art .. .. .. .. .. .. .. 59
Rail Corrugation in Chicago .. .. .. 59
From Foreign Sources .. .. .. .. .. .. 60
The Imperial College of Science, etc. X.

HENLEY'S
Electric Wires and Cables
AND INSULATING TAPES
ARE THE BEST.
W. T. HENLEY'S Telegraph Works Co. Ltd.
546 COLLINS ST., MELBOURNE.
61 YORK ST., SYDNEY.

BELTING!
Largest stock of all kinds of Machine Belting in the Commonwealth.
Conveyor and Elevator Belting for all purposes.
HOPKINS BROS. & ODLUM PY. LTD.
LEICESTER ST., CARLTON, MELBOURNE.
'Phone, Central 754 and 5202. Box 377 G.P.O.

COKE!
NORTH BULLI COLLIERY
Limited
Supplies best quality hard
SOUTHERN
SMELTING COKE.
(Weekly output 1250 tons.)
H. G. Hyde, Secretary.
Royal Insurance Building, 16 Spring-street,
SYDNEY.

AUSTRALIAN MINING STANDARD.
PUBLISHED EVERY THURSDAY.
Forwarded Post Free to any Address.
Australasia .. .. .. .. .. .. .. .. .. .. .. .. 26/- per
Abroad .. .. .. .. .. .. .. .. .. .. .. .. .. 30/- Annum.
Payable half-yearly or yearly, in advance.
All amounts should be made payable to order of "CRITCHLEY PARKER, Bank of Australasia."
12 O'Connell-street, Sydney
Tel Central 2703.
P.O. Box 331.
376 Flinders-lane, Melbourne
Central 7931 & 1838.
P.O. Box 253.

### BACK NUMBERS OF THE "MINING STANDARD."

The following is the rate for back copies more than a month old. Applications by post must be accompanied with cash and postage added. In no case can we guarantee to supply copies, as our storage accommodation is limited.

A postcard will be sent if the number required is out of print.

For copies three months old, ninepence; six month, one shilling; and beyond that period, one penny per month per copy.

As there is a regular demand for back copies of the "Mining Standard," newsagents are requested to send back all returns uncut and in good condition, otherwise they will not be accepted.

All Returns from Newsagents must reach us by the end of each month (the whole paper must be sent). No credit will be allowed beyond this term.

Postage — British, 1d.; Foreign, 1½d.; Australasia, ½d per copy.

Stamps will be accepted as pre-payment.

Address communications: Publishing Department, "Mining Standard."

### CASUAL ADVERTISEMENTS.

The rate for this class of advertisement is governed by the position it occupies.

If it appears on leader page or amongst or next to reading matter, the rate is 15s. per inch (nonpariel) per insertion.

Towards end of reading section, set in brevier, 16 ems width, 6s per inch per insertion.

If set in nonpariel the rate is 4s. per half inch.

### ALTERATION TO ADVERTISEMENTS.

As our publishing arrangements necessitate the "Mining Standard" being issued simultaneously in Sydney, Melbourne and Adelaide on the same day each week, advertisers wishing to change their advertising matter must supply same ten days in advance of publication.

### ADVERTISEMENT PROOFS.

Proofs are submitted to advertisers in order to give them an opportunity of going over the advertisements before printing. Any alterations from the original copy will be charged for. Advertisers are specially requested to instruct their publicity departments, advertisement writers, etc., to give clear and definite instructions respecting changes of matter or new copy, to avoid incurring extra charges.

Advertising Copy must be typed and so arranged as to clearly indicate the display required for the more important features of the advertisement.

AUSTRALIAN MINING STANDARD.
PUBLISHED EVERY THURSDAY.
ESTABLISHED 1888.
It is requested that all business communications be Addressed to Critchley Parker.

THURSDAY, JULY 17, 1913.

## COMPANY LAW.

While the address of the president, Mr. H. Y. Braddon, at the recent meeting of the Associated Chambers of Commerce in Sydney, touched upon many matters of vital importance to the general welfare, such as the balance of trade between Australia and the outside world, the depreciation of gold, the industrial unrest, the cost of living, and the relation of Government activity to private enterprise, the subsequent proceedings have been severely criticised, as having shirked all these great questions, and as having made no attempt either to formulate any recommendations concerning them, or even to discuss them. To men of business, painfully conscious of their inability to impress their views upon the legislative bodies of the Commonwealth, and conscious also of the brief space of time at their disposal, the discussion of such subjects might well have seemed academic and unpractical. There was one topic of general interest, however, which received some attention, the necessity, namely, for uniformity in company law. Certain canons of equity and good conscience ought to be made operative in the formation of joint-stock companies, in which the general public may be invited to become shareholders. In no State is the observance of these canons insisted upon as it should be. In one State some are neglected; in another others are overlooked. The effect is that there is not only inefficiency, which often leads to victimisation of investors; but there is also hopeless confusion. The inadequateness of the law in one State is different from the inadequateness of the law in others, and there are scarcely any broad principles which can be relied upon as having been made universally applicable. In short, as the president observed, a limited company means one thing in New South Wales and quite another in Victoria, and stock exchange usage varies in a similar manner. He considered that the law should be made uniform, and that the English company law, so far as applicable to Australian conditions, should be adopted. The congress was, however, confronted with the fact that the Federal Government had sought additional powers which would have enabled it to pass such a law, but that these powers had been refused by the people. It was conceded that it would be useless to ask for a reversal of the verdict in this particular at so early a date after it had been given. Exception, moreover, was taken to the fact that the Government had not only asked for power to regulate the creation and dissolution of companies, but also for powers to control them. This, if granted, would subject a joint-stock company to disabilities from which competitors who were not incorporated would be exempt. It seems highly probable, therefore, that, if less had been asked, more would have been conceded. The alternative to an amendment of the constitution is joint action by the legislatures of the several States. It might be possible to induce the six Premiers, when they meet in conference, to agree upon such a measure, and, in the interests of legitimate investment and fair dealing, it would be highly desirable that they should. But, even if this could be accomplished—a contingency which, in the present state of affairs seems somewhat improbable—there would still be the difficulty, even more likely to prove insuperable, of piloting the measure through six legislatures without amendment. However, the situation calls for action. If the commercial community in each State were to agree on the principal features which it is desirable to enforce in the formation and dissolution of companies, an important step in advance would be taken. The united opinion of the six States of the Commonwealth would weigh very powerfully with Ministers and representatives of the people, and the desired goal would be brought somewhat nearer. But, if the men of finance and commerce are too much engrossed in other matters to bestow upon this one the attention which its importance demands, it would be unreasonable to expect the politicians, who have no special facilities for making themselves acquainted with it, to master its intricacies in a satisfactory manner. The subject having now been broached, should not be allowed to slumber until an authoritative pronouncement has been formulated by those most intimately concerned, and a strong effort has been made to impress the powers that be with a sense of its importance.

## THE POST OFFICE.

In the leading article in which we commented upon the constitution of the new Federal Government, we remarked that we hoped the new Postmaster-General, Mr. Agar Wynne, would introduce business methods into the conduct of the Commonwealth Post Office. He has begun well by announcing that the Department will be handed over to the control of expert commissioners. Mr. Wynne is the eleventh political head of the Department in little over twelve years, and two of the occupants of the position held it on two different occasions, so that we may say there has been a change of command on the average every twelve months, and never any change for the better so far as concerns the treatment of the public. During that time the annual expenditure has more than doubled, growing from 2½ millions sterling to nearly 5½ millions, while the number of employees has increased nearly 100 per cent. Owing to the deplorable methods adopted, the expenditure has in fact increased with very much greater rapidity than the revenue, and the authorities have always, apparently, been at a loss to understand why. The idea has usually been to restore the balance by cutting away some of the public's privileges, and, as often as not, the result has been the reverse of what was expected. The greater the number of people employed, and the greater the expenditure, the less has been the efficiency, and therefore Mr. Wynne is to be congratulated upon his determination to try to set the Department going upon really proper lines.

But what are proper lines? The Post Office will not be considered to be at all satisfactory until every State is able to say that the service accorded to it is at least as good as it was before Federation was established. In other words, the policy hitherto existent of reducing the service in all the States to the level of the worst will have to be abandoned, and the diametrically opposite policy followed of endeavouring to raise it everywhere to what used to be the best level prior to Federation. In all probability, however, Mr. Wynne will not be contented merely with a restoration of what should never have been departed from. To judge by the speech in which he made his announcement of the intention to appoint a commission, he has the very excellent idea of so extending the usefulness of the Post Office as to make it take its proper place in the business of the country, and to make it have its due effect upon the cost of living. As Mr. Wynne pointed out, the immense discrepancy that exists between the prices of country products in the country, and the prices of the same products in the metropolitan areas, might, to a very great extent, be obviated by an extension of the uses of the Post Office. In Mr. Wynne's own district fowls are purchasable at 2s. a pair, whereas in Melbourne four or five times that amount is asked for them. It has occurred to him, accordingly, that if the Post Office were as useful as are the Post Offices in many other parts of the world, the poultry farmer might be able to get half a crown for his fowls in the city, and so do fully as well as he does at present when the bulk of the profit goes into the hands of middlemen. To do this Mr. Wynne suggests that the Post Office should transport his fowls at a cost of, say, 6d. a pair. The effect of that on the cost of living is obvious. So great would be the advantage to the residents of the city that, even if the Post Office made no profit at all out of the transaction, the reform would still be one that it would be well worth the while of the Government to set going. The only people likely to object would be the middlemen, and they are deserving of no sympathy. If Mr. Wynne can succeed in thus popularising the Post Office, he will have done a great thing, not merely for the people of the country, but for the Post Office itself, for the Government of which he is a member, and for his own reputation as a statesman, and, we may add, for the Commonwealth generally; for, as we have already stated more than once, the Federation has little chance of having other State Departments transferred to it so long as its conduct of the Post Office remains the shocking example it has hitherto been.

---

After some 30 years of practical monopoly of the passenger traffic of the Melbourne streets, the Melbourne Tramway Company is at last threatened with a very serious rivalry. The company has gone on quietly and persistently ignoring the demands of the public, and careless of its requirements, secure in the belief that the terms of its concession shut it out from all serious opposition. Over twelve months ago it was quite confident that it would go on successfully to the end of its term, defiant of everything and everybody, making its huge profits, charging its heavy fares, and conducting its obsolete system to the scorn of electricians and the contemptuous amusement of travellers. It reckoned without the motor-bus; but the motor-bus has arrived, and is proving to be a very serious rival indeed. The beginning was made so recently as last December by the running of a 'bus to St. Kilda, and so hugely successful has this been that half a dozen 'buses are now running on this route, while others have been ordered. The success of the first motor-bus company has led to the formation of a second, and it too is doing remarkably well, and is eating very seriously into the profits of the tramway company. Now there are numerous schemes for the connecting-up with the city of various suburbs that have hitherto been more or less neglected. The takings may perhaps be taken as averaging about a shilling per 'bus mile, and it is said that this gives a clear profit, over all expenses, of 2d. a mile. It is expected that the next few months will see a tremendous addition to the number of motor-buses traversing the Melbourne streets, and there can be little doubt that the tramway company, which has already felt the competition very severely indeed, will yet feel it very much more than it has hitherto done.

* * *

A cable message received from London last week affords a good illustration of the frequent falsity of the homely saying that what is sauce for the goose is sauce for the gander. Our readers are acquainted with the very dubious circumstances attending the speculations of members of the British Cabinet in the shares of the American Marconi Co. and with the white-washing of those gentlemen by a House of Commons which notoriously is loath to deal hardly with those who belong to it. We hold that such white-washing of the principals in a very unsatisfactory business reflects no credit upon either the House of Commons or the Government; but what are we to think of the latter when we find that it not only excuses its own members for action which would never have been taken by men of very fine feeling and a very keen sense of honour, but actually proceeds to punish a subordinate for a proceeding in no sense more nefarious, and far more pardonable, because done quite openly? Mr. J. E. Taylor, engineer in the Post Office, deposed to the Marconi Contract Enquiry Committee in December last that 12 months previously he had bought 30 £1 shares of the English Marconi Company. His shares were not held two days like those American shares in which Mr. Lloyd George "invested," but were held for about three months. The Postmaster-General subsequently expressed his grave displeasure with Mr. Taylor for his conduct, and gave instructions that he should be reduced in rank. These instructions have been carried out—rightly perhaps, but assuredly not rightly by a Government that has seen fit to resent the criticisms on the conduct of its own members, who have, to say the least of it, acted with no more discretion that was displayed by Mr. Taylor.

* * *

The Cook Government has begun by getting rid of the incubus of preference to unionists, which its predecessor had fastened on the Commonwealth. It has restored the liberty of the subject which the Labour Government had done its best to destroy. The action of the new Government has, of course, met with much adverse criticism from Labourites throughout Australia, and it is, naturally, being represented as an attempt to reduce wages. Mr. Cook, in reply, has pointed out that wages will not be affected at all, that all the Government has done is to render the non-unionist as available as the unionist for employment at the unionist rates of wage. Benefit should accrue in the long run from the Government's action, but it is not to be expected that the evil resulting from the extreme preference for unionists shown by the late Ministers for Home and External Affairs will be brought to an end by a stroke of the Government's pen. It is to be feared that the evil consequences of the deplorable action of the late Government in this respect will be very long lasting and very hard to eradicate.

* * *

A gentleman with the historic name of McGregor—whose foot has strayed far from its native heath—has been entertaining the Port Melbourne Council with glaring accounts of a method by which, without hope of emolument, he will transform the murky smoke-laden atmosphere of the southern industrial districts into a state of pristine purity. The Mayor, who had had a talk with the magician, assured his colleagues on the Council that Mr. McGregor had produced documents indicating that he had practically banished smoke from the city of Glasgow! Any man who can perform such a wonderful feat deserves the utmost encouragement. Mr. McGregor explains that the whole thing can be done by scientific stoking, so the sooner we establish a college for the scientific education of stokers, housewives, and maids, the better will it be for all concerned.

## NEWS AND NOTES.

A London message says the shareholders of the Chaffers G.M. Co. (W.A.) have approved of the scheme of the directors for underwriting 500,000 shares.

A requisition has been signed by shareholders, representing 10,000 shares, calling for a special meeting of the Junction North, Broken Hill (N.S.W.) Co., to consider the resignations of Messrs. J. S. Palmer and J. H. Stephenson, Sydney directors, in favour of Messrs. Alexander Campbell and C. Gordon Lyon. The trouble has been created by a Melbourne section of the shareholders, who are dissatisfied with the representation, and think that the Victorian capital should be more largely represented on the board. There is no objection to the gentlemen named other than their locus.

Chillagoe Limited reports that the railway receipts for the month of June amounted to £8321, and for the three months of the financial year ending 30th June, £24,297. For the corresponding periods of the previous year the respective amounts were £8084 and £24,396.

The gold imported into New South Wales last month was—coined, £2700; uncoined, £58,371. The exports were—coined, £130,251; uncoined, £33,666.

The plant of the New Imperial Company, Buninyong (V.), was sold last week by auction by Messrs. Bell, Lambert and Co. for £1300 to Messrs. Miller and Co., of Ballarat, who subsequently disposed of it in small lots. The New Imperial mine had been constantly worked for nearly 60 years. It is expected that the proceeds of the sale will enable the directors to declare a final dividend of 1/- per share. There are only

13,000 "live" shares in the company, the balance of the issue of 30,000 having been forfeited for non-payment of calls.

The Minister of Mines stated in the Victorian Legislative Assembly last week, in reply to Mr. Bowser, that the dredging company now working on the Freeburg public reserve was doing so by the authority of the Cabinet. It had been decided by the Cabinet that a lease should issue to the company to dredge through the recreation reserve—an area of under two acres of low lying ground—to enable the company to get from one lease to the other. The land was worth not more than £3 per acre.

The Shell Transport and Trading Co. Ltd. made a profit of £1,159,113 in 1912 after allowing a sum of £1,100,000 for depreciation by intermediary companies. After deducting expenses and an amount for depreciation of securities £18,280, there remained £1,135,818, part of which was devoted to paying a dividend at the rate of 30 per cent. for the year, and £265,194 carried forward.

The general manager of the Briseis Tin Co. has reported that it is not the intention of the board to exercise its option of purchase over the property of the East Bauca Co., situated near Branxholm, Tasmania.

Subsequent to the receipt of the report of the managing director of the company, who recently visited Australia to enquire into and report on the position of the company, the British Australian Oil Co. set up a committee to enquire into the company's affairs with a view to making recommendations as to the company's future policy. A cable just to hand states that the committee has recommended the strengthening of the directorate, and the appointment of a general manager, with full powers, in Australia. The scheme of reconstruction provides for a levy of 5/- per share. The committee was not, however, unanimous in its finding, and individual members are preparing separate reports.

Giving evidence before the Arbitration Act Commission, Mr. N. J. Clark, representing the Hunter River Collieries Defence Association, drew attention to the disparity between the maximum penalty of £1000 that could be imposed on an employer breaking an award, and the maximum of £10 to which an employee was liable. He thought strikers should not receive strike pay from union funds, and should be compelled to pay their own fines for striking.

The gold received at the Melbourne branch of the Royal Mint during July amounted to 77,258 oz.

A huge block of greenstone measuring 7ft. by 3ft. by 4ft., the largest piece as far as is known ever obtained, passed through Sydney last week on its way to Germany. It is valued at £700, and was obtained at the New Zealand Greenstone Co.'s quarry at Greymouth (N.Z.). Its approximate weight is two tons.

The N.S.W. Minister for Mines has ordered a full enquiry to be made into the accident at the Greta colliery by which a miner lost his life.

Brown coal has been struck by the Government boring party at Morwell (V.), at a depth of 180ft.

## PERSONAL.

Mr. W. F. Link, of Daylesford, has been appointed general manager of the Sloane's and Scotchman's Company's mine (V.).

Mr. Maurice Burke, having resigned from the Pacific Cable Board, has arrived from Suva on a short visit to his parents at St. Kilda (V.), prior to proceeding to his new appointment on the staff of the Deputy High Commissioner of the Western Pacific, to which he was nominated by His Excellency Sir Ernest Sweet Escott, Governor of Fiji. Formal confirmation of the appointment by the Secretary of State for the Colonies will follow.

Mr. E. Massey Burnside, who has been in Australia as representative of the Daimler Company, of Coventry, has accepted the position of general manager of the Melbourne Motor Omnibus Co. Ltd. He will shortly leave for London in the interests of the company, and will be absent for some three or four months.

Mr. Samuel S. Davies has been appointed assistant engineer on the Northern Territory railways at a salary of £450 per annum.

Professor Easterfield, Professor of Chemistry at Victoria College, Wellington, N.Z., has been presented with the Hector medal for research in chemistry.

Mr. Percy A. Fildes, engineer-in-charge and chief inspector of scaffolding and lifts, Department of Public Works, Sydney, has been elected an associate member of the Institution of Electrical Engineers, England.

Mr. W. Jamieson, chairman of directors of the Mount Lyell Co., is about to take a trip to the United States and Great Britain, leaving Melbourne in about 6 weeks' time. He expects to be away from Australia a few months.

## THE INVESTOR'S COLUMN.

### Some Companies Attracting Attention To-day.

(By Our Exchange Reporter.)

### Junction North (N.S.W.).

Few, if any, of the stocks on the mining list were more in evidence during the week than Junction Norths; and, although this was probably owing more to jobbing operation than to increased public interest, it is not unlikely that part of the improvement in price which took place, and which amounted to about 1s. 6d. per share, was to some extent due to the latter cause. Several occurrences have lately co-operated in the interests of the stock: the first, and probably the most important, being the establishing of the value of certain mining residues which have hitherto been regarded as next to worthless from a commercial point of view owing to the difficulty and expense of extracting their metal contents, the above fact having been established by the sale of a parcel of between six and seven thousand tons. The price is not yet disclosed, but it is understood by the market to have been a satisfactory one. As there is a further substantial quantity of the same class of material available, it will be seen that the company has improved its financial position in an unexpected way. A second reason for the better demand for the shares is the fact that two parties are contending in connection with representation on the Board, Melbourne and Sydney shareholders being in conflict, and the result is a rise in the price of shares, which is, however, not likely to be maintained when the cause is removed, that is, unless some other favourable cause exists. This may be found in the present high price of lead—the the main product of the mine, as it is of the other great Barrier companies. The recent quotations for the metal have been in the vicinity of £20, the latest being £19 12s. 6d., and as it is recognised that trade is generally duller than was the case twelve months or two years ago, and as the demand for lead is largely dependent upon trade and industrial conditions, this firmness, while copper and spelter, which are equally dependent on similar conditions, have both had a serious decline in value, have caused a good deal of speculation as to what may be the reason for it. The primary cause now being generally accepted, is that of the unsettled state of affairs in Mexico, which has caused a cessation of work at the mines; and, as that country is one of the great producers of lead, probably to the extent of one-ninth or one-tenth of the world's output, it will be seen that the decrease in demand owing to dullness in trade has been balanced or compensated for by decreased supplies. Some of the financial magnates, whose operations control or largely affect the metal market, are believed to have foreseen this maintenance in value, owing to the above compensating factor, and when the recent set-back in price occurred, to have bought the metal largely to about £15 10s. Some of the "Bears" were caught when the sharp recovery took place, and it may be taken as certain that every endeavour to hold the market up against them will be made, so that the maintenance of a high range of quotations for the metal is not unlikely. The above occurrences help to illustrate the number of considerations quite apart from those in connection with the mine itself, which have to be weighed before an estimate can be made of the value of such a stock as Junction North. With regard to the ore reserves and assets of the company, these have been dealt with in previous articles, and nothing of special importance has occurred since then. It may be sufficient to reiterate that, with lead at about present prices, these shares are worth buying; as indeed are those of nearly all the great Barrier enterprises. And an alteration in the constitution of the directorate by the election of Messrs. Alexander Campbell and Gordon Lyon will probably be to the benefit of the shareholders.

### Caledonian Colliery Ltd. (N.S.W.).

By a resolution of the members of the Stock Exchange of Melbourne, it was recently decided that, in order to have (as far as is feasible) uniformity in practice and charges with other Australian Stock Exchanges, that coal companies should be regarded in future as investment stocks. This determination may, or may not, have been the cause, to some extent, of the business which has taken place in the shares of the Caledonian Co., but it is quite safe to say that for a long while the coal section of the official list has not shown so much vitality. This is, however, owing mainly to the excellent prospects of this stock, which is probably at the present moment the most important coal enterprise in the Commonwealth. The locality of the company's extensive holdings is South Maitland and Newcastle (N.S.W.), where the deposits for close on half a century have furnished a large proportion of the coal requirements, not only of that State and other parts of the Commonwealth, but of outside countries also. The two main holdings of the company are the Aberdare and the Aberdare Extended, with an area of 8600 acres, but other properties, comprising some 2500 acres, have been recently acquired. As far as the value of the coal is concerned, it may be taken as of the very highest quality, both for steam and gas, the tests for the latter showing 13,043 cubic feet per ton, coke per ton 12 feet, and candle power 21.80. There is also a minimum of ash, and the califoric value is exceptionally high—1 lb. being capable of evaporating 14.55 lbs. of water at a temperature of 212 degrees F. This seam underlies practically the whole of the Aberdare properties of 8600 acres. It may, therefore, be taken as certain that in the most important requirements, namely, that of value and quantity of its coal seam, the position of the company is unassailable, and if any further proof than those already furnished by the working results were wanted, it could be found in the fact that the members of a great shipping firm, which has been using the coal for years, were the persons who took a leading part in forming a company for the purpose of acquiring the properties when the opportunity of doing so arrived. It is probable that the holdings would have been acquired and worked as a proprietary company, had it not been that the exigencies of modern business have shown that a certain amount of advertising is necessary in order to bring goods and products more prominently before the public, and in this particular instance such a result is helped to be brought about by the formation of a public company with as widely spread and large a number of shareholders as possible. As the operations are carried on under very favourable conditions, being in the neighbourhood of a deep water harbour and railway, the one important question now remaining to be answered is that of the probable return on the shares as an investment. It must be remembered that the properties were formerly worked by another company, the Caledonian Coal, whose shares were partly owned by Messrs. Coates and Co. (the registered office being in Glasgow) and partly by Messrs. Howard Smith and Co. The latter company bought out the other interests, and floated an Australian company, under the title of the Caledonian Collieries Ltd., to deal with them.

The nominal capital of the present company is £2,000,000, divided into preference and ordinary shares of £1 each, and the first issue was of 750,000 ordinary and 250,000 preference. The latter shares carry a fixed cumulative preference dividend of 6 per cent., but should the dividend paid on the ordinary rise above 8 per cent., then the preference shall similarly increase their dividend, but such increase shall not in any case exceed an extra two per cent. Messrs. Howard Smith and Co., as vendors to the new company, received 600,000 ordinary and 240,000 preference shares, and in February this year they offered 50,000 of the latter to the shareholders in their company, at par. As only the preference shares are dealt with On 'Change, the prices having now risen to 22s. 6d., it will be unnecessary at present to refer to the ordinary, and in any case there is not yet sufficient data available to justify an expression of opinion, beyond that they are probably worth buying, but with regard to the preference shares, it may be said, with confidence, that they appear to be a very sound investment, possessing good chances of an improvement in price.

### Cathcart Central (V.).

During the last two or three weeks the shares in this prominent alluvial venture have exhibited great firmness, the highly payable returns, together with the declaration of a first dividend of 2s. per share, having created a good impression and hardened the hearts of the holders. Neighbouring alluvial stocks also benefited, the turnover in New Langi Logan being on a substantial scale. It came, therefore, rather as a shock when, towards the middle of the week, sellers began to predominate, and prices fell away several points. The reason for the setback was the fortnight's yield, which showed a decline in the average value of the washdirt treated, that is, as against previous returns—the figures being 613½ oz. from 406 fathoms, as against 612½ oz. from 307 fathoms, a fortnight before. The yield was, of course, highly payable, but the reduction in the average value was sufficiently pronounced to attract the attention of market operators, and some selling took place, with the result that the shares declined to about 67s. 6d. It does not take much nowadays to cause a setback in the price of shares—a slightly unfavourable report or falling off in a return will do, and in this particular instance there has not been quite the same confidence with regard to the mine as was the case five or six months ago. This is not owing to any disappointment in the mine itself, but to that experienced by the Cathcart, the neighbouring venture on the northern boundary. This company, after sinking a new shaft in order to work the remaining portion of the gutter in its lease (about 1000ft.), found the value nearer £2 per fathom than £10, as was confidently expected. This fact had something to do with the uneasiness about "Centrals," and, although it was dispelled for a while by the excellent returns, and the announcement of the dividend, it was revived immediately by the falling off in the latest yield. It is not improbable, however, that the management may have thought it advisable to keep the returns at a little over 600 oz. per fortnight, and it would not be wise, therefore, to attach much importance to the average value of the return.

## METAL QUOTATIONS.

### By Cable.

(From Our Correspondent.)

**London, Tuesday.**

There was continued weakness in the metal market, copper again receding in price by about 10s. for spot quotation. Tin was steadier, and firmed as the week advanced to £185 15s. for the middle position. Lead was steady around £19 10s. Quotations were:—

COPPER.—Spot—£63 10s., £62 17s. 6d., £63 2s. 6d.; and £62 17s. 6d.; three months—£63 2s. 6d., £63, £63 5s., and £63.

Electrolytic—£67 10s. and (to-day) £65 15s.

**TIN.**—Spot—£178 5s., £177 10s., £179 5s., and £185 15s.; three months—£179, £178 5s., and £186 5s.

LEAD.—£19 5s., £19 7s. 6d., and £19 10s.

SILVER.—26 13-16d., 26 7-8d., and 27 1-16d.

**ANTIMONY.**—"Star" brand, £30; fifty per cent. ore, £8 10s.

**WOLFRAM** (70 per cent. ore).—32s. 9d. per unit, or £114 12s. 6d. per ton.

MOLYBDENITE.—2s. 6d. per lb., or £280 per ton.

**MANGANESE** (50 per cent. ore).—Unchanged at 9½d. per unit, equal to 39s. 7d. per ton.

## ROCK CRUSHING TESTS.

A series of investigations on rock-crushing has been carried on at McGill University (U.S.), and the consumption of power has been accurately measured for several standard types of crushers, working on different kinds of rock and crushing to different degrees of fineness. The result of these experiments is finally to disprove the law of crushing originally enunciated by Rittingen and accepted by nearly all authorities since his day, and to show that the more recent theory advanced by Kick is either true or so nearly true that it affords a close working approximation to the truth. Kick's law was originally stated in 1885 as a general theorem in mechanics, and it is only within the last few years that it has been applied to ore dressing, first by H. Stadler in South Africa, and more recently at McGill. It may be stated as follows:—The power necessary to crush a given quantity of any given rock from any known size, to any other known size, will be directly proportional to the reduction in volume of the particles; in other words, it will take almost three times as much power to crush 1in. cubes to ⅛in. cubes as to ½in. cubes; or it will take twice as much power to crush from 1in. to ¼in. as from 1in. to ½in.

The McGill experiments were first directed to settling the question of the truth of the theory, and the results of a long series of experiments agree with the law to within the reasonable limits of error of experiment on so variable material as broken rock. Next the efficiency of a single crusher was studied over different parts of its range to determine whether it gave as high efficiency when working from ½in. to 1in. as from 1in. to 2in. or from 2in. to 3in. Other crushers, such as stamps, rolls, and tube mills, were similarly studied with a view to finding the most efficient range of each machine and the comparative efficiencies of the different machines. Obviously the amount of ground to be covered is enormous, especially as the experiments have to be carried out on a large scale, yet with the utmost care to eliminate errors. Therefore, only a small part of the work has as yet been completed, but enough has been done to justify the preparation of a preliminary report which is now being prepared for publication. It is believed that it will soon be possible to state with a considerable degree of certainty what type of crusher is most suitable for a given degree of crushing, and to state what output may be expected for any rock for which the size-limits have been determined.

## RAND MINES STEAM AND ELECTRIC WINDING.

(From Our Johannesburg Correspondent.)

Electric winding on the Rand is probably carried on to a greater extent than on any other goldfield of the world, despite the fact that both coal and water are plentiful and cheap. A short time ago several interesting papers were read on electric hoisting, in which prominence was given to the many advantages the Ward-Leonard system of control possessed over the plain three-phase system, which by one of the leading groups had also been somewhat extensively adopted on the Witwatersrand.

At that time the discussions on the merits and demerits of the two systems were somewhat lively, but the practical experience of the two methods at that time was limited, and the conclusions, largely based on theoretical grounds, but the bulk of the opinions expressed seemed, when taken altogether, to favour the Ward-Leonard system.

Since that date quite a year's actual experience of electric hoisting has been gained on the Rand, and it may not be amiss to point out some of the results of the additional experience as to costs and safety thus gained. An interesting paper was recently read before the local Institute of Electrical Engineers, giving an account of the costs of electric hoisting in a vertical shaft at the Brakpan mines, where both the Ward-Leonard and three-phase systems are at work. In this instance an average of 45,000 tons of rock are hoisted from one level at a depth of 3825ft.; in addition, 900 men per shift have to be handled, as likewise all tools and materials. All descriptions of work are done by the two hoists, but the bulk of the rock is hoisted by the three-phase system, the men and materials being mostly handled by the Ward-Leonard system.

The following are the actual results obtained during a period of six months' winding at this particular shaft, the full details of which are as follows:—Depth of wind, 3825ft.; total number of tons hoisted, 260,727; total number of trips with men, 28,050; total number of trips with material, 3186; total number of trips, 79,558.

| | £ | s. | d. | Cost in pence per ton of Rock Hoisted. |
|---|---|---|---|---|
| Cost of purchased power . | 4,317 | 3 | 8 | 3.973 |
| Engine-driver's wages .. | 1,238 | 12 | 6 | 1.139 |
| Banksmen, Onsetters, and Skipmen .......... | 853 | 12 | 4 | 0.786 |
| Native wages ........ | 961 | 1 | 7 | 0.885 |
| Repairs and maintenance to engines, ropes, sheaves and skips ........ | 996 | 3 | 5 | 0.917 |
| Stores ............ | 271 | 14 | 5 | 0.249 |
| Rope Renewals ...... | 1,560 | 0 | 0 | 1.436 |
| Total cost per ton hoisted .... | | | | 9.385 |

It may be noticed that a good many items outside actual winding costs are mentioned above, and that power itself only represents 43 per cent. of the total cost, whilst repairs and maintenance to engines, ropes and skips nearly amount to the same as enginemen's wages. On the whole, however, the costs for stores, repairs and maintenance of electric hoists—that is, inside the engine-room—are lower than those for a similar-sized steam plant.

It is of course difficult to make true comparisons between the costs of steam and electric winding in this instance, as steam has never been in operation at this mine, but on the Rand, with best Middleburg coal, the efficiency under normal conditions has been estimated to vary from 32 to 50 foot tons per lb. of coal consumed. Taking the highest efficiency and coal at the lowest ruling price, this means that 816 foot tons would be lifted at a coal cost of one penny. If we compare these favourable results with those obtained by the electric winders under consideration, we shall find that the electric winders have still an advantage, even in the matter of power costs over steam, when every advantage is conceded to the latter. In the instance quoted, the electric winders lifted 260,727 tons of rock from a depth of 3825ft., and handled men and tools amounting to 40 per cent. of the total work performed for a power cost of £4317, the work done in rock hoisting alone coming out at 960 foot tons for one penny, as compared with 816 foot tons under the most favourable conditions for steam.

Some interesting facts and figures relating to power costs only were also given in a description of the three-phase hoists at the Bantjes Consolidated gold mines, where steam winders have been converted into electric hoists and better facilities for comparison between costs of steam and electrical power afforded. At the No. 1 shaft a Grant-Ritchie steam winder, with parallel drums 6ft. diameter, has been converted into an electrically-driven hoist through single reduction gear ratio 127/42, by a three-phase motor, 2000 volts, 600h.p., with a synchronous speed of 375 revolutions per minute, controlled by a four-panel contactor board (reversing switch), and liquid starter of the S.A.G.E. type. The electric hoist was started on the 2nd of May, 1911. At the No. 2 shaft the winder is similarly equipped in every respect, except that the motor is 900h.p., 2000 volts, and the rheostat proportionately larger. It is hoisting rock from a minimum depth of 2500ft. on an incline of 34 degrees, and as there is a great deal of development work and shaft sinking in this shaft, in which the winder has to deal entirely with the transporting of rock, men and material to and from the mine, the figures given for this winder when based on tons hoisted are of very little value for the purpose of comparison with past conditions; the number of rock trips to the total number of trips is approximately 60 per cent. The description of this winder and the actual costs from October to July, 1912, a period of ten months are, however, appended.

The hoist is a converted winder, with 6ft. drums driven through single reduction gear ratio, 127 to 42, by three-phase induction motor, 2000 volts, 900h.p., 362 revolutions per minute; maximum speed, 2000ft. per minute. During the period October to July, 207,813 tons of reef and rock were hauled and 470,327 units consumed, averaging 2.263 units per ton hoisted. The total cost of power at 0.5617d. per unit for that period was £1100 15s. 4d., the cost of the current only in pence per ton hoisted averaging 1.271d. If spares, renewals and labour costs in connection therewith be added, amounting in all to £149 8s. 5d., the total electrical costs come out at £1250 3s. 9d., or 1.443d. per ton hoisted.

At the No. 1 shaft a Grant-Ritchie winder is installed with parallel drums 6ft. in diameter, driven through single reduction gear ratio 127 to 42, by three-phase induction motor 2000 volts, 600 h.p., 362 revolutions per minute. During the period October, 1911, to July, 1912, inclusive, this hoist raised 133,684 tons and used 231,392 units, the units per ton hoisted averaging 1.730. At .5617d. per unit this amounted to £541 11s. 4d. as the total cost of current used, and averaged 0.972d. per ton hoisted. If the amount for spares, renewals and labour be added, amounting to £104 13s. 9d., a total electrical cost of £646 5s. 1d. is arrived at, making the total electrical costs per ton hoisted as 1.160 pence. This winder hoists from a minimum depth of 482ft. to a maximum depth of an incline of 34 degrees of 1535ft., works from 6.30 a.m. to 10 p.m., and deals entirely with all rock, men and material transported to and from the shaft.

It is possible, however, in this instance to make a reliable comparison between running this particular shaft and hoist by steam and electricity. From November, 1910, to April, 1911, including coal, firemen's wages, and maintenance charges on two boilers running three shifts, over a period of six months, the average cost was £102 16s. 3d. per month. The average cost of current for five months, from May to September, was £65 per month, to which £10 per month on the average must be added for renewals and repairs, making a total of £75 per month as electrical costs, as against £102 16s. 3d. actual costs per month for steam. The actual costs from 1st October, 1911, to 31st July, 1912, for running two shifts, as from figures already given, will be seen to average £64 12s. 6d. per month, which confirm in a striking manner the other figures quoted.

The mine manager of the Great Zeehan Dundas Silver Lead Mining Co., N.L. (T.), has supplied the legal manager (Mr. F. A. Taylor, Melbourne), with the following account of the ironstone formation, carrying payable tin, found on the south-west section of the company's property, as reported in the "Mining Standard" a fortnight ago:—"The formation appears to be on the surface about 20ft. wide. I have picked this up at the foot of the spur rising from the flat country and traversing in a north-west direction through the northern section into the highest point in the range. Here I marked off an additional section in your name, and here the ironstone outcrops in immense boulders and appears to be chains wide; in fact, the mountain appears to be one mass of iron, which stands out boldly from the surrounding country, and is about 900 to 1000 feet above the point where I first picked up the formation, and distant about 60 chains. If we get the same values in the stone in the mountain as we got in south section this will stand as an equal to Mt. Bischoff, as we have the quantity, and now we have to prove the values." In view of the two recent unexpected and rich developments, the directors have determind to offer 100 of the reserved shares at their face value, £2 each, to provide capital for the further development of the mine while the rich galena (silver lead) ore is being driven on and broken out.

# MINING IN NEW SOUTH WALES.

## Broken Hill.

(From Our Correspondent.)

Broken Hill, July 11th.

The Broken Hill mines, despite the in and out running of the share market, have been doing wonderfully well of late. The output for June in mineral exports from the Barrier was worth £474,437, made up as follows:—

| | | | |
|---|---|---|---|
| Silver lead concentrates, | values | .. | £364,154 |
| Zinc concentrates, | " | .. | 103,933 |
| Silver lead crudes, | " | .. | 5,663 |
| Silver lead slimes | " | .. | 687 |

This total of £474,437 is one of the best of the year. The output for the half-year was valued at £2,019,878, against an (estimated) output for the whole of 1912 of £4,436,759. Although the zinc concentrates in tonnage were much greater than the lead concentrates, the slump in metal values made a vital difference. The drop in spelter down to the twenties has strongly affected zinc producing concerns, but continental advices assert that the zinc metal will get back to combine standard before long. Also according to private advices the fall in lead values is probably only temporary.

Consider these figures: March quarter £908,462, June quarter £1,111,416. In the March quarter occurred a serious strike which minimised both output and sent away for several weeks.

Taking the figures, all in all, Broken Hill apparently is in a particularly good position, and given higher metal prices the field would be in an enviable position. Broken Hill is able to fight against these temporary drawbacks and manages to do it when least expected. This is not only due to the wonderful producing capabilities of the leading mines, but also to great metallurgical improvements which the companies have adopted. Ore, of next to no value a little while ago, is now of good value after treatment.

The Zinc Corporation, even with the low price of metals, estimated its profit for June at £14,416. The Amalgamated Zinc (De Bavay's) estimated its profits at £13,097. Both the companies are treating increased stuff. The easing off of the stacks at the Border and in Broken Hill gives them this chance.

And, apropos, the good work of the Amalgamated Zinc will show well for the North mine, which has just completed one of its best half-years. This mine is proving at depth, and the outlook has, on the lower levels, increased tremendously in standing.

The British, working for the five days ending June 5th, mined some splendid ore, even though mixed with low grade. But good grade sulphides continue to show at all levels even including down to No. 8 at 800ft. level. The mill started the new half-year on good foundation. Diamond-drilling from No. 9 and No. 7 levels proved possibilities of big ore bodies. Mr. G. C. Klug, general manager of B. M. and Co., is again on a visit to the field. Mr. W. J. Loring, who recently visited the field and had so much to say in its favour, returned to England this week.

The Junction mine, for the latest week, treated 1282 tons crudes, the concentrates averaging 58 per cent. lead, 25 oz. silver, and 6 per cent. zinc. The Junction North, for the same period, treated 1675 tons crudes, 843 tons purchased ore, and about 1400 tons other products, its lead concentrates going 56.7 per cent. lead, 32.8 oz. silver, 13.7 per cent. zinc. Junction mine still reports a shortage of men, and Junction North mine also advertises daily for working help.

The North mine continues to develop in rich fashion at the lower levels, so does the British. The South mine still develops as one of the best along the line of lode.

South Extended, which opened up very encouragingly at its 1150ft. level, has suspended underground work for a time: the why probably only the directors and the manager know.

Sulphide Corporation, for its last official week, treated 4117 tons of crudes; concentrates produced went 65.6 per cent. lead, 32.8 oz. silver, and 7 per cent. zinc.

The South Blocks (Zinc Corporation) continues to do everything that could be expected of it in both the main lode and the zinc lode. Both ore bodies are developing well, each week more and more proving the existence of valuable bodies underfoot. On the developments of the South Blocks, the Silver City Blocks ought easily to find favour with Melbourne speculators.

This is racing carnival week in Broken Hill, and mining this week plays second fiddle to horse.

## Bathurst District.

(From Our Correspondent.)

Bathurst, July 11.

A good bit of money was spent a few years ago by Bathurst speculators at Mount Werong without success. Assays of silver lead ore went very high, but no decent-sized lodes could be discovered, most of those encountered being stringers or narrow veins. Its inaccessibility was another drawback, it being over 40 miles distant from the nearest railway station. A further attempt is being made to prospect the field. Messrs. Jennings and Savage applied recently for a 10 acre lease of what is known locally as the Flat reef, and since then a further 30 acres has been applied for, and it is understood that considerable capital will be available for development. This mineral belt of country is a continuation of the Yeranderie field, from which it is distant about 10 or 12 miles as the crow flies. A 10 acre lease has been secured by Messrs. Chapple and Johnson at Wiseman's Creek, adjoining the Phoenix copper mine. They are working on a gossan lode 16ft. wide, and have a shaft sunk on it 30ft. The gold values run from 5 to 8 dwts., and with so large an ore body it looks like a good show. A Huntington milling plant has been erected, and is about ready to commence work, and if the trial runs are satisfactory, it is intended to erect cyanide works.

An engine and pump have gone forward to the lease recently taken up by Cadogan and party, 2 miles up the Turon River from Sofala. Trial holes will be put down to test the value of the ground, and the water being heavy a pumping plant is necessary. Previous to this they had a Government boring plant which did not prove a success, as where boulders were encountered the machinery invariably broke down.

The latest crushing from Hawkins' Hill Reward mine from the new reef returned 28 oz. from 15 tons of quartz. The shaft is now down over 100ft. on the reef, and excellent stone is being raised. Work in connection with the equipment of the Exhibition shaft is well advanced. The poppet heads are in position, the boiler built in, and winding engine in position. An aerial ropeway is to be installed, which will run the trucks of ore direct from the shaft into the mill.

A few weeks' work should complete all this, when regular returns from the twenty-head plant may be expected, and from the enormous body of ore opened up in the Frenchman's Reef, it is anticipated that substantial profits will be made. It is pretty safe to predict that this mine will at an early stage be on the dividend list. At the 320ft. level, the unwatering drive is proceeding north, and on the hanging wall side the reef is carrying coarse gold, probably worth 2 oz. per ton, but this will not be broken down until the Exhibition shaft is ready for haulage. The big cavities of the Frenchman's Reef further south come in very handy for the storage of all mullock, there being no necessity to haul it to surface. At the 190ft. level, from Exhibition shaft, going east, a payable reef has been intersected, and is being driven upon north. The continuation of this crosscut will shortly intersect the new reef, and when continued further, will also strike Rowley's Reef, and all in virgin ground.

The Amalgamated Hill End have several tribute parties at work in the upper levels, and these are meeting with fair success. After a good bit of trouble Carroll and Beard's shaft has been located at the bottom tunnel, and communication made. The old shaft is not in very good order, being blocked up with a lot of timber and debris, but when repairs are effected this will give a good supply of fresh air, which is badly needed. The level going north is making good headway, and one of the leaders in the face is carrying fair gold. It is evidently the intention of the management to push forward this level as expeditiously as possible, and this may be considered to be the best prospecting work the company has undertaken since its inception.

The battery being situated at the mouth of the consolidated or upper tunnel, 300ft. above the present level, the ore will have to be raised this distance. An aerial tramway has been erected for this purpose.

## Orange District.

(From Our Correspondent.)

Orange, July 11.

During the last week additional hands were put to work at the Carcoar ironstone mines, but even now only 25 men find work there. At one time these mines employed nearly 100 men, but after the strike of miners, about 18 months ago, the numbers were gradually reduced until a short time ago only seven hands were employed. The continual labour troubles at Lithgow have been responsible for this, coupled with the fact of the cancellation of the State Government contracts. As soon as matters settle down at Lithgow it is expected that more men will be put to work at Carcoar.

At Brown's Creek, in the same locality, pumping operations have been commenced at the old gold mine.

At the Cadia copper mine the weekly disbursements in wages, fuel, etc., amount to £1000 per week. If Messrs. Hoskins Bros., of Lithgow, who hold options of some country at Cadia, carrying an inexhaustible body of the highest grade ore, decide to open up their property, there will be a big future for Cadia, and, incidentally, Orange. The bad state of the Orange-Cadia road is somewhat of a factor in the development of the property. At the Red Hill, which is one of the worst spots to negotiate in wet weather (the grade being 1 in 6), it recently took 20 horses all they could do to pull six tons of coke to the top. Even with these difficulties nearly £3000 worth of copper is being mined each week. The Cadia Company has offered the Canobolas Shire Council £500 towards the provision of a more accessible deviation, but the latter body seem apathetic towards the proposition. There is a big future before Cadia, as the ore in sight at present will last for years.

## Lithgow District.

(From Our Correspondent.)

Lithgow, July 12.

The oil retorts at Torbane, one of the C.O.C.'s works on the Mudgee line, was permanently closed down yesterday. Nearly the whole of the employees have been paid off, and are leaving the village.

Word has been received in Lithgow that the Burraga Lloyd Company's works are still dragging along, handicapped as they are for want of fuel and men. Through the recent continual rains causing the tram line to sink in places, the engines and wood-trucks are almost as often off the rails as they are on them, while the bush timber country is so boggy that the teams have great difficulty in drawing wood to the terminal fuel depot.

---

The Leadville party, who despatched 100 tons of copper ore for treatment thence to ascertain if such a course would prove payable, realised a profit of £2 10s. per ton, after paying heavy cartage prices, freight, mining, smelting, etc.

During the fortnight the Lloyd Copper Co.'s mine, Burraga, treated 1500 tons of ore for 249 tons concentrates worth 14.06 per cent. copper, and 91 tons 15 cwt. picked ore worth 11.45 per cent. Fifty tons of matte was produced at the mill, averaging 64.4 per cent. copper, and 16.8 dwt. gold, and 15 oz. silver per ton.

What is believed to be the old reef from the Baden-Powell mine has been picked up within half a mile of the township of Parkes. Spice and party report having obtained coarse gold in that locality.

The old Blake mine, at Bushy Hill, Cooma, and surrounding country, has been taken up by a syndicate, who claim to have discovered the lode the Blake mine failed to locate. It is said a large quantity of mineral, worth 25 per cent. copper and showing a little gold, has been discovered near the surface. Small parcels are being despatched for treatment.

---

# VICTORIAN MINING ACTIVITIES.

## The Central Plateau Mine.

### An Interesting Position.

(By Our Ballarat Correspondent.)

The cutting of the lode in the 700ft. east crosscut at the Central Plateau was the most notable development of the week. The lode is lying just where it was expected to be found, but is of better appearance than where it was intersected in the level above. That, perhaps, is not surprising, when it is learned that the track passed through recently in the 700ft. crosscut was larger and more mineralised than in the level above. In fact, the country throughout is better looking in the deeper level, and having regard to the fact that the lode is poorer in the stopes above the 600ft. level, where they have been breaking down stone from a height of 50 or 60ft. above level in a short distance along the drive, it would appear that it is improving with depth.

They are not likely to stope much higher, as the alluvial bed lies above the quartz, and an immense sea of water must be held up by the intervening rock, though they might, with safety, rise another 50ft. or 100ft.

Latest advices show that the lode has been penetrated 4ft. without revealing the footwall, and a truck full of stone hauled up carries gold throughout, and is well mineralised and nicely laminated. They will, as soon as possible, start driving northerly, and it is expected that the payable shoot of gold will be met in 40 or 50ft. of driving. In the 600ft. level, this shoot of gold is about 400ft. in length, and after a barren stretch of nearly 200ft. the lode is of better quality, though not equal to the stone in the shoot nearer the shaft. The crushings so far have averaged close up to half an ounce per ton, and with the generally improved prospects in the deeper levels, it is hoped that this average will be exceeded when the stampers get to work again.

So far, the company has been making use of the Sebastopol Plateau No. 1 plant.

Up till the half-yearly meeting, in April last, the company had crushed [illegible] tons for a gold return of [illegible] oz., and including nearly 200 oz. from the pyrites.

The company has shifted its battery (20 heads) from the old site to a convenient spot adjacent to the new shaft, and crushing will be commenced when the lode in the bottom level has been opened on. The battery is equipped with a h.p. boiler and four Wilfley tables.

The present shaft is the second sunk by the company, which worked the Consols and Guiding Star lodes from the old shaft. The capital with which the company sunk the new shaft was partly subscribed by British investors, who hold about 15,000 out of the 25,000 shares issued, being introduced to the company by Mr. P. R. Sutherland, when he visited the old country about four years ago.

It is just over 15 years since the company paid its last dividend, one of 1s., and the total amount distributed is £13,750. The paid-up capital is 74s. 1d. per share. The dividends came from the Guiding Star lode, and a lot of money has since been expended in keeping the water under control in the old shaft, especially when the Star of the East, Band and Loch, and other Sebastopol companies ceased pumping. There is now no fear of trouble from the water, very little inconvenience being caused in that way in the 600ft. level.

The work done so far is the sinking of the shaft to 830ft., and the extension of the 600ft. and 700ft. levels east of the shaft, and driving north and south on the lode at 600ft. A plat has also been cut at 800ft. Some shareholders are hopeful of profitable prospecting work being carried on west of the shaft. There is indeed good scope for prospecting in all directions, the shaft having been sunk in new country, save that the Star of the East worked the lode now being exploited in the Central Plateau, which is known as the Albion, or western lode, for some distance; but did not find it profitable working so far from the shaft and having trouble with the water from the other lodes nearer at hand. The old Albion workings are about 500ft. or 600ft. still further north of the face of the 600ft. level, and the shoot of gold may be found to extend right to that point. Anyway, as far as can be determined, the Central Plateau will not tap the old workings, and therefore will not drain the locked-up water that compels a hands-off policy right along the old line of mines of the Sebastopol Plateau until at least such time as a very powerful pumping station is established.

To the north of the Central Plateau No. 2 shaft the North Central Plateau are about to commence sinking, having bored first to get a suitable site for a shaft. This company is an off-shoot of the Central Plateau: but away still further north, on the same line of country, is the Central Plateau Extended Co.'s shaft, which is down about 130ft., and is now on the second rock. It was hoped the remainder of the sink would be in reef, and the existence of rock is a disappointment. Some delay has been occasioned during the past week or two owing to the shaft not being huddled up sufficiently where the drift was wet; but the trouble has now been remedied.

The Sebastopol Plateau No. 1 are operating away to the south of the Central Plateau, and have a fairly extensive scheme of prospecting in hand, which also embraces what is thought to be the Albion lode; but a payable shoot of gold has not yet been located.

Altogether, the prospects of a revival in the once famous plateau field are very bright, and credit is due to the Bent Government, of which Mr. P. McBride was Minister for Mines, for coming to the help of the Central Plateau Co., without which, it is held, the British shareholders would not have been persuaded to help in the sinking of the new shaft.

## Bendigo and District.

(From Our Correspondent.)

The gold production for the week ending July 12th, 1913, amounted to 2826 oz. 3 dwt. The principal producers were Golden Pyke, 252 oz. 12 dwt.; South New Moon, 237 oz.; Central R., W. and Blue, 229 oz.; Catherine Reef, 184 oz. 12 dwt.; Carlisle, 146 oz. 14 dwt.; Williams United, 142 oz. 14 dwt.; Windmill Hill, 120 oz. 12 dwt.; Ironbark, 99 oz. 18 dwt. Three companies disbursed profits totalling £3872 10s., viz.:—South New Moon, 1s., equal to £1600; total to date, £496,800. Golden Pyke, 1s., equal to £1372 10s.; total to date, £73,940 7s. Carlisle, 6d., equal to £900; total to date, £54,900.

Carlisle scrip was accepted to the substantial advance of 14s. 6d., the last lift of 1s. per share following on the announcement of an improvement in the 1264ft. north level. This level, like those at 1200ft. and 1140ft., is being extended on the east back of the Victory reef. It is advanced to only a few feet north of the shaft, the last firing showing several colours of gold in a fair number of spurs. In extending the main crosscut to the back at this depth a few nice colours of gold were found in a large spur, but for 20ft. before reaching the bedded vein of stone on the back, crosscutting was through country rock. A rise was subsequently put up to the west of the back, meeting with spurs of lower value, and trial crushings were unpayable in the first 45 of rising. In these circumstances, it was not anticipated that anything of importance would be met in driving north, till the pitch of the more auriferous quartz, associated with the two faults, was reached: a matter of about 200ft. from the shaft. This earlier development, therefore, came as a surprise. It is, however, doubtful if the improvement at this depth will show any permanency, and apparently the company will have to rely chiefly on the quality of this spurry formation around the two faults now existing at 1200ft. and 1100ft. to maintain a profitable gold production. From an inspection of these workings during the past few days, it is patent that shareholders are in for a considerable period of steady dividends. Of late the south stopes at 1140ft. and the side stopes at 1200ft. have shown more gold. At the former depth the leading side stopes, at 15ft. west of the Victory back, have been squared to the end of the level, at about 180ft. south of the shaft. This level was driven on the east back, but as the stone allied to the upper fault has risen overhead, there is 12ft. of "clean" country immediately west of the back, the west dip of the fault quartz again bringing the auriferous stone within the range of the side stoping further west. In order to keep in closer touch with the formation, driving will now be continued from where the leading side stope is situated. The last few breakings at this point have exposed a nice sample of gold in spurry quartz, of a well mineralised character. At 40ft. nearer the shaft the second side stope is operating at 37ft. from the back, and spurs, with a little gold, are still existing further west. The only other stope is above the level timber, where the reef is consolidated for a width of 12ft. to 14ft.; highly mineralised and shows coarse gold. There has been an enrichment in this stope, since beating out the intrusion of mullock. This stope is 85ft. south of the main crosscut and the height attained is not more than 8ft. above the timber of the level. From here the top fault is probably 35ft. overhead, and there should be a fair asset in the block of crushing material running up to this fault for the full length of the present south workings at this level, as this portion of the deposit proved productive till it disappeared with the north pitch below the north level. From where the slide went underfoot the stone has been stoped up to the break, for a length of 80ft., the south face of this stope showing a series of spurs, and 4ft. of fault quartz closer to the slide; at a few feet north of the shaft, running to over 20ft. above the timber. The stoping carried out in this end demonstrates that there are also gold bearing spurs to 15ft. above the top fault. In the vicinity of this slide, it is now apparent that there is a height of more than 60ft. of workable quartz, varying in width of from 15ft. to 35ft. Though driven on for 300ft. in length at 1140ft. and side stoped for a little over 250ft., the overhead stoping toward the break is still less than 160ft. Of the latter, only 90ft. in length has been extracted up to the faulting. Since the opening of the year 10,749 tons have been milled for 3348 oz. 13 dwt., exclusive of mineral. This has permitted of £7200 being paid away in dividends, equivalent to 4s. per share. Now that the opening up work is well advanced, an equally prosperous period seems assured before the close of 1913. What appears to be the most important of recent improvements is in side stoping off the 1200ft. rise, at 40ft. ahead of where the top fault left the 1140ft. level. Though the rise and winze traversed good stone for the greater part, the prospects in the 1200ft. level were not as favourable in driving at this point. Recent favourable indications in side stoping suggests the location of better grade quartz as operations extended west from the back. This stope is 40ft. below the top slide, extending southward toward the shaft. The level is an intermediate off the rise connecting with 1264ft., and is in 30ft. beyond the last rise. It is officially stated that the last 25ft. of driving revealed very satisfactory prospects, and the slide is still 30ft. overhead in the end. Driving will be resumed during the next few days. Next month there will be a suspension of stoping for about a fortnight to form a plat and start another crosscut to the same back at 1060ft. This will permit of filling up the 1140ft. south stope and allow of the formation being followed in this direction.

Windmill Hill again disclosed one of those enrichments of the 2610ft. reef in the last few days, which are periodically met in driving and stoping. This time the best results are from the stopes over the main south level, an average of a trifle over 2½ oz. per ton being obtained. There is still a fair length of solid ground ahead. At 2110ft. the company are driving on the east back of the Koch's Pioneer 1900ft. reef. As yet, the stone is small and of very low value, but the shoots of gold in this eastern reef being also rich and short interesting discoveries are anticipated weekly.

Golden Pyke return, averaging over 15 dwt. per ton, reflected a substantial improvement. This was partly due to the resumption of stoping south from the No. 1 rise over 543ft. This portion of the reef has been standing for some time, gold showing freely along the back of the previous stope. Having carried a second stope into the Golden Age boundary, it will now be possible to draw on this higher grade stone. The second stope failed to reveal anything of value adjacent to the boundary, the large spur seen in the first stope at this point temporarily affecting the deposition of the quartz along the east back. For the present, the only stoping northward at this depth is in taking up the reef for the length of 50ft. and a depth of 8ft. to the Constellation boundary, where there is 12in. of fair quality stone. After completing this work, the overhead stopes will be continued to reach the rich shoot traversed in the No. 3 rise. The 447ft. north level has been resumed on a thin vein of quartz. There is another 130ft. of solid ground in this direction, where the continuation of the rich stone seen in the No. 3 rise may be located, as it rises north. The first stope takes 10in. of stone and a few colours of gold. In the second stope is 6in. to 10in. quartz of good quality. No change of note has been observed in the south stope. In extending the 643ft. south level to 280ft. and within 30ft. of the boundary, the reef has greatly contracted. To determine if any more quartz exists further east, it is intended to break through the hanging wall at this point. In rising to 68ft. over the 447ft. north level, on the tribs' old reef, or outer back, the outlook is more promising, several colours of gold showing in 6in. to 10in. of well mineralised quartz.

Great Northern reported several colours of gold in 15in. of quartz, at 390ft. in the 1240ft. north level. This level is going in on the lower extension of the west back of the massive centre formation, now being stoped at 1184ft. Previously there had been from 15in. to 2ft. of stone, but no gold. The development is evidently important, as the level is getting further into the formation with the north pitch of the beds, and an extensive width of crushing material is known to exist under the 1184ft. workings. At the latter depth the north level is extended to 787ft. on this reef, which is still more than the width taken in driving, a colour of gold showing at intervals. Further east the parallel level on the McDuff back is advanced to 846ft. and 146ft. north of where the last winze was put down from the intermediate. Gold is visible in this end in 4in. of bedded and several spurs. These spurs are stated to be pitching less rapidly, which should give a greater length of stoping ground at this depth. Just now the higher grade stone is being drawn from the stope 90ft. south of the old winze, and the stope operating southward of the crosscut at 700ft. north of the shaft, taking 9ft. of crushing material. At 2680ft., the north level, on the deepest reef yet found in the mine, is extended to 382ft. There is 2in. to 6in. of bedded quartz here of no value.

Clarence United average of close on 10 dwt. per ton from the 2280ft. and 980ft. levels shows a further gain, attributable chiefly to the material from the former. This level is opening up a west leg at 206ft. north of the main shaft, which tribs formerly worked with good results. About 12in. of stone is available. A rise is to be extended on the same back at 400ft. further south and about 80ft. from the New Argus boundary. At 980ft., an east back has been reached in following the eastern system of spurs for a width of 35ft. off the north level, a few nice colours of gold showing for a width of 7ft. overhead, prior to uncovering the backs. Levels will be driven on the back and this more productive portion of the reef stoped. The 835ft. crosscut to meet the 935ft. rise is in clean country, but a spur with a little gold is showing in the latter. Both the rise and crosscut are at an interesting stage, the continuation of the South New Moon 980ft. spurs being shortly expected. On the Paddy's Gully line the 389ft. south level, on the spurry quartz in centre, shows an occasional colour of gold, but the trial milling was unsatisfactory.

Victoria Consols 512ft. north level is showing more mullock at 230ft. from the plat, but the reef is still consolidated overhead. The level is along the wall and lavas, with more quartz to the east. Little gold is seen, either in driving or stoping, only three fine colours showing in breaking last week's crushing of 204 tons, though the payable yield of 47 oz. 17 dwt. was obtained. Southward the level is in 244ft., opening up several highly mineralised spurs in the centre beds. Similar prospects are visible in the first stope, the reef consolidating upward in the neck formed by the lavas. After a suspension of a couple of weeks, the 600ft. north level on the east back is being continued. At the main shaft on the New Chum line the company are rising over the 344ft. south level, to intersect the upper portion of reef, which formerly proved profitable north of the shaft.

Goldfields Consol continue to meet with encouraging results in squaring the 305ft. stopes into the north boundary, several colours of gold showing in 3ft. of quartz, toward the close of the term. These stopes are being squared in, prior to driving into a 200ft. block of ground, held on tribute from the Goldfields North Co. At 730ft. the old west leg affords 1ft. to 2ft. 6in. of reef and spurs, but the quality is inferior. Two other formations are shortly expected to be reached, in rising at this depth and in crosscutting at 510ft.

Princess Dagmar 853ft. intermediate level has passed through the inverted cap of the middle reef and now shows a few spurs containing gold. The weight of the rich shoot traversed in the level a short time ago will be proved to some extent by the stope following. Providing the higher grade quartz continues over the back of this stope, a steady gold production will be possible by starting the rise here and increasing the working faces. On the other hand the failure of this shoot to extend far overhead would necessitate under stoping to maintain recent averages. The back stopes toward the Golden Age boundary will be restarted shortly, after lying idle for six weeks.

## Castlemaine and District.

(From Our Correspondent.)

The gold bought by the banks at Castlemaine for the quarter ending June 30th amounted to 3084 oz. 0 dwt. 17 gr., being: quartz, 50 oz. 18 dwt.; alluvial, 3033 oz. 2 dwt. 17 gr. This is a decrease on the previous three months of 145 oz. Broadly speaking the district output remains the same. The alluvial returns are much higher, while the quartz gold is contemptuous for such a district—a paltry 50 oz. for three months. Of course, the current term is already brighter, owing to the improvement at Spring Gully. A reference to the returns for the past two years shows that the tendency has been downward, but always just topping the 3000 oz. mark.

There is no fresh developments from Spring Gully, and the next crushing is expected to be a normal one. After paying all accounts from the last crushing £741 remains to credit.

At South Wattle Gully a trial crushing from the 230ft. workings is being sent to Spring Gully battery, and it will be crushed during the current week. At 300ft. they are in stone nearly 6ft. thick, and it looks as if the leg of the saddle has been cut. The outlook is held to be more promising than at any previous time.

The locally owned mine at Dunolly, Burnt Creek Reefing Co., reports having struck good payable wash in the drive. A puddler is being erected, and it is expected to start puddling during the present week.

The payable returns from the double plant of the Campbell's Creek bucket dredge continue. During last week a full run yielded 77 oz. 10 dwt. gold.

The first boring operations from the underground workings of the Malmsbury Alluvial mine give satisfaction to the directors. This is really the pioneer venture on the deeper alluvial leads of that district. In a cross-cut driven a few feet off the main reef drive, the first bore was commenced. Last week it was officially announced that gravelly sand was met at 57ft., and on washing the borings fine colours of gold were obtained. In the opinion of the manager this is proof of the bore being on the edge of the gutter. The bottom of the No. 1 surface bore, which is 80ft. in a direct line ahead of the face of the drive, is 11ft. or 12ft. lower than the bedrock level that was proved by the bore just completed. It is intended to continue boring as the reef drive advances, and the next bore will most likely be 40ft. ahead of the present face.

## Maldon

(From Our Correspondent.)

Still another attempt is being made to properly test the ground immediately adjoining Oswald's North British mine. There has been a bar to this for some time owing to one party holding the lease that is said to contain the gold, and a second party holding some ground on which was a shaft that could work it. Lately the first syndicate has absorbed the second, and it is now considered that with a reasonable outlay the mine can be made to pay. The last stone sent to the battery was in the pre-cyanide days, and, although it was just payable (5½ dwt.) then, the sand was sure to be of considerable value. At a meeting of the owners held a week ago, with Mr. W. M. Rowell in the chair, it was resolved to form a no-liability company to be named the Oswald Gold Mines North, with a capital of £7500 in 30,000 shares of 5s. each, to be allotted at 6d. per share. Mr. W. E. Preece was appointed secretary pro tem. and the necessary steps will be taken at once.

The Oswald's Estate mine during the time it was owned by the Oswald family, 50 years, yielded about 300,000 oz. gold, and it was valued at £4 per oz. This means £1,200,000. Practically on the 50th anniversary of its birthday the mine was sold for £25,000 cash, which is something of a record.

South British has extended the 110ft. level in the new shaft to 108ft. Stone is showing for the full width of the drive, and is well mineralised, with a little gold. At the 130ft. level in the old shaft stoping is turning out crush dirt worth 6 dwt. The battery is working full time.

Maloney's Red, White and Blue is still breaking out stone from between 84ft. and 160ft. levels. A crushing of 62 tons yielded 22 oz. 4 dwt.

At the South German Baxter and party, who are stoping north and south of the winze below and above the floor on payable stone, cleaned up a parcel of 148 tons for 189 oz. 6 dwt. of amalgam. The intermediate level north below 1750ft. is being extended on reef 2½ft. wide, with 18in. of clean quartz in the east wall. Although not payable, it is improving in appearance. Other tributers are working without change.

In view of the satisfactory developments at the New Day Dawn mine it has been decided to immediately instal an air compressor and rock-drilling plant, to allow the mine to be opened up and worked cheaply and quickly. This is a much better method than the present one, of working one shift by hand labour.

Evidence of great patience by the believers in the Maldon goldfield is shown by the current week's list of calls due, viz., Derby United, 145th; Blow Reef, 12th; G.S.G. Amal., 80th; South German, 79th; New Day Dawn, 1st; Pioneer Otago, 45th; South British, 12th.

At the Newstead end there is talk of fresh activities. Sandy Creek seems likely to come again. Mr. Clarke is satisfied with the support he is getting in his effort to get off Rewell and Pedler's show on the Concord Reef. Mr. Evan Jenkins, who is still in charge of the once-celebrated Brassey mines, says that all the leases on the line are to be consolidated with the intention of floating a company with a big area of country. The North Lady Brassey machinery was not strong enough to go any deeper than the shaft is, and the new company, if formed, will put un up-to-date plant to allow of proper deep-sinking operations being done.

Blow Reef has cleared out the well and started sinking. From the rise above 280ft. level north 30 tons have been sent to the battery; the latter is not yet available.

Uncle Sam shaft is down 183ft., going through sandstone. It is intended to keep on sinking for some time, unless interfered with by water, of which there is so far no sign.

John Bull (Green Valley) crushed 100 tons for nearly 25 oz. gold.

---

At the Glen Wills warden's court before Mr. Warden Gray, E. O'Connell sought an order to restrain S. J. Chambers from dealing with a heap of tailings over which he had obtained a certificate of protection. He also claimed £5 damages for trespass. The case for complainant was that he took possession of a heap of tailings on 28th April, for which he produced a certificate of protective registration. On 9th May defendant registered the same heap, and he served defendant with notice objecting to his registration. Defendant deposed that in February, 1912, he purchased a cyanide plant, and he understood that the heap now claimed by O'Connell was included in his purchase. He had been running residues from his vats over the heap of sand since February, 1912. Last February he wished to re-register the site, but was told by the registrar that it was unnecessary. The warden held that O'Connell was in rightful possession of the tailings, and ordered the cancellation of Chambers's registration. The claim for trespass was withdrawn, and costs amounting to £26 5s. were given against defendant.

---

# LABOUR DISPUTES.

The partial strike of Bendigo (V.) miners as a protest against the employment of non-unionists, still continues at three mines. The non-unionists are still at work, and the mine-owners give no indication of giving way. Between 200 and 300 men are idle, and receiving strike pay.

A strike of labourers at the excavation works of the proposed North Ballarat (V.) locomotive works is in progress, for an increase of wages over 7s. 6d. per day. A similar dispute is in existence at White Hills, Bendigo (V.), but work has not altogether ceased.

Summonses, under the Industrial Peace Act, have been issued to the representatives of the employers and the employees, in connection with the dispute in the Cloncurry (Q.) mines. The parties have to appear before Judge MacNaughton, in the Industrial Court, Townsville, this week, under the compulsory arbitration clauses of the Act.

# TASMANIAN MINING.

## Mount Lyell District.

(From Our Correspondent.)

Queenstown, July 11.

Since last writing, they have got the 1100ft. level of the North Lyell mine into working order, and ore-breaking is now in active progress. This additional source of production has enabled the output to be appreciably increased, and about 1800 tons a week is now being sent to the smelters. The three main producing levels of the mine, 850ft., 1000ft., and 1100ft., are now all in fair going order from a productive point of view, and although they are not yet being exploited up to their full capacity, owing to shortage of practical miners, the management is hopeful that the difficulty in this respect will gradually be surmounted, and the output brought up to the old average of 10,000 tons a month within the near future. Concurrently with ore production the work of constructing the new mullock pass between the 300ft. and 850ft. levels is being actively pushed ahead, while a lot of work is being done in the way of thoroughly filling some of the stopes in which ore-breaking has not yet been started.

A portion of the work at the 1000ft. level of the North Lyell mine is the extension of the east crosscut for the purpose of making a connection with the Lyell Blocks shaft at the corresponding level. This work is being carried out in conformity with the instructions of the Mines Department, issued after the North Lyell disaster. The two companies are to bear the expense of the work between them. It did not take the Blocks Company long to do their share of the work, as they had only 37ft. to drive from their shaft to reach the boundary, and this was finished some months ago. The Mount Lyell Company had, however, something like 140ft. to go to reach the boundary, and of this over 100ft. has been driven to date. The reaching of the boundary by the Mount Lyell Company's drive will not, however, quite complete the work of connection, as it has been ascertained that the 1000ft. level of the North Lyell mine is about 27ft. below the 1000ft. level of the Blocks' shaft, consequently a rise will have to be put up for this distance to effect a connection.

At the Mount Lyell mine the output of pyrites is being interfered with by climatic conditions, which, during the last fortnight have been of the genuine West Coast type. After an exceptionally fine spell of weather—the rainfall for the first six months of the year was only 38 inches, which is 9 inches below the average—the old conditions have returned, and on several days lately surface work at the mines was practically suspended. This means that they are unable to get any pyrites from the open cut, or to break dirt for filling, with the result that production, both on the surface and underground, is unavoidably curtailed. But this rough weather trouble is always experienced at the big mine for several months in the year, and although on the present occasion it has been a bit later than usual in arriving, it is bound to come along just the same.

With the opening up of the South Lyell mine ore body they should, however, be more independent of weather conditions than at present. Good progress is being made with this work, and as soon as the cutting of the main galley through the ore body is completed, stoping operations above the ground floor of the South Lyell workings, which was pretty well beaten out by the old company to provide pyrites for the Crotty smelters, will be started, and this supplementary source of supply—provided always that sufficient labour is obtainable—will enable the management to appreciably increase the present underground output of pyrites for smelting requirements.

At the reduction works they have had the best monthly run since the disaster in October last. Three furnaces have been in continuous operation for the full four-weekly period which closed on Wednesday, July 9, and there will, of course, be a corresponding increase in the metal production, although, owing to the proportionately smaller tonnage of North Lyell ore treated, it will necessarily be a good deal below the old-time average of 650 tons of copper. Whether they will be able to keep three furnaces in regular commission for the current month is, however, a bit doubtful, as it requires somewhere about 5000 tons a week of pyrites to do this, while with the hampering of surface operations caused by bad weather, it is about as much as they can do to get out anything up to 4200 tons a week of this material. And this is where the benefit of having the South Lyell pyrites to draw on will come in.

The supply of labour at the mines, although fairly adequate as far as numbers are concerned, is hardly so in regard to efficiency, and there is plenty of room both for good miners and good labourers. The great difficulty in this respect is in connection with surface work, owing, of course, to the severe weather, and every week sees men getting away to where there is less rain and more sunshine, and in this connection it may be mentioned that some 30 or 40 of the Maltese labourers, who have been in the employ of the company for the past twelve months, have lately left, either for the mainland or their own country.

## MINING IN WESTERN AUSTRALIA

(From Our Correspondent.)

Kalgoorlie, July 7.

The reconstruction of Chaffers has not been well received here, as investors are of the opinion that recent developments have been so satisfactory that holders of scrip will only be too willing to meet the assessment, and that paying a commission of £3500, and giving a three years' option at par on the 86,604 unissued shares, were unnecessary and foolish. The fact, however, is overlooked that Messrs. Lionel Robinson, Clark and Co., the option holders, have done more in the last few years for Western Australian mining than any other firm. They carried through the reconstruction of the Lake View and Star, and also of the Oroya Links, and are on the point of floating the Slippery Gimlet mine at Ora Banda on the London market. They also tested the Great Victoria mine at Nevoria jointly with Mr. Hamilton of the Great Boulder Co., and are at present employing men in testing the continuation of the Kanowna deep leads, which produced a million sterling between 1897 and 1899. They are also behind a movement to reopen the Golden Valley mine in Kanowna, which was abandoned by an English company in 1904. This mine produced £20,000 from 10,000 tons by amalgamation only, from ore broken above 300ft., and the tailings are now being treated by a party of working men. Messrs. Robinson, Clark and Co. are the only prominent London stockbrokers with a large following who are bringing capital into Western Australia, and the bigger profits they make the better for everybody concerned. For instance, their option on Chaffers' shares are worthless unless they can make a market, and raise the price over 4s., by which all holders would benefit.

There are rumors current that the No. 4, or boundary, lode, which passed into the Golden Horseshoe from the Great Boulder at a depth of 2400ft., is being thrown back by a slide towards the Great Boulder mine. Two months ago, Mr. Sutherland, manager of the Horseshoe, cabled that the winze on the west branch of No. 4 lode had been sunk 12ft. in ore worth 212s. 6d. per ton, over a width of 60in., 110ft. south and 205ft. east of the main shaft. This means that this winze is 510ft. south of the north boundary, and only 5ft. from the Great Boulder boundary. It is significant that nothing official has since been published regarding this winze.

The cutting of the lode at the No. 5 level of the Victorious at Ora Banda, worth 110s. over a width of 72in., has not been well received by the market, but Mr. G. M. Roberts, the general manager of the mine, is quite satisfied that higher assay values will be met in driving. Mr. Roberts also anticipates that the ore-shoot will be longer at No. 5 than at No. 4. At the latter level the east drive averaged 140s. for a length of 220ft., and the west drive 43s. 6d. for a distance of 30ft. The winze below the west drive averaged 131s. per ton for the 60ft. sunk, and was worth 265s. for the last 15ft. This makes it appear that the ore-shoot is dipping west instead of east, as was originally believed.

The Oroya Links Co. has taken an option on the adjoining Levant lease, as the ore-shoot at No. 7 level has been worked right up to the boundary, and is pitching north. At a depth of 814ft., the lode has been proved from a winze to be worth 40s. a ton over a width of 24ft., and the old Croesus Proprietary shaft is being deepened to open up a level at this depth. Ore reserves are estimated as on December 31, 1912, at 126,470 tons, assaying 25s. 4d. per ton, with a probable 60,000 tons more of a payable grade. It is, however, rather significant that, for the first quarter of this year, 32,350 tons were treated for a yield of £34,140, or 21s. 1d. per ton only. The April return panned out at 21s. 3d., while, for May, the average was only 19s. 6d. per ton. The average extraction is thus only about 80 per cent., whereas many of the mines, including the Great Boulder, claim to make an extraction of fully 90 per cent. For instance, on December 31, 1911, the Great Boulder reserves were given as 731,300 short tons, assaying 55s. 4d., and, during 1912, 216,700 short tons were treated for a return of 52s. 11d. per ton, thus showing a recovery of nearly 96 per cent.

Ora Banda is becoming quite fashionable since Mr. Tom Creer acquired an option on the Trafalgar, adjoining the Victorious on the east. The Churchill has since been floated into a syndicate at Adelaide, and further flotations are pending. Some 200 leases were pegged out in the district in 1910, but were nearly all abandoned on the Bullfinch boom, and a great many of these are now being re-pegged. The lodes in the district are very low grade, so far as tested, as the Government mill, which is now crushing 200 tons from the Golden Mount, will soon demonstrate, and only cheap methods will make ore of 20s. to 25s. per ton payable propositions. The Victorious ore reserves only averaged 22s. per ton when Mr. Roberts bought the property.

## QUEENSLAND MINING.

### North Queensland Fields.

(From Our Correspondent.)

Mareeba, July 5.

One of the most pleasing features to report with regard to the mining industry in these parts are the splendid developments in the Vulcan tin mine, Irvinebank. Good faces of ore are showing in several levels, in fact, the old mine never looked more promising than she does to-day. In the 280ft. winze a rich ore body has been discovered near the boundary of the famous Tornado mine. This is a new find, which has given the greatest satisfaction to the directors. Faces of ore are being worked at depths of 310ft., 550ft., 840ft., 900ft. The winze from the 900ft. level is now down 126ft. for the past month, and it has been in tin all the time, and has now holed through into the rise put up from the 1050ft. level. This lode is all in virgin ground, and is a most important development. Sinking on it is proceeding in order to open the workings at the 1220ft. level. These new developments have given the Vulcan another long lease of life, and will fully justify the erection of the aerial tramway, which is now proceeding.

Mr. Colin Caird, director of the Irvinebank Mining Co., who has been inspecting all the properties owned and controlled by the company, left for the south this week. Mr. Caird is very pleased with the prospect of the industry, and especially so with the wolfram propositions at Wolfram and Mt. Carbine.

Mr. John Darling and Son and Colonel Beach, who have big mining interests at Stannary Hills, arrived here on Monday, and return south to-day. During the week they thoroughly inspected their properties, and also conferred with the Irvinebank Co.'s directors, with regard to one control of the Stannary Hills and Irvinebank tramways. At the present time two staffs are employed, and it would result beneficially to both companies if the control of both lines was vested in any one of the companies.

The aerial ropeway erected between the Irvinebank Co.'s Governor Norman mine and battery is working splendidly, but it is reported that recent developments at the mine have not been too favourable.

Good progress is now being made with the construction of the railway line from Dimbulah to Mt. Mulligan coal mines, and over 200 men are now employed. The labour difficulty has been satisfactorily settled, the men working in the main by day labour, but some are on piecework. The construction of the long bridge over the Walsh River is being pushed ahead, as this is a big job, and being nearly at the beginning of the line, its completion will greatly help along the other work. The Railway Commissioner, Mr. Chas. Evans, the Chief Engineer, Mr. Bell, and the Chief Mechanical engineer, Mr. Pemberton, are at present inspecting the work and also the Chillagoe and Etheridge lines. The Commissioner and party also thoroughly inspected the Mt. Molloy line on Monday last, and Mr. Evans stated that the line was in better order than he supposed. He was instructed by the Minister for Railways to undertake this inspection, in view of the request of the miners and settlers in the district that the Government purchase the line from the Mt. Molloy Co. I think, from the Commissioner's remarks, that his report will be a favourable one. The Mt. Molloy district is rapidly coming to the front as a farming and dairying district, and the stability of the wolfram mining industry at Mt. Carbine demands that this line be kept open. Then beyond Mt. Carbine, at Mt. Armit and Mt. Windsor, extensive tin mining operations are in progress. At the former place Mr. E. B. Torpy has a sluicing plant in full swing, and regular consignments of tin are now coming forward.

At Mt. Windsor, Mr. R. H. Miller, on behalf of a syndicate, is installing a powerful nozzle, which will shortly be playing on one of the many beaches of alluvial tin, which, owing to inaccessibility, have been neglected in the past. This district has a great future in front of it.

Gold mining.—At the New Minnie Moxham mine the shaft is being rapidly pushed down, and is now at a depth of over 180ft. It is anticipated that another 3 weeks' work will result in the reef being cut. If the values are the same as at the 140ft. level, the reserve shares will be issued and a battery purchased and erected immediately. In the meantime, no stone is being raised, as no stone will be sent away for treatment. The development of this mine is being watched with keen interest in the north, as on its success depends the future of the Northcote field.

At the Mareeba goldfield a few men are employed prospecting the company's leases. The lode, both in the London and Queen Constance leases, has been proved for some distance.

## PUBLICATIONS RECEIVED.

We have received from the Australian Metal Co., Melbourne, the "A.E.G. Journal" for April, which contains an interesting article (among other things) on A.E.G. direct-current motors for driving rolling mills.

* * *

We have received from Curtis's and Harvey Ltd. (Cannon-street House, London, E.C.) a copy of the "Shorter's Year Book" for 1913-14. It is a handy pocket diary, with a great deal of miscellaneous information of use to sportsmen, and with spare leaves to be used as a game register. The firm will be pleased to send a copy to any of our readers upon receipt of a penny stamp.

* * *

From the Italian Minestero delle Poste e dei Telegrafi comes a copy of the "Chronique Illustree du Concours International de Telegraphie Pratique." This is a souvenir of the proceedings of the Postal and Telegraphic Congress, held in Turin, in 1911, and has been compiled by Ferdinando Geronimi, and is issued with the sanction of Commendatore Giuseppe Greborio, the President of the Executive Committee of the Congress. The bulk of the publication is in French, but many of the speeches are given in Italian, and there are occasional excursions into German, English and Spanish. The volume is well got up, well illustrated, and will, doubtless, be valued by those who attended the Congress, to whom it will form a very noteworthy and interesting souvenir of a memorable occasion.

* * *

By far too little attention has been paid to the wood wealth of Australia. One hears often enough of the value of the country's timber as sleepers, or for use in mines, or for other such very practical purposes, but its cabinet timbers are still remarkably little known, and the wanton destruction of them by burning that has gone on in all parts of Australia is nothing less than shameful. An attempt to remedy this disgraceful state of affairs finds shape in a new publication issued by the Technological Museum, Sydney. This is No. 18 of the Technical Education series. It is devoted to the cabinet timbers of Australia, and is by the Curator and Economical Botanist of the Museum, Mr. R. T. Baker, F.L.S. It is a work which does great credit to the author, to the Museum, and to the Government of New South Wales, under whose authority it is issued. It contains numerous illustrations of these timbers in natural colours, other illustrations in black and white, showing how the timbers are used. Each tree treated of is given a few lines of description, from the point of view of both the botanist and the cabinet maker, and its geographical range is also stated. A very useful section is the one on the uses to which these various timbers can best be put. A glance through this section shows that for flying machines the white honeysuckle and the grey plum are particularly recommended, while for the interior decorations of railway coaches and tram cars, crowsfoot elm, maiden's blush, blue fig, scrub hickory, rosewood, red beam, cedar, Queensland maple, black bean, blackwood, tortoiseshell tulip, coachwood, Queensland walnut, silky oak, fire tree, white honeysuckle, beefwood, red myrtle, white pine, black pine, King William pine, hoop pine, Queensland kauri, celery top pine, and brown pine are the most suitable. It is to be hoped that this very excellent publication will do much to popularise Australian cabinet timbers, and much also to stop the senseless destruction of them which has so long accompanied the opening up of the country for settlement.

---

An enterprise, from which important developments are expected, has been initiated on the Mount Doran gold-bearing slopes at Sailor's Hill and Dolly's Creek (V.). A company, financed by English capital, has made application for an area of deposits aggregating 2500 acres. It is estimated, a report says, that there are deposits in the district sufficient to keep a number of plants going for 20 years. There is no clay or sludge, and settlement tanks are to be provided to prevent sand getting into the Moorabool River. There are a number of other applications for areas in the district, for which a prosperous future is predicted.

# THE COAL MINING INDUSTRY.

## New South Wales.

### Southern District.

(From Our Wollongong Correspondent.)

During the week the colliery proprietors and miners' associations had an interview with the Railway Commissioner on the subject of being better served than they at present are on the railway. Of course, the Commissioner could do nothing more than explain the difficulties, and promise to do his best to redress them. It is reported by the collieries using trucks that there has been lately a better supply.

The coking plants of the district have a good demand, and are making no yard stacks to speak of. The company formed for making coke of the Coalcliff colliery slack is understood to be having plans got ready, and that a design of oven which will be the first of its kind in Australia will be adopted; it is also understood that the company formation is not yet complete.

The reports that a party had secured the slag dump of the smelting works at Dapto, some 11 years' accumulation, is proving well founded. Within the past few days men have been put to work. The treatment will be for two purposes: one to extract what there may be of precious metal; the other to prepare material for the manufacture of steelite. The plan of treatment involves, it is stated, the erection of two furnaces.

Wollongong Municipal Council has had an offer from the Wollongong Electric Light Co., recently formed, to supply street light, which service is at present in the hands of the Wollongong Gaslight Co. The Electric Co. is an expansion of a small establishment, which has been operating in the main thoroughfare for the past year, having induced not a few who were dissatisfied with the gas to change to the electric light. The Council were informed that the capital of the company is £10,000, and that it is proposed to establish a plant costing £6000. The company is very little of a local one.

Apropos treating smelting works dumps, it may be mentioned that during the existence of the smelting company at Dapto, there was a rumor that material went over the dump which had been very imperfectly treated. This dump may prove a bonanza. That there was carelessness there is no doubt. For instance, a find of 600 bags of ore in a swamp was made after the company had ceased operations.

### Western District.

(From Our Lithgow Correspondent.)

Although ten shifts were worked at the Vale of Clwydd colliery (Lithgow) for the fortnight ended Friday, the 11th inst., there was considerable broken time. At the Great Zigzag colliery, about nine days were put in, three-quarters of a day being lost owing to a washaway, while shortages in trucks were responsible for the remainder. At Oakey Park mine, 9½ days were worked, the truck supply at this colliery being very unsatisfactory also. Almost a full fortnight's work was recorded at the Boldon colliery, only a few hours being lost. Two half-days were lost at the Invincible colliery, Cullen Bullen, owing to a sufficient number of trucks not being available. The total worked for the fortnight was 9½ days. About ten days were worked at both the Lithgow and Hermitage collieries.

## Victoria.

### Powlett River District.

(From Our Wonthaggi Correspondent.)

During the past week negotiations have been proceeding between the management of the State mine and the representatives of the men, over the amendments made by the special meeting on the previous Sunday to the new working agreement. As the main principles of the agreement had been accepted as satisfactory, very little difficulty was experienced in coming to a settlement on the minor amendments, each side conceding a little. There were, however, two questions which had to be referred to those directly interested, viz., the men engaged on the coal-cutting machines and the wheelers. In both cases the men have been engaged on shift rates, and under the new agreement provision was made for the work being done by contract. The wheelers asked for an increase in their rates of pay from 9s. 2d. to 10s. 2d. in preference to taking the contract work, but this Mr. Broome refused to concede. He, however, expressed his willingness to let out the work in sections on contract on the co-operative principle, and to guarantee a minimum rate of 9s. 2d. per shift, whether the wheelers earned it or not. The coming into force of the new rates could, if it was so desired, remain in abeyance until the end of the present cavil. The wheelers held a special meeting on Sunday to consider whether or not they would accept the offer of the management. The union officials put the matter before them, and in doing so urged them to accept the terms. They pointed out that under the new agreement the wheelers had nothing to lose, as they were guaranteed their present rate of pay, and had a chance to make more. After a good deal of discussion, in which some favoured rejecting the contract rates, and standing out for an increase in shift rates, a motion was carried that the manager's terms be accepted. The rates offered the machine men for undercutting the coal were referred back to Mr. Broome, with a request for an increase, but this was not granted. Mr. Broome pointed out that the rates he had fixed were based on what the coal had cost him to cut in the past. As it was a new class of work, however, he was prepared to allow the men to continue on shift rates for another quarter, so that they would get a better idea of what the work was worth. The men concerned also met on Sunday, and decided to agree to the general manager's conditions. It is quite likely that the wheelers and machine men will not wait for the expiration of the present cavil before taking on the contract rates, but that they will do so at once.

The rates for all other classes of work under the new agreement came into force last Thursday, the 10th inst. As soon as the agreement is made out in proper form it will be signed by both parties, and it is generally expected that a period of industrial peace will then be assured, a thing to which the State mine has been a stranger since the inception of operations nearly four years ago.

# MINERAL RETURNS.

The Western Australian gold output for June was 113,485 fine oz., valued at £482,054. The total is 3307 oz. more than for May, and 5342 oz. more than for June last year.

The Victorian yield of gold for June was 47,500 oz. gross, or 44,305 oz. fine, valued at £187,289. Compared with the yield for June of last year there has been an increase of 7206 oz. fine. The yield for the last six months was 229,760 oz. gross, or 212,933 oz. fine, valued at £903,577. This shows a decrease of 15,201 oz. fine compared with the quantity won during the corresponding period of last year.

In Western Australia, in June, the gold production amounted to 113,485 oz., valued at £482,054.

The New Zealand Mines Department reports that in June 17,336 oz. gold was produced, valued at £73,217, compared with a product worth £50,258 in June of 1912. During the six months the gold recovered was valued at £672,270, compared with £784,668 in 1912. Of silver, the production was 61,753 oz., valued at £6206 in June, compared with 1638 oz., valued at £176, in June of last year. The figures for the six months were 498,030 oz., valued at £51,804, compared with 532,411 oz. in the first half of last year, valued at £54,530.

The usual return furnished by the Under-Secretary of Mines shows that the gold yield recorded for New South Wales for the month of June is 14,643 oz. crude, equal to 12,342 oz. fine, valued at £52,424, compared with 10,568 oz. crude, equal to 8819 oz. fine, valued at £37,461, for the same month in 1912. The yield for the first six months of this year amounts to 87,283 oz. crude, equal to 70,191 oz. fine, valued at £298,151, compared with 94,037 oz. crude, equal to 78,308 oz. fine, valued at £332,632 for the same period in 1912, thus showing a decrease of 8117 oz. fine and £34,481 in value.

The mineral export of the Barrier district (N.S.W.) for the month of June showed a total value at £474,437. Silver lead concentrates were valued at £364,154, and zinc concentrates were valued at £103,933. June output made the value of the quarter's output £1,111,416, against £908,462 for the January-March quarter, when the industrial trouble was on. The total value of the output for the year was £4,436,759, against £3,832,431 for the year 1911.

# MINING INVENTIONS.

Mr. Fred Walsh, patent and trade mark attorney, George and Wynyard-streets, Sydney, has supplied us with the following lists of applications for letters patent of Australia recently lodged in respect to mining inventions:—

No. 9507 (23/6/13).—William Warrington: "Improvements in or relating to percussive rock drills and the like."

No. 9508 (23/6/13).—Minerals Separation and De Bavay's Processes Australia Pty. Ltd.: "Improvements in the separation of mixed sulphide ores."

No. 9524 (24/6/13).—Edward Needham Waters: "Improvements in sintering apparatus."

No. 9544 (25/6/13).—Hooker Electrochemical Co.: "Improvements in electrolytic cells."

No. 9547 (25/6/13).—Refractory Ores Ltd.: "Improvements in the treatment of refractory ores."

# S.A. RADIUM.

At a meeting of the South Australian Radium Proprietary Co., in Adelaide, last week, it was reported that the directors had resigned. Mr. Sebastian George, who presided, said there was no directorate, but there were one or two past members of the board whose services would commend those gentlemen to the shareholders. The greater part of the work had been done by Mr. Arthur and Mr. Hutton. As a matter of economy, it would be advisable to appoint three directors, instead of five. The two vacancies could be filled later if deemed necessary. He proposed that Messrs. C. Hutton, J. H. Arthur and W. J. Barker be appointed members of the board. This was carried.

The secretary said he had sent samples of ore from the Sydney Radium Hill Co.'s property to Madam Curie, Paris, who had replied that, while the samples possessed some ratio-activity, the greater the depth they went the better the ore would become.

The question of finance was raised, and the secretary mentioned that the Government subsidy was expected, contingent upon a favourable reply from the Government geologist. The company had £550 in hand, and it hoped to receive £500 from the Government.

It was resolved that the board offer 1000 of the 4000 unissued shares to the present shareholders at £1 each.

---

The following letter has been received by the Radium Hill Co., Olary (S.A.), from the chairman, Mr. Jones, who is in England:—

"I have been very busy amongst the leading scientists in the radium circle, viz., Professor Bragg, of the Leeds University, and Professor Rutherford, of Manchester University. The latter gentleman is at the head of the scientists, both European and English, and as all radium bromide which I brought with me had to be tested, I have taken some trouble to obtain the services of Professor Rutherford, whose word is taken all over the world. He was surprised and pleased to find that it was radium. There are so many radioactive substances, and he is becoming tired of testing them. However, I have established the fact that our product is radium by the highest authority; that is a step forward. He states that it compares favourably with the ordinary preparation of pure radium bromide sold commercially."

# MT. LYELL M. AND R. CO.

When formally forwarding to the directors of the Mount Lyell M. and R. Co. (T.) the report of the royal commission appointed to inquire into the North Mount Lyell disaster, and the report of the mining engineer appointed by the Government to make exhaustive inquiry respecting the mine's workings and the methods employed, the Tasmanian Minister for Mines, Mr. E. Mulcahy, wrote as follows:—

"These reports, made after careful investigation in each regard by qualified and impartial men, were published directly they were received, and in now forwarding them officially as Minister for Mines, I am authorised by my colleagues to express to you the congratulations of the Government of Tasmania on their satisfactory nature. They clearly exonerate your company from the more or less vague, but too often unscrupulous and cruel, allegations made at the time of the disaster, chiefly by irresponsible persons.

"The Government desires that you will convey to your general manager (Mr. Robert Sticht) and to your mine manager (Mr. Murray), and to the rest of your chief officials immediately connected with the mines, their expression of extreme satisfaction that the management has been so clearly shown to have been conducted upon humane principles, and with every consideration for the safety and welfare of the employees."

The chairman of the Mount Lyell M. and R., Mr. William Jamieson, in his reply, said:—

"The board desires me to specially thank you and your colleagues, on behalf of themselves and the officials interested, for the appreciative way in which you have expressed the congratulations of your Government. The exoneration of the company from the attacks made upon it affords keen gratification to all of us."

# ROYAL MINT RETURNS.

## Melbourne Branch.

The receipts at the Melbourne branch of the Royal Mint in June and since 1st January were:—

| | June. Fine oz. | Since 1st Jan. Fine oz. |
|---|---|---|
| Victoria | 37,744.08 | 227,284.23 |
| New South Wales | 261.27 | 2,891.68 |
| New Zealand | — | 30,679.11 |
| Queensland | 255.06 | 1,200.41 |
| South Australia (including Northern Territory) | 84.32 | 5,715.92 |
| Tasmania | 2,088.45 | 11,325.34 |
| Western Australia | 6.47 | 2,151.58 |
| Other Countries | — | 7.34 |
| Light Gold Coin | 1,136.20 | 1,141.32 |
| Unknown | 263.15 | 1,637.15 |
| Total | 41,839.50 | 284,034.08 |
| Gross value of the above | £177,722 13 1 | £1,206,499 5 4 |

## Perth Branch.

The abstract of gold receipts for the month of June and from 1st January is as follows:

| | June. oz. | Since 1st Jan. oz. |
|---|---|---|
| Western Australia | 130,772.57 | 722,709.03 |
| Unknown origin | 41.86 | 259.35 |
| Total weight | 130,814.43 | 722,968.38 |
| Value (calculated at an average of £3 10s. 5d. per gross oz. of material received) | £460,576 | £2,544,655 |

# REPORTS OF COMPANIES AND CORPORATIONS.

## Amalgamated Zinc (De Bavay's).

The returns of the Amalgamated Zinc (De Bavay's) for the four weeks ended June 28, and those for the previous period compare as under:—

| | 28th June. | 31st May. |
|---|---|---|
| Tailings treated .. tons | 45,417 | 46,960 |
| Zinc concentrates produced .. tons | 12,889 | 12,603 |
| Average assay value of zinc concentrates— | | |
| Zinc .. p.c. | 48.9 | 49.1 |
| Silver .. oz. | 8.7 | 8.4 |
| Lead .. p.c. | 6.3 | 6.1 |
| Lead concentrates produced .. tons | 137 | 137 |
| Average assay value lead concentrates— | | |
| Lead .. p.c. | 52.9 | 53.9 |
| Silver .. oz. | 34.3 | 36.5 |
| Zinc .. p.c. | 18.0 | 17.1 |
| Estimated income from all sources, taking spelter at £22 per ton | £36,609 | £36,023 |
| Total working expenditure, including cost of tailings treated | 17,505 | 17,653 |
| Estimated profit on working account, taking spelter at £22 per ton, after deducting amount due to Broken Hill South Co. | 13,097 | 12,917 |

## Zinc Corporation (N.S.W.).

The output, costs and profits of the Zinc Corporation for the last two months are shown in the appended table:—

| | May. | June. |
|---|---|---|
| Ore milled .. tons | 15,554 | 13,822 |
| Tailings treated .. tons | 27,670 | 27,080 |
| Zinc middlings treated, tons | 3,590 | 3,000 |
| Zinc concentrates produced, .. tons | 7,605 | 7,508 |
| Lead concentrates produced, .. tons | 4,154 | 3,899 |
| Estimated income from all sources, taking spelter at £23 and lead at £15 per ton | £51,634 | £46,962 |
| Total working expenditure | £28,830 | £25,921 |
| Working cost per ton ore | 15/5 | 17/4 |
| Do., do., tailings and middlings | 10/10 | 9/8 |
| Approximate cost of redemption tailings | £8,001 | £6,224 |
| Estimated working profit for month, including cost tailings | £14,403 | £14,417 |
| Expenditure, mine development | £2,518 | £2,303 |
| Expenditure, new construction work | £514 | £6,140 |

## Mt. Morgan (Q.).

The returns for the past two years, ending 31st May, are as follows:—

| | 1912. | 1913. |
|---|---|---|
| Ore treated .. tons | 351,858 | 312,068 |
| Output— | | |
| Fine copper .. tons | 7,440 | 9,280 |
| Gold .. oz. | 134,575 | 126,082 |
| Ore reserves .. tons | 3,526,000 | 3,347,000 |
| | £ | £ |
| Total revenue | 989,714 | 1,140,028 |
| Surplus revenue | 307,999 | 371,131 |
| Appropriations— | | |
| Dividends | 200,000 | 200,000 |
| Depreciation | 49,413 | 49,413 |
| Reserve fund | *50,000 | — |
| Rebuilding fund | — | 100,000 |
| Replace stocks, stores | — | 20,000 |
| Carried forward | 14,875 | 46,591 |

*Restoration of amount temporarily provided from reserve fund the previous year.

## Mararoa G.M. Co. (W.A.).

The June costs were as follows:—

| | | |
|---|---|---|
| Mining 2650 short tons | £1172 14 7 | equal to 8/9.21 per ton |
| Milling 2650 short tons | 609 3 5 | " 4/7.17 " |
| Realisation of bullion | 36 13 1 | " 3.32 " |
| Cyaniding 1930 short tons sands | 281 1 8 | " 2/10.95 " |
| Realisation of bullion | 38 19 10 | " 4.85 " |
| Cyaniding 650 tons slimes | 179 4 11 | 16/11.50 " |
| Realisation of bullion | 16 1 1 | " 5/6.18 " |
| Cyaniding 22 tons concentrates | 40 16 10 | " 5.93 " |
| Realisation of bullion | 5 4 10 | " 37/1.55 " |
| Waihi slimes | 206 11 5 | " 4/9.18 " |
| | £2586 11 8 | |
| Amount spent on development | 658 3 10 | |
| Amount spent on capital account | 40 6 1 | |
| Total expenditure | £3285 1 7 | |
| Total value of bullion won for month | £5207 12 4 | |
| Profit earned for month on ore treatment | 2621 0 8 | |

# THE BROKERS' CONFERENCE.

The delegates of the Stock Exchange of Sydney, Adelaide, and Melbourne, who have been in conference in the Victorian capital, have concluded their deliberations. The recommendations of the conference, which was presided over by the chairman of the Stock Exchange of Melbourne (Mr. W. J. Roberts) will be forwarded to the executive committee of each of the associated exchanges, and will afterwards be submitted to meetings of members of the respective institutions. The secretary of the conference (Mr. W. F. Boulter) has drafted the appended summary of the proceedings:—

"The following resolutions were adopted.—Uniform regulations for placing companies on the official list of the three exchanges: That it be compulsory for all companies applying for quotation to issue scrip in the future; that shares be 'ex rights' on the date transfer books close, or in the event of books not closing on the day of allotment; that companies be requested to give timely notice of new share issues, and the closing of transfer books and that provision be made for the recognition by companies of renunciation forms; also that facilities be provided for dealing in 'rights' and the issue of fractional certificates where practicable; that the committees of the stock exchanges of the Commonwealth be requested to bring under the notice of the Premiers of the various States the desirability of having a uniform company law throughout the Commonwealth, including the no-liability mining law; that the tonnage of ore treated and the actual yield of gold, also the estimated bullion value, be reported by companies; that it be a recommendation to the State Governments of New South Wales and of South Australia to adopt a similar Gold Buyers' Act similar to the Victorian Act.

"The present practice of locking up vendors' and promoters' shares in mining companies was reaffirmed, and the question of treating similar shares in investment companies in the same way was considered, and recommendations made to the respective exchanges. Recommendations were also made to the committees of the stock exchanges relating to many important matters of public interest, and of internal management with a view to uniform practice."

The last clause of the official report may be presumed to include recommendations regarding the revision of brokerage charges, and also issues connected with the proposal to reintroduce the bona fide agents system.

# ROYAL HUMANE SOCIETY.

The Royal Humane Society has awarded the Clark gold medal for the bravest act of the year to the mother of the late Mr. A. M. Gadd, for meritorious services rendered by him in rescue work in connection with the fire at the North Mt. Lyell mine in October last. Mr. Gadd subsequently died in Launceston from pneumonia accelerated by the sufferings he went through on the occasion of the disaster.

In all, 34 medals were made in connection with the Mount Lyell disaster as follows:—

Silver Medals.—Frederick J. Chambers, Frederick J. Burton, Richard O'Connor, C. Brown, Russell Mervyn Murray, Robert Cox, John Pearton, Arthur Neighbour Moore, Henry Peasnall.

Bronze Medals.—H. Trousselot, Henry De Goldi, Oswald Fowler, William Dunn, Henry Williams, Joseph Smedley, Frank Patterson, Walter Johnson, Basil Sawyer, Aaron White, Joseph Theodore Caldwell, Graham W. Gilham, F. Luttrell, George Tilley, S. Symmons.

Certificates.—Michael Lonergan, John Lees, Samuel Joseph Dawson, James Kinsella, William Edmonds, H. Powell, George Ernest Bass.

Recorded in the Archives.—Sampson Rodda Bray, Richard John Treverton (who lost their lives in the mine).

All on the Mount Lyell roll of honour, with the exception of A. N. Moore and J. T. Caldwell, are residents of Tasmania. Moore and Caldwell are members of the Melbourne Metropolitan Fire Brigade.

Other awards made during the year include a silver medal to Henry Lewis, aged 18 years, and George Gillett, 24, miners, who rescued Arthur Ernest Killick, in the Williams United mine, Eaglehawk (Bendigo), on March 1, 1913.

# THE FORM OF THE EARTH.

## The Tetrahedral Hypothesis.

By Professor James Park.

If we examine a terrestrial globe, we cannot fail to observe that the great mass of the dry land lies in the northern hemisphere, and the greatest expanse of sea in the southern hemisphere. Moreover, we shall at once see that the continental units and seas are frequently triangular in shape, the former presenting their bases to the north, and tapering to the south. Further, we shall find that the continents and seas are antipodal.

The unequal distribution of land in the two hemispheres, the dominant triangular shape of the geographical units, and the antipodal distribution of the land and seas cannot be set down to mere coincidence or fortuitous happening, but to the operation of well-defined physical laws.

As so clearly demonstrated by Lothian Green, the arrangement of the continental units approximates the shape of the tetrahedron, which is a figure bounded by four triangular planes. The great oceans lie on the flattened or depressed triangular faces of the figure.

Now a sphere is the figure which presents the smallest surface for its volume, and the tetrahedron the greatest. So long as a globular mass possesses heat it will continue to shrink, and the inner portion, on account of its greater heat, will contract more rapidly than the outer rigid shell. As the cooling and internal shrinking proceed, the globular mass will, in time, be encumbered with an excess of surface which will be most easily disposed of by assuming the form of the tetrahedron.

When a metal tube collapses under compressive stress, as may be easily demonstrated in a compression testing machine, it becomes triquetral, that is, bounded by three concave sides. As viewed in cross-section, each of the three projecting lobes is seen to be opposite a depression.

The antipodal arrangement of the land and seas is the natural corollary of the tetrahedral form assumed by a rotating globular mass.

# FURTHER NOTES ON BROKEN HILL TREATMENT METHODS.

By J. Malcolm Newman, B.E., Etc.

In my previous article I pointed out the probable effect of Selective Flotation on the composition of Broken Hill treatment products and the commercial results that might be expected. The successful solution of selective flotation problems may be looked to, also, to bring into line the treatment systems of the various mines. At present each plant presents distinctive features depending partly, of course, on the physical and mineralogical properties of its ore, but chiefly on the view its management takes of the best means of getting the maximum profit out of its particular ore, both for the time being and ultimately. The following general statement of the operations of the twelve companies at work along the line of lode will elucidate this:

(1) The Central Mine.—Sulphide Corporation Ltd.—puts crude ore into its mill, and produces—

Lead concentrates
Zinc concentrate, and
Waste residue

in a continuous process. The ore goes through a lead mill, producing lead concentrate, by water concentration in jigs, and on tables and vanners. The whole of the residue (including slimes) goes to a zinc mill, producing, by the Minerals Separation flotation process, mixed zinc-lead concentrate and waste residues. This mixed concentrate is deleaded by water concentration on tables and vanners, producing lead concentrate, zinc concentrate and slime. The slime is refloated, producing zinc concentrate and waste residue. It may be said that, speaking generally, this process was as perfect as possible before selective flotation arrived. The ore treated is rich in lead and silver.

(2) The Junction North mine puts crude ore into its lead mill, where, by water concentration in jigs and on tables, it performs an initial concentration, producing lead concentrate. The residue from this crude ore wet mill is then treated, together with dump tailings and dump slime, in a Minerals Separation flotation plant, producing mixed zinc-lead concentrate and waste residue. The mixed concentrate is deleaded by series treatment on tables, vanners and strakes, producing lead concentrate, zinc concentrate, and "second-grade" concentrate.

It will thus be seen that the Junction North process is, like that of the Central mine, continuous, and produces—

Lead concentrate
Zinc concentrate
Waste residue.

The limitations of the process without selective flotation are evidenced by the composition of the final lead and zinc concentrates. The crude ore from this mine is particularly hard and difficult to treat. It contains up to 45 per cent. of rhodonite.

The foregoing two mines are the only ones in Broken Hill which account for all their crude ore in concentrate and waste residue; of the others

(3) The Zinc Corporation Ltd. has two mills—one for South Blocks mine crude ore, and one for South Blocks mill zincy tailings and purchased dump tailings. The South Blocks mill, by the usual water concentration, makes the following products from the crude ore, viz.:—

Lead concentrate
Zinc middlings to flotation mill
Reject waste tailings
Slime to Lyster plant.

The low silver content of its crude ore enables this company to carry its grinding and wet concentration far enough to reject some of its tailings without further treatment. Until the Lyster process (selective) came along, the slime from the wet mill was stacked. It now goes through the Lyster section to extract a lead-silver concentrate, the residue being stacked for zinc extraction. Presumably, this is a temporary arrangement pending the installation of a zinc section to the Lyster plant.

The flotation mill, using the Minerals Separation process, takes the South Blocks zinc middlings and dump tailings from the South and other mines. In the grinding process preliminary to flotation, a certain amount of slime is made. This is treated with the other coarse material in the Minerals Separation plant. The products are—

Mixed zinc-lead concentrate
Waste residue.

The mixed concentrate is refloated to bring to a higher grade, and then deleaded in a Wilfley table and vanner plant, yielding—

Lead concentrate
Zinc concentrate
Vanner middlings.

The vanner middlings are treated by Horwood's (selective) process for lead concentrate and zinc concentrate. This company's operations may then be summarised as "treatment of crude ore and dump tailings, producing—

Zinc concentrate
Lead concentrate
Waste residue
Crude or zincy slimes."

It will be seen that the Zinc Corporation plants occupy an intermediate position as regards slime treatment between the Central-Junction North, which treat both tailings and slimes, and the Proprietary-De Bavay plants, which treat tailings with slimes eliminated; also that it only requires further selective flotation to make the treatment complete.

In the same category as the Zinc Corporation will come, presumably,

(4) The British mine, which is having a Minerals Separation flotation plant added to its wet mill. Assuming that it will also use selective flotation, its operations will consist of treatment of crude ore, producing—

Lead concentrate
Zinc concentrate
Waste residue.

(5) The Proprietary.—This company formerly treated its current wet mill slime by sun-drying the sludge and cutting it into blocks, which were afterwards sintered in heaps and shipped to the smelters at Port Pirie. It also treated accumulated dump slimes in a Potter-Delprat flotation plant, making zinc-lead concentrate and waste residue. In its main treatment plants to-day, however, it discards slime—not only that produced in reducing its crude ore, but also that produced in regrinding dump tailings. It runs three main mills. One (the old mill) treats crude ore by wet concentration, using jigs, Wilfley tables, and Luhrig vanners, and makes three products, viz., lead concentrate, tailings (to regrinding plant and zinc plant) and slimes (to dump). The second (the new mill) is practically a regrinding mill, preparing jig tailings from the old mill and tailings from dumps for the zinc plant. After these tailings are reground, they are run over tables and vanners, giving three products, viz., lead concentrate, tailings to zinc plant, slime to dump. The third mill is the zinc plant, taking tailings (without slime) from the two other mills, and producing in one operation by the Potter-Delprat flotation porcess two products, viz., zinc concentrate and waste residue. It should be noted that, by eliminating slime and making a table lead product in the regrinding mill, deleading of the flotation concentrate is not required. It is obvious, also, that this company has a special opening for a selective process which will treat slime. Its operations may be summarised as "treatment of crude ore and dump tailings for the following products, viz.:—

Lead concentrate
Zinc concentrate
Slime (untreated)
Waste residue."

(6) The Amalgamated Zinc (De Bavay) Co.'s plant is practically a composite auxiliary to the wet lead mills of the North, South and Block 10 companies. It takes their current tailings, grinds them in tube mills, washes out very thoroughly all slime made in grinding and treats the remainder by the De Bavay "Skin-float" process for the following products, viz.:—

Zinc-lead concentrate
Middlings
Waste residue.

The North and South mine zincy tailings are low in lead and silver; hence no deleading is required on the concentrate produced from them, but the section of the De Bavay mill treating Block 10 tailings, which are richer, makes a mixed concentrate, which is deleaded, giving lead concentrate and zinc concentrate. The middling product goes back to the grinding circuit, and is refloated.

The adaptability of the selective flotation processes for slime may have far-reaching effects on this company's operations, but, in any case, it will make available the lead, silver and zinc content of the slime now washed out before flotation begins. The company's operations may be summarised as the "treatment of tailings for the following products, viz.:—

Zinc concentrate
Lead concentrate
Slime (untreated)
Waste residue."

(7) The South Mine.—This company has a wet concentration mill only, and treats crude ore for the following products, viz.:—Lead concentrate, zincy tailings (to De Bavay Co.), quartz tailings (to waste dump), slime (stacked for future treatment. The calcitic ore of this mine is comparatively poor in silver, and like those of the South Blocks and North mine, its mill makes a reject tailings product. Last half-year this product represented 3.6 per cent. by weight of the crude ore, and assayed 2.5 per cent. lead, 2.2 oz. silver per ton, and 7.9 per cent. zinc. Selling as it does its zincy tailings to the De Bavay Co., it strives to leave in them as little lead and silver as possible, and goes in, therefore, for thorough regrinding and Wilfley table concentration. Last half-year's zincy tailings represented 71.3 per cent. by weight of the crude ore, and accounted for 15.7 per cent. of the lead, and 34.9 per cent. of the silver contained in the crude ore. For the same period the slime stacked was nearly 10 per cent. of the crude ore, and assayed 10.7 per cent. lead, 6.5 oz. silver, and 13.8 per cent. zinc, the crude ore assaying 13.7 per cent. lead, 6.4 oz. silver, and 13.8 per cent. zinc, that is, the only metal extracted from the slime in the wet mill is 22 per cent. of the lead. The 312,000 tons of slime stacked for future treatment assays 11.4 per cent. lead, 5.8 oz. silver, 14.2 per cent. zinc. Bearing in mind the fact that the South mine's contract with the De Bavay Co. for the sale of zincy tailings is on a profit-sharing basis, and practically a partnership, it will be seen that it only remains to apply selective flotation to the slimes produced in the two plants to get a complete concentration of the crude ore, and, taking the operations of both plants into account, the work may be summarised both metallurgically and commercially as to the "treatment of crude ore to produce—

Lead concentrate
Zinc concentrate
Slime (untreated)
Waste residue."

(8) The North mine is in much the same position as the South, as regards both its treatment methods and grade of ore. It possesses a wet concentration lead mill only, and treating crude ore makes the same classes of products, viz.:—Lead concentrate, zincy tailings (to the De Bavay Co.), quartz tailings (to waste), slime (untreated). The ore is, in parts, calcitic and low in silver—hence the reject quartz product. In its water concentration it uses coarse and fine jigs, regrinds in tube mills, and concentrates on Weir-Meredith vanners in series. It sells its zincy tailings to the De Bavay Co. at a fixed price per ton, and does not otherwise participate in the latter company's profits. Considered from the metallurgical point of view, however, its operations can be summarised with those of the De Bavay Co. as follows:—Treatment of crude ore to produce—

Lead concentrate
Zinc concentrate
Slime (untreated)
Waste residue.

(9) Block 10 is equipped with a water concentration lead mill only, and treats crude ore. It, however, makes only three products, namely—

Lead concentrate
Tailings
Slime.

The mill is modelled on the same lines as the North mill, with coarse and fine jigs and series treatment of reground material on tables and vanners. Its ore, however, is hard and close-grained, besides being rich in silver. These characteristics of the ore result in all the tailings being of sufficient value to pay for further treatment. No quartz tailing waste product is therefore produced in the lead mill. The company sells both its tailings and slimes. As stated above the De Bavay Co. finds it necessary to subject the concentrate made from Block 10 tailings to a deleading process.

(10) The Junction mine has a water concentration mill, and treats crude ore for—

Lead concentrate
Tailings
Slimes.

(11) Block 14 mine sells crude carbonate ore for smelting, and crude sulphide ore for concentration.

(12) The South Extended mine sells sulphide ore obtained from development work.

It will be seen from the above that the various Broken Hill companies differ considerably in the percentage of treatment they give to their ores. Of course, their equipment varies accordingly—from that of the South Extended Co., which has a mine without a treatment plant, to that of the Amalgamated Zinc (De Bavay) Co., which has a treatment plant without a mine. Some particulars of the various equipments will, perhaps, be found interesting, and I propose, at a future date, to describe them briefly, as well as give some further details of the treatment processes.

---

The Pitfield Prospecting Association (V.) has made an application to the Minister of Mines for a grant of £250 to aid them in development in the plateau. Mr. Billson promised favourable consideration to their request.

It is officially stated that the encroachment dispute between the Ajax Central and the North Nuggety Ajax (V.) companies has been practically settled in terms satisfactory to both parties. The basis of the settlement—mainly brought about by a conference between the respective mine managers—will be formally announced later. Mr. George Buchanan (chairman of the Ajax Central Co.) will be elected a member of the directorate of the North Nuggety Co. at a board meeting to be held in Melbourne.

# ENGINEERING AND ELECTRICAL SECTION

THE FAMOUS
"Brimsdown"
"Wirum"
BRITISH MADE Lamps.

The most popular, reliable and economic lamp on the market.

Sole Agents—
THE
LAWRENCE & HANSON
Electrical Co. Ltd.

405 LONSDALE ST., MELBOURNE.
33 YORK ST., SYDNEY,
and at WELLINGTON, N.Z.

## BRITISH AND EUROPEAN DEVELOPMENTS.

(From Our Correspondent.)

London, June 13.

The fifth annual congress of the Tramways and Light Railways Association opened yesterday at Blackpool, and after the usual welcome, two papers were read and discussed, the remainder of the day being filled in with the customary visits, banquet, etc. The first paper was by Mr. E. H. Edwards, general manager of the Lancashire United Tramways Co., and it considered some possibilities of increasing profits on inter-urban tramways, more particularly systems that traverse long stretches of country roads, passing through small manufacturing towns and villages, and connecting up with large municipal undertakings. Many miles of such line were constructed some years ago, and they have proved financially unprofitable, though real necessities in the districts traversed. The author said that on such systems two main objects must always be before them—decreasing costs, and increasing receipts. Running costs were discussed under five heads:—(1) electrical energy; (2) wages; (3) maintenance of cars; (4) maintenance of track; (5) maintenance of electrical equipment of lines. A schedule showed the proportion these costs bear to total running costs on twelve typical undertakings. Mr. Edwards thinks that an enormous amount of money is wasted in car maintenance, especially upon the upkeep of car bodies. Utility is all that is of main consequence in an inter-urban system, and "an absolutely plain car, built as much as possible of iron, and painted plainly, is all that is necessary." The saving in initial cost might not be great, but in upkeep it would be considerable. Cost of maintenance of car bodies is about 30 per cent. of the whole car and equipment, and any reduction is worth considering. The wear of track and paving, the author says, is largely due to the ever-increasing motor traffic which takes advantage of the tram tracks, and he says that, instead of cheapening track construction, as some had suggested, it will be necessary to spend even more on it than at present. He also hoped that legislation would force owners of motor vehicles to contribute toward the cost of road maintenance; if not, they must be driven off by healthy competition. In the second half of his paper Mr. Edwards advocated the extension of their scope of usefulness by cultivating goods traffic on tramways, a department which he predicted would yield a satisfactory return on capital outlay, would keep tramways in operation throughout the whole 24 hours of the day, and would lead to the discontinuance of much of the heavy motor traffic which now used tram tracks.

Mr. Fred. Bland followed with a paper consisting of a resume—from a manufacturer's standpoint—of tramway track from 1883 to 1913. The paper, though very interesting, was mainly a historical summary, and therefore hardly lends itself to abstracting purposes.

This morning when the association resumed its proceedings an exhaustive paper was read by Mr. Harry England on "Railless Traction Legislation," in which he gave digests and analyses of the numerous private Acts which have been passed by Parliament, authorising the construction and working of railless undertakings and trolley 'buses. In addition, the paper also contained some details of the running costs of trolley cars, and an illustrated description of the various systems of overhead line and cars now offered by contractors in England, bringing out their salient features. The systems of which running costs were quoted were those at Leeds, Bradford and Rotherham. The other running systems include Dundee, Stockport (opened this year), and Ramsbottom, now nearly, if not quite, completed. The financial information respecting the three lines named above, I summarise below:—

Bradford.—1¼ route miles, opened June, 1911. Two single-deck cars seating 28 passengers. Cost of overhead equipment £1381 per mile, plus extras, making £1654 per mile. Year ended March, 1912: 28,485 car miles run; average traffic revenue per c.m., 7.148d.; passengers carried, 332,800; units used, 52,509 (1.26 per c.m.); average speed per hour, 7.56 miles; average fare, 0.8d. per c.m. Traffic expenses, 3.860d. per c.m.; general expenses, .448d.; general repairs and maintenance, 1.087d.; power expenses, 1.228d.; total working expenses, 6.623d.

Leeds.—4¼ route miles. Opened June, 1911. Four single deck cars seating 28 passengers. Total capital expenditure, £8771. Year ended March, 1913: Miles run, 80,605; passengers carried, 379,271; units used, 71,522; average speed per hour, 8 miles; average fare, ½d. per c.m. Traffic expenses, 1.98d. per c.m.; general expenses, 0.15d.; general repairs, 2.12d.; power expenses, 0.40d.; interest and sinking fund charges, on electrical equipment of line, 2.11d. = 6.76d. total.

Rotherham.—4¾ route miles. Opened October, 1912. Three single deck cars seating 28 passengers. The figures relate to period from October, 1912, to January 31st, 1913: Miles run, 38,918; passengers carried, 126,028; receipts per car mile, 10.07d.; gross profit per c.m., 3.46d. Working expenses, 6.61d. per c.m.; interest and sinking fund, 1.20d. per c.m. Net profit per c.m., 2.26d.

The only other paper read to-day was one by Mr. A. V. Mason, in which he gave an explanation of the new rules and regulations for tramway employees, which have just been published by the Tramways and Light Railways' Association.

Mr. A. C. Cramb, the borough electrical engineer of Croydon, last year made some interesting observations in his annual report on the subject of cooking and heating which were mentioned here at the time. He has now published his statement for the past year, and to this I may refer. He shows that his sales for lighting purposes increased by 242,516 units over those of the previous year. The increase in sales for power was 73,985 units. The advance for heating and cooking was 56,558 units, the greater portion of this being for heating. Mr. Cramb adds here:—"The cost of electric heaters is comparatively low, with the result that this business can be developed much easier than in the case of cooking, where the cost of the apparatus is such that few people will buy, and it is hopeless to expect any materially-increased business in cooking until the Corporation take in hand a satisfactory scheme for developing this business by hiring out cookers at reasonable rates." Mr. Cramb reports coal prices, and, indeed, prices of "practically all material purchased" as from 10 to 20 per cent. higher than in the preceding year.

Mr. H. Mozley claims that "probably no tramway undertaking can show more advanced improvements in construction and design, than his system at Burnley, and he attributes it to the encouragement given by the committee in all attempts to discover, and experiment in, better plant. For example, the Burnley maximum traction truck has now been adopted as the standard for all types of cars in use in the borough. Mr. Mozley's reports are always interesting. This time he states that in accordance with the practise on other tramways, it has been resolved to remove the centre poles and substitute wire suspension with side poles. During the year 456 hammered joints have been filled in by the oxy-acetylene process at an average cost of 13s. 6d. per joint. The work is being done during the night. Last year a number of broken axles were attributed to the malformation of points. Since then, by the aid of the oxy-hydrogen cutting blowpipe, points and crossings have been made in the tramway depot which promise to be entirely satisfactory in service. The running of the cars over the points is stated to be entirely changed, there being an absence of shock.

The British Electric Traction Co. Ltd. has issued its first report since its capital re-arrangement scheme went through. For the past year it shows an increase of getting on for 14 million passengers and £61,467 receipts in respect of lines running for the whole year, but its aggregate traffic receipts at £1,749,246 show a decrease of £21,502, several undertakings having been disposed of. Electric supply receipts showed an advance of £35,564 at £353,002. Last year's strikes abnormally increased the cost of fuel, materials, and stores of all kinds, so that the net profits have not increased proportionately to the larger volume of business. The directors have something to say about the progress of motor omnibus traction, with modern and improved vehicles, and their belief that it will still further discourage the extension of tramways and light railways in Great Britain, and in some cases have an important bearing on the profits of existing undertakings. The British Electric Traction Associated Undertakings have in some districts taken steps to provide such vehicles for working in connection with their tramways, and a subsidiary company is establishing motor 'bus services in districts having no tramways or light railways.

The Poplar (London) Borough Council publicly inaugurated the other day considerable extensions to its power station equipment, consisting of two 3000 kilowatt Willans-General Electric turbo-alternators (three-phase), and a 1000kw. Westinghouse rotary converter and switchgear, as well as a 1000kw. motor converter by Bruce Peebles, new Babcock boiler equipment, coal and ash conveying plant, etc.

Quite a lot of turbine and other power station plant is being ordered just now, as well as railway electrification material. Whether it is due to our factories and works being so busy upon the big work ordered during the last year, or whether it is due to other reasons, there is a good deal of plant business being placed abroad at present, the prices quoted by continental firms being so much lower that municipal corporations declare themselves compelled to take advantage of such large economies where public money is concerned. The past week has produced several cases which have given rise to criticism, and it has to be remembered that British manufacturers have been for some time trying to raise their prices so as to earn a fairer margin of profit than hitherto, while the big rush of business has helped them in that direction. The London and North-Western Railway is reported to have given a contract for £160,000 for the electrical equipment of about 40 trains to the Oerlikon Co. of Zurich, and this fact has led things to be said. The London and South-Western Railway Co. is, on the other hand, understood to have placed the contract for electrifying a portion of its line with the British Westinghouse Co., of Trafford Park. In neither of these cases have the power-house contracts been announced yet, but they are expected to be known shortly.

## LITHGOW INDUSTRIAL ITEMS.

(From Our Correspondent.)

Lithgow (N.S.W.), July 12.

Mr. C. H. Hoskins states that the 18in. mills have been working all the week, and the 27in. (or rail) mills were putting in full time until yesterday, when there was a minor breakage, and the mill was thrown idle for the remainder of the day. Work is proceeding satisfactorily on fish-plates for the transcontinental railway, while the fitting and moulding shops are very busy, mostly on work necessary for the extensions now being carried out in various sections of the industry.

Further trouble has arisen at Lithgow iron-works. Up to the present definite particulars are not available, but it is alleged that the dissatisfaction is caused through an alteration in the duties of the lad employed on the "little hook" on the finishing rolls. It is further stated that the alteration has had the effect of making the work of the lad extremely dangerous. Mr. Hoskins was interviewed by the men's representatives yesterday morning, and Inspector Dunleavy has arrived in Lithgow in connection with the case.

The report of the Royal Exchange Co., Sydney, for the past half-year shows a balance to profit and loss account of £2651, of which £900 is devoted to the payment of a dividend at the rate of 6 per cent., and £250 is written off the furniture account, leaving £1501 to be carried forward.

# THE ALIGNMENT OF MACHINERY.

By William Sinclair.*

No subject was fraught with greater interest to Engineers than the alignment of the various parts that go to make up a machine, engine, or combination of machinery. And probably there was no subject upon which so many different ideas were held, or which called for greater originality and accuracy, and, finally, it was well to consider the far-reaching effect of this important and initial part of the erection of plant. Two machines that were similar in every particular would probably show a marked difference in running; and if careful search were made it was more than probable that such a result could be traced back to the defective alignment in the assembling and erection of either one or both plants.

The subject was far-reaching and had many ramifications, so that he could but touch the fringe of it, and doubtless many points would no doubt occur to members as he proceeded. Instances might be remembered of work under different conditions to those with which he would deal, and he hoped that his short paper would lead to a discussion upon a subject of which they all knew something, and he felt sure that they had many specialists among them whose everyday work lent itself to interesting modifications of standard practice in alignment, and he had to confess to a certain amount of diffidence in handling a subject so open to criticism.

The lines used in work of this class were piano wires of about 18 I.W.G., tightly stretched from substantial posts at each end of the machine, and a few experiments would soon show to what point the wires could be safely and conveniently tightened. It should be noted that the wires must be altogether independent of the machine and should touch it nowhere.

A good illustration of the positions in which the wires should be placed was afforded by an examination of the drawings of the machinery, as in nearly every case the wires were simply a reproduction of the centre lines, but in a tangible form; and just as the draughtsman built up the machine on paper, working to his centre lines, so should the engineer erecting the machine build up the actual cylinders, cranks and guides, etc.

In work of this class a knowledge of the art of callipering and gauging was of first importance, and it was useless to apply thought and work unless supported by accurate appliance such as spirit levels and callipers. Such conditions, members would think, went without saying, but they came across numbers of men who would do the work with a snapper line, a carpenter's level and a two-foot rule, and it was an astonishing fact that many a machine was running to-day which had been aligned in such a way and was doing its work well; but he thought the risk was not worth taking, and it could be easily realised that no matter how well the machine might run, accurate work would probably have made it do so even better.

As a general rule, for all measurements gauges should be used of, say, 3/8in. round iron, and a separate gauge made for each point in the alignment system, because, as the work proceeded, each part might require moving slightly one way or another, and to continually shift callipers to suit such a condition was apt to confuse the erector, and furthermore the effect of altering a part of the engine or machine could at once be felt at each point when separate gauges were used and the result of trying one was compared with the other points.

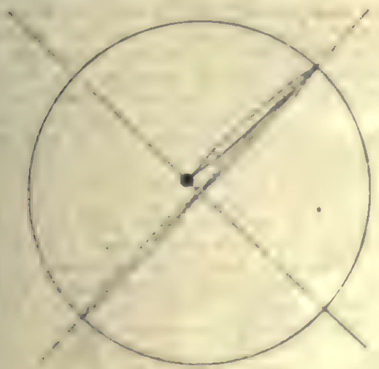


Fig. 1.

Fig. 1 showed the type of gauge used for cylinder bores and pieces of a hollow circular section, for it must be borne in mind that it was impossible to tighten up a horizontal piano wire so that it became an absolutely straight line; so for all horizontal measurements the better way to set about it was to mark with chalk the horizontal centre line of the circle and gauge from these points, then, although the centre was not correct, being more or less above the wire, still the gauging could be accurately done so far as the side alignment was concerned, and the vertical alignment would be dealt with later.

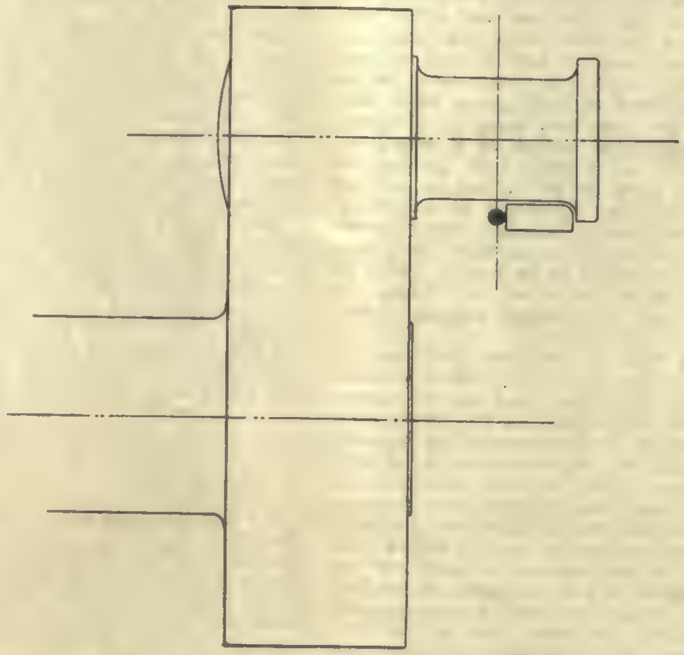


Fig. 2.

For gauging the line over a crankpin, a gauge of the kind shown in Fig. 2 would be found the easiest to handle. It should be carefully fitted to the fillets, for in a position of this kind callipers were not of much use, although a narrow steel rule would often afford as handy an instrument as the gauge.

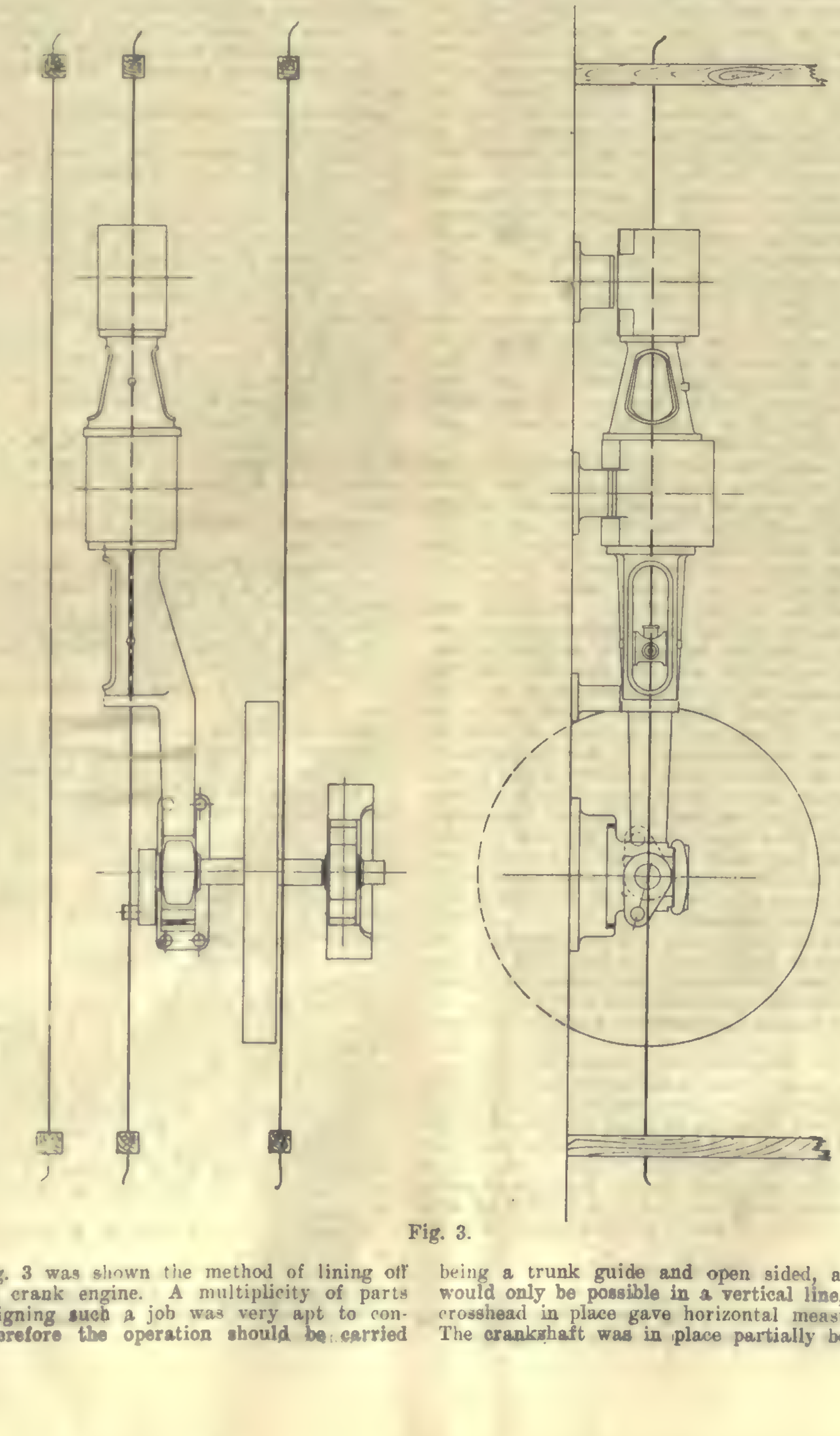


Fig. 3.

In Fig. 3 was shown the method of lining off a single crank engine. A multiplicity of parts when aligning such a job was very apt to confuse, therefore the operation should be carried out with as few parts of the engine as possible, the solid unalterable parts only being necessary and convenient. Here it would be seen that there were no cylinder covers in place, for joined cylinder covers with stuffing boxes could be made to come in line almost anywhere by tightening up one side more than another, and no help was got by putting them metal to metal, as the clearance in the studs was a place where error might creep in, and, generally speaking, they were better omitted. The crosshead was in place because, being a trunk guide and open sided, a gauging would only be possible in a vertical line, and the crosshead in place gave horizontal measurements. The crankshaft was in place partially bedded.

---

*Paper read before the March meeting of the Engineering Association of N.S.W.

The whole scheme of lining off consisted in gradually increasing the accuracy; it was quicker to gradually bring up the alignment by working in every piece than to take one or two parts and adjust them and then to find that everything had to be gone over again because the other component parts had not been taken into consideration. The author found it a good plan in large work of this class to make a rough sketch of the work and note down at each point what happened as the work proceeded, using for this purpose a set of numbered feelers, as it was practically impossible to recollect each gauging as he moved from point to point, and to talk of "just a feel" and the "thickness of the line." although certainly handy, did not convey much to anyone else except the man with the gauge. In this engine the points to be gauged would be the inner and outer centre of the crank, the outer and inner end of the trunk, and each cylinder end.

Most engines were so designed that the respective parts, such as trunk, cylinders, distance pieces, etc., all fitted into their proper places, and at first one might say, as was often said, "Put the job up to the shop marks and it won't be far out;" but two arguments could be used against doing this. First, we were perhaps doing the job in the shop starting from bare castings, and this was the first time of alignment; secondly, it was not careful engineering to take such a risk. One of the uses of the lines was to prove work as well as to adjust it, and he had often found that when machinery was transported great distances, and perhaps stored for some time in the sun, long castings had warped, quite apart from the usual warping that was inherent in castings of which one side was machined and the other was rough; also, it must be remembered that when each part went to make up a straight line when they were bolted together, the joint nearest the trunk should be a little distance out; by the time the H.P. gland was reached the whole engine would be quite an appreciable distance out of truth.

The most important point to be observed in the erection of any engine was to correctly place the crank shaft so that the path of the crank pin was perfectly parallel to the engine centre line, and this condition was checked by turning the crank on to the inner and outer centres and making sure that the wire accurately bisected the centre line of the pin at each of these two points; no other method was to be trusted. But it might possibly occur that when the crank had been shrunk on the shaft it was out of truth, and the engineer erecting it would find that, no matter what he did, no amount of adjustment would bring the shaft into line, so in the event of an occurrence like this happening it was advisable as a further check to run a second line parallel to the fly-wheel rim and to turn the fly-wheel through a revolution to be sure that this second line was true at all points; then, if it proved to be parallel to the engine centre line, they could be quite assured that the fault was not in the shaft but in the web; the pin itself could be checked by means of a square off the face of the crank web.

At the same time that all the parts were being lined off, the levels must be taken in both directions. The bases of the castings should always be placed on flat bar iron so that any lateral movement would not alter the levels. Wedges were not satisfactory except as a preliminary method of raising the various parts.

In addition to the two lines mentioned, the author showed another line running close to the cylinder. This line indicated a method he had used in conjunction with the line near the fly-wheel in order to try the alignment of an existing engine where doubt had existed as to its alignment. It was not so accurate as could be wished, but it served where it was impracticable to draw the running parts and covers and pass a line through in the usual way. The line alongside the engine was first put up and trammelled accurately from the centre of the rear cylinder and from the crank pin path, taking care to level it up. This latter was most conveniently done by means of a dumpy level, but if a dumpy level was not available then a long straight edge laid under the wire and packed up to just touch it was needed, and the level tried on this. The various points, such as centres of glands, crossheads, etc., were then tried with one trammel, and any serious discrepancies would be observed at once.

The line alongside the fly-wheel mentioned before was an additional safeguard in that it checked the right angle line of the crankshaft, but it could only be used when the fly-wheel was turned on the edge of the rim, and proved by turning the wheel to two points. This line would, of course, be higher than the other line by half the diameter of the crankshaft, but if it was levelled off with a dumpy level it could be trammelled just the same.

(To be continued.)

Numurkah (V.) Shire Council has decided to lay down an electric installation in Nathalia.

## VICTORIAN RAILWAY REVENUE.

The Victorian Railway Department, at the end of its financial year, June 30th, finds itself with receipts fallen off, compared with 1911-12, to the amount of £14,171. The total revenue was £5,204,796, the deficiency being in goods traffic. At the end of December the deficiency from goods traffic was approximately £208,000, but this has been reduced to £142,175, the traffic during the past few months having been very satisfactory. Last year purely goods traffic brought a return of £2,085,488, and live stock £320,831. The receipts from live stock on this occasion showed a deficiency of £12,696.

There was a remarkable expansion of the passenger traffic, the receipts having been £122,150 in excess of those obtained in 1911-12, when the coaching revenue was £2,624,493. Parcels and mails are included under this heading, and the receipts from those sources were respectively £10,547 and £3816 in excess of those derived last year. The revenue derived in each of the financial years since 1908-09 was as follows:—

| | |
|---|---|
| 1908-09 .. .. .. .. | £4,178,124 |
| 1909-10 .. .. .. .. | 4,443,863 |
| 1910-11 .. .. .. .. | 4,896,210 |
| 1911-12 .. .. .. .. | 5,218,967 |
| 1912-13 .. .. .. .. | 5,204,796 |

For the nine days ended 30th June, the revenue amounted to £96,511, compared with £95,649 for the same period of 1911-12. There was an increase of £2349 from passenger traffic, £2056 from goods traffic, and £2607 from live stock; while owing to certain adjustments, which had to be made, a decrease of £5952 was shown in respect of mails.

## N.S.W. ENGINE-DRIVERS' EXAMINATIONS.

The Board of Examiners of Engine-drivers, appointed under the N.S.W. Mines Inspection Act, 1901, have submitted to the Honorable the Minister for Mines (Mr. Edden) their report on the examinations of candidates for Engine-drivers' certificates of competency, held in terms of that Act, at the centres mentioned below.

175 candidaates attended; 133 passed and 42 failed.

Following is an alphabetical list of the passes at each centre:—

Tingha: Winding—J. W. Cross; ordinary—G. T. Cragg, J. H. Cross, C. Grosbernd, H. R. Lockrey, J. Stien.

Hillgrove: Winding—F. J. Hardie; ordinary—E. Goodwin, A. H. Keys, W. M. Waters.

Torrington: Winding—J. T. Quinn; ordinary—R. R. Dixon, L. S. Fletcher, T. G. Gray, H. S. Lennon, N. S. K. McCallum.

Broken Hill: Winding—A. G. Ellis, J. Kleinert, A. A. Pound; ordinary—R. E. Blight, H. J. Burns, W. J. Burns, H. P. Byteria, A. T. Gaines, E. R. Crocker, H. W. Elderfield, W. Gooley, A. E. Holt, J. Malone, K. E. Mattsson, B. S. Pound, W. Ray, J. T. Shannon.

Cobar: Winding—J. Clayton, S. M. Corbett, J. Griffiths, S. Langford, G. Williams, A. W. Winn.; ordinary—A. E. Green, J. H. McLaughlin, W. H. Sharp.

Condobolin: Winding—E. L. Jarrett; ordinary—L. Miller.

Canbelego: Winding—T. W. McKeon, C. E. Matthews, W. J. Paton, J. W. Roach, W. E. Sedgman; ordinary—H. Johnson.

Burraga: Winding—R. J. Eassie, F. B. Jardine; ordinary—J. Boyling, C. W. Murray, G. Nash, T. J. Stewart, J. Worthington.

Stuart Town: Ordinary—C. W. J. Hough, P. Quealy.

Araluen: Ordinary—F. Fleming.

Sydney: Ordinary—W. R. Bissell, T. Coleman, R. R. Cooper, G. H. Eggins, H. Feltham, W. Fox, C. J. E. Gordon, B. J. Halloran, F. Kane, H. T. Lewis, A. F. Lyons, E. H. McKnight, S. Middleton, W. Moriarty, J. W. Nelson, A. Nicol, C. H. Olsson, R. J. Peck, J. D. Pope, H. H. Strike, W. H. Vest, G. Williams.

Newcastle: Ordinary—F. K. Butcher, S. S. Evans, J. A. Llewellyn, E. G. F. Lowe, P. McNamara, J. Ryan.

Electric Motor.

Sydney: B. L. Turner.

Broken Hill: F. A. Barrow, C. W. Blakeley, W. Bottrall, H. M. Burgess, S. P. Byrne, G. E. Carnie, J. L. Dinning, W. Forster, C. H. Hicks, A. Ledgerwood, H. W. Lutjens, H. May, W. J. Mayne, V. E. Millington, P. E. Nickson, J. Sprout, D. Stephen, B. E. Tester, G. W. Williams.

Cobar: H. Beecher, F. M. Carter, W. Cork, L. A. Edgar, R. Friend, A. J. Hawkins, V. C. Heinisch, T. Jones, C. H. Kirkman, J. McPherson, W. Pope, P. E. Richards, E. Rickard, E. C. Wiechmann.

Hillgrove: J. C. Aisbett, C. A. Bruce, A. Gray, S. H. Hipkins.

Gas.

Yalwal: A. A. Carroll, T. McGregor, E. Smart.

Bodangora: C. Allen, J. Nisbet, A. Smith, F. Winchester.

## COST OF TRADE DISPUTES.

In a report concerning industrial conditions in Australia for the quarter ended March 31st the Commonwealth Statistician (Mr. G. H. Knibbs) states that during the period mentioned 39 disputes, which caused stoppage of work, occurred, and of that number 25 were in New South Wales. The total number of workpeople affected by these disputes was 13,234, while the number of working days lost during the quarter was 125,521, and the estimated loss to workpeople in wages was £55,887.

During the three months under review variations in rates of wages, all of which meant increases, were accounted for on 49 occasions, 25 in New South Wales, and 12 in Victoria, while, in addition, there were three changes for which no reliable information was secured by Mr. Knibbs. Altogether, 33,504 persons benefited by the increased rates, and the aggregate amount of increase a week was £8394—an average of just over 5s. a week for each individual.

## MUNICIPAL ELECTRICAL CONFERENCE IN LONDON.

(Continued from issue of July 10.)

The report of the committee showed a membership of 386, an increase of six on the year; 177 members are chief electrical engineers, and 167 members are committee representatives. The rest are either assistant engineers or honorary members. The proposal to establish a statistical bureau is not approved owing to the expense and doubt as to whether there would be adequate support. It is thought that the present system of filing information in the secretary's office is sufficient, provided that members co-operate by sending in information. The report touches upon many matters showing that the past year has been a busy one. A brief reference is made to the question of electric supply publicity, and it is explained that the reason why municipalities cannot financially support a scheme for an extension in this direction is that many local authorities are at present debarred from spending money on publicity and other similar objects. The association is promoting a Bill this year—it was recently introduced in the House of Commons—"The I.M.E.A. Bill," and says "that the electrical industry will continue to be hampered, and to be unable to compete with other industries in regard to developing its resources" until such a Bill is passed. Another point that has received much attention is the standardisation of conditions of contract as a basis for contracts between purchaser and contractor. Negotiations on the matter, between the British Electrical Manufacturers' Association and the Incorporated Municipal Electrical Association, are still proceeding, the latter association not having agreed to the proposed conditions up to the present. A proposition from the Institution of Electrical Engineers for closer relationship between themselves and this association, and the holding of annual joint conferences in place of their separate summer gatherings, was put to the council, and the majority were averse to it in principle, though an occasional joint conference was not objected to. The interests of the two bodies are described as "entirely different, and distinctly opposed in some instances."

The new "I.M.E.A." Bill, mentioned above as being now before Parliament, formed the subject of one of the "in camera" discussions at the convention. In view of the present political position, over-clouded with daily "Marconi revelations" and rumours of a coming general election, it cannot be predicted with confidence whether success or failure is more likely to be the experience of this Bill during the coming months. It contains a number of provisions, first and foremost being the proposals designed to secure full authority for electric contracting (provided it is not done at a loss and that accounts are clearly set out showing the position of this department of the work), and hiring out of apparatus, etc., for light, heat, and power, the authorising of publicity and exhibition work, and the setting up of show rooms, and the using of profits or surpluses on supply business for establishing capital funds. These and other suggestions are embodied, as it will be observed, for widening the powers under which electric supply undertakers operate, the belief of the association being that when in possession of such proper authority electric supply business of all kinds will be able to proceed with less obstacle and restriction than in the past.

Among the works visited by members during the present meeting are the Deptford power station of the London Electric Supply Corporation, the new equipment of which was described here last year; the Kingston-on-Thames municipal generating station, where there have lately been installed new Diesel engine-driven sets of horizontal type (M.A.N.); and the Lot's-road, Chelsea, power station, where there are, as part of the equipment, eight Parsons-Westinghouse turbo-alternators of recent design, each rated normally for 5500 to

6000 kilowatts, extensive British Thomson-Houston switchgear, and over 60 Babcock boilers. Special interest attaches to the Kingston Diesel equipment. It comprises one 400b.h.p. four-cylinder, four-cycle engine running at 192 revolutions per minute, which drives a single-phase Siemens flywheel alternator between the pairs of cylinders, and one two-cycle engine driving a similar alternator at 165 revolutions per minute. In regard to oil storage for these engines there are a couple of 60-ton tanks placed in the boiler house, which would meet the normal needs of the four-cycle engine for between four and five months. Mr. J. E. Edgcombe, who is acting as president for this year's meeting, consequent upon the real president (Mr. Shawfield) being unable to hold the office now that he has left municipal electrical service, is the borough electrical engineer of Kingston-on-Thames, and it is to his plans that these Diesel additions have been carried out.

(To be continued.)

## MISCELLANEOUS.

Application is being made by Messrs. Hoadley and Lawton, Moe (V.), for a licence empowering them to divert water to the extent of 12,000 cubic feet per minute from the Narracan Creek, near the Narracan railway station, for electric power purposes, and also to occupy certain Crown lands for works of storage and diversion, and to cut a race thereon. Objection to the application is likely to be offered by the Narracan shire council, which has only recently decided upon erecting a stone crushing plant at a cost of nearly £1200, which will be driven by motor power from the Narracan Falls. It is understood that the above applicants are applying in the interests of a co-operative company who propose erecting extensive works in a neighbouring town on the Gippsland line, about 28 miles from the Narracan Creek.

* * *

The Union Co.'s s.s. "Magara," which was recently overhauled at the Woolwich Dock, is the largest vessel ever docked in Sydney, being 500 tons larger than the "Orama," which heretofore held this record. The dock, however, is capable of taking the "Ceramic," the 18,000-ton White Star liner.

* * *

The fines inflicted on the recent railway strikers at Darling Harbour have not yet been paid. In order to avoid trouble the Government has extended the time for finding the money.

* * *

Burwood municipality is considering the question of installing electric light, and is in negotiation with the Sydney City Council for a supply of current.

* * *

Mr. John Harper, assistant Railway Commissioner, N.S.W., giving evidence respecting the proposed Barraba-Bingara railway before the Public Works Committee, stated that the length of the proposed line was 44 miles, and the estimated cost £378,823. He could not recommend the construction of the line, as it would involve a distinct financial loss. As regarded another railway scheme, Manilla to Boggabri, he suggested the question of a line joining the main northern line should be fully investigated, as such a route would serve a much wider area of country between Manilla and Boggabri.

* * *

Oil fuel gave complete satisfaction on the run of the Union Co.'s s.s. "Magara" from Vancouver to Sydney. Unlike coal, the oil fuel gives a steady steam pressure of 220 lbs. When coal was used as fuel the pressure varied between 160 lbs. and 210 lbs. The steamer carries 5000 tons of oil, which is more than sufficient for the round trip.

* * *

Whilst the New South Wales Government has decided to introduce a Bill next Session, authorising the construction of the underground railway system, it does not intend asking Parliament to sanction the building of the North Shore Bridge, deeming the placing of the city traffic underground as a work of greater necessity. Mr. Griffith, Minister for Works, holds that while railway duplication, railway extensions, and the supply of rolling stock were absolute necessities for country interests, the underground railway system was equally a necessity for the people of the metropolis. The bridge, though justified on every ground, could not claim to be in the same category as the railway, and must naturally stand back until money became cheaper and more plentiful. The shorter that postponement was the better he would be pleased.

* * *

Though the transfer of the Garden Island naval depot to the Commonwealth by the Imperial authorities was believed to be settled, the N.S.W. State Government has now stepped in, and questions the power of the British Naval Authorities to transfer its interest to the Commonwealth. It holds that the title of the Admiralty automatically expired when it ceased to occupy the property, and the depot then reverted to the State. It consequently holds that the Commonwealth can only acquire the island as "transferred property," which, if correct, involves the Federal Government in the payment of an annual sum of £50,000 as interest. The immediate difficulty has been met by the Admiralty instructing the Admiral not to surrender the establishment, but to permit the Commonwealth to use it pending a proper settlement. As to whether the Admiral is to rely on law or his guns is not stated, but it is not regarded as likely the Commonwealth Government would, in the circumstances, send the fleet to bombard the place, and New South Wales has only a police-launch or two to back up any demand for "surrender."

* * *

The principal item for discussion at last week's meeting of the Metropolitan Board of Works (Melbourne), under the chairmanship of Mr. W. J. Carre-Riddell, was the 4 per cent. loan of £300,000 which has just been floated. The finance committee reported that 86 tenders, totalling £96,800, ranging from £96 10s. to £98 5s., had been received, and that the average price realised was £96 11s. The expenses of flotation were approximately £1 10s. 4.7d. per cent. The loan was underwritten by the Commonwealth Bank at 1 per cent., and it will therefore receive an allotment of £203,200. The interest cost to the board, allowing for expenses and redemption, will be £4 5s. 3d. per cent., which is considerably less than the recent Government loan raised in London.

* * *

Hansen and Heyde Ltd. has been registered in Sydney with a capital of £10,000, in £1 shares, to carry on business as engineers and motor-car body builders. The registered office is in Sydney.

* * *

The report of the N.S.W. Water and Sewerage Board for the year ended 30th June shows that the average consumption of water per head of population was 41.9 gallons, as against 41.51 gallons for the previous year. The average daily supply was 32,590,000 gallons, and the estimated population supplied 777,000. The total output from Prospect reservoir was 11,897,000,000 gallons. The quantity of water supplied through high levels was 65 per cent. of the total supply. Working expenses totalled £216,995, interest on capital £384,863. The revenue amounted to £629,758, thus leaving £27,900 to be carried forward. The capital debt now amounts to £10,922,852.

* * *

Under the auspices of the Sydney University Engineering Society, Mr. Charles Wilkin, M.I.M.E., formerly interlocking engineer in the New South Wales railway service, gave a lecture in the Sir P. N. Russell Lecture Theatre on railway interlocking as an integral part of the curriculum of a modern engineer. He dealt extensively with the evolution of the system, and touched on manual, all-electric, electro-pneumatic, electro-mechanical, automatic, semi-automatic, lock and block, and hydraulic installations, all of which had their special characteristics and advantages in varying circumstances.

* * *

Five recently imported Hunslet locomotives are being put together at the Newcastle Dyke workshops (N.S.W.) They are for use on railway construction work, and are the first of the type to be imported. Two have had satisfactory trial runs, and the remaining three are expected to be under steam in a few weeks.

* * *

The N.Z. Government has decided to compensate Captain Atwood, of the "Elingamite," who lost his certificate years ago, owing to the wreck of that vessel on the Three Kings. A subsequent enquiry showed that the charting of these rocks was incorrect, and that the Captain had set a proper course according to the position assigned them in the official charts.

* * *

The Lord Mayor of Sydney (Alderman Cocks) states that he intends to lay before the City Council a scheme by which the Council would construct the North Shore bridge in return for the right to levy a toll, provided Parliament would confer such a right on the Council. He points out that some 500,000 people in the city and 160,000 in the northern suburbs would be benefited by the construction of the bridge, and believes that a special tax in the metropolitan area augmented by a toll-charge would enable the Council to meet the financial requirements of such a project.

* * *

Mr. Holman, Premier of New South Wales, replying to a deputation which waited upon him and complained that the importation of engines had brought about general slackness in the engineering trade, promised that immediate enquiry would be made into the alleged throwing of 100 skilled artisans out of employment. He also promised to enquire into the matter of the repairing and putting together of the engines imported, with a view to ascertaining whether the work could be given to mechanics here, and stated the Government had not imported mechanics for some time.

* * *

Recently Sir Alexander Peacock, Minister of Labour (V.), invited Professor Payne, of Melbourne University; Mr. W. Stone, electrical expert for the Railway Department, and Mr. H. R. Harper, electrical engineer of the City Council, to form a committee and report on the question of whether the speed of Melbourne lifts could be increased with safety from 200ft. to 300ft. per minute. The three experts have now reported to the Minister that they consider the increased speed can be allowed with safety in every case in which the lift is in charge of an attendant. The present rate of speed, they recommend, should be observed in the case of automatically operated lifts. The Minister has ordered that section 27 of the regulations should be altered, to enable effect to be given to the recommendations.

* * *

A strike occurred last week on the Wagga-Tumbarumba railway owing to the men claiming pay for the half-hour occupied in travelling to and from their work. It was promptly settled by the engagement of another gang.

* * *

The first creation of the Victorian State shipbuilding yard at Williamstown, the dredger "W. H. Edgar," was launched last week, with the assistance of the Minister of Public Works and other dignatories. The vessel, which is of the suction type, has been constructed to deal with 400 tons of silt an hour, and is to be used on the Gippsland Lakes.

* * *

The loop line, which will give communication with the Railway Department power house at Yarraville (V.), is nearing completion, and should be in running order by the end of this month. This is the first step in the railway electrification scheme.

* * *

Three hundred cases of material were landed last week for the conversion of the Newtown (Sydney) telephone exchange to the automatic system. Balmain and Glebe are to be the next to be dealt with, and then will follow Ashfield, Burwood, Randwick, Parramatta, Homebush, and Rookwood, Epping, Ryde, Hunter's Hill, Wahroonga, Paddington, Waverley, and Watson's Bay.

* * *

The manager in Melbourne of the Western Electric Automatic Telephone Company of Australia Limited has received intimation that the company's tender for the installation of automatic telephones in New Zealand had been accepted. The contract price is approximately £200,000.

* * *

The New Zealand Conciliation Council has arrived at an agreement on points in the dispute between the Australasian Institute of Marine Engineers and the owners of small coastal steamers. The wages of chief engineers will range from £22 per month to £23 10s.; second engineers, £17 10s.; third, £15 10s. The agreement is for three years.

* * *

Mr. Valentine J. Crowley, A.M.I.E., has submitted to the Victorian State Government plans for a hydro-electric plant at Dights Falls. It is claimed for the scheme that Melbourne can be supplied with electricity at one-tenth of a penny per unit. The scheme is being considered by the Public Works Department.

* * *

Plans for alterations to be made at the Geelong (V.) railway station have been forwarded to the town clerk. The work, which is to be put in hand early, will consist of construction of a subway, the erection of new locomotive sheds, the lengthening of the passenger platform and rearrangements of the yard, the whole involving an expenditure of £100,000.

* * *

By a boiler explosion a locomotive and engine shed were wrecked at the Labasa sugar mill recently. The locomotive first blew up through the top of a shed, crashed down through the laboratory adjacent, and after a second explosion came down in a mass of debris on a coal heap. Two coolies were killed, and two more, also a European mechanic, were badly injured.

* * *

In reply to a deputation making a few mild requests of the following nature, viz., that the eighth section of the North Coast railway from Coff's Harbour to Glenreagh, should be begun without delay, that the Glenreagh to Dorrigo line should be commenced, that provision be made for increased harbour facilities at Coff's Harbour, and the decision to reduce the endowment subsidy for the Dorrigo shire be reconsidered, Mr. Griffith, N.S.W. Minister for Works, said, in effect, "Barkis is willing, but the cupboard is bare." "I have been spending nearly all the money in the country," he stated, but I still realise we are not spending enough. The Government has spent a million a year in wages alone, and could spend three or four times the amount. There has been too much in the past of dragging everything down to Sydney, and I intend to make Coff's Harbour a capable, deep-sea harbour, for the reception of the produce from the huge districts both north and south of it."

* * *

Chiefly owing to the liberality of Mr. H. V. McKay, who presented the Education Department with four acres of land and £2000 for the purpose, a junior technical college has been founded

**P & O.** COMPANY'S ROYAL MAIL STEAMERS

FOR MARSEILLES PLYMOUTH, AND LONDON.

Leave Sydney on the subjoined dates, calling at usual ports

FIRST AND SECOND SALOON ONLY.

| Steamer. | Tons. | Commander. | Noon. | Melb., 3 p.m. |
|---|---|---|---|---|
| MALOJA | 12,500 | Weston | July 26 | July 29 |
| MONGOLIA | 10,000 | Llewellyn | Aug. 9 | Aug 12 |
| MACEDONIA | 10,500 | Bennett | Aug. 23 | Aug. 26 |

PASSAGE MONEY TO LONDON—
Single, £41 16s to £82 10s.
Return £69 6s. and £123 4s

Return Tickets between Inter-State Ports are available for return by Orient, Messageries Maritimes, and N D L steamers having room.

SPECIAL HOLIDAY RETURN TICKETS to COLOMBO are now issued, available for two months. Fares from Sydney, £45 2s. first saloon, and £31 18s second saloon.

A. GORDON WESCHE, Superintendent IN AUSTRALIA, 63 Pitt-street, Sydney.

**The COLONIAL MUTUAL FIRE Insurance Company Limited.**

Principal Office 60 MARKET-ST., MELBOURNE

Branches in all the States

Transacts Fire, Guarantee, Employers' Liability, Marine Burglary, and Plate Glass, Accident, Workers' Compensation and Live Stock Insurances

Send for Prospectus

W. TUCKER, General Manager

*Harringtons* LTD

**ANALYTICAL & METALLURGICAL DEPT.**

Lowest fees for all kinds of Assay, Analytical, and Metallurgical work.

Expert Advice on Ore Treatment, Bullion Refining, Smelting, etc., etc. Directed by a qualified Analyst from Messrs. Johnson and Sons, London; Assayers to Bank of England; H.M. Mint, The Council of India, etc.

**HARRINGTONS LTD.**
**386 George Street, Sydney.**

at Sunshine (V.). Mr. McKay has intimated to his apprentices that all who enrol as students will be granted a half-day off every week, at full pay, to enable them to carry on their studies. The college, which is well equipped, will be opened next month.

* * *

South Melbourne Council (V.), after agreeing that an expert report on a proposed electric tramway line Prince's Bridge to Middle Park should be obtained, have dropped the scheme.

* * *

Hawthorn (V.) Council has voted against the proposed Kew-Hawthorn and Camberwell electric tramway from Cotham-road to Waverley-road. The cost would be £54,000. A line along Burwood-road would probably receive the support of the Council, as being of more use to the district.

* * *

A through service of electric cars from Kew (V.) to St. Kilda Beach was opened on Saturday, and was largely patronised.

• • •

Commenting on the position of the metal industry of the world, a Russian paper says that there can be no doubt the development of the Russian non-ferrous metal industry is on the tapis, particularly for zinc and lead. Copper production, as is known, is already well on the way as an important Russian industry. An opinion has begun to prevail that to establish a lead-producing industry in Russia the importation of foreign lead ore should be facilitated. As a rule, at present, lead is produced where the ore is found, whilst zinc is extracted where fuel is plentiful. Thus, in the Caucasus, with its innumerable lead-ore deposits, we have what will undoubtedly be one day a great lead producing centre, whilst zinc ore, too, is to be found in abundance in the Caucasus. But for want of conveniently situated fuel it will have to be carried to where fuel is, or the ore may have to be sent out of Russia altogether. The above observations, too, apply to the treatment of the lead-zinc ores of the Primorsk territory. And as to the Khirgis Steppes, where the deposits of zinc and lead are not only numerous, but very rich, in view of the undeveloped condition of the country, particularly in respect to ways of communication, it is difficult to decide now where the ore should be treated. Lead ore besides, to a large extent, should be treated with the local coal, whilst the zinc ore should be taken to some suitable smelting centre, says the writer of the report.

# *Tenders Invited and Accepted*

It is particularly requested that the information regarding contracts open, and the successful tenderers, be forwarded to The Editor not later than Monday of each week.

The following contractions are used throughout:—S—supply; D—delivery; M—manufacture; C construction; E—erection; P—purchase; I—installation; R—removal. Where no contractions appear, supply and delivery is understood. The date at the beginning of each paragraph refers to the closing of tenders.

## INVITED

### Commonwealth.

Specifications, tender-forms, etc., for tenders invited for the Postmaster-General's Department of the various States under this heading may be had as follows:—Victoria—Various State G.P.O.'s. New South Wales—Departmental Stores, Sydney, and various G.P.O.'s in other States. South Australia—Adelaide, Melbourne, Sydney and Brisbane G.P.O.'s. Western Australia—Departmental Stores, Perth, and various G.P.O.'s in other States. Queensland—Various State G.P.O.'s. All States—Various G.P.O.'s. If the Specifications, etc., may be had elsewhere in addition the places will be given in parentheses.

POSTMASTER-GENERAL'S DEPARTMENT, Melbourne.—22nd July.—Batteries and battery material, as per schedule No. 881.

22nd July.—Wire (silk covered), schedule No. 884.

22nd July.—45 lb. wire (silk covered), as per schedule No. 883.

22nd July.—10,000 porous pots, as per schedule No. 882.

22nd July.—Ironwork, as per schedule No. 891.

22nd July.—Telephone switchboards, as per schedule No. 899

22nd July.—Telephone switchboard cable, as per schedule No. 856.

22nd July.—Telephone switchboard cable, as per schedule No 857.

22nd July.—Sundries, as per schedule No. 892.

29th July.—Detectors, keys, staples, tongs and rosettes for table telephones, as per schedule No. 901.

29th July.—Sundries, as per schedule No. 893.

29th July.—Coach screws and spikes, as per schedule No. 904.

19th August.—105 miles of paper-insulated, lead-covered cable, as per schedule No. 906.

26th August. — 460 coin-collecting devices, electrically controlled, as per schedule No. 916.

16th September.—S., D., E., and I., at the Telephone Exchange, Collingwood, Victoria, of a common battery switchboard, as per schedule No. 860, or an automatic, or semi-automatic, switchboard, as per schedule No. 859.

16th September.—Galvanised-iron piping and fittings, as per schedule No. 951.

23rd September.—Sulphate of copper, as per schedule No. 956, in the undermentioned quantities:—New South Wales, 140 tons; Victoria, 25 tons; Queensland, 55 tons South Australia, 20 tons; Western Australia, 60 tons.

23rd September.—500 letter-box fronts, small size, as per schedule No. 957.

23rd September.—General stores, for a period of two years, from the 1st July, 1913, to the 30th June, 1915, as per schedule No. 913.

7th October.—S. and I. of electrically-driven machinery for operating pneumatic tube services, Central Telegraph Office, Melbourne, as per schedule No. 900.

14th October.—S. and E., at the Telephone Exchange, Melbourne, of a common battery multiple switchboard, as per schedule No. 868.

4th November.—D. and E. of eight automatic telephone switchboards at the Ascot, Canterbury, Malvern, Cheltenham, Footscray, Oakleigh, Sandringham, and Williamstown Telephone Exchanges, as per schedule No. 953.

POSTMASTER-GENERAL'S DEPARTMENT Sydney.—23rd July.—20,000 blocks "Parcel Bill No. 7," 4000 blocks "registered letter list," as per stores schedule N.S.W., No. 325.

30th July.—S., D., and E., at the Telephone Exchange, Sydney, of two sections of switchboard, common battery multiple, to form an extension to the existing common battery switchboard at the Telephone Exchange, Sydney, as per schedule No. 264.

6th August.—62,300 lineal feet of conduit (6 and 9 ducts), as per stores schedule N.S.W. No. 321.

20th August.—575 detectors Q. and I., as per stores schedule N.S.W. No. 322.

27th August.—(1) Telephones to stores schedule N.S.W. No. 301; (2) switchboards to stores schedule N.S.W. No. 302; (3) lamps, electric, incandescent, to stores schedule N.S.W., No. 304.

15th October.—450 fire sheets (asbestos), as per stores schedule N.S.W. No. 326.

POSTMASTER-GENERAL'S DEPARTMENT, Perth.—23rd July.—S. and D. of switchboards and parts, telegraph and telephone instruments, to W.A. schedules Nos. 254, 255, and 256.

30th July.—S. and D. of switchboard cable, to W.A. schedule No. 275.

30th July.—S. and D. of steel towers, battery material, wire and iron work generally, to W.A. schedules, Nos. 259, 262, 263, 268, and 269.

6th August —S. and D. of insulators, telegraph and telephone material, and iron poles, to W.A. schedules, Nos. 258, 261, and 264.

6th August.—Screws, coach.

6th August.—One motor car to the Postmaster-General's Department in Western Australia, in accordance with schedule No. 302.

13th August.—About 20 tons of bolts and nuts to W.A. schdule No. 300.

20th August (extended from 6th August).—Cable, lead-covered, paper-insulated—telephone.

8th October.—Expansion bolts and shields to schedule No. 297.

POSTMASTER-GENERAL'S DEPARTMENT. Brisbane. — 30th July.—Cable, as per stores schedules Nos. 254 to 260 (omitting 258); wire, copper and accessories, as per stores schedule No. 267; wire, covered, as per stores schedule No. 268.

30th July.—Battery, glassware, as per stores schedule No. 252; battery material, chemicals, etc., as per stores schedule No. 253; conduits, earthenware, as per stores schedule No. 261; crossarms and spindles, wood, as per stores schedule No. 262; wire, steel strand, as per stores schedule No. 270.

27th August.—S., D., and E. at the Telephone Exchange, Brisbane, of five sections of switchboard, common battery, multiple, and other equipment to schedule No. 243, specification No. 458

10th September.—Telephone Exchange, Brisbane, nine sections of a trunk line switchboard, to schedule No. 244, specification No. 461, and the general conditions, drawings, etc., attached thereto.

24th September.. — Ironwork, as per stores schedule No. 264; pipes, cast iron, as per stores schedule No. 265; poles, iron, etc., as per stores schedule No. 266; wire, G.I., as per stores schedule No 269.

POSTMASTER-GENERAL'S DEPARTMENT. Adelaide.—23rd July.—600 coppers for gravity cells, as per schedule No. 302.

13th August.—Telephone parts, as per schedule No. 292, and switchboards, as per schedule No. 293.

12th November.—One lamp signalling trunk line switchboard, of five sections, one cable turning section, and one cable storing section, one two-position recording desk, and one chief operator's desk, as specified in specification No. 431, etc., delivered at the Telephone Exchange, Adelaide, as per schedule No. 296.

DEPARTMENT OF HOME AFFAIRS (Works Director, Victoria).—21st July.—S. of laundry plant to Captains' Point, for the Naval College, Jervis Bay, N.S.W.

DEPARTMENT OF HOME AFFAIRS.—

**Osborn's Truck Wheels & Axles**

**Osborn's Mushet High Speed Steel, Twist Drills, Mining Steels, Crusher Jaws and all classes of Castings.**

Samuel Osborn & Co. Ltd., Sheffield, are Standard Makers.

Gibson Battle & Co. Ltd.

**535 Kent St., Sydney.** **486 Collins St., Melbourne.**

S.A. Agent: C. C. Deland, Victoria Square, Adelaide.

Federal Capital Power Plant.—15th September.—S. of sect. 1. main power-house switchgear; sect. 2 switchgear for Diesel engine plant.

DEPARTMENT OF HOME AFFAIRS.—Kalgoorlie-Port Augusta Railway.—23rd July.—7ft. wheel lathe, single-ended punch and shears, 10 cwt. portable cupola, 5 cwt. steam hammer; (alternatively) 5 cwt. belt-driven pneumatic hammer.

29th July.—M., in Australia, S., and D. of car bodies for construction train; M., in Australia, S., and D. of car bogies for construction train.

2nd September.—M., S., and D. of 80 lb. steel rails and fishplates; M., S., and D. of iron dog spikes and steel fishbolts and nuts for 80 lb. rails.

DEPARTMENT OF EXTERNAL AFFAIRS.—Port Augusta to Oodnadatta Railway.—22nd July.—M., S., and D. of 4 wheel brake vans (3ft. 6in. gauge).

DEPARTMENT OF EXTERNAL AFFAIRS.—Pine Creek to Katherine River Railway.—19th August.—S. 80 lb. steel rails and fishplates; sleepers, (a) steel, (b) timber (Powellised); iron dog spikes and steel fishbolts and nuts for 80 lb. rails.

DEPARTMENT OF TRADE AND CUSTOMS.—26th August.—S. and D. of eight (8) automatic flashing lights.

DEPARTMENT OF DEFENCE.—28th July.—Period of supply, from 1st July, 1913, to 30th June 1916.—Metals, cord, tubing and wire cloth, for the Commonwealth Small Arms Factory, Lithgow, N.S.W.

25th August.—S. and E. of an oil storage tank at Garden Island, Sydney.

## Victoria.

VICTORIAN RAILWAYS.—17th July.—Moulded tumblers.

17th July.—S. of mild steel headplates, angle bracing, etc., for bridges.

17th July.—Adapters, wall plugs, switch and wall plugs combined; 4-light cluster globes, shortening balls; pure rubber tape.

18th July.—Wrought iron legs, straps and stays for platform seats; mild steel nuts; red double pressed bricks; plain white bricks.

23rd July.—M. (from iron, which will be sold to the contractor by the corporation), S., and D. of ½in. dog spikes.

23rd July.—C. and riveting of mild steel girders for bridge over Nicholson-street, Footscray (Williamstown line).

23rd July.—M., S., and D. of one hydraulic forging press.

23rd July.—S. and D. of girders and superstructure for one railway and cable tramway crossing complete, for Plenty-road crossing, Queen's-parade, North Fitzroy.

30th July.—S. and D. of one electric-driven motor lorry chassis.

30th July.—Balls and ball races for 70ft. turntables.

30th July.—M., S., and D. of gun metal carriage fittings.

30th July.—S. and D., as ordered during the period ending 30th June, 1914, of brass symbols for trackmen's passes.

4th August.—Electrification of the Melbourne suburban railways—(a) circulating water and sump pumps with motors; (b) air and water extraction pumps and motors; (c) surface condensers, hot wells, piping, and sundries.

6th August.—Steel channel bars.

13th August.—Best steel boiler plates for steel cranes, boilers, etc.

13th August.—30,000 lineal feet of wrought-iron steam pipe, 1in. diameter.

20th August.—M., S., and D. of (a) lathe, (b) sawing machine, (c) chisel mortiser, (d) cut-off machine, (e) moulding machine.

27th August.—Hollow chisels and bits.

3rd September.—S. of three petrol engines and pumps for use at Newport Workshops. (Fresh tenders.)

3rd September.—Steel faced machine knives.

1st October (extended from 10th September).—Neutral track relays.

VICTORIAN RAILWAYS COMMISSIONERS.—State Coal Mines.—13th August (extended from 25th June).—S. of electrical equipment.

## New South Wales.

PUBLIC WORKS DEPARTMENT.—11th August.—Steel bridge for Macleay River, Wauchope to Kempsey section, North Coast railway.

11th August.—Steel bridges for Hastings River and flood channel, Wauchope to Kempsey section, North Coast railway.

11th August.—25 five-ton steel gantry cranes.

3rd September.—Efficient steam tugs for use at Bellinger River and Cape Hawke, from 1st November, 1913.

RAILWAY DEPARTMENT.—6th August.—S. of one live steam feed water-heater for Ultimo power-house. (See advertising columns.)

20th August.—S. of a pneumatic ash handling plant for White Bay power-house. (See advertising columns.)

15th October.—S. of 13 direct-current motors. (See advertising columns.)

METROPOLITAN WATER AND SEWERAGE BOARD. — 21st July.—Contract Nos. 1195-8. construction pipe sewers—(a) northern division, (b) eastern division, (c) western and southern divisions, (d) north-western divisions, for period ending 30th June, 1914, separate tenders.

21st July.—S. of 4½ miles of 28lb. or 30lb. "T" rails.

## South Australia.

SUPPLY AND TENDER BOARD. — 22nd July.—S. and D. of chain iron.

RAILWAYS.—22nd July.—C. of 30 or 50 bogie waggons, 5ft. 3in. gauge.

5th August.—C. of 12 refrigerator vans, 5ft. 3in. gauge.

12th August.—M. of wrought iron details for waggons, 5ft. 3in. gauge.

12th August.—C. of five or ten class "K" locomotive boilers, 5ft. 3in. gauge, the principal material for which, as detailed in the specification, will be supplied by the Railways Commissioner.

PUBLIC WORKS DEPARTMENT. — 29th July.—Putting down of a bore for water in the hundred of Ettrick, about two miles north-east of Naturi railway siding.

5th August.—C. and E. of 52 sheds with 4 tanks, each in the hundreds of 499 and 502, about 30 miles south-east of Minnipa Hill.

## Western Australia.

GOVERNMENT TENDER BOARD.—31st July.—3520 pairs of fishplates for 46¼ lb. material.

## Queensland.

RAILWAYS DEPARTMENT.—22nd July.—P. of about 21 tons of cast-iron scrap, at Brisbane and Pinkenba.

29th July.—S. of steel superstructure for three 149ft. 6in. spans for widening Bremer River bridge.

19th August.—General supplies for 1914 and 1915 for Northern Division, schedule No. 1 (fixed quantities) to be for year 1914 only, schedules Nos. 2 to 30, inclusive, are for two years.

26th August.—General supplies for the years 1914 and 1915, for the Southern and Central Divisions.

PUBLIC WORKS DEPARTMENT. — 18th July.—Steel super-structure of two spans of 120ft. each on one cast-iron pier, and concrete abutments for new bridge over McIntyre River, Goondiwindi.

TREASURY DEPARTMENT.—29th October.—C. and E. of central sugar mill at Babinda Creek, North Queensland.

## New Zealand.

RAILWAYS DEPARTMENT.—31st October.—S. and D. of stores for the period from April 1, 1914, to March 31, 1917.

## General.

CITY OF MELBOURNE.—18th July.—Insulated copper cables.

29th July.—S. and D. of (a) two 5-ton motor-driven waggons, with tipping body; (b) two motor-driven street watering vans, at least 1000 gal. capacity; (c) one motor lorry, 1 ton; (d) one runabout motor car (to seat four persons). (See advertising columns.)

1st August.—P. of scrap electric lead, accumulator materials, etc.

MUNICIPAL COUNCIL OF SYDNEY.—21st July.—P. of scrap copper, lead, brass, and wrought iron. (See advertising columns.)

21st July.—S. of curve drawing ammeters and voltmeters, motor stairwall, and platform. (See advertising columns.)

CORPORATION OF HOBART (T.). — 4th August.—105 tons of straight cast-iron pipes, together with sundry special castings.

CITY OF CHRISTCHURCH (N.Z.). — 7th August.—S. and E. of a 13-panel E.H.S. switchboard.

MUNICIPALITY OF NORTH SYDNEY. — 29th July.—S. and E. of refuse destructor, capable of dealing with 200 to 250 tons per week.

CITY OF CAULFIELD (V.) (F. Jowett, Town Clerk).—23rd July.—P. of old tramway rails and fishplates. (See advertising columns.)

SHIRE OF BRAYBROOK (V.). (Walter J. Andrew, Shire Secretary, Sunshine). — 18th July.—S. of portable stone-breaker, and power for driving same.

SHIRE OF KYEAMBA (N.S.W.) (C. L. Daley, Shire Clerk).—17th July.—S. of 8h.p. portable engine.

SHIRE OF SPRINGFIELD (V.) (H. C. White, Shire Secretary, Romsey).—25th July.—C. of a bridge, with (a) reinforced concrete, or (b) concrete abutments and steel girders and cylinders (3 spans of 40ft. each), over the Deep Creek at Darraweitguim.

NORD DEUTSCHER LLOYD
REGULAR SERVICE TO EUROPE.
REDUCED FARES TO LONDON.
TO MANILA, CHINA AND JAPAN.
Via New Guinea and Yap.
Fares to Hong Kong, £40; II., £26.
Full particulars will be sent on application to—
LOHMANN AND CO., General Agents,
7-9 Bridge-street, Sydney.
Ostermeyer, Van Rompaey and Co., Melbourne; H. Muecke and Co., Adelaide; L. Ratazzi and Co., Fremantle; Thos. Brown and Sons Ltd., Brisbane.

**The Mount Lyell Mining & Railway**
CO. LIMITED.
Purchasers of Ores containing Copper, Gold and Silver. Rates obtainable on application to the Secretary.
Manufacturers of Coke for Smelting and Foundry Purposes, Acids, Etc.
HEAD OFFICE—
39 QUEEN-STREET, MELBOURNE.
D. G. LUMSDEN,
Secretary.

The Human Life depends on the Reliability of the Mine Engine . . .
and when life is at stake you cannot afford to run any risks.
Be certain; select the Engine of known efficiency and reliability, that has been adopted by Mine Managers everywhere—
THE "ATLAS" DIESEL CRUDE OIL ENGINE.
No fear of the "Atlas" failing at a critical moment.
Every "Atlas" Engine is built of the highest-grade materials by expert workmen.
It runs on the very cheapest fuel—petroleum residue, etc. This, combined with its high efficiency, makes the running cost extremely low.
"Atlas" Engines are made from 15h.p. upwards in horizontal type.
Many other superior features to interest you.
Call and see the Engine running, or write.
STAWN LIMITED,
*Specialists in Mine Machinery and Tools.*
343 KENT STREET, SYDNEY.

Dunlop Mining Goods
Send for Illustrated Catalogue
The Dunlop Rubber Co. Aust. Ltd.
108 Flinders St. Melbourne.
Dunlop Rubber Belting
Is more efficient than Leather belting for Outdoor & Wet Work.
Sample & Price on application

"FIBRO-CEMENT" Fireproofing
Everyone about to build should obtain full particulars of this cool, acid-proof, ant-proof and fire-resisting material. The slates for roofs and the sheets for walls and ceilings are specially suited for the Australian climate. Used by the Federal and State Governments and by all the leading Architects and Builders.
ECONOMICAL AND EVERLASTING.
Full particulars, etc., from Sole Agents and Importers—
JAMES HARDIE & CO. Melbourne & Sydney

**W. F. Stanley & Co. Ltd.,**

**Scientific Instrument**

makers, are recognised by all users as being foremost in their craft the world over. They have appointed us as the **N.S.W. Sole Agents**, and we are selling their manufactures at their **English Catalogue Prices**, plus only 15 per cent. Customs and importing expenses. Our stock is now the largest one in Australia, and contains all the latest improvements in instruments. Write for catalogues.

**FAIRFAX & ROBERTS LTD.,**
Vice-Regal Opticians.
**23 and 25 Hunter-street, Sydney.**

Levels, Theodolites, Mining Dials, Drawing Instruments, Papers and Inks, etc., etc.

METROPOLITAN GAS COMPANY (V.) (A. E. Bradshaw, Subst. Secretary, Melbourne).—11th September.—P. of a total fixed quantity of 1800 tons of sulphate of ammonia, to be produced by this company during the twelve months ending 31st August, 1914.

MELBOURNE AND METROPOLITAN BOARD OF WORKS (Geo. A. Gibbs, Secretary).—25th July.—M., S., and D. of 420 lineal feet of 36in. C.I. pipes, with 21 branches, bends and other special castings.

29th July.—M., S., and D. of pipes, branches and bends, in vitrified stoneware, cement concrete, or reinforced concrete.

29th July.—S. and D., at the Metropolitan Farm, Werribee, of two steel wire plough ropes.

METROPOLITAN WATER AND SEWERAGE BOARD, Brisbane (Q.) (Geo. Johnston, Secretary).—31st July.—41,000 casks Portland cement, under contract No. 10, 1913; and 41,000 casks Portland cement, under contract No. 11, 1913.

MUNICIPAL TRAMWAYS TRUST, Adelaide (W. G. T. Goodman, Chief Engineer and General Manager).—29th July.—S. and D. of hardwood blocks.

29th July.—S. and D. of bonding material.

19th August.—M., S., and D. of steel poles.

Specifications relating to the S. and D. of copper cable and wire may be obtained on application to W. G. T. Goodman, Engineer and Manager. Tenders will be invited at 48 hours' notice, at a later date, and specifications are now issued to facilitate prospective tenderers obtaining quotations.

O.K. COPPER CO. N.L. (in liquidation) (Sidney Cornish, 23 Brookman's Building, Adelaide, S.A.)—21st July.—P. of large traction plant; also smelting, converter and mining plants, buildings, stores, etc., estimated to have cost £75,000, comprising engineering plants, 30-ton weighbridge, 4 Babcock boilers, also number of engines of mines, smelter and converter plants, air compressor, pumps of various descriptions; also 9 traction engines, number of trailers, together or separately; also large quantity of stores and sundries. The whole mine and plant as a going concern, or the mine, including all leases; the whole of the plant, in one lot; any article of machinery and plant separately.

FRANKLIN COPPER AND LEAD MINING SYNDICATE N.L. (in liquidation) (A. G. Kimber, 29 National Mutual Buildings, King William-street, Adelaide, S.A.).—28th July.—P. of various mining machinery and tools.

BARWIDGEE BUCKET DREDGING CO. N.L. (in liquidation) (V.) (A. F. Showers, Liquidator, 31 Queen-street, Melbourne).—28th July.—P. of the company's bucket dredging plant, at Lower Buckland, including 75ft. pontoon, main engine, by Ruston and Proctor; multitubular boiler, 10ft. Tangye pump, tools and usual accessories, in good order.

THE PLACER TIN MINING CO. N.L. (J. V. M. Wood, F.C.P.A., incorporated accountant, official liquidator, official assignee, etc., 34 Queen-street, Melbourne).—21st July.—Dredging plant of the above, situate at Germanton, New South Wales, comprising a Standard mining dredge, by Thompson and Co., Castlemaine, with all improvements; compound engine (dry-back marine type), dredge boiler, connections, fittings, nozzles, etc.; also electric lighting plant, with lamps and fittings complete; substantial oregon pontoon, and quantity of plant, stores, etc.

MITTA MITTA BUCKET DREDGING CO. N.L. (A. J. Peacock and Jas. Warne, liquidators, 339 Collins-street, Melbourne). — 21st July.—P. of plant, etc.

GISBORNE WATER WORKS TRUST (H. M. Hussey, Secretary, Gisborne, V.). — 25th July.—S. of 4in. C.I. pipes, valves, lead and yarn, and special castings.

TE AWAMUTU WATER SUPPLY (N.Z.).—21st August.—S. of cast-iron pipes and fittings; spiral steel pipes and fittings; drawn steel tubes and fittings.

ST. PAUL'S CATHEDRAL, Melbourne (V.).—19th July.—I. of electric lighting and power.

H. W. AND F. B. TOMPKINS, F.R.V.I.A., 115 Elizabeth-street, Melbourne (V.). — Steel frame construction, three electric passenger elevators, and one electric goods elevator.

SALVAGING CO. OF AUSTRALASIA PTY. LTD. (in liquidation) (E. McGregor, Liquidator, 369 Collins-street, Melbourne. — 26th July.—P. of assets and plant. (See advertising columns.)

NEWCASTLE COAL MINING CO. LTD.—26th July.—D. on rail, Newcastle, one Lancashire boiler, 30ft. by 8ft., complete with fittings, pressure 120 lb. per square inch.

## ACCEPTED.

### Commonwealth.

POSTMASTER-GENERAL'S DEPARTMENT, General.—Supply and delivery of probable number of typewriters required by department throughout the Commonwealth over a period of three years, commencing 30th June, 1913, the machines to be delivered at the General Post Offices, Sydney, Melbourne, Brisbane, Adelaide, Perth, and Hobart, and to be kept in good operating order by the contractors during a period of five years from the commencement of their contract, £15 each (foolscap size), £17 each (brief size), larger sizes in proportion for every 2in.—Stott and Hoare, Melbourne.

POSTMASTER-GENERAL'S DEPARTMENT, Queensland.—144 braces, all iron, split socket, 10in. sweep, 2s. 11d. each—Webster and Co. Ltd., Brisbane.

144 padlocks, four-lever, brass 1½in., with duplicate keys, keys to be non-interchangeable, 2s. 8½d. each; 432 pliers, Universal, 7in., 9¾d. each; 144 spanners, genuine Clyburn, 14in., 3s. 10½d. each—W. G. Watson and Co. Ltd., Sydney.

Receptacles, cane, canvas-lined, for parcels, as under—50 circular, 36in. high by 23in. diameter, £1 5s. 6d. each; 100 circular, 21in. high by 20in. diameter, 17s. 6d. each; 100 rectangular, 30in. high by 22in. by 16in., £1 7s. 6d. each; 100 rectangular 24in. high by 18in. x 18in., £1 2s. 6d. each—D. Lanham and Co., Brisbane.

POSTMASTER-GENERAL'S DEPARTMENT, Western Australia.—432 lamps, metal filament, 32c.p., 220 volt, 1s. 9d. each; 144 lamps, metal filament, 50c.p., 220 volt, 1s. 9d. each—Dick Kerr and Co. Ltd., Sydney.

Three miles cable, paper-insulated, lead-covered, telephone, 156 pairs, 12½ lb. conductors, to be on drums of about 220 yards in length, about one-third at £497 6s. 8d. per mile, balance at £494 per mile; 1 mile cable, paper-insulated, lead-covered, telephone, 208 pairs, 12½ lb. conductors, to be on drums of about 220 yards in length, about one-third at £608 per mile, balance at £603 per mile; 1 mile cable, paper-insulated, lead-covered, telephone, 260 pairs, 12½ lb. conductors, to be on drums of about 110 yards in length, about one-third at £754 per mile, balance at £747 per mile; 1 mile cable, paper-insulated, lead-covered, telephone, 312 pairs, 12½ lb. conductors, to be on drums of about 110 yards in length, about one-third at £874 per mile, balance at £864 per mile—Imperial Electric and Engineering Co., Perth.

85 rings, steel, galvanised, and associated equipment for distributing poles, £1 7s. 6d. each—T. Eilbeck and Son, Perth.

714 casks cement, 14s. 8½d. per cask—William Sandover and Co., Perth.

375 tons metal, 1in., 10s. 1d. on trucks at Perth, 10s. 4d. on trucks at Burswood—Public Works Department of Western Australia, Perth.

1800 conduits, cement concrete, 3ft. lengths, with round ducts (alternative tender "D"), 6s. 6d. each—Vincent Paving and Concrete Co., Perth.

48 plates, mild steel, manhole, 3-8in. thick, £1 13s. each; 68 plates, mild steel, manhole, 3-8in. thick, £1 13s. each; 116 beams, rolled steel, 6in. by 3in., 5ft. long, 12 lb. per lineal foot, distributed load 8.4 tons, deflection 0.05 in span 4ft., 6s. each—Tomlinson Bros. and Co., Perth.

24 covers and frames, cast iron, manhole, £3 18s. each—Holden and Lewis, Yarraville, Melbourne.

58 gratings, cast iron, 1s. 6d. each—Hoskins and Co. Ltd., Perth.

20 tons wire, hard-drawn copper, 200 lb. per mile, £84 4s. 9d. per ton—Nielson and Maxwell, London, by their agent, Herbert T. Wright, Perth.

### Victoria.

VICTORIAN RAILWAYS.—Coach screws, at £23 per ton—Acme Bolt and Nut Co.

Forgings for new 15-ton trucks—Item No. 9, brake shafts brackets (outside), at 11s. each—A. Roberts and Sons.

Steel blooms—16¾ tons, at £12 per ton (not publicly advertised)—J. E. Strachan.

Gas coke—340 tons, at £1 2s. 6d. per ton (not publicly advertised)—Metropolitan Gas Co.

Scrap copper—1 ton 16 cwt. 3 qr. 22 lb., at £3 2s. per cwt. (not publicly advertised)—Charlotte Plains Gold Mining Co.

Scrap gunmetal—3 cwt. 1 qr. 21 lb., at £3 5s. per cwt. (not publicly advertised)—Charlotte Plains Gold Mining Co.

Scrap lead—1 ton 12 cwt. 3 qr. 13 lb., at 10s. per cwt. (not publicly advertised)—Charlotte Plains Gold Mining Co.

Metal tickets—11,880 No., at 2½d. each (not publicly advertised)—Cole Bentley.

Gas coke—150 tons, at £1 2s. 6d. per ton (not publicly advertised)—Metropolitan Gas Co.

Gold passes—101 No., at £1 15s. each (not publicly advertised)—H. Newman and Sons Pty. Ltd.

Pintsch gas retorts—12 No., at £16 each (not publicly advertised) — Robison Bros. and Co. Pty. Ltd.

Gas Coke—490 tons, at £1 2s. 6d. per ton (not publicly advertised)—Metropolitan Gas Co.

Slack coal—137 tons, at 15s. per ton (not publicly advertised)—Huddart, Parker Ltd.

Slack Coal—900 tons, at 12s. 6d. per ton (not publicly advertised)—Huddart, Parker Ltd.

Telegraph galvanised wire, No. 8 (400 lb.), at £9 17s. 3d. per ton—Briscoe and Co. Ltd.

8b.h.p. air-cooled petrol engine sets, provided with driving chains and sprocket wheels, a set of spares, and a complete set of spanners, at £61 per set—R. F. Millane.

Bluestone or other approved metal, as ordered, during the period ending 30th June, 1914—Item No. 1, bluestone or other approved metal, 2½in. ring gauge, at 4s. 9d. per cubic yard; item No. 2, bluestone or other approved metal, 1½in. ring gauge, at 4s. 11d. per cubic yard—Woolamai Quarrying Co. Pty. Ltd.

Anti-blowpipes safes—10, at £413 each — Chubb's Australian Co. Ltd.

Purchase of certain miniature electric staff instruments, £1578 10s.—McKenzie and Holland Ltd.

STATE RIVERS AND WATER SUPPLY COMMISSION.—500 meter wheels, for Dethridge meters, £943 9s. 2d.—John Wilson, East Brunswick, Victoria.

### New South Wales.

STORES SUPPLY SERVICE.—Motor lorry for Stores Supply Department — Birt and Co. Ltd.

Rope, as required, to 30th September, 1913—pure best Manilla, ¾in., and up, £3 16s. cwt., whole coils—J. Kennedy and Co.

Second quality Manilla, ¾in. and up, £2 13s. 6d.; coir, up to 2in., fine yarn, £2 6s.; coir, 2in. or up, heavy or light, £1 19s. 6d.; New Zealand flax, best quality, all sizes, £2 7s.—John Broomfield.

PUBLIC WORKS.—S. and D. three 82k.v.a. motors for Newcastle workshops, Walsh Island—Australian General Electric Co.

C. of electric passenger lift at seventh shop, George-street, Sydney, £630 — Standard Waygood Ltd., Sydney.

### Western Australia.

PUBLIC WORKS DEPARTMENT. — One "Ruston Proctor" boiler, £70—Imperial Electric Engineering Co.

58 tons of arsenic, f.o.r. Bunbury, £15 10s.—R. Bryce and Co. Pty. Ltd.

One Ford motor car, £210—The Grave and Dwyer Motor Co. Ltd.

WATER SUPPLY DEPARTMENT. — One Cradley boiler, £144—McLean Bros. and Rigg.

### General.

MELBOURNE CITY COUNCIL.—50 refuse baskets, at 16s. each—Greer and Ashburner.

S. of Newcastle slack coal to 31st March, 1914, 17s. 9d. per ton—Adelaide Steamship Co. Ltd.

S. of 160m.m. section twin tyres, with special outside flanges, to the back wheels of the "Lacre" motor lorry, £158 16s.—Continental C. and G. Rubber Co. Pty. Ltd.

1000 tons of N.S.W. slack coal, at 16s. per ton—Melbourne Steamship Co. Ltd.

Waterproof coats, for use of outdoor staff, £27 2s. 6d.—Perdriau Rubber Co. Ltd.

SHIRE OF MILDURA (V.) (G. B. Lincolne, J. K. MacDougall, Managers, Electric Supply Department). — One 5h.p. electric motor, £30 16s. 11d.—Union Electric Co. of Australia Ltd.

400ft. of 5in. diameter wood piping, £36 5s.—Australian Wood Pipe Co. Ltd.

One 4in. centrifugal pump, £15 — Cameron and Sutherland.

One boiler tank, £26—Cameron and Sutherland.

**MELBOURNE HARBOUR TRUST COMMISSIONERS** (V.) (R. Rudd, Secretary). — One motor launch, £507 10s.—Inglis, Smith and Co.

**TOWN OF NORTHCOTE** (V.) (W. G. Swift, Town Clerk).—S. and D. of underground electric cable, £1015 6s. 6d.—W. T. Henley's Telegraph Works Co. Ltd.

Laying same, £1170—Trench and Moran.

**SYDNEY MECHANICS' SCHOOL OF ARTS.**—I. of electric light—Lacey and Co.

## DIVIDENDS.

The following dividends and bonuses of mining companies in Australia have been declared, and are payable on the dates noted:—

July.

**17th.—Catbcart Central, 2s., £5000.**

17th.—Tongkah Compound, 1s. and 2s. bonus, £7500.

21st.—Pioneer Tin, 6d., £5000.

22nd.—Bourke's Hill, 6d., £1125.

**22nd.—Tongkah Harbour, 2s., £25,000.**

24th.—Associated Gold, 6d., £12,500.

29th.—Ivanhoe, 3s. 6d., £35,000.

31st.—Ajax Central, 1s. 6d., £2250.

August.

9th.—Amalgamated Zinc, 1s. 6d., £37,500.

## BANK CLEARINGS.

The Melbourne Clearing House reports as follows, for the week ended July 7:—

| | | |
|---|---|---|
| Total clearance | | £6,495,885 |
| Settled by certificates | £569,000 | |
| Settled in coin | 270,695 | |
| | | 839,695 |
| Total clearance for the corresponding week, 1912 | | 6,047,495 |

The Melbourne Clearing House reports as follows for the week ended 14th July:—

| | | |
|---|---|---|
| Total Clearance | | £5,450,905 |
| **Settled by certificates** | **£633,000** | |
| Settled in Coin | 124,242 | |
| | | 757,242 |
| Total clearance for the corresponding week of 1912 | | £5,451,513 |

## INDUSTRIAL.

We are in receipt of the Austral Engineering Supply Co.'s No. 3 catalogue, which gives comprehensive and full information concerning the machinery and machinery requisites handled by this company, including the Tarbon fan, Sterling boiler, and Nicholls' pumps, wood-working machinery, tools, etc.

## THE DOWSER'S ART.

Seven representative "dowsers," or water-diviners, were taken down to Guildford (says the London "Daily Telegraph") to submit to a series of tests of the remarkable powers which they claim to possess of locating the presence and extent of hidden water supplies. The places in which the trials were to be made had been carefully selected in advance, and, in order to prevent any suspicion of pre-knowledge on the part of the water-finders, the whole party, with the exception of the promoters of the enterprise and the judges, were kept in entire ignorance even of the direction in which they were going until they assembled at 9 o'clock in the morning at Waterloo station.

Seven well-known engineers acted as a committee of judges, and one was attached to each of the competitors throughout the whole of his trials. The judges were:—Mr. W. Whitaker, F.R.S., Professor Henry Adams, Mr Chambers Smith (editor of the "Sanitary Record and Municipal Engineering," by which journal the whole scheme was devised), Dr Lapworth, Dr. Samuel Rideal, Mr H. D. Searle Wood, and Dr. Burnett Ham (chief officer of health, Victoria, Australia), and the competing dowsers were Mr Tomkins (Diss), Mr H. Bacon (Bishop's Stortford), Mr W. Antcliffe (Bawtry), Mr T. S. Child (Ipswich), Mr R. H. Sutton (Horsham-road, Sussex), Mr W. Taylor (Clare, Suffolk), and Dr Beyer of Germany, who had come over to this country for the express purpose of taking part in the trials.

Three separate sites had been chosen—a somewhat swampy piece of meadowland on the north of Guildford, a similar grass-covered plot on the south, and a small lawn in the centre of the town, high up on a hill near the castle; and the programme was so arranged that no dowser should at any time see what his competitors were doing. One by one they tramped over the ground, most of them armed with the forked twig which for 500 years at least has been the favourite implement of the water-finder. Dr. Beyer, however, preferred a steel instrument of his own make, similar in shape, while others occasionally substituted a strong steel clock-spring or a fork of whalebone. Frequently the forked implement would become agitated, and bend upwards from the earth; sometimes the motion would become quite violent, the fork making several complete revolutions, or the steel spring twisting convulsively; and the diviners would thereupon declare in many cases not only the presence of water beneath the spot, but the depth of boring which would be necessary to reach it, and the approximate amount of the water supply which could thus be obtained. All the diviners found water at several places at each of the sites, one discovering as many as 16 on a single site, but the indications were fewest and smallest on the little central lawn. Many amateur and professional diviners were among the party accompanying the competitors, and they were no less successful in securing the supposed indications of underlying water.

It had been announced that some of the results would be disclosed after a luncheon in the town, but, somewhat to the disappointment of those assembled, Dr. Whitaker, who presided, informed the company that a careful comparison of the records would have to be made before any definite statement could be issued. He revealed, however, the interesting fact that the site in the centre of the town was in the nature of a trap, the entire lawn being immediately over a reservoir, from which the water was kept running throughout the tests. Dr. Rideal fulfilled the promise of the programme by going more fully into details of the tests. Both the larger sites were places under which water would probably be found everywhere at a depth of about 150ft. The diviners, according to Dr. Rideal, were not at all agreed as to the direction of the flow of the water. Most of them entirely missed a large sewer, through which water was running right across one of the sites, and little, if any, indication had been given of a remarkable underground spring, which was known to exist under the other.

In the afternoon some tests in the location of metals were made, four diviners—not among those who had taken part in the water tests—attempting to locate the positions of some coins which had been hidden under the carpet. All of them failed completely.

Although the dowsers' exhibition of their supposed powers seemed to be very far from convincing, it is, as the chairman pointed out, only fair to await the judges' full report before coming to a final decision, and it should be added that the diviners themselves were ready with explanations of some of their apparent shortcomings. Thus Dr. Beyer explained in regard to the failure to detect the presence of the reservoir and the sewer, that artificial water supplies are much more difficult to detect than natural sources.

## RAIL CORRUGATION IN CHICAGO.*

The two companies which operate almost the entire electric street railway system of Chicago (approximately 700 miles) are having a great deal of trouble with rail corrugation. In both cases the matter has been investigated with rather indeterminate results, and a large amount of work has been done in the way of grinding the rails in the track to remove the corrugations and give a new smooth running surface for the wheels. One reason for the investigations was the belief that the cost of car maintenance was being increased by the vibration of the cars due to the corrugated rails.

On both of these roads the tracks are laid with 9in. 129 lb. grooved girder rails. The former line has both steel and wood ties, largely on a concrete base, but partly on stone ballast. Where the tracks are on old cable lines the concrete is about 36in. deep, but in other places its depth is 6in. The tracks giving trouble are in general three or four years old. The latter line has mainly wood ties, either on 6in. of concrete or 8in. of broken stone, and the tracks examined for corrugations were generally two or three years old.

Chicago Railways Co.—In a statement prepared by J. S. Bowman, of the engineering department, it is stated that it seems apparent that the corrugations develop only in rails embedded rigidly (as in a concrete base), and that they are developed by such irregularities as low or loose joints. There is no consistency or uniformity in the way in which the corrugations develop. On some lines they are practically continuous for several blocks, then for some distance they are entirely absent, and then for a space appear only in spots. Other lines have only a few spots or corrugations and still others have none at all. The corrugations do not cause hard riding of the cars, but they cause a loud and disagreeable noise when a car passes over them, and this is very objectionable to people living along that part of the street. They cause also a decided vibration of the car truck and of the electrical wiring and connections under the car, which results in considerable wear and tear of the equipment.

The depth of the corrugations varies from a few thousandths of an inch to 0.035in. This latter is the greatest depth measured, but the men in charge of the grinding machine say that the corrugations are sometimes as deep as 1-16th inch. Those measured were on Madison street, where they seem to be the worst of any place on the system. The average depth was found to be approximately 1-100th inch. The distance from crest to crest of the corrugations varies from 2in. to 5in., averaging about 3in., the longer ones usually being deeper than the shorter ones. The corrugations appear to the eye as small shallow waves in the steel surface.

The grinding is continued back and forth over the rails until the corrugations are entirely ground off, except in small spots where they are so deep that to grind them entirely out would leave a low spot in the rail. In such places the grinding is continued until the bearing of the rails and emery wheels is continuous and approximately ¾in. wide on the low spots. The amount of grinding is left entirely to the discretion of the men in charge of the machine. The cost of grinding a foot of track (two rails) varies very considerably, depending on the depth of the corrugations, but an avergae cost is about 7.13 cents (3.56d.) per foot. This includes wages, interest and depreciation on the machine, and energy consumption. The last item is a very small part of the cost, averaging approximately 0.13 cents (0.06d.) per foot of track.

Chicago City Railway.—The corrugations in the rails do not cause noise or vibration noticeable to passengers, but there is a loud noise in the street when a car passes; this can be heard at a considerable distance, and is unpleasant for residents along the line. There is also considerable wear of the trucks, due to the vibration and jar in running over the corrugations. There is no uniformity in the location or extent of the trouble, which may be continuous for several blocks, or may occur in stretches ranging from 5ft. or 10ft. to 60ft. or in isolated patches 12in. to 24in. or up to 5ft. in length. In some places the corrugations are short and sharp, while at other places (perhaps closely adjacent to the former) they may be longer and more wavy.

In grinding long stretches, the work is done over bad and good rail alike, giving a uniform finished surface. Very short stretches of corrugation, only 12in. to 24in. long, are ground to an approximate radius of 3000ft., so that the depression below the level of the good rail at either end is not noticeable. Pockets at low joints are ground out also. The work is done on all parts of the system where this trouble develops. It is an interesting fact that corrugations sometimes reappear after the grinding. The explanation given for this is that the metal of the rail has been disturbed by the vibration to a depth below that of the new finished surface, and experiments are being made to determine to what depth the metal is thus affected.

This road is making experimental use of the Romopac compound rail, and on this also the corrugation has appeared. The rail consists of a grooved-head channel bar, resting on a T-bulb which forms the web and base of the rail. The flanges of the channel are bent under the bulb-head by a machine travelling along the track, but in spite of the weight of the machine, the inward bending of the flanges tends to cause the head to curve slightly upward, so that it is not in close contact with the top of the bulb. This infinitesimal losseness of fit is sufficient to cause vibration and movement of the head which results in corrugation. A heavier machine, with a load of 23 tons on the rails, is to be tried in order to ensure an absolutely close and tight fit of the two parts of the rail.

The work of grinding is slow, averaging 3500ft. to 4000ft. per month. The cost depends largely on traffic conditions and the depth of the corrugations, but ranges on an average from 3.50c. (1.75d.) to 4.25c. (2.12d.) per foot of track. During May, 1912, two men with one machine ground 4,030ft. of track at a labour cost of 1.7c. (0.85d.) per foot.

Opinions as to Rail Corrugation.—Chicago City Railway.—The principal causes of rail corrugation on this road are believed to be as follows: (1) A direct bearing on a rigid foundation; (2) long stretches of continuous rail with welded joints; and (3) irregularity of gauge of track. As to the first two, the rails tend to buckle vertically and so work loose, while the traffic hammers them down upon the rigid base. In consequence, this road is not now using a concrete base on its new work. From Mr. Boswell's report the particulars given below are taken, and in explanation of the types of track mentioned we may explain that these were developed by the Board of Supervising Engineers, which has supervision over all the street railways of Chicago, and is composed of representatives of the companies and the city. The types of track are: No. 1, steel ties in concrete; No. 2, wood ties in concrete; No. 3, wood ties in a well-compacted bed of stone ballast. The following is from the report mentioned above:—

---

*Abstract of an article in "Engineering News."

Other conditions remaining the same, the amount of corrugation varies directly with the speed of the cars and the amount of traffic. Practically no corrugation occurs at street crossings, except in two cases where curves are located at the street crossing. Loose rail is usually found to be corrugated, and nearly all heavily corrugated rail is found to be loose. The types of track which is most rigid shows the heaviest corrugations.

Conditions favourable for rail corrugation are loose rail (held tight at joints not too far apart), concrete bed, continuous or welded joints, high speed and heavy traffic. The corrugation is caused by the cars at a rather high rate of speed passing over a suspended or loose section of rail. The car upon entering this loose section causes the rail to vibrate, and in passing over this vibrating rail it pounds on the rail at certain intervals, depending upon the frequency of the vibration. Since the bed is absolutely rigid (except in track of type No. 3), the rail cannot transmit this pounding to the roadbed, and hence will have to withstand all of the force thus exerted against it. As a result, we have this pounding ground into the tread of the rail.

There are two causes which tend to cause corrugations on curves such as those on Cottage Grove-avenue, at Oakwood Blvd., and north of Twenty-ninth-street, (1) the rail receiving the sliding motion of the wheels, and (2) the same vibrating action which causes corrugation on straight track. It is evident that if the wheels on the outside of the curve roll normally on the rail, the wheels on the inside rail must slip forward in relation to the roll of the outside wheel, and as a result of these two actions the corrugation at curves where the speed is not reduced is especially heavy.

Probably the loose rail is caused by the upper part of the rail becoming heated more than the lower part, which causes the rail to buckle up, and the upper part to spread more than the lower part. The rail being practically one continuous strip, is unable to lengthen, and consequently buckles up at the joint, causing the fastenings to loosen themselves from the ties, eventually forming the corrugation.

Suggested means for preventing corrugation are:—(1) to have a bed of greater flexibility than in track of types Nos. 1 and 2, and more like type No. 3 (or even more flexible); (2) to make the rail absolutely tight without concrete; and (3) to allow in some way for expansion in order to prevent loose rail trouble.

Various theories which have been advanced for the cause of rail corrugation are as follows.—(1) The steel is too soft for such extremely heavy cars; (2) flat wheels pound waves into the rail; (3) the expansion of the rail on its upper surface causes the steel in that part to wrinkle (but this fails to explain why it did not straighten out when the rail contracted); (4) stopping the cars too quickly; (5) the gauge is either too narrow or too wide· (6) one rail is higher than the other; (7) there is quicksand under Cottage Grove-avenue, so that the road bed is floating.

## FROM FOREIGN SOURCES.

(Specially Translated for the "Mining Standard.")

On the Prussian Government Railways, the section from Dessau to Bitterfeld, which was electrified about two years ago, has been provided with improved overhead feeder arrangements, enabling the tension to be increased from 10,000 volts to 15,000 volts, while at the same time the poles, which were 246ft. apart, have been placed at a distance of 328ft. from each other. In this way, it has been possible to reduce the number of insulators, while, as regards signalling, a much better view of the line was also obtained. Since the introduction of electric traction, much valuable experience has been obtained in other respects, quite apart from the fact that the line offers the best means for training a large number of men required in connection with the proposed electrification of the Berlin metropolitan lines. The erection of the new power station at Muldenstein, is rapidly progressing. The chimneys will have a height of 328ft., with a diameter of over 13ft. at the top. From the Muldenstein station, power, at a tension of 60,000 volts, will be transmitted to the three substations at Wahren, Marke and Gommern, situated at a distance of up to 44 miles, and will there be transformed into 15,000 volts. The wiring on the section from Magdeburg and Halle to Leipzig is well in hand, so that the line may confidently be expected to be opened for electric traction in the early spring of 1914. The total length of the sections to be electrified for the present is 93 miles. The new electric passenger engines, which have been ordered, will be of the 2-6-2 coupled type. They will have driving wheels 4ft. 5in. in diameter, while their maximum speed will be 68½ miles per hour.

Investigations carried out by the Government Testing Office, at Lichterfeldi, and the Imperial Physical and Technical Laboratory of Charlottenburg, in connection with a new chrome-nickel wire made by a German firm, have shown that the alloy in question possesses the extremely high specific resistance of 1.21 ohms per meter, and sq. mm. cross section temperature co-efficient equals 0.000,124, specific weight equals 8.03, solidification point equals 1335 degrees centigrade, breaking strain equals 9070 kilogramms per sq. centimeter. It is a very material point that this alloy, when exposed to the open air, is covered with a thin oxide film, which protects it from further oxidation, and permits a permanent load, even in a red-hot condition. In the form of thin ribbons, this chrome alloy has already done good service on electrical flat irons, so that from the experience already obtained, a life of almost two years may be guaranteed.

Herr Kuschewitz, one of the superior officials of the German Telegraph Department, and Herr Oscar Moll, manager of the German-Atlantic Telegraph Co., have designed a type of induction resistances which can be regulated, and are in themselves quite able to almost entirely free a cable from all outside disturbing influences. With the aid of these variable resistances, the speed of telegraphing across the German-Atlantic cables has been increased from 150 to 225 letters per minute, or, in other words, by exactly 50 per cent. It was owing to the adoption of this invention that, when recently one of their cables to the Azores was interrupted for some time, the German-Atlantic Telegraph Co. was able to deal with its normal business without any delay, and without resorting to the expedient of sending telegrams by some other route. Herr Kuschewitz is at present in New York, superintending the work of fitting the American end of the German-Atlantic cable with the new invention, which is patented under the name and style of the Moll-Kuschewitz system, and owned solely by the German-Atlantic Telegraph Co.

Owing to the Leipzig central telephone exchange being now taxed to the utmost limit of its capacity, it has been decided to establish a number of sub-exchanges on the semi-automatic principle. The arrangement of these semi-automatic sub-exchanges is a very ingenious one. In the future, subscribers connected with a given sub-exchange will no longer be in direct communication with the central exchange, but their wires will end at the sub-exchange. Both the latter and the central exchange are connected together, but the number of connecting lines is considerably reduced. Nevertheless, there must be a sufficient number of lines for the "selector" finding a line that is not engaged. This "selector" is the automatic feature of the whole arrangement. It connects the subscriber with the central exchange. As soon as the receiver is taken from the hook, the "selector" moves along its sliding rail and climbs upwards until it finds an unengaged line leading to the central exchange. When the connection is effected, an incandescent lamp is lighted at the central exchange, and the subscriber is connected with the number he requires.

Under the heading of "The World's Largest Electric Companies" a New York paper writes as follows:—"Of the five largest corporations of the electrical branch three are American and two are German. The largest of them is now the A.E.G. of Berlin. Formerly the list was headed by the General Electric Co., but since two years it has been surpassed by its German rival. After the two aforementioned companies there follows the Western Electric Co., while the fourth and fifth positions are occupied by Messrs. Siemens and Halske, of Berlin, and the Westinghouse Electric Manufacturing Co., respectively. The three American companies, during their last business year for which the figures are available, have done business to the aggregate amount of 170 million dollars, as compared with a business of, together, 152 million dollars done by the two German companies. An interesting comparison as to the business activity and organisation of the largest American electric companies and their principal European rivals is afforded by the following figures:—

| | Value of General Business. Dollars. | Share Capital. Dollars. | Interest Bearing Debt. Dollars. | Surplus and Reserves. Dollars. | Net Capital Invested. Dollars. | Percentage of sales in comparison to Capital Invested. |
|---|---|---|---|---|---|---|
| A.E.G. .. .. .. .. | 86,000,000 | 30,940,000 | 19,459,000 | 18,735,000 | 69,136,000 | 124 |
| General Electric .. | 70,384,000 | 77,335,000 | 2,806,000 | 29,020,000 | 109,161,000 | 64 |
| Western Electric | 66,211,000 | 15,000,000 | 15,091,000 | 23,073,000 | 53,164,000 | 124 |
| Siemens & Halske | 66,000,000 | 14,994,000 | 11,077,000 | 6,644,000 | 32,715,000 | 202 |
| Westinghouse .. | 34,196,000 | 40,699,000 | 29,547,000 | 6,649,000 | 76,895,000 | 45 |

Consequently, Siemens and Halske have, during their last business year, succeeded in effecting sales amounting to twice the amount of the firm's net capital invested, and in the case of the A.E.G. and the Western Electric the sales exceeded the latter by one-fourth. In view of such enormous transactions, these companies are in a position to sell their manufactures at a relatively small profit. A comparison of the relation existing between the net receipts (previous to deducting interest) and the net capital invested gives the following result:—

| | Net Capital Invested. Dollars. | Net Receipts. Dollars. | Percentage of receipts in relation to Capital Invested. |
|---|---|---|---|
| General Electric .. .. | 109,161,000 | 10,934,000 | 10 |
| A.E.G. .. .. | 69,136,000 | 6,751,000 | 9.8 |
| Siemens and Halske .. | 32,715,000 | 3,003,000 | 9.2 |
| Western Electric .. .. | 53,164,000 | 4,135,000 | 7.8 |
| Westinghouse | 76,895,000 | 3,006,000 | 3.9 |

In addition to its large wireless plant at the Nauen experimental station, the Telefunken Co. has recently added a smaller plant, consisting of a Telefunken high-frequency generator for direct production of waves without sparks. It is in connection with this small plant, which serves only for transmitting messages over a distance from 995 to 1245 miles, that a world's record respecting wireless telephony has just been established. According to a statement by the company, this record has been obtained by reading, before the Nauen generator, during thirty minutes, a number of newspaper paragraphs. A number of wireless receiving stations had previously received information that this would be done. They one and all were able to verify the fact that, at a distance of from 373 to 435 miles—for instance, also at the station of the Vienna technological trade museum, by Professor Karm—the paragraphs read at Nauen arrived quite audibly, and could be completely understood. Some stations even reported that the reader at Nauen had spoken in too loud a voice, and therefore recommended that, in further experiments, the paragraphs should be read in a more subdued voice. The results of these experiments have given rise to the hope that, by using very large generators, it may yet be possible to establish transatlantic telephony.

Silit is the name of a new electric resistance material, possessing not only superior electric conductivity, but also great solidity and resistance against chemical influences and high temperatures. It is produced by silicium carbide being mixed with silicium and a volatile carbonisable binding agent, after which the desired shape is given, and it is heated electrically. During this process, the separated carbon combines with the silicium. No binding agent remains in the substance, which becomes perfectly homogeneous. This is supposed to result from the silicium carbide forming a carbide of a low order with the silicium. Articles made of silit may be heated to a white heat and sprinkled with water without being fractured. Silit used for heating resistances withstands white heat temperatures for a long while without suffering any damage. The silicium carbide used an an electric resistance material is not only suited for continuous charges at a white heat, but also for high momentary charges, such as, for instance, safety switchboards, and regulating and starting resistances. Silit heating appliances represent an improvement in the manufacture of heating and warming plates, roasters, electric ranges, etc. Silit ranges are used in exactly the same manner as gas and coal stoves. When the current is switched on, the grate-shaped silit pipes of the ranges begin to become heated, and at once radiate their heat. Silit protective cases, for pyrometers, as fireproof tubings, as material for making electric radiators, etc., are of importance in connection with the chemical industry.

The New Zealand Government has accepted the tender of the Western Electric Company to instal full automatic telephone exchanges at Auckland. Blenheim, Wellington, Hamilton, Oamaru and Masterton, for £89,555. The expenditure amount is to be spread over four years, the first payment being due for 1914-15.

## Commonwealth of Australia.

Department of Defence,
Melbourne, 15th July, 1913.

MILITARY FORCES OF THE COMMONWEALTH.

TENDERS are invited for the undermentioned supplies:—

ON MONDAY, 28th JULY, 1913.

PERIOD OF SUPPLY, FROM 1st JULY, 1913, TO 30th JUNE, 1916.

Metals, Cord, Tubing and Wire Cloth, for the Commonwealth Small Arms Factory, Lithgow, New South Wales.

Tenders will be received until Three o'clock p.m. on the date shown, at the office of:—

The Manager, Commonwealth Small Arms Factory, Lithgow, New South Wales.
The Superintendent of Contracts, Department of Defence, Victoria Barracks, Melbourne;
The Senior Ordnance Officer, Ordnance Stores, Circular Quay, Sydney;
The Senior Ordnance Officer, Ordnance Stores, Petrie Terrace, Brisbane;
The Senior Ordnance Officer, Ordnance Stores, Adelaide;
The Senior Ordnance Officer, Ordnance Stores, Perth;
The Senior Ordnance Officer, Ordnance Stores, Hobart.

Tender forms and all information may be obtained at the above-mentioned offices.

The lowest or any tender will not necessarily be accepted.

E. D. MILLEN,
Minister of State for Defence.

## Government Notice (N.S.W.).

New South Wales Government Railways,
Office of the Chief Commissioner,
Sydney, July 12, 1913.

TENDERS will be received at this Office until 12 o'clock noon on the dates specified for the undermentioned Works, etc., viz.:—

WEDNESDAY, AUGUST 6, 1913.

The Supply of One Live Steam Feed Water Heater for Ultimo Power House. Specification No. 397 (price 2s. 6d. each).

WEDNESDAY, AUGUST 20, 1913.

The Supply of Pneumatic Ash-handling Plant for the White Bay Power House, to Specification No. 415. Copies, 5s. each.

WEDNESDAY, OCTOBER 15, 1913.

The Supply of Thirteen Direct Current Motors, to Specification No. 412. All specifications are obtainable at the Electrical Engineer's Office, 61 Hunter street, Sydney (price 2s. 6d. each).

Tenders are to be endorsed, "Tender for Water Heater," or as the case may be.

The Chief Commissioner does not bind himself to accept the lowest or any tender.

By order,
J. S. SPURWAY,
Secretary.

## CERTIFIED MINE MANAGER

required for
"CADIA" COPPER MINE.

Applicants to submit copy of references and state salary required.

G. H. BLAKEMORE,
10 Castlereagh st., Sydney.

## WANDILIGONG GOLD DREDGING CO., No Liability.

A DIVIDEND (the 55th) of One Shilling per share has been declared, payable at the registered office of the Company, Cavan street, Bright, on Friday, 25th July, 1913.

Transfer books close Friday, 18th July, 1913.

P. J. BREEN, Manager.

## ALFRED RONALDS.

Will the relatives and friends of the late Alfred Ronalds (author of Ronalds' "Fly-Fisher's Entomology") please communicate with—

Critchley Parker,
"Mining Standard,"
Melbourne or Sydney.

## MUNICIPAL COUNCIL OF SYDNEY.

TO CONTRACTORS.

SEALED and ENDORSED TENDERS will be received by the undersigned until 3 o'clock p.m. on MONDAY, the 21st JULY instant, for the SUPPLY of CURVE DRAWING AMMETERS and VOLTMETERS, and also for MOTOR STAIRWELL and PLATFORM.

Copies of specifications, etc., may be seen or obtained upon application at the office of the City Electrical Engineer, Town Hall, Sydney, upon payment of the sum of 10s. 6d. in each case.

The lowest or any tender not necessarily accepted.

TENDERERS, please note that they must pay their CASH DEPOSITS direct into the City Treasury, and NOT enclose same with the Tenders, otherwise their Tenders will be rejected as INFORMAL.

THOMAS H. NESBITT,
Town Hall, Sydney, Town Clerk.
9th July, 1913.

## MUNICIPAL COUNCIL OF SYDNEY.

LEASES.

OXFORD STREET WIDENING.
SHOPS, FACTORIES, WORKROOMS, ETC.

SEALED and ENDORSED TENDERS will be received by the undersigned until 3 o'clock p.m. on WEDNESDAY, tne 23rd JULY instant, for a LEASE of PREMISES, near completion, in OXFORD-STREET, situated between Crown and Palmer streets.

The highest or any tender not necessarily accepted.

PARTICULARS of LEASE may be obtained upon application, and plan may be inspected at the Office of the Comptroller of Assets, Town Hall, Sydney.

TENDERERS, please note that they must pay their CASH DEPOSITS direct into the City Treasury, and NOT enclose same with their Tender, otherwise their Tender will be rejected as INFORMAL.

THOMAS H. NESBITT,
Town Hall, Sydney, Town Clerk.
10th July, 1913.

## MUNICIPAL COUNCIL OF SYDNEY.

SALE OF SCRAP COPPER, LEAD, BRASS, AND WROUGHT IRON.

SEALED and ENDORSED TENDERS will be received by the undersigned until 3 o'clock p.m. on MONDAY, the 21st JULY instant, for the Purchase of a Quantity of SCRAP COPPER, LEAD, BRASS and WROUGHT IRON.

The highest or any tender not necessarily accepted.

Conditions of purchase may be seen upon application at the Office of the Comptroller of Assets, Town Hall, Sydney.

TENDERERS, please note that they must pay their CASH DEPOSITS direct into the City Treasury, and NOT enclose same with their Tender, otherwise their Tender will be rejected as INFORMAL.

THOMAS H. NESBITT,
Town Hall, Sydney, Town Clerk.
10th July, 1913.

## CITY OF MELBOURNE.

TENDERS will be received until 3 o'clock p.m., on TUESDAY, 29th instant, for SUPPLY and DELIVERY of—

(a) Two (2) Five-ton Motor-driven Waggons, with tipping body.
(b) Two (2) Motor-driven Street Watering Vans, at least 1000 gallons capacity.
(c) One (1) Motor-lorry (one ton).
(d) One (1) Runabout Motor-car (to seat four (4) persons.

Specifications may be seen at the office of the City Surveyor, Town Hall.

JOHN CLAYTON,
Town Clerk's Office, Town Clerk.
Town Hall, Melbourne,
12th July, 1913.

## CITY OF MELBOURNE.

TENDERS will be received until 12 o'clock noon on TUESDAY, 9th SEPTEMBER, for the supply and delivery of—

ELECTRICITY RECORDING METERS AND MAXIMUM DEMAND INDICATORS.

Specification may be seen at the Office of the City Electrical Engineer, Town Hall.

JOHN CLAYTON,
Town Clerk.

Town Clerk's Office,
Town Hall, Melbourne,
16th July, 1913.

## WANTED.

A FIRST-CLASS MILL MAN

familiar with

MILLING PRACTICE,

must thoroughly understand

MINING AND MILLING MACHINERY,

capable of handling men. Good salary paid to right man. References required.

Address—

Z, "Australian Mining Standard,"
Melbourne or Sydney.

---

TENDERS, in toto, or per item (addressed to the undersigned, 369 Collins-street, Melbourne), are hereby called for the PURCHASE of the ASSETS of the SALVAGING COMPANY OF AUSTRALASIA PTY. LTD. (in liquidation).

Tenders close at noon, on Saturday, July 26, 1913. The highest or any tender not necessarily accepted.

30-ton aux. ketch-rigged VESSEL, 83ft. long, 18 beam, 6 depth; and DINGHY, 50h.p. motor engine. Fully equipped. About 6½ years old. Cost £3000. Lying in Yarra.
6in. CENTRIFUGAL PUMP and ATTACHMENTS, 16h.p. marine motor-engine. 'Frisco standard, with all equipment.
At Port Victoria, S.A.—WRECK, "Songvaar," 1969-ton iron ship. Sails, gear, etc. Now ready for raising.
10h.p. MOTOR WINCH; 3-cylinder diver's pump, gear, etc.
8h.p. MOTOR-ENGINE, 'Frisco standard, and LAUNCH; 1 SHIP'S GIG.
1 CASE FORMALIN, 2 TENTS (8 x 10), and FLIES; SUNDRY TOOLS, etc.
At Port Campbell, Vic.—3½h.p. Gardner Oil-engine, Wire-winding Plant, Buffalo Forge, Tools, Anvils, etc., 1 Hand Drilling-machine, 1 Polishing Emery-wheel, 1 Vice and Bench, 1 Carpenter's do., 1 Surfacing and Screw-cutting Lathe (6ft. bed, 6in. centre), Chucks, etc.; 2 Iron Sheds (40 x 15, 25 x 15), Anchors, Chains, Buoys, etc, etc.

E. McGREGOR, Liquidator.

---

**SURVEYING INSTRUMENTS,** all complete, and in good working order. Theodolite, 6in., "Y," by Watson, £17 10s.; Theodolite, 5in., "Y," by Troughton and S., £15; Level, dumpy, 14in., Stanley, in aluminium, latest pattern, virtually new, £16 10s.; Level, dumpy, 12in., by Pallant, £8 10s.; Box Sextant, 3in., by Elliott, £3 10s.; Prismatic Compass, with shades and mirror, £2; Prismatic Compass and Altitude Instrument combined, £3 5s.; 14ft. Levelling Staff, £1 15s. We hold a fine selection of new Surveying and Mathematical Instruments, by Stanley, Harling, and leading European makers. Illustrated Catalogue gratis. W. Watson and Sons, 78 Swanston-street.

## SHIRE OF BUNGAREE.

The undersigned would be glad to receive offers of portable stone crushers, with full particulars as to cost and powers, etc., from makers and agents, and where same may be seen at work.

JULIUS S. LAZARUS.
Shire Hall, Leigh Creek, 15/7/13.

---

A remarkable instance of the use to which the heat given off by the retorts of gasworks may be put to has recently been furnished by the heating of a new swimming bath, belonging to the city of Tuebingen, in Wuerttemberg. The whole scheme was thought out by the municipal gas works of that town, and carried out after careful experiments, extending over a period of eight months. These experiments established the fact that a daily quantity of not less than 2,000,000 calorific units could be obtained from the gases leaving the retorts, and a further 400,000 units from the heat radiated from the oven into the air. This quantity of heat was obtained in the form of hot water, and without any influence, technical or economic, being noticeable as regards the working of the plant. The experimental oven is an ordinary gas-producing oven, having nine horizontal retorts, 13ft. in length, and has been in uninterrupted use for a period of eight months. During that time, it was also shown that the outside temperatures do not affect the working.

## THE IMPERIAL COLLEGE OF SCIENCE AND TECHNOLOGY.

Representatives of the press were entertained at luncheon by Sir Alfred Keogh, the Rector of the Imperial College of Science and Technology, South Kensington, London, in the commodious new Students' Union, when the several buildings which are to house the new and enlarged departments were thrown open to inspection, and the experiments and investigations being carried on were explained.

For some time reorganisation and consolidation of the various institutions forming the Imperial College have been in progress, so that instead of there being may departments carrying on more or less the same work within a stone's throw of one another, it is possible for the interchange of students to take place so that the best and most practical teaching of all subjects is obtainable for all. In the new building of the Royal School of Mines there is, among other equipment, a complete full-sized plant for the treatment of various ores, including crushers, shaking tables, slimers, etc., all driven by electric motors. Another and perhaps better known department is the Electrical Department of the City and Guilds (Engineering) College, under the direction of Professor T. Mather, where, in addition to the large and well-equipped general laboratories, the "Traction Bay" is now in full working order. It contains a motor-generator, static balancers and transformers, so that direct current from 100 to 600 volts is available, as well as alternating current of different frequencies and pressures for experiments on traction motors. A full-sized bogie tramcar, with rails and conduit, is also available for testing. In this connection there is a dynamometer for determining the draw-bar pull, and each wheel drives a drum, to which is affixed a flywheel in three sections. These can be coupled together by means of electromagnetic clutches, so that the equivalent of a 5, 10, or 15 ton car can be obtained. Another unique equipment consists of a complete installation of McKenzie Holland electric signalling. In this course, as in others including advanced dynamo design, the foremost experts in the several branches are retained to deliver lectures on their special subjects. In addition, one must mention the large and important department of Civil and Mechanical Engineering, under the direction of the Dean of the College, Professor W. E. Dalby, and the department of Geology, which includes oil production. The latter is, we believe, the only one of its kind in the world. Others of the new departments which have immense possibilities are those dealing with the commercial treatment and preservation of timber and the cultivation of rubber.

---

Melbourne Council has decided to supply electric current for experimental purposes at 1½d. per unit.

* * *

Prahran and Malvern Tramway Trust (V.) has drafted a scheme of amalgamation of the various electric car lines in the south-eastern suburbs, and an extension of the trust's operations. Prahran Council has determined that the Commercial-road-Malvern line must be laid before it can take the scheme into consideration.

"ROYAL EDISWAN" Carbon & Metal Filament Lamps

"EDISWAN" Electrical Supplies of all kinds

SHIP, FACTORY, & COLLIERY FITTINGS, WIRES, CABLES, MOTORS, SWITCHGEAR, INSTRUMENTS & ACCESSORIES.

Large Stocks held at following addresses—

The Edison & Swan United Electric Light Co. Ltd.,

58 CLARENCE STREET, SYDNEY.
368 LITTLE COLLINS STREET, MELBOURNE.
62-64 QUEEN STREET, BRISBANE.

Largest and Oldest Established British Makers.

The Metal Market,

SOME PRESS OPINIONS.

The whole publication affords a convenient means of obtaining quickly a comprehensive view of the world's trade in the chief metals.—Mining and Scientific Press (U.S.A.).

. . distinctly interesting, as it narrates in a concise form the various factors that have influenced prices during the period covered.—Financial News (London).

. . . admirably compiled by Mr. W. E. Figgis, and embraces a large amount of information that will be of great assistance to mining men generally.—Sydney Morning Herald.

The two charts accompanying the work are about 3ft. x 2ft. in size, and give very clearly an outline of the market positions. —Queensland Government Mining Journal.

. . . the charts are of much interest, and to those for whose use they were designed they must prove of much practical value.—Newcastle Morning Herald.

The charts should hang in every broker's office for the information of their clients.—Mining Standard.

PAST AND PRESENT METAL MARKETS
15/-, posted 16/3, foreign 16/5.
Mining Standard, Melbourne and Sydney.

GREAT COBAR LIMITED,
COBAR, N.S.W.

MINE OWNERS, SMELTERS, COLLIERY PROPRIETORS, PURCHASERS OF COPPER ORES AND MATTES.

VACANCIES FOR COMPETENT MACHINE MINERS.

SYDNEY: Australasia Chambers, Martin Place, And at Lithgow and Singleton. LONDON: 65 New Broad Street, E.C.

## CONTENTS.

THURSDAY, JULY 24.

**EDITORIAL—**

Small-pox in Melbourne .. .. .. .. 61
The Aims of Japan .. .. .. .. .. 62

Leaderettes .. .. .. .. .. .. .. .. .. 62
News and Notes .. .. .. .. .. .. .. 63
Personal .. .. .. .. .. .. .. .. .. .. 64
Metal Quotations .. .. .. .. .. .. .. 64
The Cloncurry (Q.) Strike .. .. .. .. 64
Australian Oil Companies .. .. .. .. 64

Investors' Column—
Nuggety Trafalgar .. .. .. .. .. 65
Mount Cuthbert (Q.) .. .. .. .. 65
Edna May (W.A.) .. .. .. .. .. 65

Arbitration in N.S.W. .. .. .. .. .. 65
Mining in New South Wales .. .. .. 66
Victorian Mining Activities .. .. .. .. 66
Tasmanian Mining .. .. .. .. .. .. 67
Queensland Mining .. .. .. .. .. .. 67
Mining in Western Australia .. .. .. 68
The Coal Mining Industry .. .. .. .. 68
Engine-drivers' Examination .. .. .. 68
Industrial .. .. .. .. .. .. .. .. .. 68
Phases of Mining in Victoria .. .. .. 69
Bendigo Gold Stealing .. .. .. .. .. 69
Oil Fuel and Coal Miners .. .. .. .. 69
Sydney City Council .. .. .. .. .. .. 70
Melbourne Tramways .. .. .. .. .. 70
Border Railways .. .. .. .. .. .. .. 70
British and European Developments .. 71
The Alignment of Machinery .. .. .. 72
N.S.W. Railway Award .. .. .. .. .. 73
Imperial Wireless Chain .. .. .. .. 73
Port Augusta to Oodnadatta .. .. .. 73
Miscellaneous .. .. .. .. .. .. .. .. 73
Electric Plant Enlargement .. .. .. 74
Tenders Invited and Accepted .. .. .. 74

---

WELSBACH
WIRE LAMPS,
BRITISH MANUFACTURE.
SEND FOR CATALOGUE.
Welsbach Light Co. of Aust. Ltd.
302 Pitt Street, SYDNEY.
390 Lonsdale Street, MELBOURNE.
Creek Street, BRISBANE.
102 Victoria Street, WELLINGTON, N.Z.

---

FIRE. . BRICK
Our Products have proved their superiority.
FIRE CLAY GOODS For Every Purpose.
Darley Fire Bricks will withstand the most intense heat, and will not shrink. Our bricks are made near Bacchus Marsh, Victoria, and we supply all the States.
Specialities
High-Grade Firebricks & Retorts.
Prompt Delivery. For Prices, etc., write to—
DARLEY F. B. Co.,
Oliver's Lane, Flinders St. Melbourne

---

COKE!
NORTH BULLI COLLIERY
Limited
Supplies best quality hard
SOUTHERN
SMELTING COKE.
(Weekly output 1250 tons.)
H. G. Hyde, Secretary
Royal Insurance Building, 16 Spring-street,
SYDNEY.

---

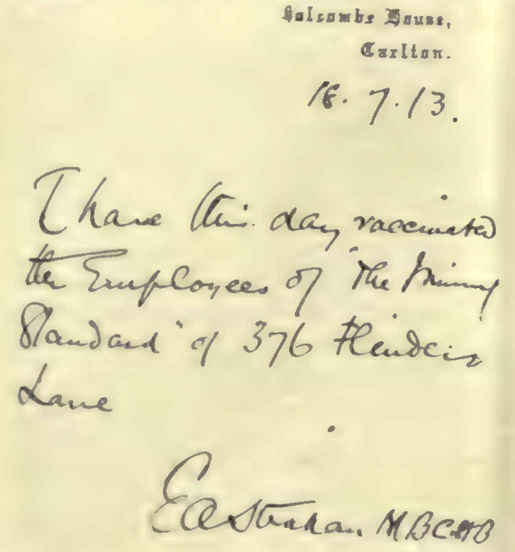
AUSTRALIAN MINING STANDARD.
PUBLISHED EVERY THURSDAY.
Forwarded Post Free to any Address.
Australasia .. .. .. .. .. .. .. .. .. .. .. .. 26/- per
Abroad .. .. .. .. .. .. .. .. .. .. .. .. .. 30/- Annum.
Payable half-yearly or yearly, in advance.
All amounts should be made payable to order of "CRITCHLEY PARKER, Bank of Australasia."

12 O'Connell-street,
Sydney.
Tel. Central 2703.
P.O. Box 331.

376 Flinders-lane,
Melbourne.
Central 7931 & 1838.
P.O. Box 253.

### NOTICE.

On account of the fears entertained concerning the spread of small-pox in Melbourne and Sydney, the whole of the staff of the "Mining Standard" has been vaccinated. Following is a reduced facsimile of the doctor's certificate to that effect:—



Salcombe House,
Carlton.

16. 7. 13.

I have this day vaccinated the Employees of "The Mining Standard" of 376 Flinders Lane

E A Strahan. MBCM

---

AUSTRALIAN MINING STANDARD.
PUBLISHED EVERY THURSDAY.
ESTABLISHED 1888.

It is requested that all business communications be Addressed to Critchley Parker.

THURSDAY, JULY 24, 1913.

## SMALL-POX IN MELBOURNE.

Where does the blame lie? That is the question which, even if it be not the prominent question of the moment in Melbourne and Sydney, will be the question to be asked when the present fearsome visitation is a thing of memory only. That great carelessness has been shown would seem to be certain. Victoria has hitherto blamed New South Wales; New South Wales has blamed the Commonwealth; and the Commonwealth blames Victoria. As far as can be seen, all three—the Federal authority and the two State authorities—are distinctly blameworthy. We have already pointed out that the inadequacy of the law in the States concerned and the variations in the law between one State and another are largely responsible for the outbreak, but, over and above these, there would seem to have been gross mismanagement and an exhibition of deplorable carelessness. The precautions taken to prevent the spread of the disease from Sydney to the State of Victoria have been, if not altogether farcical, at least quite inadequate. To accept a certificate of vaccination is not enough; it is a certificate of successful vaccination that is required. Again, to admit into the State anyone who has been vaccinated a few hours previously is making a farce of the whole business. It takes fourteen days for the disease to develop; and there should, accordingly, be a certainty that the vaccination has been performed at least 14 days previously. There was nothing to prevent the Federal authorities from issuing a regulation to that effect, and their neglect to do so does not redound to their credit. The Federal Director of Quarantine has issued a ukase that henceforth 7-day certificates are to be demanded. If these be certificates of successful vaccination, they will be adequate; if not, the situation will not be very materially improved by this new regulation.

All this is a matter for the authorities; but also the question arises whether even the executive officers who have had the task of enforcing the regulation issued by the Federal Government have done their duty properly. The "Karoola," the boat by which the infected woman reached Melbourne, arrived on Monday of last week. The very next morning she exhibited signs of a rash. She is said to have advised an officer of the vessel of the fact, and to have been recommended to use some treatment for eczema. No report was made by the "Karoola's" officer, either to the master of the vessel or to the Health authorities; and it was only when the patient visited a Collins-street medico the same evening that the case was diagnosed as one of small-pox. Now, apart altogether from the question of the responsibility of one of the "Karoola's" officers, does it not seem probable that there was some degree of negligence in the examination to which presumably the victim was subjected, together with the other passengers. One knows that in ordinary times the examination of steamship passengers by the health officials is apt to be a very perfunctory business, but it should certainly not be perfunctory in such a case as this, where a steamer was coming from a port known to be infected. Yet another criticism to be levelled against the authorities is that great laxness was shown in regard to keeping in touch with all the passengers by this steamer. As it was, those who landed in Melbourne seem to have been distributed all over the town and country without there being any attempt made at the time to keep in touch with them; and, consequently, every one of these persons is a potential carrier of the dreaded disease.

But, whatever the deficiencies of the executive officers of the Commonwealth and State Departments in control of these matters, it is much more serious to find that the governing powers have not taken steps that it was absolutely necessary to take. The Minister for Customs, in excusing the failure of his department, has said:—"It has been pointed out to me that had the full and complete powers under the Act been available, and the extreme measures suggested by critics been taken, it would in effect have involved the complete isolation of the city of Sydney so far as its interstate relations are concerned. Such a course would necessarily have held up all vessels in the port, and involved a complete stoppage of all trade and commerce, and the paralysis of the whole business undertakings of this important centre so far as their interstate character was concerned." But, whatever the inconvenience to trade, whatever the damage done to the business of Sydney, it seems to us that it was the Minister's duty to see that the disease did not spread. We can appreciate Mr. Groom's attitude; none the less, we think it was a mistake. For another thing, we must say that it is positively ridiculous that, in a situation such as the present, the Commonwealth and the State should exercise a divided jurisdiction in matters of such vital importance. For the Commonwealth to have "control in what might be termed an interstate sense," and for the State to exercise jurisdiction in regard to its local health laws is absurd. It is all very well to talk about co-operation, but no amount of co-operation will make things work as smoothly as they would work under one single authority; and assuredly there has been a tremendous failure of political sagacity in leaving such an outbreak as this to be dealt with in each State by two different authorities.

## THE AIMS OF JAPAN.

After the spilling of gallons of ink in Australian newspapers in the airing of absurd views in regard to the aims of Japan, it is satisfactory to note that in the Melbourne "Argus," of Saturday last, a really sensible article appeared on the subject. This is the more noteworthy inasmuch as only a fortnight before, the same paper, in one of those editorial epileptic outbursts to which it is liable, had presented its readers with a comparison between Melbourne and its hated rival, written in that vein of smug self-conceit and ostentatious modesty which used to make Melbourne ridiculous 20 years ago, but which has, happily, been passing away, as the outlook of the citizens has become saner and broader. The paper which could print this deplorable exhibition of appalling pettiness and of utter incapacity to understand the pettiness it showed, has yet given to us an article by Mr. H. L. Wilkinson in which a really statesman-like view is taken of the policy of Japan in the Pacific. We have urged before now that Japan, with vast interests to further on the Asiatic mainland, would be guilty of a cardinal strategical blunder if she dissipated her strength in other quarters; that it is not to her interest to take any action that would alienate Great Britain; that, with a host of enemies envious of her sudden rise to a position of importance, it would be madness for her to pick a quarrel with any one of them; and that, however small the population of Australia, however poor its defences, however insignificant the forces it could put into the field, it would yet be beyond the power of Japan to reduce it to submission. Some of these points are made by Mr. A. J. Wilkinson, the writer of the article we have referred to; and he makes a further one—that Japan is not eager for conquests, that what she is desirous of obtaining is an extension of her opportunities for trade. He dots the i's of our assertion that Australia would not be the first country Japan would care to annex, by pointing out that, even if Japan had not her hands full with Korea and Manchuria, her first objective would be either the Philippines or the Dutch East Indies. The former, as being the nearer to Japan, will be the more desired of the two, but probably the Dutch East Indies are the more thought of, because they would be the more easily conquered. Either of these would be of enormously more value to Japan than Australia, and would be capable of being held with much less difficulty. To consolidate her power in Australia after conquering it would, in point of fact, cost Japan very much more than she could afford at the present time, or is likely to be able to afford for many a long day to come; so our pessimists and our scaremongers may take heart of grace and pluck up courage.

The new Minister for External Affairs, Mr. P. McM. Glynn, is so completely satisfied with the promise of the oilfield on the Vailala River, Papua, that he has cabled to the High Commissioner, Sir George Reid, asking him to engage an expert to proceed to Papua and report on the best means of opening up the field. The Minister has also given instructions for a railway line to be laid from the coast to the field, a distance of 15 miles. The cost is estimated at between £50,000 and £60,000. The idea at present is to run the line from Orokolo Bay, but the survey may show that another starting point is preferable. Besides opening up the oilfields, the prospects of which are considered bright, the line will tap a fine agricultural district, the tropical produce from which will in due time provide abundant freight. It would surely, however, have been advisable to first make quite sure that the oil was there.

* * *

When a member of a Ministry ventures to criticise the doings not only of previous Cabinets, but of his own as well, there is a hope that things may take a turn in a right direction. The West Australian Government has of late given much consideration to railway construction, but last week the Minister for Works, Mr. Johnson, acknowledged that he was convinced they had begun building railways in the wrong direction. Mr. Johnson did not go into particulars, but probably one line at least would come to the mind of his hearers, namely, that which was rushed on with to connect the Bullfinch district with the main line and so with the western ports. Mr. Johnson spoke as one who, as a farmer in the eastern part of the State, would benefit to some extent by railway construction in that region; yet he was honest enough to admit that he agreed with those who said that they should have served those areas which had an assured rainfall and where success was certain, before opening up the eastern dry districts. He regretted that people should not have been encouraged to go out there as early as they had done. The position now was that the making of railways in the eastern areas had been commenced, and dry seasons had come along, with the result that the Government had to "carry the baby." They had to try to finance the farmers, who with bad seasons to combat could not pay their debts. The year's deficit was due to the financial consideration shown to the agricultural industry. Of course it has to be remembered that some explanation had to be made to account for this latest in a long series of deficiences, and it would never do to leave the people to ask questions as to the agreement with the Commonwealth Government to hand over the Savings Bank, whose funds had until then been applied to assisting farmers, as they are now employed in some other States. For all that, few will gainsay the wisdom of providing the fullest traffic accommodation first of all to districts in which success is certain, leaving it to a later day, when possibly artesian water may be made available, to similarly deal with the now dry eastern districts. On the other hand, if Mr. Johnson can carry on his farming in the east, there is no reason to doubt that others may do the same. The farmers of the better watered areas at least will cordially thank Mr. Johnson for his frank advocacy of their cause.

* * *

If the attitude taken up by the Brickmasters' Association in New South Wales towards the Brick and Pipe Makers' Wages Board had been adopted by the workers, it would have elicited general condemnation. Those who have studied the operation of the wages board system, particularly in Victoria, the home of its birth, recognise in it a highly satisfactory means of avoiding or minimising industrial strife, and it is utterly hopeless for Parliaments and Governments to provide means to that end if either party obstinately refuses to appear before the Court or the Board so provided. Yet this is what the Brickmasters' Association of New South Wales has done. Last week Mr. J. P. G. Sheridan, the chairman of the Brick and Pipe Makers' Wages Board, received a letter signed by Mr. A. Stuart, on behalf of the brickmasters, as follows:—"We have determined not to appear before your Board nor to take part in the determination of the above matter, our experience having been that it is a waste of time and money, the last award having cost us £400 as well as occupying months of our time and serving no purpose. We claim that the industry being unskilled, the application of a living wage can only apply. The living wage has been defined by the judges of both the Federal and State courts, whose opinions should be sufficient to guide the Board without assistance from us, and for this reason we leave the responsibility with the Board to determine the matter." It is not surprising that the chairman was indignant. Had he spoken more strongly than he is reported to have done it would have been still less surprising. As it was, Mr. Sheridan simply said that the brickmasters concerned in the sending of the letter had tried to get "the ear of the Court" before the board had heard evidence. It was an attempt to influence him, but it would not do so in the way apparently desired. The public, which is always an interested party in labour disputes (though usually the least considered), had a right to expect from the employers at least as much consideration for the public courts as from the employees, and there will be widespread regret that in this case at least the employers have set a bad example.

* * *

Vergil's "Times Danaos et dona ferentes" found an echo last week at a meeting in Newcastle (N.S.W.), when Mr. Hanlon interjected "I feel afraid when I hear of capitalists giving a labour council £100." The chairman of the meeting, Mr. O. Rogers, had just announced that the Council had accepted an offer from representatives of two oil companies to pay delegates from the council to lecture in advocacy of a duty on oil for the purpose of safeguarding the industry. The arrangement was certainly an unusual one, but the circumstances of the case are such that even Mr. Hanlon's scepticism may well prove unjustified. As a matter of fact the oil works of New South Wales have once more fallen upon evil days, and at Newnes, at Hamilton, and in other places, they have been closed down in consequence of being unable to stand against foreign competition. The result has been that, although the shareholders in the two companies have suffered through stoppage of their works, something like 1700 men have been thrown out of work; both parties, therefore, are interested in doing whatever they can to secure a duty on foreign oil, sufficient to bring about a new start. The companies' representatives, therefore, approached the Labour Council and offered to pay £100 to defray the expenses of Labour lecturers who will make it their business to advocate a tariff which will benefit both sides. The capitalists will find the funds if the Council will find the lungs. The proposal is not put forward as a philanthropic one; if it were, Mr. Hanlon's fears might have some foundation. It was more in the spirit of co-operation that it was made, and the Labour Council acted wisely in accepting the offer. Already the Commonwealth is offering a bonus on kerosene manufactured in Australia, but that is insufficient to enable the companies to stand up against the competition of the very wealthy oil corporations of other countries. It may even be questioned whether any duty which the Federal Government is likely to impose will be much more effective than the bonus; yet only in this way and on these lines is it possible for the industry to be carried on locally. That the necessary shale exists in immense quantities has been amply proved, but the cost of mining it and extracting its marketable contents is a serious handicap to enterprise in Australia. If, by co-operating, the representatives of shareholders and of workers succeed in putting the industry on a paying basis, all parties will have reason to rejoice that the companies asked the men to lend a hand.

* * *

Although the news that the strike of miners at the Hampden and Mt. Elliott mines, in the Cloncurry (Q.) district, has ended was pleasing to shareholders in those companies, it is probable that there was still greater rejoicing amongst the miners and their families and the tradesmen of the district affected. The story is a really pitiful one, for the calling of the strike was not the work of the men themselves, a majority of whom were entirely opposed to it. The offenders were the agents of the Australian Workers' Union, and the unionists were obliged to put up with the consequences of whatever was ordered by those officious parties. The dispute arose over the system of contract working which has hitherto prevailed at the two mines concerned. The men working under contract were making good wages and supporting their families in comfort, their earnings ranging from £4 10s. to £6 per week, and sometimes even more, for a week of 44 hours. But this happy state of things could not be allowed to continue; it would never do to allow the members of a union to be contented; some pretext for strife must be found, or for what purpose did the A.W.U. exist? In these two mines nearly 1500 men were employed, and something must needs be done to impress on them the majesty of federated labour; if they derived some benefit from their unionism they must be prepared to make sacrifices at the bidding of those in whose hands they had put the power to harass them. So for six weeks the mines and the men were laid idle; the single men moved away to other districts, but those who had dependants had to make the best they could of the situation. How little the workers appreciated the interference of the strife-mongers was indicated by the total absence of excitement, the apathetic bearing of the majority of those who were thrown out of work, cheated of good money and forced into idleness against their will. It is estimated that between 3000 and 4000 men, women and children were practically reduced to want; only those who had been sufficiently provident to put by a few pounds, against the bad times which every unionist has to count upon sooner or later, were able to keep their heads above water. So little enthusiasm was there in the movement that not a single meeting was held. The men had to stand by and see non-unionists taking their places for certain kinds of work, but even this did not sting them into activity to denounce either their own leaders or their late employers. In this respect the Cloncurry strike stands almost alone; like "dumb driven cattle" the men bowed their heads to their fate and submitted uncomplainingly to their own undoing. Were it not for the much abused Industrial Peace Act which the State Parliament passed after the tramways strike, the trouble would no doubt have lasted longer, but that Act gave the judge power to order a compulsory conference of the parties, and, this having been done, a solution was at once arrived at. The A.W.U. did not gain its point, however; the men return to work on the old conditions for some months to come, although with the understanding that the contract question will be brought up again at the next annual meeting of the A.W.U. There is just one bright point in the dismal fiasco which has now closed—at least for some months; that is, that a large number of the unionists had become so disgusted with the meddlesomeness of their leaders that steps were taken to form an independent workers' union, and considerable response was met with. It is almost a matter for regret that his Honour Jodge McNaughton should have felt called upon to express regret that this second union had been formed, for, if it have any significance at all, it surely means that the men recognised that, although unionism of an improper kind is the bane of labour, there is a unionism of another kind which is its greatest boon.

---

## NEWS AND NOTES.

"Carbon" (Q.) asks for information, through these columns, as to a good method of coppering carbon brushes for dynamos, together with any literature bearing on the subject. Will any of our readers oblige?

The Tewksbury Amalgamated (N.S.W.) dredges, three in all, washed up for 91 oz. for the fortnight. The dredges turned over 40,508 cubic yards of an average value of 2s. 2d. per yard.

At a meeting of the Bendigo (V.) Mine Owners' Association held last Monday, Messrs. S. H. McGowen (chairman), J. H. Craig, J. G. Stanfield, R. A. Rankin and G. A. Petrie (secretary) were appointed representatives on the Chamber of Mines of Victoria, and a committee of ten was appointed to form a local branch of the Chamber.

The Treasurer of New South Wales, Mr. Cann, will introduce early in the current session a Bill authorising the borrowing of about £3,000,000 for railway duplication works and rolling stock, both of which are much needed.

The Camberwell (V.) Town Council has adopted the revised agreement with the Melbourne Electric Supply Co. Ltd. for lighting the streets of the town with electricity for a period of five years from 1st November next, at an annual cost of about £900. The present agreement with the gas company costs £969 per annum for 212 lamps, while the new agreement provides for 251 lamps, seven of which are are lamps of 700-candle power.

The Carpathia Tin Mining Co., Ardlethan (N.S.W.), the prospectus of which was issued only last October, is about to pay a second dividend of 1s. per share, which will absorb £5700, making a total disbursement of £11,400 within about three months.

Owing to the breaking of a winding engine drum at the Eleanora mine, Hillgrove (N.S.W.), an eleven-ton boiler dashed down the side of the mountain, killing Charles Nicholson, one of the mine-workers, badly damaging the Proprietary battery and leaving havoc in its path. The boiler was being transported from the bottom of the gorge to the new works of the Eleanora, at the top of the mountain. Three days had been occupied in hauling it half-way up the tram line, and it was passing four ballast laden trucks on the line alongside, which were being wound down in order to assist the haulage of the boiler, when Nicholson got into the bottom truck of ballast to ascertain if the ascending and descending bodies would clear each other. At that moment the drum broke, and Nicholson was struck down and killed by the boiler, which went at a terrific pace down the incline, breaking down the telephone lines, traversing the Proprietary battery, but missing the air compressors, and uprooting trees and boulders as it went. The signalman at the bottom took refuge behind another boiler at the bottom of the gorge, which the runaway boiler just reached as it embedded itself in the earth. Nicholson, who was 49 years of age, was one of the oldest mine-workers in the district, and was widely respected.

In the Equity Court in Sydney last week, John O'Neill and Co., merchants, of Kent-street; John Toole, trading as J. E. Toole and Co., engineers, of Hunter-street, and Kynoch Ltd., petitioning creditors, moved for an order directing the winding up of the Bimbimbie Gold-mining Company (no liability), situated near Moruya, and that Mr. George Henderson, legal manager of the company, be appointed official liquidator. The petitioning creditors in their affidavit stated that the company was indebted to them for goods sold and delivered. The sole assets of the company, consisting of plant, buildings, and stores in hand, amounted to £463 7s. 1d. In addition, the company owned six mining leases, comprising 12 acres or thereabouts, upon which no certain or even probable value could be placed. The liabilities of the company amounted to over £1300. Various judgments had been obtained against the company, including judgments by miners for wages due to them, and the petitioners further averred that the company was unable to pay its debts. Counsel mentioned that the matter was urgent because Mr. Henderson had entered upon certain negotiations with regard to the company, under instructions from the directors, and he found himself very much hampered by other creditors who were clamouring for payment. His Honour granted the application, subject to the right of reopening the matter on the part of any person who might have been misled by the case being taken that day. Application for reopening to be made within a week after the winding-up order was advertised.

The Porepunkah Gold Dredging Co. (V.), during the first six months of this year, won 493 oz. gold—a weekly average of 18 oz. 19 dwt.—as against 400 oz. for the previous half year. The gold won to date is 5675 oz., valued at £22,998. The ground dredged for the period under review covered 7¼ acres, the quantity of wash treated being estimated at 225,807 cubic yards. The company's financial position improved during the period, which was ended with a net credit balance of £141, while stores, etc., on hand were valued at £224.

No actual development has taken place in connection with the miners' strike at Eaglehawk (V.). Everything is very quiet; and, although there is some talk of the trouble extending to other mines, this has not yet happened. The following communication was received by the Bendigo branch of the F.M.E.A., with respect to the special levy which Mr. J. R. Little, general secretary, requested that branch to make. Mr. Little wrote:—"The trouble has begun in earnest, and the non-unionists have definitely refused to join. There are over 187 men on strike at the Virginia, New Prince of Wales, and the South Prince of Wales mines, with every possibility of the dispute extending. We intend to win, but must have funds to do so. The blacklegs cannot beat us, as the engine-drivers have definitely refused to lower them. The strikers are firm, and will fight as long as the ammunition lasts." On the other hand, Mr. H. Burridge, who presided at the half-yearly meeting of the New Prince of Wales G.M. Co., held at Bendigo last Friday, said that the only cloud was the calling out by the miners' union of the unionists three weeks ago because two or three non-unionists in the mine would not join the union. The directors were not antagonistic to the unionists, but they had entered into a bond with 72 other companies to keep an "open" mine. He would be sorry to be associated with any mine that withdrew from that bond. The directors did not know why their mine had been picked out by the union, when scores of non-unionists were at work in other mines on the field. The half-yearly report of the Virginia company, presented last Monday, also expressed the determination of the directors to withstand the attempt to restrict employment to members of the F.M.E.A., and to continue working an "open" mine.

At the half-yearly meeting of the Ballarat (V.) branch of the Federated Mine Employees' Association last Saturday night, it was announced that Mr. J. Hocking had been elected president, in succession to Mr. T. Uren, Mr. S. Bathurst vice-president, and Mr. J. E. Lawn secretary. Some ill-feeling was caused by the re-election of Mr. Lawn, who beat his opponent, Mr. J. W. Truscott, by only four votes. Mr. Truscott's supporters complained that Mr. Lawn had not been re-elected in accordance with the rules of the branch, and that therefore the declaration of the returning officer was null and void. It was also alleged that a steward had voted for three absent men at their instructions, and that was regarded as irregular and illegal. Several in the meeting urged the returning officer, Mr. Wallace, to declare the election of Mr. Lawn null and void, but Mr. Wallace refused to do so at that juncture. He desired that Mr. Gullock should be asked to attend and explain matters. A very heated discussion ensued, and at 11 o'clock a division resulted, a decision to declare the election of the secretary null and void, and to take a new poll under the old rules of the branch. The position of secretary is worth £150 a year.

A deputation representing the Ironworkers' Union waited last week upon the Victorian Minister of Public Works, Mr. Hagelthorn, and urged him to give a substantial preference to Victorian ironmasters and machinery makers, when tenders are called for the machinery for the new Government cool stores. It was stated that between 1000 and 1500 iron-workers are now unemployed in the State, and that if the contract were let to a Victorian firm the effect would be to circulate something like £30,000 amongst their own people. The Minister replied that the policy of the Government had been to give preference to local manufacturers when there was a prospect of the article required being equal to what could be obtained elsewhere. In this case the same policy would be adhered to. Specifications had been drawn up by the department, and it was now the business of the local manufacturer to prove that he could do the work satisfactorily. Tenders will be received until towards the end of the month.

The Secretary of the Briseis Tin and General Mining Co. (T.) reports as follows:—Total output during June, black tin, 45 tons; drift and overburden removed, 18,000 cubic yards; Ringarooma drift, 14,000 cubic yards; Ringarooma overburden, 5000 cubic yards. Wallace properties, 544 oz. gold from 121,200 cubic yards, of which 121 oz. gold and 24,000 cubic yards came from Argo Co.'s property. Previous month—45 tons black tin, 485 oz. gold from 130,200 cubic yards.

Great interest is being taken in the district between Castlemaine and Kyneton (V.) in the activity of parties of prospectors searching for tin deposits. Nearly the whole of Mt. Alexander has been pegged out in prospecting areas, and the pegging extends to Mt. Barker, which is three miles away. The latest recruits to the prospecting parties are Messrs. Lawrence and Cartynedge, who have pegged out 100 acres on the east side of Mt. Alexander.

The Tongkah Compound, N.L., Puket, Siam, has declared its 15th dividend—viz., 1s. per share, and a bonus of 2s. per share, payable on August 15th. The total disbursement will be £7500, making a total distribution to date of £82,500, equal to 33s. per share, the paid-up value being 20s. per share.

The Broken Hill Proprietary Company announces its 164th dividend, viz., 1s. per share, which will absorb £48,000, payable on August 20th.

During the six weeks ended 28th June, 26,498 tons of crude ore were milled by the Sulphide Corporation at the Central mine, Broken Hill, producing 4472 tons of lead concentrates and 7961 tons of zinc concentrates. During the same period, at the Cockle Creek works, 5728 tons of leady concentrates, purchased ores, etc., were smelted, yielding 1659 tons of lead, containing 5019 oz. gold and 163,883 oz. silver.

The quantity of gold received at the Melbourne branch of the Royal Mint during the week ended on the 19th inst. was 12,611.68 oz.

Three truckers at the Sloanes and Scotchman's mine, Stawell (V.), had a miraculous escape from a terrible death last Saturday morning . Several tons of stone broke away at the 1000ft. level directly above where the three men were loading a truck. The truck was completely wrecked. The three men were William McKenzie, Ernest Tomlinson, and William Gray. Gray escaped injury, Tomlinson received a scalp wound and a severe cut on the arm, which necessitated four stitches, besides abrasions on the back and legs. McKenzie, who took the place of a sick man in the level that morning, had an extensive laceration on the side of his head. When the accident occurred the men were clearing the place so that the headwall might be timbered. All three are expected to be about again in a few days.

Mr. W. A. Mercer, representing strong English capitalists, left Melbourne last Saturday on a visit of inspection to the property of the Australian Diamond Pipe Mines Company, at Delegate, New South Wales, accompanied by Mr. F. B. Kirsten, the company's expert, and Mr. Allan Bowler, chairman of directors of the company. Mr. Mercer is inspecting the property with a view of completing an agreement for an option of purchase.

Finding that their mine was not likely to prove profitable to work, the directors of the Golden Hope, situated at Blakeville, near Ballan (V.), decided to recommend the shareholders to abandon it. In the meantime they looked about and eventually purchased the Undaunted mine, about a mile west of the Golden Hope, and at an extraordinary meeting of shareholders held last week, this action of the directors was confirmed. The chairman, Mr. V. J. Saddler, stated that the company had a complete hauling and crushing plant on the mine, considered to be worth at least £1500, and the liabilities of the company amounted to under £500.

The management of the Great Boulder Proprietary mine, Kalgoorlie (W.A.), have discontinued the night shift, or dog watch, since last Monday.

A crushing of 8 tons of stone put through at the Government battery, Blakeville (V.), on behalf of Messrs. J. Stephens and Sons, gave the splendid return of 56 oz. of gold.

Under the name of the Bealiba Gold Mining Co. (V.), Messrs. Ellerton and Mathews's Puzzle Flat mine has been floated as a limited liability company. Mr. Ellerton will be managing director, and Mr. W. H. Butler, legal manager. Shaft sinking will be commenced at once.

The Victorian Government drill, which has been boring about 3½ miles north-west of Morwell, entered a seam of brown coal at a depth of 492ft., and passed into clay at 774½ft., thus proving the seam to be 252½ft. thick. The next nearest bore is close to the Morwell railway station.

At the half-yearly meeting of the Ballarat (V.) branch of the F.M.E.A., held last Saturday night, it was stated that, although 92 accidents in the local mines had been reported, only two were serious. Accident allowance for the period was £314 10s., making the total paid by the branch since its inception £39,950 8s. 8d., in addition to £1265 paid to buy members off the accident fund, and £5005 fatal accident allowance.

After an interval of 19 years, the Princess Dagmar G. M. Co., Bendigo (V.), has declared a dividend of 1s. per share, the last previous distribution having been 6d. per share, paid in August, 1894. So confident was everybody concerned that the property was a valuable one that in the long interval £50,000 has been expended in prospecting and developing the mine. The management is now confident that a new lease of life and prosperity lies ahead. Last week's crushing of 251 loads gave an average of 1 oz. 6 dwt. per ton.

## PERSONAL.

Mr. George Kermode, engineer of the Victorian Public Works Department, has been appointed to succeed Mr. T. W. Fowler, on the Municipal Surveyors' Board. Mr. Kermode was educated at Wesley College, and entered the Public Works Department as an engineering pupil in 1889. While engaged as a pupil he began the engineering course at the Melbourne University, and graduated in 1895. He was engaged with the General Exploration Company from 1896 to 1899, and held the position as borough surveyor of Castlemaine from 1900 to 1903, city engineer of Hawthorn from 1903 to 1905, and re-entered the Public Works Department as assistant engineer in 1905, his present position being engineer of roads, bridges, and harbour works.

Mr. T. W. Fowler, of the Victorian Municipal Surveyors' Board, has accepted an appointment as Engineer-in-chief of Public Works and Railways in Tasmania.

Mr. T. Veal, for many years manager of the Francis Ormond mine, Chewton (V.), died on the 19th inst. from bronchitis and asthma, at the age of 52 years. Deceased was for several years a member of Chewton borough council, and was twice mayor.

The death of Mr. Jacob Answerth was announced at Ballarat East (V.) last Saturday. Deceased, who was 77 years of age, was a pioneer of the district, where he had been closely associated with mining for many years.

Mr. T. Johnson, the New South Wales Chief Railway Commissioner, whose term of office expires early next year, will leave for England in September, the Government having granted him three months' leave of absence prior to his formal retirement. The selection of a successor to Mr. Johnson and the general question of railway administration will be dealt with after the coming general elections.

## METAL QUOTATIONS.

### By Cable.

(From Our Correspondent.)

**London, Tuesday.**

At the beginning of last week the metal market was still weak, but as days passed a general improvement set in, though in the case of tin the price was still about £3 15s. below the quotations of a fortnight ago. There was a substantial advance in 50 per cent. antimony and in 70 per cent. wolfram. The quotations were:—

COPPER.—Spot lines brought £62 6s. 3d. (a fall of 11s. 3d.), £62 7s. 6d., £63 5s., £63 10s. and £63 15s.

Three months' parcels were quoted at £62 10s. (a fall of 11s. 3d.), £62 12s. 6d., £63 7s. 6d., £63 11s. 3d. and £63 16s. 3d.

Electrolytic was quitted at £65 10s., £65 15s. and £66, and opened this week yesterday at £66 5s.

TIN.—The spot quotations were £181 (a fall of £4 15s. per ton), £181 10s., £182 and £182 5s.

For three months' delivery the rates were £181 15s. (a fall of £4 10s.), £182 5s., £182 10s., £183 and £182 15s.

LEAD.—Monday's price was £19 12s. 6d., showing a rise of 2s. 6d. on the previous Friday's rate; next day the metal brought £20, but last Friday it receded to £19 18s. 9d.

SPELTER was quoted at £20 15s.

SILVER opened at 26 13-16d., the subsequent quotations being 27d., 27 1-16d. and 27¼d.

ANTIMONY.—"Star" brand was quoted yesterday at £30, and 50 per cent. ore at £9, as compared with £8 10s. on the previous Friday.

WOLFRAM (70 per cent.) rose to 33s. 6d. per unit, equal to £117 5s. per ton.

MOLYBDENITE remained at 2s. 6d. per lb., or £280 per ton.

MANGANESE (50 per cent.) was stationary at 9½d. per unit, or 39s. 7d. per ton.

## THE CLONCURRY (Q.) STRIKE.

After sitting for three days a conference held at Townsville (Q.), under the provisions of the Industrial Peace Act, has arrived at a settlement of the labour troubles at the Hampden-Mt. Elliott mines, which had lasted for six weeks. Messrs. Corbould, Wharton and Huntley represented the companies, and Messrs. McCormick and Dash the A.W.U. In announcing the award, Judge McNaughton expressed satisfaction that an award satisfactory to both parties had been arrived at. He referred to the effort to form a separate union, and deprecated this, as, in his opinion, there could be no useful scope for two labour organisations, and it would be desirable, in the interests of the workers and the companies, that the newer union should be dissolved.

The award was as follows:—1. Work to be resumed on the same conditions as obtained prior to the stoppage of work. 2. Contract work is not made a condition of employment, but employees may accept contracts. 3. The union undertakes that no concerted action will be taken to prevent men taking contracts, provided the company undertakes not to victimise the men refusing to take contracts. It is also provided that the question of contracts shall be dealt with in conference by the union and companies after the next A.W.U. annual convention, some time next year.

Prior to stopping the Hampden employed upwards of 750 men, and the Elliott 300. The total wages of the two companies for the twelve months prior to the stoppage amounted to over £300,000, railage £103,000, stores, coke, etc., £150,000.

Under the contract system miners in the Cloncurry district can easily earn from 18s. to 20s. per shift, and not infrequently still higher wages are secured. The minimum wage for miners on the field recently offered by the employers was 14s. 6d. for machine men and 16s. 3d. in wet ground. Engine-drivers received 14s. 6d. to 15s. 6d., and tappers and feeders (for all men) 13s., and labourers 11s. to 11s. 6d.

Judge McNaughton also ordered a compulsory conference with respect to labour troubles in the Ravenswood mining district, and this was held at Townsville immediately after the successful issue of the Hampden-Mt. Elliott conference had been announced. The result was equally satisfactory, an agreement being arrived at that work should be resumed. Truckers, mullockers, and monkeys will be paid the minimum wage of 9s. a day, with a week of 44 hours. The strike was, therefore, declared "off" at an open air meeting of the men, amidst great rejoicings.

## AUSTRALIAN OIL COMPANIES.

It was announced in Melbourne last Thursday that the Chancery Division of the High Court of Justice, London, had sanctioned the rearrangement of the Commonwealth Oil Corporation Ltd., which was registered in 1905, and has since been operating at Wolgan and Capertee (N.S.W.) The scheme which had already been adopted by shareholders and debenture-holders, provides:—(1) That the £350,000 of new money shall constitute a first charge on the whole undertaking, and bear interest at 6 per cent.; (2) that the existing first debentures, amounting to £150,000, shall be continued, but, in view of their consenting to this prior lien, their rate of interest shall be raised from 5½ per cent. to 6 per cent., and all arrears of interest be paid in cash; (3) that the existing 6 per cent. debenture stock shall be converted into 6 per cent. income bonds, and reduced in amount from £400,000 to £240,000, and the arrears of interest cancelled; (4) that the loan creditors shall accept similar income bonds to the amount approximately of £50,000, being 50 per cent. of the face value of the loans; (5) that the trade and other creditors, being of small amount, shall be paid in cash; (6) the subscribers of the new money, amounting to £350,000, shall receive as an underwriting commission £175,000 in fully paid preference shares bearing interest at the rate of 6 per cent., these shares being entitled to receive one-half of the surplus profits after 6 per cent. has been paid on the remaining share capital; (7) the present issued shares, both preferred and deferred, shall be reduced from 20s. to 5s. per share, fully paid, and after receiving 6 per cent. in the order of their priority shall be entitled to the remaining half of any surplus profits in the proportions provided by their present constitution. The total amount of the various issues of securities in priority to the share capital will thus be £790,000, of which £350,000 is new money.

At the beginning of this week a cablegram announced that the shareholders in the British Australian Oil Company Ltd. had approved generally of the scheme of reconstruction, under which holders of the existing £1 shares are to receive shares credited with 15s. paid, but had reserved approval of details to a later meeting. This company was registered in March, 1910, as the Australian Oil Company, the present title having been adopted a few months later. The property is at Murrurundi and Capertee (N.S.W.), and comprises 19,766 acres.

---

The Sydney City Council has resolved to devote half of its surplus, amounting to £19,445, to further write down the goodwill account of the purchased companies, and £14,926 to providing for renewals and replacement, as it is regarded advisable to replace certain of the machinery with more up-to-date apparatus.

The session of the N.S.W. Parliament, opened on Tuesday, is expected to be a particularly lively one. After the usual address-in-reply and inevitable censure motion have been disposed of, supply will be asked for by the Government, and a pretty extensive legislative programme entered upon.

# THE INVESTOR'S COLUMN.

## Some Companies Attracting Attention To-day.

(By Our Exchange Reporter.)

### Nuggety Trafalgar (V.).

After a long period of dead work, during which calls of 3d. per share have been made with great regularity, the shaft has attained a depth of over 700ft., and crosscuts are now being put in east and west at this level. As the previous prospecting work was done at about 400ft., there is a large area of reefing country awaiting exploration between these two points, and as the property is on the line of continuation of the Ajax and Nuggety reef tracks, there has been, not unnaturally, an increased demand for the shares, with the result that, allowing for the monthly call, the quotations, after a fair amount of business, have improved from 1s. to 1s. 11d., closing at 1s. 9d. The property is situated between the Nuggety Ajax and Christensen's Ajax leases, being at one time the most southerly portion of the former, and the company which was floated in order to work it is in 30,000 shares, which is the usual number for the different enterprises on this line of lode. As the Christensen's Ajax, despite a large amount of prospecting work, has so far been a failure, although some promising bodies of stone have from time to time been discovered, and as the workings coming south from the Nuggety Ajax have had a very similar result, the shareholders in the Trafalgar Company have not had much encouragement so far from the neighbouring mines, although when Nuggety Ajax were in strong demand at over 25s. or 26s. there was a sympathetic support for Trafalgars up to 6s. Under the circumstances there would not appear to be much justification for a small investment even at the present range of prices were it not for the fact that the workings of both the adjoining leases have been carried on at comparatively shallow levels, those of the Christensen's having all been carried on above 500ft. As the payable chutes of stone on the main lode tracks appear to pitch southward, it seems that the only chance of success for this portion of the line will be found in sinking to a greater depth than the levels which are being worked by the more Northern companies, and some of these are getting down to eight and nine hundred feet. For this reason the Trafalgar must be given a chance in the present crosscuts, although it is doubtful whether the shaft is yet deep enough. The main question now is what distance will have to be driven before the vertical reef tracks may be expected to be intersected? This is a matter with regard to which a little information from the office of the company would have been of considerable interest to the shareholders, although such a statement could only be taken as an approximate one. In these days of dullness in the gold mining industry of this State it is particularly necessary that shareholders should from time to time be kept posted in the position of affairs at the mine, and when developments may be expected as the result of prospecting work.

This is especially the case when shareholders have been paying heavy calls for a long while without getting any return, for it often happens under existing conditions that, being unaware developments are at hand and, being disheartened, they sell out, very often to persons "in the know," who have been holding off until the psychological moment arrives. The weekly progress reports from a mine should, when the occasion demands, be supplemented by a fuller and more comprehensive statement from the office. Judging from data obtained by the operations of the Christensen's, there are three different lode tracks which should sooner or later be intersected in the Trafalgar, of which the Nuggety is the most westerly, then a smaller track which, allowing for the apparent westerly underlie, should be met with close to the shaft, and the Welcome or Eastern vertical. This last reef in the Christensen's mine was prospected at the 325ft. level by means of a crosscut which was put out nearly 500ft., a large body of stone up to 8ft. in width being met, but unfortunately it was of poor quality. Allowing for the underlie, and also for the fact that the Trafalgar shaft is relatively farther east than Christensen's, this lode should be cut at about 250ft. east of the shaft. On the other hand, the Nuggety lode, which in sinking the shaft was passed through at a depth of 395ft., should be about 170ft. to the west. These opinions are not official, and are based upon an assumption that the lodes maintain their apparent underlie, which is of course by no means certain, as they may go down much straighter, in which case the Nuggety lode would be located sooner, and the Welcome later, than estimated above. In any case, it seems that a considerable amount of dead work remains to be carried out before important developments can reasonably be expected—that is, unless a lode track between the two main ones is discovered, and proves to be of good quality. Such a development is not impossible, and bearing in mind the character of the Daylesford field with its numerous occurrences of flat makes and verticals, it is probable that other discoveries will be made, but on the whole it would be safer not to count on much outside of the two main lode tracks. And what are the chances of their carrying payable bodies of stone? Well, they do not seem to be particularly good, but mining in such cases as this is nothing more or less than a gamble, and at about the present price the speculation is not an unreasonable one.

### Mount Cuthbert (Q.).

Although there has been a great falling off in the volume of business in this stock—that is, as compared with the buoyant market of eight or nine months ago, still the shares have held up fairly well, despite the heavy fall in the price of copper.

This comparative steadiness can be accounted for by the fact that the company is not yet an ore producer—that is, on a scale of any importance—so that the decline in the value of the metal makes practically no difference to it, and in the meantime the development work seems to be progressing in a satisfactory manner—that is, judging by the reports of discoveries which continue to come to hand from one or other of the different properties. The most important of these recent announcements was that gossan ore 5ft. thick and worth 11½ per cent. had been struck in one of the shafts of the Mighty Atom property, while in another 7ft. of ore, worth 22½ per cent., had been located. These are high values, and will help to sweeten the general average returns when the producing stage is reached. When that period will be it is rather a hard question to answer, but the completion of the railway will help to elucidate it, and the announcement of the settlement of the strike and resumption of work at Cloncurry will be welcomed by the shareholders. Prospecting and mining operations are being carried on at other properties of the company with encouraging results, 2½ft. of ore having been cut at a depth of 34ft. in the Little Wonder, the value being 10½ per cent. Machinery is being erected at the Warwick Castle, and preparation is being made for resuming work at the Kalkadoon. It will be gathered that, although the success of the company is at present mainly dependent upon the mine from which its title is taken, and where very large bodies of medium grade ore have been opened up, yet the results may be materially affected and improved by the operations on the outside leases. The matter of finance is, no doubt, one that will sooner or later have to be seriously considered by this company, in order that the mines may be sufficiently opened up to maintain a continuous average output and provide the necessary milling and reducing plant. What form of treatment will be most suitable for the ore bodies of the different mines is a question which will be answered in due course, and it may be said that the market indicates that no anxiety is felt with regard to the ultimate success of the concern, for it closes with a buyer at the improved price of 13s.

Such a confidence is probably well justified, but the more one studies the records of these copper-mining enterprises, the more strongly is the opinion held that the delays and difficulties to be overcome before they reach the dividend stage are many and costly.

### Edna May (W.A.).

One of the most pronounced features of the market was the sudden jump in the price of the shares in this company—a rise of 6s. being recorded—and the closing quotation on Monday afternoon being sales 42s. This improvement was more in accordance with the transactions Western Australian stocks during the Bullfinch boom than with those of more recent date, the general tendency for some length of time having been a downward one. It may be said that the rise should have been anticipated, for it has been obvious for some months that the mine has been opening up remarkably well, the operations continuing to disclose large bodies of payable ore—some being of high grade. The results of the crushings which have taken place have also been very satisfactory, justifying a belief that there should not be any difficulty in maintaining for a year or so at least an average value of over an ounce to the ton. There is little doubt that the difficulties encountered in sinking the main shaft and which led to sinking having to be discontinued had a decidedly discouraging effect upon the market, an opinion being formed that the country was dangerous and unsound, and that similar difficulties would be encountered with the new shaft which is now being sunk. Under this belief it is fairly certain that some of the "Bears" took advantage of the uneasy feeling to sell, although it is probable that each individual account was not large, until prices fell to below 30s.

Some of the members of the Room, however, became soon aware of the fact, that it would be necessary to sink a new shaft, that which had been affected, and where sinking had been discontinued, would still be available for haulage of ore, connection with the workings at the 70ft. level having been made. These well-informed dealers therefore quietly bought up all the shares offering at the lower prices, with the result that when the facts regarding the position became known, a quick recovery to 38s. ensued, and although there was a temporary reaction to 33s. 9d., it is probable that the market was still oversold when the recent favourable report came to hand, and the sudden jump in price was largely owing to "covering up" operations. The report referred to stated that the average value of the stone in the stopes above the S.W. level was two ounces for 18ft.

There had been an impression in the market, that for the present 40s. was about the price limit; but now that this high water mark has been passed, the tendency will probably be towards a still higher one.

---

# ARBITRATION IN N.S.W.

## Dr. Robertson's Views.

Dr. Robertson, representative of the N.S.W. Southern Coal Owners' Association, giving evidence before Mr. A. B. Piddington, K.C., who is sitting as a Royal Commission to inquire into the operation of the N.S.W. industrial laws, said, "The Industrial Laws passed that were expected to act as a panacea for industrial turmoil and to put an end to strikes of workmen have not, I think, fulfilled this object or intention, and have been a failure. Trades disturbances and strikes have been increased, not diminished, since their advent, and workmen have shown an amount of unrest and discontent unknown before. A new race of officials specially educated to scent out so-called grievances has been called into being, whose ways have not tended to harmony and good feeling. Perpetual unrest and extravagant demands through officials of unions has had the effect of estranging men and masters. The operation of the Industrial Acts has caused great vexation, worry, loss of time and money to employers. The public have had to pay an enormous bill without any compensating return." He suggested that heavy financial penalties should be imposed on those who failed to observe awards, as relief could only be obtained from the present conditions by a system under which large sums of money would be deposited to be forfeited by the party responsible in the event of a strike or a lockout taking place. In regard to fines imposed on strikers, he suggested that they be paid to the employers instead of to the Government. In place of the wages boards he advocated the establishment of small conciliation committees as a step in advance of the present system, and pointed to the fact that such a committee had for years past completely settled the whole of the differences arising in the Southern Coal District. "The multiplicity of trivial, cast-iron regulations," he continued, "in awards which are often unnecessary, are always harassing, and when bad times come, and diminished demand supervenes on the present boom conditions, they will probably prove disastrous. When the evil time comes—and come it will, unless conditions and wages, and probably hours can be regulated quickly to suit the altered conditions of trade—then only the very best, the pick of the vigorous and able-bodied workmen, will be employed." Wages, hours, prices, and conditions, and restrictions of all kinds could not be maintained by Acts of Parliament, or by award of wages boards, if trade was to be retained. Industries were not established to pay workmen high wages under easy conditions, but to earn a profit, and when that disappeared they would not be required, or they would have to work for an altered wage."

Dr. Robertson went on to state that where a Commonwealth award was higher than the State award, or vice versa, the lower one was ignored. No business could prosper or expand under such irrational conditions. In reply to the Commissioner he stated that the whole arbitration system had been a failure and should be abolished. The Commissioners stated that Dr. Robertson's statement went outside the scope of the inquiry, and that if it were admitted it would lead to interminable discussion.

---

Fresh working capital was required by the Murex Magnetic Co. Ltd., whose authorised capital is £120,000, of which only £70,000 had been called up, and this is to be raised by a new share issue. Shareholders in the old concern are to receive one share fully paid up to 5s. in exchange for each £1 share in the old company. The general scheme provides for a portion of the new issue being underwritten, and it is possible a working capital of £10,000 may ultimately be obtained. The directors express much disappointment that their process was not adopted at Broken Hill, but claim that its value has been established in actual work at the Grund mine, in the Hartz district, and at the mines of the Malines Company, in France.

## MINING IN NEW SOUTH WALES.

### Broken Hill.

(From Our Correspondent.)

Broken Hill, July 18.

Broken Hill doesn't quite know where it is these days with the metal market in such a weatherly temperament, and with so many international complications playing cup and ball with values. Spelter in the vicinity of £20 does not leave too great a margin of profit, and the fluctuations of lead cause an uneasy feeling. A steadier market would steady public feeling, for, although the managers need not worry too much about the metal market the directors have to, and limitations become necessary when values fall to a certain point. Of course, lead at £20 is sweet for the producers and more than equalises the depreciation in zinc.

The trouble in Mexico is one of the causes of the strong lead market, and Broken Hill watches the progress of events there with no little interest.

Meantime, the Broken Hill mines jog along merrily, though "routine work" best describes what they are doing. There have been no developments of note anywhere, unless one takes the closing down of the South Extended as a development. The whyfore of this is not explainable, and no official information is given. A peculiar secrecy has marked operations here since the death of Manager Sweet.

Several of the leases held by the New White Leads Co. have been cancelled.

The news from the South Blocks (Zinc Corporation) continues good. The main shaft has reached a depth of 1248ft. The main north drive on No. 7 level has been resumed, and at latest was in 124ft. The last 15ft. of driving was through ore averaging 19.1 per cent. lead, 3.0 oz. silver, 12.7 per cent. zinc. This is the main lode. The zinc lode is also proving satisfactory. Both the north and south drives on the 522ft. level are in ore going over 20 per cent. for zinc.

The South continues to do an immense amount of development work on all its working levels, and the deepening of shafts also proceeds. The 1170ft. level looks pleasing. The diamond drill put out in section g4 on the 1070ft. level was taken to 294ft., passing through 14ft. of high-grade sulphides and 6ft. of low-grade.

Block 10 is still exerting itself (or the manager is exerting himself) to prove ore at depth, but the result has not been very satisfactory. The intermediate north drive on the 1465ft. level, now in 41ft., shows ore over the full face, but values go only 5.6 per cent lead, 5.8 oz. silver, and 7.0 per cent. zinc. On the other hand, splendid ore is being reopened both at the 415ft. and 515ft. levels. What a pity the 415ft. level body could not be transferred to the 1465ft. level.

Diamond drilling was continued on the Proprietary during the past official 4 weeks, at the 650ft. level, but, although the core proved mineralised country for 100ft., nothing payable was encountered. All the plants on the mine are doing good, steady work. Operations at Port Pirie continue, though poor quality coal caused the temporary shutting down of some of the furnaces. Zinc distillation is being extended, and 7 or 8 furnaces are now in operation. Steady progress, Mr. Delprat reports, is being made with the steel works at Newcastle.

Block 14 continues its usual output of carbonates and sulphides.

The main crosscut on No. 11 level on the British (Thompson section) has been extended to 35ft., through mineralised stone. The levels above; however, show a plenitude of ore. Diamond drilling has been persevered with on No. 7 level, going north-west, but the results have not been of value.

The management of the Junction still complain that it cannot get men, and that this is responsible for the low tonnage put through the mill. The plant last week treated 1182 tons crudes for 151 tons concentrates—a ratio of 1 to 7.82 tons. This doesn't seem good enough, compared with work elsewhere.

More interest just now is being taken in the wrangling between the directors and shareholders of the Junction North than in the mine itself. A regular Bulgarian bombardment of criticism is being hurled against the Sydney management, and some of it is deserved. There is but little news on the mine—the milling plant last week only ran portion of the time, owing to the engine requiring repairs.

The North mill is doing splendid work—6210 tons treated for 1065 tons of leady concentrates. Values—69.3 per cent. lead, 21.6 oz. silver, and 6.7 per cent. zinc. And there is talk of extending the plant. Underground, too, the mine is looking all that one could wish. The lode at the 1250ft. level, section 6, has been proved 90ft. wide. Progressive work is being accomplished on the 1400ft. level.

### Orange District.

(From Our Correspondent.)

Orange, July 18.

At Gallymont, Messrs. W. Mulally and T. Digby have pegged out four acres along the line of a reef which they have located. The reef has been opened up in three different places, and is estimated to yield from four to five ounces of gold to the ton. Messrs. Moss Bros. are also on good 2 oz. stuff, but are hampered for want of a battery.

In connection with the Cadia Copper Mining and Smelting Company, a conference is to be held between the directors of the company and the Canobolas Shire Council respecting the provision of a better road from Orange to Cadia. The Shire Council has already resumed and paid for the land necessary to provide a more accessible deviation. The deviation requires to be fenced, and, of course, formed and metalled.

### South Coast.

(From Our Wollongong Correspondent.)

July 19th.

Reports from the Tilba district, South Coast, state that most of the claims which were pegged on the prospect obtained in a shaft on the Dromedary Mountain, stone from which showed free gold. The Bimbimbie Company, Moruya, has gone into liquidation. This was a gold reef proposition from which much was hoped for; large prospects of district mining development were founded upon it. It was pointed to as an inducement to invest in developing the mineral wealth of this part of the State. It proves to be typical of the shows opened up in our far South Coast, in that it is impermanent.

---

The Lady Clare mine, Adelong, crushed 120 tons for 294 oz. gold, which it is expected will be supplemented by 60 oz. from 12 tons of mineral recovered. This mine is on the same line of reef as the old Doulsey Hill, and has recently installed up-to-date winding machinery.

Encouraging results are being obtained at the New Burragorang silver mine, where a body of ore has been struck at the 630ft. level, carrying galena and silver. The lode is believed to be the same as was worked by the Yerranderie Company. Assays gave the contents of a sample as silver 107 oz. per ton, lead 41.2 per cent., gold 4½ dwt. A new winding plant, capable of winding to 3000ft., including a heavy set of Tangye engines, is being installed.

Something in the nature of a revival is taking place at Solferino, where the Solferino Syndicate has crushed 20 tons for 23 oz. The Mountain Maid claim has been registered, and timbering is to be started next week. A crushing is to be put through at the Puska battery next week. The flotation of the Garibaldi mine and amalgamation with the Lion claim is also under way.

It is reported that Hoskins Ltd. intends opening up the Eurunderee iron deposits, which are situated on the Mudgee-Gulgong railway line, a few miles from Mudgee.

---

## VICTORIAN MINING ACTIVITIES.

### Bendigo and District.

(From Our Correspondent.)

The gold production for the week ending July 19th, 1913, amounted to 3421 oz. 12 dwt. The principal producers were Princess Dagmar, 327 oz. 4 dwt.; Central R., W. and Blue, 310 oz. 6 dwt.; Golden Pyke, 287 oz. 12 dwt.; South New Moon, 239 oz. 16 dwt.; Carlisle, 228 oz. 11 dwt.; Johnson's Reef, 106 oz. Dividends totalling £4892 18s. were announced, viz.:—Central R., W. and Blue, 2s., equal to £3200; total to date, £124,800. Princess Dagmar, 1s., equal to £1692 18s.; total to date, £93,290 9s. 6d.

Princess Dagmar re-appeared as a dividend-paying venture, after a lapse of 19 years, the last distribution of profits having been made on August 2nd, 1894. Just previous to that period the company were most successful in working a saddle formation, located under a strong eastern fault on the main fold of the Garden Gully anticline. This reef was responsible for more than three-quarters of the sum divided amongst shareholders, and it also proved highly productive in the Johnson's Reef No. 2 lease, the latter company paying over £100,000 in dividends from it. The Princess Dagmar are now opening up the west back of this formation, where it recurs on the "Pyke" fold, as an east back, at a depth of 1845ft. There is also a cap associated with it on this channel and a small west back. The company are driving north on the east leg to prospect the upper portion of the formation, as it pitches in this direction. Should the stone turn out profitable, it will reopen the interesting question as to whether auriferous backs on one anticline are not just as likely to prove gold bearing over the next. The original reef referred to was met in shaft sinking between the 1500ft. and 1600ft. level, and there is little doubt that it owed its gold contents to the influence of the strong fault with which it was allied. Last week's return of 327 oz. 4 dwt. was from 251 tons, and exceeded general expectations. The crushing was broken exclusively in driving the 867ft. intermediate level southward toward the main shaft, and in two overhead and side stopes. The stone allied to the hanging wall, which carried the shoot of rich stone for some time, has gone overhead with the north pitch of the synclinal fold. Spurs carrying gold were reported subsequently in continuing the level in the trough, but on inspection it was found that one of these veins was bedded in the footwall. This stone is 2in. to 8in. thick and carries a nice sample of gold. It will probably be available for another 40ft. before rising out of reach of the level. A couple of spurs extending from the bedded vein into the footwall rocks also revealed a good sample of gold. From the position of the level during the period the last crushing was being broken and the fact of the two overhead stopes operating in the higher grade portion of the formation, it appears more than likely that the return reached the high-water mark. As previously pointed out, there is nothing to indicate that this shoot extends very far above the level and the depth is limited by the folding of the syncline. The rise to be extended shortly will demonstrate how far the highly profitable stone continues overhead. These operations will also show whether there is any connection between this shoot and the first high-grade quartz found at 15ft. above the top fault, close to the Golden Age boundary. The 867ft. intermediate level has reached about the centre of the lease and much will depend on the result of the Johnson's Reef crosscut, going in to tap the same back at 20ft. from the south boundary. From present appearances, it looks as if this crosscut will be too deep to intersect the objective, and a rise may therefore be necessary to locate the stone. A few spurs and a colour of gold have been seen in crosscutting at this point. The Princess Dagmar are about to continue the 784ft. crosscut to cut the west back of the present reef and the old Golden Age formation, at about 185ft. north of the shaft. Other prospecting work is also contemplated on the Garden Gully main centre, where several formations have been abandoned after an inadequate trial.

Golden Age put through 175 tons for the payable return of 66 oz. 8 dwt. The average is rather more than 1 dwt. under that of the previous yield. The milling was drawn from the 853ft. stopes as usual, the more profitable stone coming from the workings close to the main crosscut. In these top stopes there is an average width of 18in. of reef, which has lately shown more gold. On the south boundary, the 50ft. in length of comparatively low grade material, immediately over the top fault, is being extracted, to reach the better shoot, from which the Princess Dagmar had 8 dwt. per ton from the first milling, and subsequently higher averages for a time. If this particular run of good stone continued far north into the Golden Age lease, and conformed to the north pitch of the strata, it should have been located by the present intermediate stoping. There is nothing, however, to suggest any great continuity in the gold shoots along this back, the enrichments frequently proving very short. The machinery at the north of Johnson's Reef Extended shaft is expected to be in readiness this week end. From this base the company will be able to tap the same formation within 170ft. from the Golden Pyke ground. Whether the reef is the same as the latter company are working has not yet been conclusively determined. On the Paddy's Gully line a plat is being formed in the eastern shaft, prior to resuming sinking to reach the Collmann 2120ft. reef, which should exist near the shaft, within the next 200ft.

Golden Pyke again showed to greater advantage with a return of 287 oz. 12 dwt. from 318 tons. The average of over 18 dwt. per ton is 3 dwt. better than the preceding term. This is due to the inclusion of a greater proportion of the reef from the vicinity of the No. 1 rise, where there is a good width of stone available. An interesting development has occurred in the 643ft. level, in rising at about 150ft. from the Golden Age boundary. The rise is from the most advance stopes, a few nice colours of gold showing in 1ft. of quartz. The improvement is considered of more than ordinary importance, as the rich shoot traversed in the last 45ft. of rising from 643ft. to 543ft., opposite the shaft, should be opened up if it extends so far south. It had been expected that this shoot would have been found in the level, or the first stope, with the south pitch of the formation, but very little stone of payable quality had shown in either of these faces. Of course, it is still uncertain if the present stone represents the extension of the richer quartz seen in the rise. If it proves to be so, there will be a nice little asset under the 543ft. level, both north and south of the shaft. With the extension of the 447ft.

level northward, more stone is being met along the back. The next development of importance is likely to be disclosed in this end, as the good stone found in the No. 3 rise, at 200ft. north of the shaft, should rise into the level. There is still over 100ft. of ground to spend before reaching the Constellation boundary.

**Williams United** directors have appointed Mr. Thomas Banner to succeed Mr. John Roscrow as mine manager. The mine, more than any other on the field, has failed to realise expectations during the past few years. Fairly consistent results of a payable character have been forthcoming from operating on the higher grade portion of the massive irregular deposit, of a spurry character, allied to the main east back and the Catherine fault. A considerable amount of developmental work has been carried out while crushing, including the sinking of the shaft 200ft. below the 2100ft. plat. Prior to Mr. Roscrow taking charge, the underground workings were in a disgraceful condition, but these difficulties have been overcome and the mine licked into shape. Operations are not at such an advanced stage that the new manager will be in a position to make the most of the property. At 2100ft. the south level is in 636ft., still disclosing auriferous spurs, up to 9in. wide. More spurs are appearing underfoot, indicating that the pitch has again undergone a reversal at this point. This level is being driven at a few feet west of the main east back. In the first line of stopes, the formation is taken for a width of 80ft. Further north, there are spurs of better quality fringing the eastern limits of the more consolidated quartz. At 430ft. south, a crosscut was put out west, to the hanging wall of the fault. A level is now going south along the [illegible], gold showing in a few small spurs. Just overhead is the consolidated portion of the reef, which also contains a little gold. The main back is associated with stone through to 2000ft., where the south level is advanced to 260ft. Solid quartz, of a promising character and containing a little gold, is now being traversed. Though the 2100ft. level is so far from the shaft, the lease still extends for several hundred feet. At 1644ft. it is expected that the south shaft will shortly be connected and the ventilation thereby improved. To develop the property efficiently, a crushing mill and an air compressor are necessary, but a good proportion of the amount necessary will probably have been obtained from the mine, before the management undertake the outlay.

North Bendigo reported a favourable development in the 913ft. winze, at 240ft. north of the shaft, the east leg revealing several colours of gold in 3ft. of quartz, close to the cap. Levels are in course of extension on this back at this depth, as it rises further north, and also at 1000ft. At the former level, the end is a little over 100ft. from the north boundary. Here the stone is small, but enlarges to 2ft. of payable quartz in stoping to 45ft. overhead. The 1000ft. level is in nearly 300ft., and over 300ft. behind the 913ft. face, with similar conditions prevailing to a greater height. The 913ft. winze is coming down into the uppermost of these stopes. The cap is expansive, but of low value. Along the west back, occasional enrichments have been met, but, on the whole, this portion has been of inferior quality. The formation shows a profit of £6000 to date, which will be increased before the stone is all extracted.

Central R., W. and Blue had their best return for several weeks, a larger tonnage showing an average of a fraction over ½ oz. per ton. More stone was taken from the eastern hanging wall, north of the No. 3 winze, where the reef is being extracted close to the 318ft. level. Gold was seen more frequently at this point and also in driving along the inner west wall, near the turnover, in the north intermediate.

Catherine Reef will resume milling this term, after a week's suspension, due to overhauling the machinery. The 2300ft. south level is still in a full width of reef, associated with the fault and lava. Though well charged with minerals, the quartz is of no value. Up to the present there has not been any gold in this level, which is in 644ft. Near the shaft the fault is not far east of centre, and as the pitch is north, while the reef channel trends east in depth, it seems probable that the level may now be on the west side of the [illegible]. For the past couple of weeks stoping has been restricted to between the Nos. 1 and 3 winzes, where it is anticipated the massive reef will prove more productive and strengthen the financial position.

Koch's Pioneer abandoned the 2650ft. eastern reef to tribe. Attention is now concentrated on the opening up of the other eastern formation, at 2150ft. and 2250ft. At the former depth there is a [illegible] on 10in. to 12in. of low grade quartz, in 45ft. from the shaft. The object is to prospect this stone in reaching the position of the tribs. winze, at 550ft. ahead. These tribs. have had averages of up to 14 oz. per ton, to a depth of 60ft. below the 1900ft. north level. Before reaching this point, other pay shoots should be found. The 2250ft. level is much farther advanced on [illegible] inner backs, carrying 15in. of attractive looking quartz. This reef is likely to give better results at an early date.

Garden Gully are continuing the 494ft. north level on 6in. of stone along the east back of the 400ft. reef, revealing a little gold. From the last rise extended, at 300ft. north of the shaft, stopes are in progress north and south, a few colours of gold showing in 4in. to 9in. of quartz. The stopes near the shaft, from the No. 1 rise, have reached the old 440ft. level, where the same back is opened up for about 80ft. in length, at 20ft. under the cap. Having squared these stopes to the old workings, the full height of the reef will be taken in future. In driving south on the Victory back at 745ft., 2ft. of good looking quartz is showing, without gold. These operations are believed to be near the same channel as the Carlisle spurs. The 1552ft. under stopes reveal a few colours of gold in 18in. of quartz. At 2039ft., the cap of the "outer" reef is well up in the end of the north level, at 246ft. from the No. 3 shaft. A full face of mineralised quartz is exposed, but of no value. As the level approaches the No. 1 shaft, payable prospects are anticipated. The same expectations prevail in connection with the driving on the inner formation above 2180ft., in consequence of the attractive character of the reef.

Lansell's Little No. 180 returns continue on the up grade, 259 oz. 5 dwt. resulting from last week's milling. The material came from the south workings on the Central R., W. and Blue reef at 300ft. and 405ft. At the shallower depth there is 25ft. of solid quartz, with a little gold near the hanging walls. A greater width of higher grade stone is being broken at 405ft. Shaft sinking is in progress below 1000ft., and another lift of 100ft. will shortly be completed. The next crosscut will be deeper in the beds than the Central R., W. and Blue 720ft. workings.

South Prince of Wales anticipate resuming driving and stoping at 590ft. and 690ft. this week, the strike having caused a suspension of underground work for the past fortnight. The company are opening up the New Prince of Wales reef from the latter company's mine. At 690ft. there is a little gold in 2ft. of stone in the level, prospects improving in the stopes, upward along the fault. As good width of stone is showing and the outlook encouraging. At 590ft. the stopes are in the upper portion of the same deposit, close to the main back. A slide is also exposed and the quartz appears payable.

Johnson's Reef, in crosscutting for the "Dagmar" 867ft. formation, above the 784ft. level at the No. 2 shaft, have seen a colour of gold in spurs, on the eastern side of the syncline. The crosscut is close to the north boundary, but owing to the steep north pitch of the beds, it is possible that operations are too deep to disclose the objective. This would necessitate either rising over the crosscut, or driving south from the higher level. At the Derby line, there is no material change in prospects.

## TASMANIAN MINING.

### Mount Lyell District.

(From Our Correspondent.)

Queenstown, July 18.

A satisfactory increase continues to be made in the output of ore from the North Lyell mine, and they are now sending about 350 tons a day to the smelters. Owing, however, to the rough weather, which is always a source of trouble at this time of the year, matters in connection with production at the Mount Lyell mine are not so satisfactory, and they have not been able to keep the output of pyrites up to the smelting requirements of three furnaces, with the result that one of these furnaces, which had been running continuously for over a month, has had to be closed down until larger supplies of pyrites are available. The management, however, does not anticipate that the shortage of material in this respect will be for more than a few days, and it is probable that the three furnaces will be in blast again by the time this is in print.

Since last writing the long list of fatalities which have already occurred at the North Lyell mine has been added to by an accident happening on Saturday last, resulting in the death of an immigrant miner named Sharpe. The accident was caused by the sudden rush of filling from a mullock pass which had hung up. To loosen the dirt, the usual practice of putting a shot in was resorted to, and after this had been done Sharpe, with other men working in the stope, retreated to a safe distance away. The firing brought the filling, which in this instance was in a state of "slurry" from the action of the water which is turned down the pass to assist in getting it through, away with an unexpected rush, and the sudden concussion of air brought about extinguished Sharpe's light. This alarmed him to such an extent that he left his place of security and made for another part of the stope, and in doing so he got right into the track of the rushing "slurry," and was swept into an ore pass some distance away and suffocated. The fatality, coming so soon after the lamentable disasters of September and October last, is certainly unfortunate, as it tends to strengthen the impression that the work in the North Lyell or Mount Lyell mines is of a more dangerous nature than in other mines in Australia. That such an impression or belief is utterly unwarranted is practically certain, but unfortunately it appears to exist, with the result that it militates against the company's efforts to obtain an adequate supply of labour for their mines.

The accident to Sharpe happened about 10 o'clock in the morning, and as soon as it became known pretty well all the other men on the day-shift knocked off work, while the whole of the afternoon men also declined to turn to, and took the shift off. This is following the practice adopted at the Broken Hill mines, but it has only been previously carried out here on one occasion, which was in connection with a fatality at the Mount Lyell mine about 18 months ago. The men say that they cease work from sentimental reasons, out of respect to the dead fellow workmen, but they would be showing both their respect and sympathy in a much more practical and sensible manner by remaining at work and donating the proceeds of the shift to those who have lost their breadwinner. In the case under notice, the dead man has left a widow and four children in poor circumstances in England, and if the 200 or more men who lost their shift in this instance from motives of "sentiment" had gone to work and given the proceeds to Sharpe's widow and children these would have benefited to the extent of at least £100. While this sort of "sentiment" may be all very well from one point of view, it is no earthly good to the widow and orphans; and, when Sharpe's widow and children want food and clothing, 100 sovereigns would be of more use to them than 1000 tons of sentiment. But the majority of men employed at the Mount Lyell mines say that in adopting this practice of ceasing work for a shift when a fatality occurs they are only doing what is done at Broken Hill. That evidently settles the matter; but, all the same, it is a rottenly stupid business, because the only people it hurts are the workers themselves.

The result of the struggle between the mineowners and the men at Bendigo over the non-unionist question is being awaited with keen interest here, and the local branch of the Federated Miners' Association is using every legitimate means to bring every man on the field who is eligible into the association. And, as far as can be ascertained, they are meeting with a large amount of success, although, of course, there is a small minority who prefer to remain outside the union. The executive of the association is, however, very confident that these few individuals will ultimately be persuaded to join the ranks of unionism; and it appears pretty certain that when the agreement under which the Mount Lyell Company's employees are now working expires in June next, there will be very few, if any, of them who are not members of the union.

## QUEENSLAND MINING.

### North Queensland Fields.

(From Our Correspondent.)

Mareeba, July 11.

The heavy drop in the price of tin is causing same anxiety in these parts, and the miners are wondering when the market will steady again. The production of the metal is increasing throughout this district. The companies are not the largest producers, as there are many individual and syndicate shows which are returning to their fortunate owners handsome returns.

The Rainbow mine at Herberton, owned by Messrs. Forrester and Thompson, is now in a position to supply large and regular quantities of stone to the Northern Mill. This mine, in the opinion of old hands, promises to be better than even the famous Great Northern, and though not so sensationally rich as the old Patrick, it is estimated that ore body is more regular.

The Epsom, a large low-grade proposition, which was floated into a syndicate by Mr. Geo. Morrison, is not looking too well at present, but one never knows when something is going to turn up, as the lodes are most erratic in these parts.

At Watsonville, S. J. Day and party have secured a further 2 years' tribute from the Irvinebank Mining Company, of the United North Australian property. The tributers are installing a suction gas plant at the mill, so they have every confidence in the mine, which is looking very well at present.

The individual miners are all doing well in this district. The old Perseverence is being floated into a syndicate, and from reports to hand the venture appears to be a good one.

Mr. A. T. Linedale, who is in charge of operations at Mr. John Moffat's Ortona mine, in the Percyville, Georgetown district, was in Mareeba this week. He stated that the first load of machinery for the concentrating mill had been forwarded from Forsayth. They were spending £400 on the Forsayth-Percyville road, which was now in trafficable condition. Several parcels of ore have been sent in to Chillagoe for treatment, but it is not likely that much more will go forward, in view of the early erection of the mill at the mine.

Mr. Walter Colley is in charge of operations (on behalf of the Chillagoe Ltd.'s Etheridge mines) at the Union and other mines in the Percy river, distant about 30 miles from Ortona. Here also a mill is in course of erection. Mr. Colley has had many years' experience in this district, and under his capable supervision the venture should be a profitable one for the Chillagoe Ltd.

From Forsayth, Mr. John Candlish is sending parcels of ore from his Dry Hash mine to southern treatment works. This mine is a rich proposition, and overtures have been made to the owner by the Chillagoe Ltd., but the buyer and seller have not been able to come to terms.

At Chillagoe, things are very quiet at present. The lead furnace closed down last week, to enable ore supplies to creep up again. The copper furnace is still going on Emasleigh and other ores. The Emasleigh mine was a splendid investment for the company. When the Caidross smelters are in full swing, there should be a fair amount of matte going forward to the Chillagoe converters. The inability of the Mungana Co. to raise ore from the Lady Jane decreases the supply of ore to the Chillagoe smelter, but it is hoped that the day is not far distant when this mine will be again producing on a large scale. The Girofla has stood the strain exceptionally well, as all the ore produced during the past 4 years has come from this mine.

The Chillagoe Co. could do with another big mine, and the management are looking out for likely propositions. Mr. Horsburgh inspected several shows in the Stannary Hills district last week. Several small but rich shows are being worked there.

The railway traffic on the Chillagoe line is very brisk, and the company show a large profit on this year's operations. The Commissioner for Railways has entered into an agreement with the Chillagoe Ltd., whereby the company will provide engines and men to do all the hauling necessary of material used in the construction of the Mt. Mulligan railway line. The latter line is being steadily pushed ahead, and as the weather is perfect, a big section of the line should be completed before the next wet season. There are no industrial troubles in this part to report.

Mr. J. Audley Smith paid a flying visit to the Mareeba goldfields last week and intends to revisit them at a later date.

At the Mt. Mulligan coal mine, Mr. Watson is now in charge, and a tunnel 500ft. long is being driven. Large quantities of material are also going forward to the mine, so that by the time the railway is finished the company will able to send shipments of coal away immediately.

## MINING IN WESTERN AUSTRALIA

(From Our Correspondent.)

Kalgoorlie, July 14.

The crosscut at the 2570ft. level of the Ivanhoe penetrated the east lode at a distance of 266ft. from the shaft, but results are not yet available. The erratic course of this lode, due to slides, may be seen from the fact that it is now nearer the shaft than it has been since the 1200ft. level was opened in 1906, where it was 265ft. east of the shaft. At 1370ft. it was 380ft. east of the shaft, and Mr. F. A. Govett, chairman of the company, told shareholders that it was dangerously near the Great Boulder, and looked like passing into that property. It was then gradually thrown west, till at 1820ft. it was 330ft. from the shaft. At 2120ft. it was again 374ft. east of the shaft, but, in the last 600ft. of sinking it has been thrown 108ft. west. The three bottom levels are in an impoverished zone, due to an intrusion of graphite; but, according to Dr. Malcolm McLaren, this is probably only temporary. The board has decided to instal a new winder and strengthen the head gear, as the present winder, which was installed in 1902, only has a hauling capacity of 3000ft.

The Edna May South has very wisely taken an option on a new lease of 15 acres, situated a mile east of the Edna May. A trial parcel of 48 tons from the 65ft. level of this property yielded a return of £140, or, say, 60s. a ton, exclusive of gold in residues. The Edna May has taken an option on the Myrtle East, probably with the idea of a fresh flotation. The price of both these properties is £3000 cash, and one-tenth fully paid interest. The Edna May battery is now treating 400 tons of seconds from the dump, and the result should be known by the end of the month.

The first clean-up of the volatilisation plant on the Gwalia Consols has been made, but results are not yet available. Mr. Ben Howe, the manager, says that he is recovering 85 per cent. of the gold contents by using 5 per cent. salt. The ore is crushed dry in a ball mill, the salt being obtained by spraying the mine water on the outside end of the furnace, and scraping off the dry salt. The crushed ore and salt are fed into a rotary furnace 27ft. by 5ft., and the gases with about 5 per cent. of dust pass through a dust chamber into a wooden box 5ft. x 5ft. x 18ft. This box is covered with a perforated tray, through which water passes in a constant shower, and then passes through cocoanut matting filters, from which the gold is removed as a black sludge, and smelted exactly like cyanide gold slimes. So long as salt can be got by evaporating the mine water the process may be feasible enough, but Wiluna is 548 miles by rail, and 170 miles by road from Fremantle, and, when working on a large scale, salt may have to be imported, and will cost 10s. to 12s. per cwt., equivalent to 10s. to 12s. per ton of ore treated. With copper or antimony gold ores Mr. Howe reckons that 10 per cent. of salt will be required, and make the process an expensive one where salt is not locally obtainable.

The poor return from the Victorious has been a bad thing for the Ora Banda district, which was just beginning to attract capital. Mr. G. M. Roberts, the manager, is still confident that good ore will be met with when the drives at No. 5 level are extended. The rich ore in the rises above No. 4 level only extended upwards for an average height of 40ft., and it is practically worked out. The intermediate drive, 50ft. below No. 4 level, is in ore assaying 240s. per ton for the first 30ft. driven. This proves that the high-grade ore met with in No. 3 winze extends eastwards. Development was stopped for four days owing to the shaft of the winding engine breaking. This engine was previously on the Queen Margaret mine at Bulong, and the shaft may have been cracked in transport.

The continued poor returns from the Boulder Perseverance was very disquieting, as the mine treats 20,000 tons monthly, and comes second to the Golden Horseshoe as an employer of labour. The ore reserves in the mine on March 31st were given as 498,260 tons, worth 24s. 9d., and 292,980 tons of probable ore worth 21s. 4d. per ton. Against this the April return averaged only 21s. 8d., the May 19s. 5d., and the June only 16s. 9d. per ton. The result was a profit of only £1303 in April, a loss of £658 in May, and of £2556 in June. A large amount of development has been done since the new mill started in July, 1910, and fresh ore bodies were opened up in the upper levels, but, judging from results, they are not very consistent.

## THE COAL MINING INDUSTRY.

### New South Wales.

### Southern District.

(From Our Wollongong Correspondent.)

The collieries continue working briskly. The deficient place problem, which will be perhaps the greatest ground of contention in fixing up a new agreement, can be solved to a certain extent by using coal-cutting machines. The manager of North Bulli, who has had some trouble in the new district just opened with disputes about hard coal, considers the machine the only means of satisfactorily treating deficient places. The use of coal-cutting machines is not extending as rapidly in this district as was expected when they were first introduced; apparently the view is that machines give the best results when used on coal which in some respect is out of the ordinary.

Speaking at a social function on Thursday evening, the ex-Minister for Home Affairs, Mr. G. W. Fuller, said that, from what he learnt while on the iron bonus commission, if an iron manufacture was to be successfully established in Australia it would be at Port Kembla, and he predicted that Port Kembla would become the Birmingham of Australia.

It was recently reported to the Minister for Mines that the horses employed in a certain colliery in the western district were not in a fit condition to be worked. Mr. Edden at once gave instructions for an inspector to visit the colliery, and he has now received from the chief inspector, Mr. Atkinson, a report dealing with the complaint. Mr. Atkinson states that there were 12 horses in the mine, and some of them were not in a condition to do the work allotted to them. The number of horses kept in the colliery was, however, sufficient, as it left a margin of two in case of accident. The Minister stated last week that he is satisfied from the inspector's report that greater attention will have to be paid in the future to the treatment of horses in coal mines. "It is proposed," he said, "to ask the inspectors of all districts to make reports in regard to all horses working in collieries. If the special rules or regulations do not provide for the proper treatment of the horses it may be necessary to take some special steps with that object in view."

### Victoria.

### Korumburra Field.

(From Our Correspondent.)

Some time ago boring operations by one of the Government drills on the plain, about three miles below Outtrim township, just off the Inverloch-road, disclosed a seam of coal of sufficient thickness to indicate that it was capable of being profitably mined, and the Outtrim, Howitt and British Consolidated Coal Company subsequently applied for three coal-mining leases thereabouts, with a view to undertaking mining operations there if proved advisable after testing the country. The leases were not granted, it having been decided while Mr. P. McBride was Minister of Mines not to issue further coal-mining leases. As Outtrim is dependent solely upon the coal industry, the residents held a public meeting and appointed a representative deputation to wait upon the Minister of Mines (Mr. A. A. Billson), and urge reconsideration of the policy referred to. The Minister's reply to the deputation last week indicated that he personally thought it unwise to hold up all the leases, and considered that private enterprise should be given full scope in this industry, outside the area reserved for State purposes. His promise to bring the question before the Cabinet has been received with satisfaction in this district, and it is hoped that the Government will decide to allow new leases to be taken up. This is an important matter, so far as the coal-mining townships are concerned, as continuance of Mr. McBride's policy would lead ultimately to the extinction of both Outtrim and Jumbunna, without any compensating advantage to the State. The State Colliery at Wonthaggi has not been so conspicuously successful as to induce the belief that similar collieries will be established in other districts within the next couple of generations, and the leases applied for by the Outtrim Co. are miles distant from the area that can be tapped by the present State mine.

The output of the collieries in this district during the months of May and June was 9969 tons and 9184 tons respectively. The production of the individual collieries was as follows:—Jumbunna: May, 4498 tons; June, 4160 tons. Austral (Korumburra): May, 3168½ tons; June, 2891¼ tons; Outtrim: May, 1691¾ tons; June, 1575¼ tons; Coal Creek parties: May, 610¾ tons; June, 557½ tons. On account of the keener demand for coal on the part of private consumers during the winter months, the Jumbunna and Outtrim companies have ceased for the time being to supply coal to the Railway Department, and the proportion of the coal won that is consigned to consumers other than the Department has therefore increased by over two-thirds. The Austral Company disposes of nearly the whole of its output to the railways. For the first half of the current year the aggregate output of the coal mines referred to was 51,695¼ tons.

## ENGINE-DRIVERS' EXAMINATIONS.

The following have passed the examination for mining and factory engine-drivers recently held by the Victorian Board of Examiners at Melbourne, and have been granted certificates:—

First-class Mining.—W. Hicks, A. C. Marchbank.

Second-class Mining.—J. F. Gribble.

First-Class Factory.—W. G. W. Charity, E. G. Mills, W. Cairns, J. J. Rochford, R. A. Allan, J. H. Mitchell, J. P. Williams, R. P. Barry, F. Grant, T. P. Flather, S. C. Chapman, F. W. Richter, W. T. Kemp, W. T. Mackintosh, W. C. Bell, A. Maxfield, A. H. Neason.

Second-Class Factory.—J. Chant, J. Morell, H. Bourbaud, D. A. Ross, P. F. Wissing, A. Fell, A. Buchanan, P. Nielson, W. F. Peddle, A. B. Clarson, A. C. Baulch, F. W. Vizard, H. Seddon, J. W. Pedersen, W. H. Lewis, J. F. Boyd, A. E. Clingin, L. A. Collyer, G. Gallop, S. J. Wheeler, A. Sinclair, J. H. Clapp, W. F. Newnham, J. P. Robinson, F. W. Stone, H. J. Beames, H. Yelland, J. A. Williams, D. Elliott, P. T. Mitchell, H. Brunet, R. Mumford, H. S. Holland, H. F. Kingsbury, P. C. Callahan.

Third-Class Factory.—R. E. Dick, E. W. Misson.

Boiler Attendant.—F. S. Fackler, L. Angelo, J. Bree, J. Donaldson, F. S. Roberts, H. Didailler, W. B. Tharle, J. Lee, L. Hess, G. E. Rumpf, A. H. Ward, C. F. Skuse, W. C. Watson, R. F. Carter, J. G. Rodgers.

## INDUSTRIAL.

The "Draeger" rescue apparatus has been installed at 2 additional rescue stations in England, viz., the Bristol and that of the Somerset coal owners, making a total of 9 stations to the credit of the "Draeger." The American scientific gold medal for the most efficient safety device invented during the last 3 years has also been awarded to the "Draeger."

## PHASES OF MINING IN VICTORIA.

At the invitation of the Victorian Legal Managers and Secretaries' Association, on the 18th inst., Mr. Hyman Herman, B.C.E., F.G.S., Director of Geological Survey, delivered an interesting lecture on "Some Phases of Mining in Victoria" at the board-room of the Chamber of Mines. Mr. Wm. Jackson presided, and there was a very large and attentive audience. The lecture was illustrated by nearly forty lantern slides, showing the geological features of the principal mining fields of the State, localities of bores, mines in operation, etc.

The lecturer first of all showed in outline the distribution of mineral products in the State; deposits of tin were to be found at Toora, on the Upper Yarra, and in the North-Eastern district; copper and platinum on the Thomson River; antimony in the Ringwood-Costerfield belt; silver and silver-lead ore at St. Arnaud, Buchan, and Deddick; wolfram at Mount Murphy and Linton; iron ore at Lal Lal and Nowa Nowa; while coal, black and brown, and gold were being mined in many parts. The greater part of the lecture, however, was confined to mining for gold, alluvial and quartz.

Treating of the Ararat field, Mr. Herman expressed regret that boring there, both in years gone by, and recently, had not always been arranged to the best advantage; more definite results should have been obtained for the money expended. However, several mines had produced good results and others were showing a measure of enterprise which should command success. The Cathcart mine had produced 12,571 oz. of gold and had paid £50,112 in dividends, while the Cathcart Central had yielded 7194 oz. The Langi Logan group were busy in developing operations and boring for the lead, the wash in the South Langi being of a similar character to that on the Cathcart lead, and should be found in good quantity 30ft. deeper to the east, for which boring is now in progress. The main lead has been located on the company's north and south boundaries. All the leads from the north must pass through this ground. The Langi Logan Central has put in 19 bores, but the lead has not been properly located.

On the Beaufort field the Hope mine is regarded as typical. This mine is on a lead running into a main system formed by the confluence of the Beaufort and Waterloo leads. Boring was in progress two miles easterly from the Hope mine and six miles east of Beaufort to locate the main lead. Bores were also being put down six miles south of Beaufort in order to determine whether the Sailor's Gully lead was the head of an important lead system going south.

Turning to the Bendigo field, Mr. Herman discussed the theory of favourable and unfavourable zones, which was first suggested some 25 or 30 years ago by Mr. W. Nicholas, and was subsequently taken up by Mr. E. J. Dunn, the ex director of survey. "It appears probable," said the lecturer, "from all the evidence available, that, eventually, distinctive zones of greater or less thickness and importance may be recognised in Victoria, but a great amount of work in structural surveys and palæontological investigation is still required before any sweeping generalizations are justified. Probably the most definite evidence in this direction will be obtained by the investigations of Mr. W. Baragwanath at Ballarat West. At Bendigo, it still remains to be demonstrated where the favourable zone or zones, if they exist, begin and end. Accurate cross-sections of the field, based on field work and palæontology, will be necessary, and synclinal axial lines will have to be mapped as well as anticlinal lines. This work has been taken in hand."

The Ballarat East field is usually regarded as only an indicator belt, but a width of 350ft. lying between an anticline (on the west) and a syncline (on the east), had now been proved to be favourable throughout. Certain faults known as leatherjackets form the footwall side of large deposits of quartz traceable for hundreds of feet, the deposits being of great size, apart from their extensions as veins, etc. Veins occur throughout the field and are intersected at times by indicators; patches of gold have been got, but the deposits are irregular. Only in the eastern-dipping beds have payable deposits been located. The extension of the belt to the north (Black Hill) and south (beyond a large crosscourse) should be looked to as well as to the east and west, on the recurrence of favourable beds on parallel folds. In support of which suggestion, Mr. Herman mentioned analogous conditions on the parallel fold to the west, where the Sulieman Pasha mine worked a large leatherjacket formation to a depth of 1000ft. The following figures show the value of gold derived from seven quartz mines which are still being worked:—Victoria United, £525,000; Britannia United, £250,000; Last Chance, £376,917; Llanberris No. 1, £[illegible]50,000; New Normanby, £473,330; North Woah Hawp, £560,512; Woah Hawp Canton (Indicator only), £44,280.

The outstanding features of the Ballarat West lodes were stated as follows:—(1) Lodes occur only on black slates, which belong to the one zone, below this zone 1000ft. deeper stratigraphically has been reached and no other black slates or favourable zone has been located. The Phoenix lode, an inverted saddle, worked by the Sebastopol Plateau No. 1 Company, has features similar to other lodes, but is in a zone about 500ft. stratigraphically above the black slates. (2) Only the western dips have the lodes proved payable, though unpayable portions exist even in these dips. The eastern dip has been intersected in a score of places without getting payable stone or inducing driving, and there is no case recorded of eastern stone more than a few inches thick. (3) The granitic dyke averages 20ft. in width, but has given no gold, though plenty of water has been found.

All but a few acres of this field are covered with basalt in four layers of an aggregate thickness of 330ft., which with interbasaltic drifts and clays give a total of 400ft. of covering over the auriferous wash and reefs containing strata. Alluvial gold was won from deep gutters and reef washes, the latter lying 100ft. above the gutters. Mr. Herman then dealt individually with the chief lines of lode found here, viz., the Consols, Guiding Star, Albion and Prince of Wales. Speaking generally the strata are bent into anticlines and synclines, and gold deposition appears to have been largely affected by certain strata. Only one favourable zone, from 60ft. to 80ft. thick (apart from the Phoenix lode) has been revealed by all the shafts and crosscutting; this was characterised by thin beds of black graphitic slates, along which signs of movement are common, and laminated quartz has been deposited. Large masses of spur or "buck" quartz occur in places, but the laminated quartz in always there, generally on one or other of the walls. The thickness of the laminated stone varies, but it is generally larger on the synclines and anticlines.

From Ballarat the lecturer took his hearers to the eastern goldfields at Wood's Point and Walhalla, which were opened some years after the discovery of gold in 1851, the notable exception being the Ovens field opened in 1852. The principal feature of the Wood's Point diggings is the dyke bulges and quartz floors in the mines, the dykes being usually through disrupted anticlines, and the quartz floors varying in thickness with the width of the dykes. The smaller dykes have quartz veins closer together, and the best gold is found in the floors near the walls. The A.I. bulge, really a silicified sedimentary rock between two dykes, shows, associated with the quartz floors, ramifying veins which are often rich, so that a floor was often stoped several times the thickness of the actual floor. Three companies have already operated the A.I. mine, and a fourth is now in possession. The first company, with a capital of £5000, paid £75,000 in dividends; the second had a similar capital, but statistics are not available; the third, an English company, was formed about 15 years ago and made good profits, but spent a lot of money on plant without securing proper equipment for systematic development, and passed, together with the South A.I. (another English company) into the hands of the liquidator four or five years ago; then came the present, fourth, company. The mine has been worked to a depth of about 400ft., and has yielded over £300,000 worth of gold. The Morning Star dyke was first opened in 1861 and shows two sets of quartz floors, the one striking more or less with the dyke and dipping across it, the other crossing the dyke at right angles and dipping along the strike. The deepest working is in the Hope engine shaft, 730ft. from the surface and 300ft. below water level; the shaft shows 13 distinct reefs, or one to every 55ft. sunk. This dyke yielded 260,000 oz. of gold to the water level, and a 10 days' crushing from one of the early claims gave £40,000 worth. The New Loch Fyne mine was at one time worth £300,000 on the market, one newly discovered floor having added £100,000 in a few months. The ore treated to date amounts to 117,930 tons, which yielded 86,029 oz., worth £304,056, and after paying £138,184 in wages the directors were able to distribute £109,700 in dividends. Coben's line of reef, on which are situated the various Long Tunnel mines, has produced 1,475,625 oz., and paid £2,378,290 in dividends. The life-history of the Long Tunnel mine is divided by Mr. Herman into three periods: the first, from Nos. 1 to 9 levels, worked from the shaft from the main adit, paid £1,041,600 in dividends; the second, worked from the N.W. blind shaft, levels 10 to 23, paid £187,800; while the incline shaft workings paid £54,000 to the end of last year. At the North Long Tunnel mine over £160,000 had been expended when the property was abandoned, of which £120,000 was lost by the last company.

After reviewing the rapid growth of the colony immediately following the discovery of gold, which led to such a phenomenal rush of immigration, which in turn resulted in the building of railways and the undertaking of numerous other public works, Mr. Herman asked: "What is gold mining now doing for the State?" And he answered as follows: "In 1912, 11,856 miners were employed in gold mining throughout the State, and a large additional number were employed cutting firewood, mining timber, etc. The value of plant in 1912, was £1,761,654, necessitating the employment of a large number of men in engineering workshops for repairs and renewals. Add legal managers, clerks, and others dependent on the industry; allow for the trade thus accruing among business people and a fair proportion of the persons therein engaged, and it is clear that gold mining even in its present condition supports a very large population. The Government Statist estimates that there are 60,000 persons, or one in every 23 of the population, supported directly and indirectly by mining in Victoria. The value of 60,000 people is the answer to the question 'What is gold mining doing for the State?'" In conclusion he said:—"The future of the industry is largely in the hands of the legal managers. Great damage is often done by under-capitalization of new companies, which are in consequence short-lived. It is the duty of everyone, in his own and the general interest, to see that the ground gets a fair trial."

## BENDIGO GOLD STEALING.

A jury at the Bendigo (V.) General Sessions last week found Benjamin Hall guilty of endeavouring to sever a piece of gold-bearing quartz in the Catharine Reef United mine, with the intention of stealing it. A similar charge was brought against another miner, named Joseph Munday, but he was acquitted. In sentencing Hall, Judge Moule said that the offence of which Hall had been convicted was one of serious moment in the community. It was difficult to detect and difficult to prove. Nothing had previously been known against Hall, but punishing the individual was one thing, and suppressing the crime was another. He had to consider the effect not only upon Hall, but the effect as a deterrent upon others. Taking into consideration the fact that nothing was known against Hall, he would be sentenced to two years' imprisonment, with hard labour.

At the same sitting of the Court, Thomas Treloar, 23, who on the previous day was found guilty of the larceny of slimes from Leggo's metallurgical works at California Gully, was sentenced to 18 months' imprisonment. Judge Moule, in passing sentence, said there was no previous record against prisoner, and the court had received a number of testimonials in his favour in respect of his past life. These testimonials would have received greater consideration were it not for the fact that from the nature of the evidence submitted the court was of opinion that although he was only now found out it was not the first time the prisoner had committed the offence. Thefts of slimes had occurred to such an extent that the officials concerned had set a watch, and prisoner had been caught in the act.

## OIL FUEL AND COAL MINERS.

Last week Mr. Winston Churchill, First Lord of the Admiralty, informed the House of Commons that the Admiralty, realising that with the adoption of oil fuel for the navy a steady supply at a steady price would be desirable, that body intended to become the independent owner or controller of its own oil supply, and with that object in view was making a contract with the Mexican Eagle Oil Company. His naval colleagues, he added, were not interested in the shares of the company, nor were the funds of the Liberal party invested in the company. There were now built and building 100 torpedo-boat destroyers and five battle-ships which would this year use oil as an auxiliary to coal, but for the present coal would continue to be the main fuel basis in the battleline. The use of oil, Mr. Churchill said, increased the active radius of a ship by 40 per cent., and permitted the designing of vessels which, though of equal fighting power with the present type, would be of lesser dimensions, and would be built at smaller cost. Light cruisers were essentially part of their tactical construction, and they could not be satisfactorily constructed on a coal-burning basis, inasmuch as they would have to be greatly increased in length and displacement, or lose three to four knots in speed.

The statement aroused considerable interest in various sections of the community, but the "Daily Citizen," a London labour journal, has raised its voice in protest, on the ground that this step is likely to have a very serious effect upon the coal-mining industry of Great Britain. The journal argues that a million miners will be affected. "Fears of war," it says, "the efficiency of the navy, and other cries must not be used against the interests of the miners and their four million wives and children." The article continues—"Perhaps oil can be obtained from coal. If the authorities cannot find a way out of the difficulty, they must be replaced by others who can. In no circumstances will the devastation of the lives of 5,000,000 people be permitted."

# ENGINEERING AND ELECTRICAL SECTION

Australian
General Electric Co.
217 Clarence Street, Sydney.
Tel.—Central, 3495, 4397; City, 2381.
"Penfold House," Cr. Queen and Little
Collins Sts., Melbourne.
Tel.—Central, 2647.
Representing—
GENERAL ELECTRIC CO., U.S.A.
The
BRITISH THOMSON-HOUSTON
CO. LTD., of Rugby, England.
The GUARANTEE of EXCELLENCE on GOODS ELECTRICAL

## SYDNEY CITY COUNCIL.

The report of Electric Lighting Committee of the Sydney City Council, adopted at last meeting, recommended:—

That extensions of electricity mains be authorised as follow:—(a) Buckland-street, from substation to Botany-road, to improve electrical pressure in the locality; estimated cost, £295. (b) Woollahra, Edgecliffe-road, from Albert-street, to supply premises of Mr. Allen; estimated cost, £145. No further guarantee required. (c) Paddington and Woollahra.—Oxford-street, Paddington, from near Jersey-road to the overhead pole in Queen-street, Woollahra.—Underground extension to improve the pressure in this neighbourhood; estimated cost, £217. (d) Redfern.—From Waterloo substation along Young-street and McEvoy-street to premises of Messrs. Garnett and Whiteoakes in Dowling-street; estimated cost, £215. Usual guarantee has been received. (e) Concord, from Government joinery works substation, to supply premises of Messrs. Ellis and Co. Ltd., Government-road, Rhodes; estimated cost, £230. No guarantee required. (f) Erskineville.—Connecting low tension network in Erskineville to low tension network in Alexandria; estimated cost, £45.

Switchboard Panels, Transformers, etc., supply by A.G.E. Co., Messrs. Ferranti Ltd., and Messrs. Noyes Bros:—

That switchboard panels, transformers, etc., be ordered as follow, under existing contracts:—(a) The Australian General Electric Co.: 6—10,000 volt feeder panels; 7—10,000 volt transformer panels; 4—415 volt transformer panels; 7—415 volt summation panels; 8—415 volt distributor panels, to specification No. 242; also 2—20kw. 10,000—415 volt Poletype transformers, with switchgear to specification No. 244, at an estimated cost of £2489. (b) Messrs. Ferranti Ltd.: 3—10,000 volt transformer panels; 1—415 volt summation panel; 2—415 volt distributor panels, to specification No. 242, at an estimated cost of £428. (c) Messrs. Noyes Bros.: 3—200 K.V.A. 10,000—415 volt transformers; 2—415 volt transformer panels; 1—415 volt summation panel; 2—415 volt distributor panels, manufactured by the British Westinghouse Co. to specification No 242. Estimated cost, £1026 8s.

That an additional fifty-five oil switches, required in the equipment of substations, be ordered from the Australian General Electric Co., provided that firm is prepared to supply them at the same price as the 40 already supplied by them.

That an additional transformer, required to supply low tension current for driving auxiliary plant at the power house, be purchased from the Australian General Electric Co. at an estimated cost of £246, the transformer to be precisely similar in every respect to those of the same size at present in use at the power house.

That twelve switches required for disconnecting sections of overhead high-tension mains from the rest of the system be purchased from the Australian General Electric Co. at a cost of £17 10s. each.

That in consideration of the annual payment of the sum of £50 by the Royal Agricultural Society, four large lamps be provided for lighting the access to the society's ground, at an estimated cost of £135.

That authority be given for the expenditure of a sum of £25 on the purchase of special rubber goloshes, to be worn by men in the Electric Light Department when handling conductors which may be alive on consumers' premises.

That in connection with work being carried out by Messrs. Elder and Co. at the Power House, approval be given for the supply by Messrs. Elder and Co. of small parts of the gantry found to have been used for other work, at a cost not to exceed £20, and for missing parts of aerial gangway between the coal bunkers and the ash bunkers at an additional expenditure not to exceed £10.

That approval be given for an expenditure of £12 in altering the installation of Mr. Schliemann, Wallis-street, Woollahra, in such a way that current is taken approximately equally from each of the three phases.

That authority be given for the purchase from Mr. R. C. Henderson (who has moved his factory from an area in which direct current is supplied to an area in which alternating current is supplied) of 4-1h.p. and 4-2h.p. direct current motors, at the price of £54 15s. 10d.

That authority be granted for the following:—(a) Town Hall Substation.—Purchase from the Australian General Electric Co of two additional switchboard panels required in connection with the motor generator to be installed, at an estimated cost of £320. (b) Drummoyne.—Substation No. 40, Ramsay-road, and substation No. 27, Blackwall-road—Fixing time switches to control the public lighting. Estimated cost, £30 and £19 respectively.

Consumption per unit at Power House, scheme to obtain reduction.—That with a view to reduce the fuel consumption at the Power House per unit in accordance with a report by the City Electrical Engineer, dated 3rd July, 1913, the following be approved for a period of six months as a trial:—The engineers in charge at the Power House, including the senior engineer in charge, the foreman mechanic and the foreman fireman, or any man acting in place of any of those officers, while so acting, to be paid monthly a bonus on their salaries or wages if the coal consumption is below a certain figure—the amount of the bonus to be arrived at as follows: The standard rate of consumption to be taken as 2.8 lb. of coal per unit of electricity generated. If during any month the average consumption is not more than 2.7 lb. of coal per unit of electricity produced, the above-mentioned officers shall receive a bonus on the salaries or wages earned during the month of five per cent.; if the coal consumption is not more than 2.6 lb., a bonus of 10 per cent. shall be paid, and so on, adding 5 per cent. to the salaries or wages for each tenth of a pound per unit produced by which the coal consumption is reduced below 2.8. If when a new contract is made for coal, a different class of coal is contracted for, the standard at which the bonus is calculated to be altered in proportion to the difference between the heat value of the new coal and the heat value of the coal at present being used.

---

## MELBOURNE TRAMWAYS.

The need for further tramway services in the eastern suburbs is still agitating the residents of those rapidly developing areas, and large public meetings were held last week at both Camberwell and Hawthorn to insist upon steps being taken to supply their wants.

On the 15th inst., one of the largest gatherings ever held at Camberwell carried a resolution:—"That, in the opinion of this meeting, it is desirable that the council be requested to provide greater travelling facilities for the residents of Burke-road, Camberwell, and adjoining districts." The mayor, Cr. A. Bowley, presided, and prior to the opening of the meeting a series of moving pictures depicting the working of railless trams in the borough of Rotherham, in England, and showing their mobility in steering through traffic and acting as feeders to fixed tramways was shown. There was evidence of a strong feeling in favour of the railless trams or trollies, which, so far, have not been adopted anywhere around Melbourne. If decided upon the proposed tramway would be four and a half miles long, and would serve a population of 18,782 within half a mile of the line, namely—Kew, 664; Camberwell, 6600; Hawthorn 7000; Malvern 4518. The cost of construction would be £54,000 for double tracks, to be allotted between the four municipalities according to the mileage adjoining each—Kew, ½ mile; Hawthorn, 2¼ miles; Camberwell, 2¾ miles; Malvern, ¾ mile. The cost of cars and overhead gear for a 20-minute service of railless cars would be £13,000. The Burke-road line would link up seven systems now operating, or about to be constructed:—Cotham-road, Riversdale-road, Malvern-road, High-street, Wattletree-road, Waverley-road, and Glenhuntly-road. A Burke-road Tramway League was formed at the meeting to keep things moving.

On the evening of the 17th a meeting of citizens of Hawthorn was held at the Town-hall, at which the greatest interest was displayed, the point urged being the construction of an electric tramway along Burwood-road, from the junction of Camberwell and Burke-roads to the Hawthorn bridge, there to connect with the cable tramway which runs into the city, and a resolution that any Bill to be put before Parliament with a view to providing Hawthorn with an adequate tram service should include this route was carried by a large majority. The mover of the resolution, Mr. R. T. Chenoweth, claimed that there should also be a loop-line connecting the Riversdale-road system between Power-street and Burke-road. The only opposition (he said) would come from the Railway Commissioners, but they could not carry the present traffic, and duplication would only provide a temporary remedy. The minority favoured an amendment to submit the Burwood-road scheme to Parliament separately. It was resolved to forward the resolution to the local council with a request that it use every endeavour to induce the Ministry to include the Burwood-road line in the Bill shortly to be presented to Parliament.

The lines now operated by the Prahran-Malvern Tramway Trust have all been carried on with such marked success that a recent conference of the Prahran and Malvern councils asked the Trust to undertake the construction and working of a new line from St. Kilda-road to Burke-road via Commercial and Malvern roads. The Trust, however, did not see its way as at present constituted to undertake any further responsibilities; already it has three independent systems under its control, and a fourth will be added shortly. Subsequently, the Trust submitted a scheme which would have the effect of combining the whole of the existing lines, including the proposed Malvern-Commercial road line, into two systems, and would greatly conduce to the satisfactory and economical working of the whole of the tramways. At its meeting on the 14th inst., the Prahran Council decided that it would not consider the scheme until the Malvern-Commercial road line had been constructed, and was in operation. This action on the part of the Prahran City Council has caused a good deal of dissatisfaction, as it has led to a deadlock which threatens to block the reconstruction and enlargement of the Trust indefnitely.

The directors of the Melbourne Tramway and Omnibus Co. have decided to recommend that a final bonus of 1s. per share be paid after the annual meeting, which will be held on August 11th, and that a sum of money be added to the reserve for return of capital sufficient to bring it up to £480,000. When this bonus has been paid the year's distributions from profits will amount to 4s. per share. The traffic receipts for the year amounted to £753,153, against £718,869 for 1911-12, or an increase of £34,284. The total distribution of 4s. per share in the form of dividends and bonuses for 1912-13, including the "final" bonus for that period, absorbs £192,000, against £144,000 on account of 1911-12. At the end of June, 1912, the reserve for return of capital amounted to £361,602, so that to bring it up to £480,000 will require the addition of £118,398, and this will be derived in part from accumulated interest, and partly from the working profits for the year. When that transfer has been made the reserve for return of capital will equal the paid-up capital of the company. The total dividends and bonuses paid during the last five years were as follows:—1908-9, £96,000; 1909-10, £96,000; 1910-11, £96,000; 1911-12, £144,000; 1912-13, £192,000.

---

## BORDER RAILWAYS.

A deputation of farmers from western areas of New South Wales waited upon the Victorian Minister for Railways, Mr. A. A. Billson, last week, with the request that the line from Wahgunyah be continued across the Murray River to Corowa, a distance of about a mile. The line, it was stated, would afford an outlet for the produce of 750,000 acres of first-class agricultural land, the whole of which would pass through Victoria to the seaboard. At present the cost of road transport from Corowa to Wahgunyah is 3s. per ton, besides which there is a terminal charge of 2s. 6d. per ton, which, the Minister stated, the New South Wales Government has steadfastly refused to forego, although frequently asked to do so. Mr. R. F. Gardner, of Corowa, who was the principal spokesman for the deputation, said that the road was bad between Corowa and Wahgunyah, while a load of only four tons was now allowed on the bridges. That would stop the carriage of wool to Wahgunyah this year. Between Culcairn and Corowa last year 1,000,000 bags of wheat were produced, and the New South Wales Minister for Railways said that it was impossible to cope with the wheat traffic on that line without duplication. That could not be completed for many years. If matters continued as at present, it would take two years to get one year's harvest away. If the connection were made, the greater part of the produce would be sent to Melbourne, particularly as only eight ships could be loaded with wheat at Darling Harbour at one time, while at Melbourne and Geelong grain could be loaded into 24 vessels at once. The farmers were further faced by the position that in the near future an inter-State commission would be appointed which would adjust freights on a mileage basis, thus making the cost of transport to Sydney a great deal higher. During the month of January only four trucks were sent to Corowa in response to an order for fifty. Eight were sent in February to transport 60,000 bags of wheat.

In reply, Mr. Billson said that he strongly approved of the proposal for linking up the lines in the various States with the Victorian system. That was of much more importance at the present juncture than the question of a uniform gauge. His sympathies were always with country propositions, and the figures quoted by Mr. Gardner made his case a strong one. He would give instructions for the opening up of negotiations with the New South Wales Government, and the deputation could rely upon his putting the proposition before it, with all the force he could. The tightness in the money market at present made the outlook for the construction of public works less promising, but he believed that the financial depression was only of a temporary kind. Mr. Billson also said the New South Wales Public Works department was preparing an estimate of the cost of the work, though nothing had come before him officially. In his opinion, the estimate would be between £50,000 and £60,000. Last year negotiations were carried on with the New South Wales Government, and as a result arrangements were made to construct lines on the Victorian gauge into New South Wales territory, further to the west, and he took it that the request of the deputation had originated from these negotiations. He would be unable to make any definite statement until the matter had been brought officially before him; yet he presumed the Victorian Government would be disposed to regard the proposition in the same light as those further to the west.

On the following day, another deputation waited upon the New South Wales Secretary for Works, Mr. Allan, in the absence of the Minister, Mr. Griffith, and complained of the prolonged delay in the construction of a railway from Nimitybelle to Bombala. The deputants were very angry, and there was no mincing of words to characterise the inaction of the Government. Mr. McGowen, it was stated, when he, as Premier, opened a line at Nimitybelle, made a distinct promise that the extension of the line would take place immediately. Mr. Hall, Minister for Justice, on the occasion of the turning of the first sod of the extension, did likewise, and stated that the plans were ready. Mr. Griffith had promised half-a-dozen times to build that line, and the people of the districts which would be served were simply disgusted with the Ministry, and with Mr. Griffith in particular. This feeling was also disclosed by a petition from residents of Monaro, but particularly from selectors of blocks on Bibbenluke and Mahratta estates. These men distinctly understood, when they applied for blocks, that the railway was going straight on. Some of them have now thrown up their holdings, and more contemplated doing so. Another speaker declared this to be the most outrageous case of Ministerial breach of faith he had ever heard of.

In reply, Mr. Allan stated that, so far as this section was concerned, everything was ready for actual construction to be undertaken as soon as the money was available, but there was difficulty in obtaining money from loan funds. Unless some new method of obtaining funds were adopted, it would be a considerable time before any new works could be undertaken. As regarded the extension to the Victorian border, an arrangement had been made with the Victorian Government by which such extension could be carried across the border on the same terms as were recently arranged with regard to extension at Euston and Wentworth into New South Wales. That arrangement with the Victorian Government would be put before Parliament in the forthcoming session.

On his return to Sydney on the following day Mr. Griffith sent a written reply to Mr. G. T. Miller, M.L.A., to the same effect as Mr. Allan's reply.

## BRITISH AND EUROPEAN DEVELOPMENTS.

(From Our Correspondent.)

London, June 20th.

Parliament has now authorised the Postmaster-General to spend over a million sterling upon his scheme for a post office electric railway from the east to the west of London for the carriage of mails and parcels. The matter is in the hands of the chief engineer and his staff, working with the assistance of Mr. Dalrymple Hay. It is intended that the line shall be 6½ miles long, starting at Paddington District Post Office, where there is connection with the Paddington Railway Station, thence under the Western Parcels Office and Mount Pleasant sorting office, under the General Post Office, and under Liverpool Street Station. There will be a 9ft. tube with two tracks, the trains consisting of comparatively small trucks, electrically controlled from the stations, and not accompanied by drivers. A one minute service, and a speed of 25 miles an hour, are intended, and according to present plans the system will be at work in 2½ years. Interest charges on the loan will cost £58,000 per annum, but it is expected that there will be a saving effected in horse traction and in other ways to the tune of £47,000 per annum in the first year. The system will, however, be equal to a growing traffic for many years to come without increased expense, and congestion of the surface thoroughfares will be in some measure relieved. The necessary electric power will be obtained from the Post Office power station at Blackfriars, which was opened several years ago, and which can be easily extended.

Marconi affairs have been much in evidence again this week. First and foremost there has been the great debate in the House of Commons regarding the dealings of Ministers in American Marconis, based upon the reports of the Select Committee published last week, in which Ministers were excused or blamed according to whichever party prepared the reports. The subject is on everybody's tongue at the time of writing. The Attorney General and the Chancellor of the Exchequer have, before the whole House of Commons, admitted that they were mistaken in having anything to do with the shares, and after a two days' debate, the Opposition resolution has been rejected by a majority of only 78 votes, an amendment, expressing regret for the Ministers' dealings, and reprobating the charges of corruption made against the said Ministers, being carried. This majority cannot be at all satisfactory to the Government, seeing that it includes the Irish vote.

A few hours before the debate at St. Stephen's began, the directors of the American Marconi Co. published their annual statement in the London papers, declaring a first dividend of 2 per cent. The proceeding of the Russian Co. were at the same time also given full publicity in the papers. Both concerns have made good progress during the past year. The Marconi International Marine Communication Co. Ltd., in which the English Marconi Co. has so large a holding, has also issued a very satisfactory report showing a net profit of £24,436 against £15,028 last year, and declaring a dividend of 10 per cent., as compared with 7 per cent. last year.

The annual dinner of the Electrical Contractors' Association was held in London on Tuesday night, President A. W. Shaw in the chair. The Association now has a membership of 500, and it is as determined as ever to resist the proposals of the Municipal Electrical Association in connection with wiring and installation powers. Mr. J. E. Edgecome, the acting president of the Municipal Electrical Association, who was present, and responded to a toast, expressed the opinion that it should not be impossible for a way to be found of reconciling the views and objects of both the electric supply engineers and the electrical contractors.

The question of motor omnibus competition is perplexing many tramway minds just now. In London the problem has presented itself in a very persistent manner. As the reader knows, the London County Council has spent millions of pounds sterling (11½ millions I believe) upon tramways, chiefly the very costly underground conduit system, as though the tramway were certain to be the most efficient mode of travel for all time. For years the motor omnibus was an inefficient nuisance, but those were early years of experimenting, and of development. To-day the motor omnibus in its developed and more efficient form is "carrying everything before it" (not the passengers, of course), and the London County Council, tied to its tracks by millions of pounds capital weight, cannot afford to think of anything but tramways, however much it may desire to do so. The figures just issued show that during the past year, although nearly 3½ million additional car miles were run, over 20 million passengers less were carried than in the previous year, while the gross earnings fell from £934,212 to £739,053, and the net surplus from £222,702 to only £497! The receipts per car mile fell from 10.98d. to 9.73d., and per track mile from £17,498 to £16,179. The miles of system open last year was 132.49 miles, as compared with 127.55 in the previous year. Naturally such results are giving rise to much discussion both in the council and in the press, and those most directly interested are looking round for some means of relieving the position. Some of us think that the workmen's fares might be made to yield more than they do without the slightest injustice being done to the horny-handed son of toil, who gets down to the city or somewhere else before a certain hour. Others want to see the dead ends of tramways connected together, making more continuous and convenient services, such as are to be found in some provincial centres. Yet others think halfpenny fares are altogether a mistake. Others, again, refer to the burden of road widening expenditure which has been carried by the tramway accounts to a large extent, but which has helped to prepare the way so that the motor-buses can have free play. Yet further, and a point very much discussed already, but to be far more discussed before it is done with, is that of putting upon motor-omnibus authorities a share of the cost of road maintenance. Rearrangements of services, and of fares, and the costliness of running the all-night tramcar services—these also are mentioned. What really will be done nobody can say just yet, but the mere statement of the matter in the foregoing sentences will suffice to indicate just where we find ourselves at the moment.

The movement among municipal electrical engineers toward revised systems of charging for domestic service continues. At West Ham the electrical engineer, Mr. J. W. Beauchamp, has just made a full report on the use of electricity for domestic cooking and heating, with a recommendation for a tariff suited to the particular needs of the borough, and based upon ascertained costs of supply. He tells his committee of the considerable development that has taken place during the past year in the production of heating and cooking apparatus for domestic use, and states that this portion of the business has passed the experimental stage, and in London a large amount of work has been done in the conversion of restaurants and in the introduction of such apparatus for private houses, where hitherto the only important use of electricity has been for lighting. Since the re-organisation of West Ham showroom in the autumn of 1912, considerable apparatus has been sold, and the consumption of electricity in the residential district has increased. "Before, however, we can hope to develop a cooking and heating load of considerable magnitude it will be necessary to offer a suitable tariff." In framing a tariff for domestic service it does not do to be unduly influenced by what is being done by other districts, as so much depends on local conditions with regard to the consumers, the cost of gas and other fuel, existing rates for supply, and the financial needs of the supply undertaking. West Ham, says Mr. Beauchamp, calls for a fixed charge per annum payable quarterly in advance, based upon the number and capacity of the lamps installed, allowing of such number and capacity up to 25 per cent. in order to encourage the use of lamps in cupboards, cellars, etc., where they are seldom used, but very convenient. It also calls for a further, but smaller fixed charge per annum payable quarterly in advance, based upon the capacity of heating, cooking, or any other electrical apparatus in the house. In this case the fixed charge is smaller, because the apparatus is mostly used in the day-time, and whereas light is mostly used at the same time of the evening, heating and cooking are also in operation at varied times throughout the day, which causes a considerable diversity in the demand for such supply, requiring a smaller percentage of plant to be held in reserve than is the case with lighting. In addition to the above fixed charges, all electricity would be supplied to the premises through one meter only and at ½d. per unit. Mr. Beauchamp goes on to show in some detail how this system would work out in practice. The system is a special adaptation of the Hopkinson method of charging, whereby a fixed payment per annum is obtained to cover capital charges on plant and mains which must be set aside for the consumer, and those costs in connection with running, metering, accountancy, etc., which do not vary appreciably with the amount of electricity supplied, and, in addition to such fixed payment, a low rate per unit used, sufficient to cover the variable costs of fuel and operation. One of the greatest advantages of a domestic tariff is that supply can be given to any part of a house for any purpose through one meter and one system of wiring. Consumers, while willing to hire or buy apparatus, are reluctant to put additional wiring into a house which does not belong to them.

Mr. C. Faraday Proctor, city electrical engineer of Bristol, reporting on the past year's progress of his undertaking, says that the rearrangement of the duties of some of the staff and the appointment of the secretary as sales manager, has been thoroughly justified. The development which has taken place in the publicity and sales department has shown most beneficial results and indicates that a still further development is justified, including an increase in the number of the technical staff employed who advised prospective consultants upon the equipment of their premises for the utilisation of electricity for power, light, heating, cooking, etc. Cooking, he says, is rapidly becoming popular in Bristol, and the number of cooking stoves in use would have been appreciably larger but for the difficulty experienced in obtaining sufficient deliveries from the manufacturers who throughout the country are over-crowded with orders. "A majority of the users have after experience expressed themselves as delighted with the results as regards efficiency, and are quite satisfied on the score of economy. Undoubtedly food cooked by electric stoves retained the natural juices to a fuller extent than is secured by other means."

# THE ALIGNMENT OF MACHINERY.

By William Sinclair.

(Continued from issue of July 17.)

The diagram shown in Fig. 4 was used for lining off a two-crank engine, and most of the remarks appertaining to the single crank engine obtained with this one also. Each engine was treated as a single crank job, and the various points adjusted and then the final point to be tried to make sure that one engine was not in advance of the other, which was just another way of proving the crank shaft alignment. As most engines of this class had long strokes it was sufficiently accurate if the crank pin centre turned up true to the line at each inner and outer centre on each engine, and if otherwise (always supposing the crankshaft and webs to be true) the adjustment could easily be made by moving one side up or down.

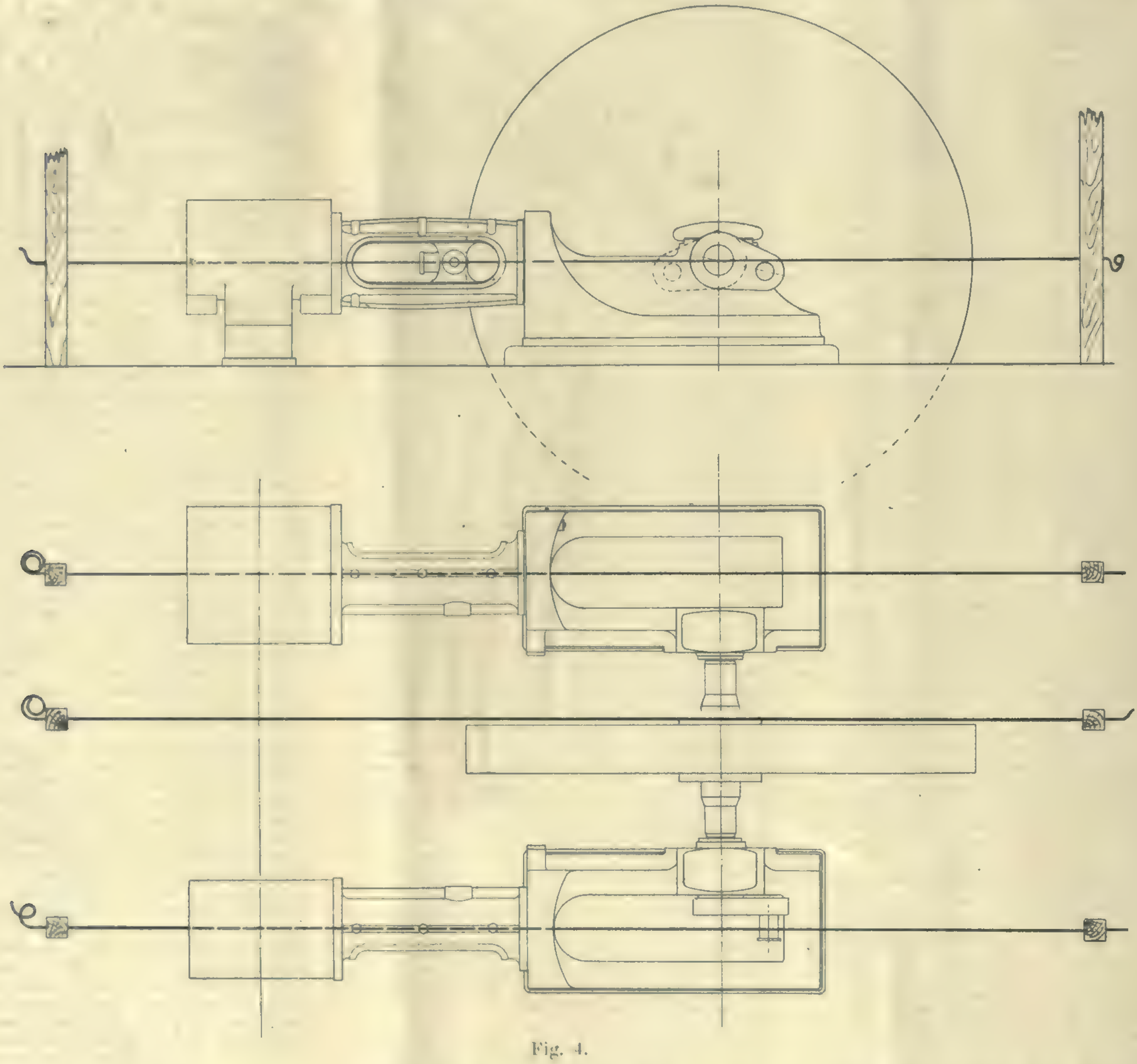


Fig. 4.

In addition to the above points, it was important to gauge the lines at the terminal points by means of a lath to make sure they had no spread.

A third line was shown here which served the same purpose as in a single crank engine and enabled the crank shaft to be checked or the alignment of an existing engine to be verified.

In each of these examples he had not touched on the question of the limit of error allowable in an engine, as such an allowance could not be stated without knowing every circumstance of any particular job. Large engines of the type shown in the last two figures had many places in them where play was allowed for, and in addition to which cylinder rings were always floating. Again, there was a marked difference between the cold engine and one under steam, and these points must all be taken into account. Then again, many of the builders of large engines in which the cylinders were tandem designed the cylinder feet so that the cylinders were free to slide in and out between machined surfaces, and in the face of all these facts he would be an exacting man who would demand gauging to a "feel"; let anyone take a micrometer gauge and set a pair of outside callipers to a size, then move the gauge even a small fraction of, say, 4/1000 of an inch (which answers to a No. 4 feeler) and it would at once be detected. It was quite possible in gauging a wire to measure as close as this, and, in fact, a No. 6 or 8 feeler appeared to be a large amount. In a well-machined and set up job, alignment to a No. 4 feeler was quite easily obtained, and when one dealt with wires 30 or 40 feet long, such accuracy was practically perfect. The method of trying if glands were free when rods were in place was all right as a second resource, and certainly an engineer would use it, but it should always come after gauging the wires. Allowances in levelling also had to be made. For instance, theoretically the wire which passed through the cylinders and guides should also show true with the crank shaft centre, but if it did not and could not be adjusted, then a slight error at this point was not of vital importance to the future running of the job, for the connecting rod would allow for any small difference. All other points, however, should be dead level.

The modern quick revolution engine had in many instances superseded the long stroke, slower running job, and it did not call for the same treatment in erection. It was short, vertical, and each part dovetailed into its receptive fellow; it was therefore, as a rule, only necessary to level up the component parts such as bed, crank-case, trunks and cylinders; but, in addition, if it was to be coupled to a line of shaft or electric generator, then just as much care must be taken. In this case the couplings were principally depended on, and it was therefore advisable always to have couplings tried in the lathe and faced up. They should then never afterwards be taken off, as rekeying was liable to throw them out. In coupling together high speed shafts flexible couplings should be used wherever possible, as one shaft might be directly coupled to a machine where a different amount of wear might occur in the several bearings and a stress thereby thrown on the shaft which did not as a rule wear so much.

A word or two might not be out of place with regard to the alignment of gas engines. There were not many units in Australia where cylinders were tandem, and these, the author thought, would be erected on somewhat the same lines as he had indicated earlier in the paper, but the general type had the stout, short, heavy beds with trunk pistons and heavy fly-wheels on overhung cranks, and the spirit level was the most important gauge used in their alignment. As a rule the power was taken off the engine by belting, and consequently to bring the driver and driven pulleys into alignment became the centre of greatest interest. When an outer bearing came into the design it would call for proper care, and the general way was to treat the crankshaft as the guiding factor and to bring the bearing into its place and to then harden it up. The whole of the parts were usually so heavy and solid that the springing of a casting was out of the question, and so, generally speaking, the matter of alignment of these engines did not warrant such detail as was needed for steam engines.

So far he had dealt with horizontal lines and machinery on horizontal planes, and no doubt comparatively speaking there were more jobs of this kind than in vertical planes (he was, of course, not speaking of vertical engines now), but, nevertheless, there were many arrangements where vertical lines only were employed. As an example of this class of work the author had prepared Fig. 5, which illustrated an arrangement of two centrifugal pumps placed in a well so that the motors were above flood level and the pumps had little or no suction head. This meant that in some instances the wells were deep, demanding long lengths of vertical shafting coupled together. In aligning this description of machinery the work was best carried out by means of very heavy plumb bobs and piano wires, and when the bottom plumb centre was found the wire was made fast to a support and tightly stretched. This was best done by drilling a fine hole in a rigid bar on the centre found by the plumb bob and then reeving the wire through this hole. It was a difficult matter to get a bob to remain steady at the end of a long length of line, but by using a bucket of water or even oil the bob came to rest much quicker and the oscillations were much less, particularly as the piano wires had no fibre to twist and untwist. When the wire was rigidly fixed at the top and bottom, the bearings should be fitted up and the brasses gauged from the hung wire, and as the shafting seldom exceeded 3in. in diameter, a steel rule with fine markings would be found a suitable gauge. When the bearings were rigidly bolted to the cross bearers the shafting should be placed in them and the couplings bolted together. On no account should the bearings be adjusted to the shafts. It is of primary importance that the truth of the shafting and couplings should be tried in a lathe, for, although in low revolution shafting, a slight error might be passed over, when the number of revolutions amounted to 1000 and over no risks could be taken, as the slightest divergence from the truth in the couplings set up a marked vibration in the lines of shafting and caused heated bearings and other troubles.

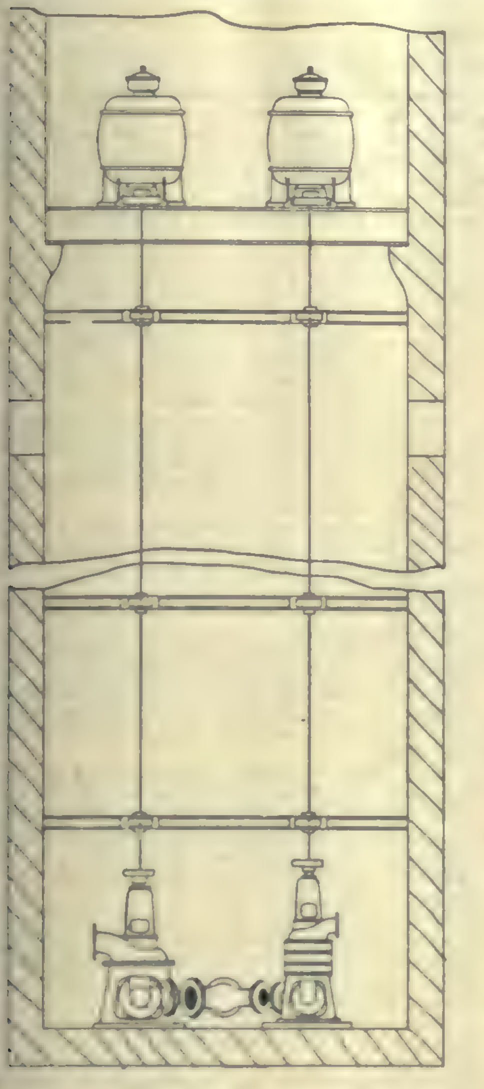


Fig. 5.

(To be continued.)

## N.S.W. RAILWAY AWARD.

The N.S.W. Railway Group No. 4 Board (Mr. H. Montgomerie Hamilton, barrister, chairman, with Mr. T. R. Johnson, Chief Commissioner for Railways, and Mr. W. Ainsworth, secretary of the Loco. Engine-drivers, Firemen, and Cleaners' Association) has made its award, the first of its kind in New South Wales, dealing with the employees of the Railway Service. The maximum hours of work per day for men on engines has been reduced from 12 to 10, with a limit of 55 hours during any one week. The interval to elapse between shifts is set down at 10 instead of 8 hours. Overtime, at the rate of time and a quarter, is provided for. Under the award, 2400 drivers and firemen receive 1s. per day extra, and 1000 cleaners 6d. per day extra. The additional cost to the Department will be £50,000 to £60,000 per annum. The maximum mileage per shift is 135 for goods trains and 160 for through passenger and express trains. Time allowances are made for preparing and putting away engines, for relief at outside stations, and outside loco. yards, and for special reports. The award is binding on the Chief Commissioner for Railways and Tramways and on all persons employed by him in the capacities mentioned, and runs for three years from date of being gazetted. Rates briefly are as follow:—

Cleaners, 4s. to 6s. 8d. per shift, according to age; adults 8s. 6d. per shift. Head cleaners, 10s. 6d. per day Eveleigh; 10s. elsewhere. Firemen, 9s. 6d. for first twelve months, 10s. for next 18, thereafter 11s. per day. Drivers, for the first 12 months, 12s. per day; second year, 13s.; third year, 14s.; fourth year, 15s.; thereafter, 16s. per day. Drivers of shunting engines, 12s. a day; locomotive cranes, 11s. Engine turners, 11s.

## IMPERIAL WIRELESS CHAIN.

In the course of a debate in the House of Commons last week on the proposal to renew the Government's contract with the Marconi Wireless Telegraph Co. for the construction of an Imperial chain of wireless stations, the Postmaster-General, Mr. Herbert Samuel, communicated to the House the opinions he had received that day from the engineer-in-chief at the Post-office, the inspector of wireless telegraphy (who was formerly in the service of the Admiralty, and is now with the Post-office), the president of the Institution of Electrical Engineers, and Lord Parker (the chairman of the Advisory Committee appointed in January), all declaring that it would not be advisable to invite tenders from the Poulsen and Goldschmidt companies at the present moment. Mr. Austin Chamberlain expressed a preference for the Postal Department carrying out the work for itself, a course which had already been hinted at by the Advisory Committee appointed by the Postmaster-General six months ago. That committee also said that in view of the rapid development of wireless telegraphy, it was undesirable that the Post-office should be pledged to the continued use of any apparatus now employed in any system; and they thought that by continuing experimental work at some of the stations, these might ultimately be equipped with apparatus far more efficient than any now used.

## PORT AUGUSTA TO OODNADATTA.

The Assistant Minister for Home Affairs (Mr. Kelly), Colonel Miller (secretary for Home Affairs), and Mr. H. Deane (Commonwealth engineer-in-chief), were passengers to Adelaide by the express train from Melbourne last Thursday, their object being to make final arrangements with the Government of South Australia with respect to the control of the railway line from Port Augusta to Oodnadatta.

It will be remembered that the Fisher Government, having failed to come to a satisfactory arrangement with South Australia, determined to purchase all the rolling-stock which would be required to carry on the service until a beginning was made to push the line towards the Northern Territory. The whole scheme involved an enormous expense, and its utility was not self-evident. Mr. Glynn, the new Minister for External Affairs, himself a South Australian representative, immediately on taking office, determined on a different line of action and negotiations were resumed, with the result that the Minister was able to announce last week that an agreement had been arrived at with South Australia by which the Federal Government would take over the management of the wharf at Port Augusta, while the State would have control of the railway. The Commonwealth undertook the responsibility of any loss that might be involved in the working of the line, and is to have a similar interest in profits (if any) that may accrue. The Commonwealth Government has undertaken to strengthen the wharf throughout, to build additional storage sheds, and to lay a double track of rails on the 4ft. 8½in. gauge to connect with the transcontinental railway depot. This will mainly be used in landing materials intended for the line across Australia.

## MISCELLANEOUS.

The Commonwealth Public Service Commissioner, Mr. D. C. McLachlan, invites applications from persons competent to take charge of wireless telegraphic stations. The stations at which positions are offering, and the salaries attached to them, are as follow:—Townsville, £264 to £312; Cooktown, £216 to £240; Rockhampton, £216 to £240; Thursday Island, £264 to £312; Mount Gambier, £216 to £240; Darwin, £216 to £240; Roebourne, £264 to £312; Broome, £216 to £240; Wyndham, £216 to £240; Esperance, £216 to £240; Geraldton, £216 to £240; Flinders Island, £216 to £240.

* * *

The Metropolitan Gas Company, Melbourne, will pay the increased dividend of 6s. 6d. per share for the last half-year, as compared with 5s. 6d. for the corresponding portion of the previous year and with 6s. per share for the intermediate period. Prior to 18 months ago the dividend was usually 5s. per half-year. The coming distribution will amount to £55,718, and is equal to 13 per cent. on par value of shares (£5). A few days before the amount of the dividend was decided upon the company announced a further reduction in the price of gas from 4s. 7d. to 4s. 4½d. per 1000ft.

The councillors of Maryborough (V.) are not disposed to sit quietly by and see an extension of railway workshops at Bendigo and Ballarat, whilst their own district is over-looked. At their last week's meeting, Councillor McDonagh brought under notice the Bendigo movement to obtain larger railway workshops, and suggested that Maryborough should move in a similar direction. Other councillors remarked that Maryborough was just as important a railway centre as Bendigo and Ballarat, and should have the same consideration. The matter was referred to a committee.

* * *

The secretary of the Tungamah Shire Council has been instructed to call for tenders for the loan of £3000 for the purpose of installing electric light and power for the town of Cobram.

* * *

It was announced in our last issue that the South Melbourne Council had dropped the scheme for an electric tramway to connect Middle Park with Prince's Bridge. We are informed by Messrs. McCarty, Underwood and Co., of 31 Queen-street, Melbourne, that such is not the case. On the contrary, that firm has been retained by the South Melbourne council to report on the proposed tramway, and has been busy on the report for the last week. The proposed route will be, roughly, 3¼ miles long, and will run from the south side of Prince's Bridge down Sturt-street, Eastern-road, Park-street, Clarendon-street, Albert-road, Kerford-road, Danks-street, and Patterson-street to Fraser-street.

* * *

Mr. Allan, in the absence of Mr. Griffith, N.S.W. Minister for Public Works, replying to a deputation regarding the Bombala-Nimitybelle railway, said everything was ready for the actual construction to be undertaken as soon as the money was available, but the Minister had pointed out the difficulty of obtaining loan funds at the comparatively small rates paid for Australian loans, and that unless some new method of obtaining funds was adopted it would be a considerable time before any new works could be undertaken. It was the Minister's intention to treat this as one of the three railway works which he would be prepared to start if ratification was given to the proposal by Parliament. Plant was available for the purposes of construction from the North Coast. As regards the question of the extension on to the Victorian border, an arrangement had been come to with the Victorian Government, by which such extension could be carried across the border on the same terms as were recently arranged with regard to the extension at Euston and Wentworth into New South Wales. That arrangement with the Victorian Government would be put before Parliament, covered by a Bill, in the forthcoming session.

* * *

At the ordinary general meeting of the Victorian Institute of Electrical Engineers to-night (24th), Mr. W. H. Alabaster will read a paper on Electric Cookery. Members are specially requested to attend prepared to discuss the subject. Country members are particularly invited to communicate any remarks they wish to make. The proceedings will include ballots for new members. There are two nominees for membership, viz., Messrs. Emanuel Josephs and Alan Griffiths Baly, and two for associateship—viz., Messrs. Chas. Clayton Gallop and Norman Barkly Webster.

* * *

The Secretary of the Federated Engine-drivers and Firemen's Association, giving evidence before the Arbitration Commission, urged that there should be restricted provision for variation of awards, and special reason for such an application should be tendered. Some members might consider that they would get improved conditions if they applied to a board, and would take the risk of applying.

* * *

The Granville (N.S.W.) Council is considering the question of adopting electric light for the borough, and is at present considering proposals from the Sydney City Council and the Parramatta Electric Lighting Supplies. Last week the Mayor and Aldermen visited Sydney and made an inspection of the City Council's plant.

* * *

The Bulli Shire electric light installation (writes our Wollongong correspondent) is now being extended to private houses. The Corrimal ratepayers, who are in the adjoining municipality of North Illawarra, are calling upon their Council to see about extending the light to them.

* * *

The Adelaide Electric Supply Co. last week informed the Melbourne Stock Exchange that the remaining 10,000 ordinary shares in the company would be offered to the holders of ordinary shares registered on July 23 at a premium of £3 per share. The allotment is to be made pro rata, avoiding fractions. The £3 per share premium is to be paid on application, and the balance of £5 on allotment on September 1. The transfer-books in connection with the issue close from July 23 to August 1, both dates inclusive.

**P & O. COMPANY'S ROYAL MAIL STEAMERS**
FOR MARSEILLES, PLYMOUTH, AND LONDON.

Leave Sydney on the subjoined dates, calling at usual ports.

FIRST AND SECOND SALOON ONLY.

| Steamer. | Tons. | Commander. | Noon. | Melb., 3 p.m. |
|---|---|---|---|---|
| MALOJA | 12,500 | Weston | July 26 | July 29 |
| MONGOLIA | 10,600 | Llewellyn | Aug. 9 | Aug 12 |
| MACEDONIA | 10,500 | Bennett | Aug. 23 | Aug. 26 |

PASSAGE MONEY TO LONDON—
Single, £41 16s to £82 10s.
Return, £69 6s. and £123 4s

Return Tickets between Inter-State Ports are available for return by Orient, Messageries Maritimes, and N.D.L. steamers having room.

SPECIAL HOLIDAY RETURN TICKETS to COLOMBO are now issued, available for two months. Fares from Sydney, £45 2s. first saloon, and £31 18s. second saloon.

A. GORDON WESCHE, Superintendent IN AUSTRALIA, 63 Pitt-street, Sydney.

**The COLONIAL MUTUAL FIRE Insurance Company Limited.**

Principal Office: 60 MARKET-ST., MELBOURNE

Branches in all the States.
Transacts Fire, Guarantee, Employers' Liability, Marine, Burglary, and Plate Glass, Accident, Workers' Compensation and Live Stock Insurances.
Send for Prospectus.
W. TUCKER, General Manager

**Harringtons LTD**

ANALYTICAL & METALLURGICAL DEPT.

Lowest fees for all kinds of Assay, Analytical, and Metallurgical work.

Expert Advice on Ore Treatment, Bullion Refining, Smelting, etc., etc. Directed by a qualified Analyst from Messrs. Johnson and Sons, London; Assayers to Bank of England; H.M. Mint, The Council of India, etc.

HARRINGTONS LTD.
386 George Street, Sydney.

## ELECTRIC PLANT ENLARGEMENT.

Owing to the ever-growing demand for electric light, heating and power around Melbourne, the Melbourne Electric Supply Company has found it necessary to greatly enlarge its plant by the addition of two large generating sets, each of 5000 kilowatts. The machines, which are single-phase turbo alternators, have been ordered from the Allgemeine Elektricitats Gesellschaft, of Berlin. They will be the largest machines of the kind in Australia, with the exception of a set used in connection with the Sydney tramway service, which goes up to 7000 kilowatts. The generators will be installed at the company's power house, at Richmond, and will bring the total capacity of the power house up to 19,000 kilowatts. One of the 5000 kilowatt sets will be regarded as a spare machine to be held in reserve in case of breakdowns, so that the normal power available and its general use will be 14,000 kilowatts, which, it is believed, will fully meet all requirements for some time to come. The delivery of the first set of machinery has been guaranteed within seven months, and the second set within six months after the delivery of the first, which is about half the time required by English manufacturers. The cost will be about £30,000.

---

In New Zealand the question of re-afforestation, which is everywhere becoming an important one as civilisation progresses, has been occupying the attention of a Royal Commission. The commission estimates the annual consumption in the Dominion to be 358,000,000ft., and expects it to be double that 35 years hence. The present rate of planting is 2566 acres, which would yield about four months' supply of timber only. It is, therefore, recommended that the extent of planting be increased to at least to two and a half times of that of the year 1911-12, that extensive areas be set aside as climatic reserves and scenic reserves; that timber on the Waipoua Kauri reservation be milled by the Crown for the people of New Zealand; that the Warawara Kauri forest be established as a national forest for the benefit of the people; and that there should be no restriction whatever imposed upon the exportation of white pine. The commission recommends that private persons planting trees should get them at cost price, that planting by private individuals should be encouraged by the remission of taxes, or otherwise, on a certain percentage of the total area of the estate which has been planted to the satisfaction of the Forestry Board, and that afforestation by local bodies should be encouraged.

# Tenders Invited and Accepted

**It is particularly requested that the information regarding contracts open, and the successful tenderers, be forwarded to The Editor not later than Monday of each week.**

The following contractions are used throughout:—S—supply; D—delivery; M—manufacture; C—construction; E—erection; P—purchase; I—installation; R—removal. Where no contractions appear, supply and delivery is understood. The date at the beginning of each paragraph refers to the closing of tenders.

## INVITED

### Commonwealth.

Specifications, tender-forms, etc., for tenders invited for the Postmaster-General's Department of the various States under this heading may be had as follows:—Victoria—Various State G.P.O.'s. New South Wales—Departmental Stores, Sydney, and various G.P.O.'s in other States. South Australia—Adelaide, Melbourne, Sydney and Brisbane G.P.O.'s. Western Australia—Departmental Stores, Perth, and various G.P.O.'s in other States. Queensland—Various State G.P.O.'s. All States—Various G.P.O.'s. If the Specifications, etc., may be had elsewhere in addition the places will be given in parentheses.

POSTMASTER-GENERAL'S DEPARTMENT, Melbourne. — 29th July. — Detectors, keys, staples, tongs and rosettes for table telephones, as per schedule No. 901.

29th July.—Sundries, as per schedule No. 893.

29th July.—Coach screws and spikes, as per schedule No. 904.

5th August.—13 ammeters, as per schedule No. 966. (See advertising columns.)

19th August.—105 miles of paper-insulated, lead-covered cable, as per schedule No. 906.

26th August. — 460 coin-collecting devices, electrically controlled, as per schedule No. 916.

26th August.—S. and D. of general stores, for a period of two years, from the 1st July, 1913, to the 30th June, 1915, as per schedule No. 912.

16th September.—S., D., E., and I., at the Telephone Exchange, Collingwood, Victoria, of a common battery switchboard, as per schedule No. 860, or an automatic, or semi-automatic, switchboard, as per schedule No. 859.

16th September.—Galvanised-iron piping and fittings, as per schedule No. 951.

23rd September.—Sulphate of copper, as per schedule No. 956, in the undermentioned quantities:—New South Wales, 140 tons; Victoria, 25 tons; Queensland, 55 tons, South Australia, 20 tons; Western Australia, 60 tons.

23rd September.—500 letter-box fronts, small size, as per schedule No. 957.

23rd September.—General stores, for a period of two years, from the 1st July, 1913, to the 30th June, 1915, as per schedule No. 913.

7th October.—S. and I. of electrically-driven machinery for operating pneumatic tube services, Central Telegraph Office, Melbourne, as per schedule No. 900.

14th October.—S. and E., at the Telephone Exchange, Melbourne, of a common battery multiple switchboard, as per schedule No. 868.

4th November.—D. and E. of eight automatic telephone switchboards at the Ascot, Canterbury, Malvern, Cheltenham, Footscray, Oakleigh, Sandringham, and Williamstown Telephone Exchanges, as per schedule No. 953.

POSTMASTER-GENERAL'S DEPARTMENT, Sydney.—30th July.—S., D., and E., at the Telephone Exchange, Sydney, of two sections of switchboard, common battery multiple, to form an extension to the existing common battery switchboard at the Telephone Exchange, Sydney, as per schedule No. 264.

6th August.—62,300 lineal feet of conduit (6 and 9 ducts), as per stores schedule N.S.W. No. 321.

13th August.—140 tons of bolts and nuts, as per stores schedule N.S.W. No. 313.

20th August.—575 detectors Q. and I., as per stores schedule N.S.W. No. 322.

27th August.—(1) Telephones to stores schedule N.S.W. No. 301; (2) switchboards to stores schedule N.S.W. No. 302; (3) lamps, electric, incandescent, to stores schedule N.S.W., No. 304.

15th October.—450 fire sheets (asbestos), as per stores schedule N.S.W. No. 326.

15th October. — Measuring instruments, to stores schedule N.S.W. No. 303; telephone parts, to stores schedule N.S.W. No. 314; switchboard parts, to stores schedule N.S.W. No. 315.

POSTMASTER-GENERAL'S DEPARTMENT. Perth.—30th July.—S. and D. of switchboard cable, to W.A. schedule No. 275.

30th July.—S. and D. of steel towers, battery material, wire and iron work generally, to W.A. schedules, Nos. 259, 262, 263, 268, and 269.

6th August.—S. and D. of insulators, telegraph and telephone material, and iron poles, to W.A. schedules, Nos. 258, 261, and 264.

6th August.—Screws, coach.

6th August.—One motor car to the Postmaster-General's Department in Western Australia, in accordance with schedule No. 302.

13th August.—About 20 tons of bolts and nuts to W.A. schdule No. 300.

20th August (extended from 6th August).—Cable, lead-covered, paper-insulated—telephone.

20th August.—2 tons of salammoniac, to W.A. schedule No. 301.

8th October.—Expansion bolts and shields to schedule No. 297.

POSTMASTER-GENERAL'S DEPARTMENT, Brisbane. — 30th July.—Cable, as per stores schedules Nos. 254 to 260 (omitting 258); wire, copper and accessories, as per stores schedule No. 267; wire, covered, as per stores schedule No. 268.

30th July.—Battery, glassware, as per stores schedule No. 252; battery material, chemicals, etc., as per stores schedule No. 253; conduits, earthenware, as per stores schedule No. 261; crossarms and spindles, wood, as per stores schedule No. 262; wire, steel strand, as per stores schedule No. 270.

27th August.—S., D., and E. at the Telephone Exchange, Brisbane, of five sections of switchboard, common battery, multiple, and other equipment to schedule No. 243, specification No. 458.

10th September.—Telephone Exchange, Brisbane, nine sections of a trunk line switchboard, to schedule No. 244, specification No. 461, and the general conditions, drawings, etc., attached thereto.

24th September. — Ironwork, as per stores schedule No. 264; pipes, cast iron, as per stores schedule No. 265; poles, iron, etc., as per stores schedule No. 266; wire, G.I., as per stores schedule No. 269.

POSTMASTER-GENERAL'S DEPARTMENT, Adelaide.—13th August.—Telephone parts, as per schedule No. 292, and switchboards, as per schedule No. 293.

12th November.—One lamp signalling trunk line switchboard, of five sections, one cable turning section, and one cable storing section, one two-position recording desk, and one chief operator's desk, as specified in specification No. 431, etc., delivered at the Telephone Exchange, Adelaide, as per schedule No. 296.

DEPARTMENT OF HOME AFFAIRS.—Federal Capital Power Plant.—15th September.—S. of sect. 1, main power-house switchgear; sect. 2, switchgear for Diesel engine plant.

DEPARTMENT OF HOME AFFAIRS.—Kalgoorlie-Port Augusta Railway.—29th July.—M., in Australia, S., and D. of car bodies for construction train; M., in Australia, S., and D. of car bogies for construction train.

2nd September.—M., S., and D. of 80 lb. steel rails and fishplates; M., S., and D. of iron dog spikes and steel fishbolts and nuts for 80 lb. rails.

DEPARTMENT OF HOME AFFAIRS. — Works Director for Victoria.—6th August.—

**Osborn's Truck Wheels & Axles**

**Osborn's Mushet High Speed Steel, Twist Drills, Mining Steels, Crusher Jaws and all classes of Castings.**

Samuel Osborn & Co. Ltd., Sheffield, are Standard Makers.

**Gibson, Battle & Co. Ltd.**

535 Kent St., Sydney. 486 Collins St., Melbourne.
S.A. Agent: C. C. Deland, Victoria Square, Adelaide.

S., f.o.w., or f.o.r., Geelong, of steel work for Commonwealth Woollen Mills, Geelong, Victoria.

DEPARTMENT OF EXTERNAL AFFAIRS.—Pine Creek to Katharine River Railway.—19th August.—S. 80 lb. steel rails and fishplates; sleepers, (a) steel (b) timber (Powellised); iron dog spikes and steel fishbolts and nuts for 80 lb. rails.

DEPARTMENT OF TRADE AND CUSTOMS.—26th August.—S. and D. of eight (8) automatic flashing lights.

DEPARTMENT OF DEFENCE.—28th July.—Period of supply, from 1st July, 1913, to 30th June, 1916—Metals, cord, tubing and wire cloth, for the Commonwealth Small Arms Factory, Lithgow, N.S.W.

25th August.—S. and E. of an oil storage tank at Garden Island, Sydney.

## Victoria.

VICTORIAN RAILWAYS.—24th July.—Cutter heads, for tenoning machine jacks (bottle).

24th July.—Chemical and laboratory apparatus.

24th July.—Mild steel boiler plates.

25th July.—Gun metal gate valves, ambulance material, taps and dies.

25th July.—M. and S. of bars, spanners, cold chisels, etc.

28th July.—Shovel handles.

30th July.—S. and D. of one electric-driven motor lorry chassis.

30th July.—Balls and ball races for 70ft. turntables.

30th July.—M., S., and D. of gun metal carriage fittings.

30th July.—S. and D., as ordered during the period ending 30th June, 1914, of brass symbols for trackmen's passes.

4th August.—Electrification of the Melbourne suburban railways—(a) circulating water and sump pumps, with motors; (b) air and water extraction pumps and motors; (c) surface condensers, hot wells, piping, and sundries.

6th August.—Steel channel bars.

13th August.—Best steel boiler plates for steel cranes, boilers, etc.

13th August.—30,000 lineal feet of wrought-iron steam pipe, 1in. diameter.

20th August.—C. and riveting of mild steel girders, etc., for first section, renewal of Moorabool Viaduct, Geelong to Ballarat line.

20th August.—C. and riveting of mild steel girders, etc., for second section, renewal of Moorabool Viaduct, Geelong to Ballarat line.

20th August.—C. and riveting of mild steel girders, etc., for third section, renewal of Moorabool Viaduct, Geelong to Ballarat line.

27th August.—Hollow chisels and bits.

3rd September.—S. of three petrol engines and pumps for use at Newport Workshops. (Fresh tenders.)

3rd September.—Steel faced machine knives.

3rd September (extended from 20th August).—M., S., and D. of (a) lathe, (b) sawing machine, (c) chisel mortiser, (d) cut-off machine, (e) moulding machine.

1st October (extended from 10th September).—Neutral track relays.

12th November.—Flame arc lamps.

VICTORIAN RAILWAYS COMMISSIONERS. State Coal Mines.—28th July.—S. of bridge Megger testing set; current transformer; direct current portable ammeter, alternating current portable indicating wattmeter.

28th July.—S. of electrical fittings and alligator belt lacing.

30th July.—S. of one 100h.p. induction motor. (See advertising columns.)

13th August (extended from 25th June).—S. of electrical equipment.

PUBLIC WORKS DEPARTMENT. — 31st July.—S. of 500 tons of wire for manufacture of wire netting at Penal establishment, Coburg.

STATE FORESTS DEPARTMENT. — 28th July.—M., D., and E., at the State Forests Timber Seasoning Works, Newport, in one contract, of one 6ft. 6in. diameter, high-class multitubular boiler.

## New South Wales.

PUBLIC WORKS DEPARTMENT. — 5th August.—M. cages for edible offal for new Public Abattoirs, Homebush Bay, Sydney (fresh tenders).

11th August.—Steel bridge for Macleay River, Wauchope to Kempsey section, North Coast railway.

11th August.—Steel bridges for Hastings River and flood channel, Wauchope to Kempsey section, North Coast railway.

11th August.—25 five-ton steel gantry cranes.

3rd September.—Efficient steam tugs for use at Bellinger River and Cape Hawke, from 1st November, 1913.

RAILWAY DEPARTMENT.—6th August.—S. of one live steam feed water-heater for Ultimo power-house.

20th August.—S. of a pneumatic ash handling plant for White Bay power-house.

15th October.—S. of 13 direct-current motors.

## South Australia.

RAILWAYS DEPARTMENT. — 5th August.—C. of 12 refrigerator vans, 5ft. 3in. gauge.

5th August.—C. of a tank with reinforced concrete wall, etc., about four miles from Minnipa.

5th August.—C. of 12 refrigerator vans, 5ft. 3in. gauge.

12th August.—M. of wrought iron details for waggons, 5ft. 3in. gauge.

12th August.—C. of five or ten class "K" locomotive boilers, 5ft. 3in. gauge, the principal material for which, as detailed in the specification, will be supplied by the Railways Commissioner.

PUBLIC WORKS DEPARTMENT. — 29th July.—Putting down of a bore for water in the hundred of Ettrick, about two miles north-east of Naturi railway siding.

5th August.—C. and E. of 52 sheds with 4 tanks, each in the hundreds of 499 and 502, about 30 miles south-east of Minnipa Hill.

ROADS AND BRIDGES DEPARTMENT.—24th July.—C. and D. of steelwork for Swan Reach ferry punt.

11th August.—C. of steelwork for Redbanks bridge on the Wasleys and Mallala main road.

## Western Australia.

GOVERNMENT TENDER BOARD.—31st July.—3520 pairs of fishplates for 46½ lb. material.

28th August.—Copper firebox tube plates for Railway Department.

## Queensland.

RAILWAYS DEPARTMENT.—29th July.—S. of 200 railway watches.

29th July.—S. of 5000 spiral bearing springs to code drawing No. 9. (See advertising columns.)

29th July.—S. of steel superstructure for three 149ft. 6in. spans for widening Bremer River bridge.

29th July.—S. of Muntz metal sheet, etc.

19th August.—General supplies for 1914 and 1915, for Northern Division, schedule No. 1 (fixed quantities), to be for year 1914 only; schedules Nos. 2 to 30, inclusive, are for two years.

26th August.—General supplies for the years 1914 and 1915, for the Southern and Central Divisions.

TREASURY DEPARTMENT.—29th October.—C. and E. of central sugar mill at Babinda Creek, North Queensland.

## New Zealand.

RAILWAYS DEPARTMENT.—31st October.—S. and D. of stores for the period from April 1, 1914, to March 31, 1917.

## General.

CITY OF MELBOURNE. — 29th July.—S. and D. of (a) two 5-ton motor-driven waggons, with tipping body; (b) two motor-driven street watering vans, at least 1000 gal. capacity; (c) one motor lorry, 1 ton; (d) one runabout motor car (to seat four persons).

1st August.—P. of scrap electric lead, accumulator materials, etc.

15th August.—P. of certain second-hand electrical plant and machinery, in accordance with specification obtainable at this office. (See advertising columns.)

9th September.—S. and D. of electricity recording meters and maximum demand indicators.

MUNICIPAL COUNCIL OF SYDNEY.—4th August (extended from 21st July).—S. of curve drawing ammeters and voltmeters, motor stairwall, and platform. (See advertising columns.)

CORPORATION OF HOBART (T.). — 28th July.—S. and D. of 10,000 hardwood sleepers (more or less).

4th August.—105 tons of straight cast-iron pipes, together with sundry special castings. (See advertising columns.)

CITY OF CHRISTCHURCH (N.Z.). — 7th August.—S. and E. of a 13-panel E.H.S. switchboard.

MUNICIPALITY OF NORTH SYDNEY. — 29th July.—S. and E. of refuse destructor, capable of dealing with 200 to 250 tons per week.

SHIRE OF SPRINGFIELD (V.) (H. C. White, Shire Secretary, Romsey).—25th July.—C. of a bridge, with (a) reinforced concrete, or (b) concrete abutments and steel girders and cylinders (3 spans of 40ft. each), over the Deep Creek at Darraweitguim.

METROPOLITAN GAS COMPANY (V.) (A. E. Bradshaw, Subst. Secretary Melbourne).—11th September.—P. of a total fixed quantity of 1800 tons of sulphate of ammonia, to be produced by this company during the twelve months ending 31st August, 1914.

MELBOURNE AND METROPOLITAN BOARD OF WORKS (Geo. A. Gibbs, Secre-

NORD DEUTSCHER LLOYD

REGULAR SERVICE TO EUROPE.

REDUCED FARES TO LONDON.

TO MANILA, CHINA AND JAPAN.

Via New Guinea and Yap.

Fares to Hong Kong, £40; II., £26.

Full particulars will be sent on application to—

LOHMANN AND CO., General Agents,
7-9 Bridge-street, Sydney.

Ostermeyer, Van Rompaey and Co., Melbourne; H. Muecke and Co., Adelaide; L. Ratazzi and Co., Fremantle; Thos. Brown and Sons Ltd., Brisbane.

The Mount Lyell Mining & Railway

CO. LIMITED.

Purchasers of Ores containing Copper, Gold and Silver. Rates obtainable on application to the Secretary

Manufacturers of Coke for Smelting and Foundry Purposes, Acids, Etc.

HEAD OFFICE—
39 QUEEN-STREET, MELBOURNE.

D. G. LUMSDEN,
Secretary.

THE

-PACIFIC CABLE BOARD-

Cablegrams should be Marked

"VIA PACIFIC."

(Not Charged for.)

The quickest and most accurate route for Cablegrams from Australasia to United Kingdom, Canada, United States, Germany, New Zealand, and Pacific Islands.

This route is owned by Great Britain, Australia, New Zealand, and Canada. Australia being the largest part owner (having one-third interest), the public are urged to support the National Cable.

RATES—

| | Ordinary. | Deferred. |
|---|---|---|
| UNITED KINGDOM | 3/- | 1/6 |
| GERMANY | 3/- | 1/6 |
| CANADA | 2/4 | 1/2 |
| UNITED STATES | 2/4<br>to 2/8 | 1/2<br>to 2/4 |
| NEW ZEALAND | 4½d. | Nil |
| FIJI | 8d | Nil |

DEFERRED RATES (IN PLAIN LANGUAGE ONLY) have now been arranged to most Countries where ordinary rate exceeds 10d. per word.

Enquiries for further information, pads of cablegram forms, maps and tariff cards, address to—

The Superintendent, SOUTHPORT, QUEENSLAND;
The Officer in Charge, 408 Collins-street, MELBOURNE; telephone 2588;
The Officer in Charge, 42 Hunter-street, SYDNEY; telephones, City 1346, City 3684;
J. Milward, Manager in the Pacific, 64 Pitt-street SYDNEY; telephones City 1346, City 3684.

Dunlop Mining Goods
Tenders & Samples submitted
Correspondence invited
Send for Illustrated Catalogue
The DUNLOP RUBBER Co. of AUS. Ltd
Flinders St. MELBOURNE.
Dunlop Rubber Belting
Is more efficient than Leather belting for Outdoor & Wet Work.
Sample & Price on application

Note this on every belt.

Be sure you get

"DICK'S"

We know there are numerous imitations. Dick's maintains its high reputation for strength and efficiency. Every belt guaranteed. Sole agents:

JAMES HARDIE & CO.
Melbourne and Sydney.

**Surveyors - Architects - Engineers**

will be interested to know that

**W. F. Stanley & Co. Ltd.,**

the greatest instrument-makers of Britain, are now adequately represented in Sydney. We have an enormous stock of Theodolites, Levels, Staffs, Ranging Rods, Drawing and Drafting Instruments, Ink Tracing Cloth and Paper; in fact, every necessity in connection with your profession. We are showing these in our special first floor showroom, and are selling these goods at the English Catalogue Prices, plus only duty and importing expenses 15 per cent.

*We will forward Catalogues upon application.*

**Fairfax and Roberts Ltd.,**

Sole Agents in New South Wales,

**23 and 25 Hunter Street, Sydney.**

tary—25th July.—M., S., and D. of 420 lineal feet of 36in. C.I. pipes, with 21 branches, bends and other special castings.

25th July.—S. and D. of one Venturi water meter for 36in. diameter pipe, with tube, pressure pipes, and recording apparatus complete.

29th July.—M., S., and D. of pipes, branches and bends, in vitrified stoneware, cement concrete, or reinforced concrete.

29th July. — S. and D., at the Metropolitan Farm, Werribee, of two steel wire plough ropes.

MELBOURNE HARBOUR TRUST COMMISSIONERS (V.) (J. H. McCutchan, Acting Secretary).—29th July.—S. and D. of 36 cast-iron bollards, with 144 bolts and 72 washer plates.

METROPOLITAN WATER AND SEWERAGE BOARD, Brisbane (Q.) (Geo. Johnston, Secretary).—31st July.—41,000 casks Portland cement, under contract No. 10, 1913; and 41,000 casks Portland cement, under contract No. 11, 1913.

METROPOLITAN WATER AND SEWERAGE BOARD, Brisbane.—12th August.—S. and D. of brass fittings.

MUNICIPAL TRAMWAYS TRUST, Adelaide (W. G. T. Goodman, Chief Engineer and General Manager).—29th July.—S. and D. of hardwood blocks.

29th July.—S. and D. of bonding material.

19th August.—M., S., and D. of steel poles.

Specifications relating to the S. and D. of copper cable and wire may be obtained on application to W. G. T. Goodman, Engineer and Manager. Tenders will be invited at 48 hours' notice, at a later date, and specifications are now issued to facilitate prospective tenderers obtaining quotations.

PRAHRAN AND MALVERN TRAMWAYS TRUST (V.) (W. O. Strangward, Secretary, 413 Colins-street, Melbourne).—4th August.—M., D., and E. of car bodies, contract No. 36a.

LAUNCESTON MARINE BOARD (T.) (Geo. S. Meredith, Secretary).—6th August.—S. of general stores and ironwork, which includes ropes, paint, and engine oil, leads, cotton waste, kerosene, motor spirit, shovels, brooms, soft soap, steel and wire nails, screw, dumb, and spike bolts, etc.

FRANKLIN COPPER AND LEAD MINING SYNDICATE N.L. (in liquidation) (A. G. Kimber, 29 National Mutual Buildings, King William-street, Adelaide, S.A.).—28th July.—P. of various mining machinery and tools.

BARWIDGEE BUCKET DREDGING CO. N.L. (in liquidation) (V.) (A. F. Showers, Liquidator, 31 Queen-street, Melbourne).—28th July.—P. of the company's bucket dredging plant, at Lower Buckland, including 75ft. pontoon, main engine, by Ruston and Proctor; multitubular boiler, 10ft. Tangye pump, tools and usual accessories, in good order.

NORTH CENTRAL PLATEAU CO. N.L., Sebastopol (V.) (J. H. Dill, Manager, 67 Queen-st., Melbourne).—28th July.—S. of a double 10in. winch plant (2 loose drums), boiler, poppet legs, etc.

SOUTH AUSTRALIAN SILICATE BRICK CO. LTD. (in liquidation) (S.A.) (E. M. Twiss, Liquidator, 12 and 13 Alma Chambers, Adelaide).—14th August.—P., as a going concern, of the whole of the machinery, plant, buildings, land (freehold, 30 acres), and stock (comprising about 714,000 bricks), of the above-named company, situate at Osborne, on the Outer Harbour line.

GISBORNE WATER WORKS TRUST (H. M. Hussey, Secretary, Gisborne, V.). — 25th July.—S. of 4in. C.I. pipes, valves, lead and yarn, and special castings.

TE AWAMUTU WATER SUPPLY (N.Z.).—21st August.—S. of cast-iron pipes and fittings; spiral steel pipes and fittings; drawn steel tubes and fittings.

SALVAGING CO. OF AUSTRALASIA PTY. LTD. (in liquidation) (E. McGregor, Liquidator, 369 Collins-street, Melbourne. — 26th July.—P. of assets and plant.

NEWCASTLE COAL MINING CO. LTD.—26th July.—D. on rail, Newcastle, one Lancashire boiler, 30ft. by 8ft., complete with fittings, pressure 120 lb. per square inch.

CO-OPERATIVE BRICK CO. PTY. LTD., 120 Queen-st., Melbourne (V.).—P. of one Tangye suction gas engine, 170i.h.p., and generator, complete; also one Tangye suction gas engine, 75i.h.p., and generator, complete.

ESTATE OF E. L. LLOYD (Executors, c/o Northmore and Hale, Solicitors, Howard-street, Perth, W.A.). — 31st August.—P. of mining leases, plant, etc. (See advertising columns.)

## ACCEPTED.

### Commonwealth.

POSTMASTER-GENERAL'S DEPARTMENT, Victoria.—1 Talbot motor car, £506 — Kellow Motor Co., Melbourne.

POSTMASTER-GENERAL'S DEPARTMENT, Western Australia.—34 covers and frames, cast iron, manhole, £1 16s. 6d. each; 290 steps, wrought iron, manhole, 1s. 4d. each—R. Kennedy and Sons, Hobart.

20 miles wire, tinned copper, No. 20 L.S.W.G., rubber insulated, cotton covered and braided, assorted colours, £3 19s. per mile—W. T. Henley's Telegraph Works Co. Ltd., Melbourne.

POSTMASTER-GENERAL'S DEPARTMENT, Tasmania.—1 mile cable, lead covered, 4 pairs, £51; 4 miles cable, lead covered, 26 pairs, £692; 3 miles cable, lead covered, 52 pairs, £771; ½ mile cable, lead covered, 104 pairs, £189; ¼ mile cable, switchgoard, 104 pairs, £118 — British Insulated and Helsby Cables Ltd., Melbourne.

500 bottles ink, black, for telegraph instruments, £8 17s. 1d.—Joplin Manufacturing Co. Ltd., Sydney.

25 detectors, £71 17s. 6d.—British General Electric Co. Ltd., Melbourne.

1000 zincs, Leclanche, £8 6s. 8d; 500 pots, porous, Leclanche, £13 0s. 5d.; 10 cwt. sulphate of magnesia, £3 16s. 8d.—India Rubber, Gutta Percha, and Telegraph Works Co. Ltd., Melbourne.

3000 sleeves, jointing, £16 15s.; 2000 sleeves, jointing, £6 5s. — Frank Brazil Cook, Chicago (Agents—A. J. Todd and Co., Collins-street, Hobart).

5 miles wire, twisted pair, outside distributing, £95—Theodore Zwicker and Co., Melbourne.

5 miles wire, twisted pair, tinned annealed copper, £65 5s.; 20 miles wire, tinned copper, vulcanised indiarubber, £128 — Armorduct Manufacturing Co. Ltd., London (Agents — Ford, Rhodes, and Ford, Queen-street, Melbourne).

5 miles cable 2-wire V.I.R., copper conductors, £122 10s.—Callenders' Cable and Construction Co. Ltd. (Agents—Noyes Bros. (Melbourne) Pty. Ltd., Melbourne).

490 protectors, £80 — British General Electric Co. Ltd., Melbourne.

100 cords, 4-conductor, £7 10s—India Rubber, Gutta Percha, and Telegraph Works Co. Ltd., Melbourne.

1000 cords, 2-conductor, £20 16s. 8d.; 100 cords, 4-conductor, with ebonite button, £5 — British Insulated and Helsby Cables Ltd., Melbourne.

150 registers, electrical, £132 10s.; 1000 cords, 2-conductor, £18 15s.; 100 cords, 4-conductor, £5—J. Bartram and Sons Pty. Ltd., Melbourne.

10,000 tapes, copper, £20 2s. 6d.; 10 tons wire, galvanised iron, £113 15s.; 5 tons wire, bronze, £439 13s. 9d.; 5000 tapes, copper, £3 18s. 4d.; 15,000 tapes, copper, £11 1s. 3d.; 4000 sleeves, jointing, £8 10s.; 3000 sleeves, jointing, £6 17s. 3d.; 3 tons wire, steel, £50 5s.—F. Vanderkelen and Co., Melbourne.

1 ton wire, G.I., tie, £17 14s. 3d.—Johnson, Clapham, and Morris, Sydney.

10,000 binders, copper, £29 3s. 4d.; 5000 binders, copper, £8 19s. 2d.; 15,000 binders, copper, £20 12s. 6d.—India Rubber, Gutta Percha and Telegraph Works Co. Ltd., Melbourne.

POSTMASTER-GENERAL'S DEPARTMENT, Queensland.—In lieu of notification which appears on page 522 of "Mining Standard," June 19, 1913, relative to the acceptance of the tender of the Australian Metal Co. Ltd., Melb., for supply of copper tapes under items 8, 9, and 10 of stores schedule No. 245, the following is substituted:—12,000 copper tapes, for use with 200 lb. wire (item 8), £2 3s. per 1000; 6000 copper tapes, for use with 100 lb. wire (item 9), 17s. per 1000; 22,000 copper tapes for use with 70 lb. wire (item 10), 16s. per 1000—Brabant and Co., Brisbane.

DEPARTMENT OF HOME AFFAIRS. — S. of general electric protective apparatus for the overhead lines in connection with the power supply for Canberra, Federal Territory, N.S.W., £447 10s.—The Australian General Electric Co., Melbourne.

### Victoria.

PUBLIC WORKS DEPARTMENT. — Electric wiring, Administrative and Stores Block, Hospital for Insane, Mont Park, £105 15s.—The Silverton Telegraph Works Co.

Installation of air gas plant, Government Cottage, Macedon, £156—Quirk's Lighting and Engineering Ltd.

VICTORIAN RAILWAYS.—Cement, as ordered, during the period commencing on the 1st July, 1913, and ending on the 30th June, 1914, at 12s. 9d. per cask—The Australian Portland Cement Co. Pty. Ltd.

Pig iron, at £5 14s. 9d. per ton—Thos. McPherson and Son.

Block tin, at £220 15s. per ton—Pioneer Tin Mining Co. Ltd.

Steel blooms, at £12 per ton (not publicly advertised)—J. E. Strahan.

Self-contained non-relieving single track truck weighbridges, at £255 each, delivered at the Metropolitan Ironworks' Shop at Spencer-street railway station—Gibson, Battle, and Co. Ltd.

Self-contained non-relieving double track weighbridges, at £327 10s. each, delivered at the Metropolitan Ironworks' Shop at Spencer-street railway station—Gibson, Battle, and Co. Ltd.

### Western Australia.

RAILWAYS DEPARTMENT.—Linseed oil, item 1192, 17s. 1d.; item 1193, 17s. 11d. (schedule No. 148a)—Elder, Shenton and Co. Ltd.

Pressed steel trolley wheels, £2 2s. 6d. per pair—Davis, Hankinson and Co.

Metal filament lamps, item 57, 2s. 8½d. each; item 58, 7s. 6d. each; item 59, 6d. each (schedule No. 13a)—Imperial Electric Engineering Co. Ltd.

PUBLIC WORKS DEPARTMENT.—Electric lift, Perth Hospital, £428 16s.—Unbehaun and Johnstone.

### General.

MELBOURNE AND METROPOLITAN BOARD OF WORKS.—10 tons of 3in. and 20 tons of 5in. cast-iron water pipes of Australian manufacture, £267 10s.—John Danks and Son Pty. Ltd.

20 cast-iron hatch boxes, £327 10s.—J. and T. Muir.

FITZROY CITY COUNCIL. — One 4-ton "Kommer" motor waggon, £870 — Tarrant Motor Pty. Co. Ltd.

## ROYAL MINT RETURNS.

### Sydney Branch.

The fine gold received for coinage at the Sydney branch of the Royal Mint last month and during the last half-year, was:—

| | June.<br>Fine oz. | Since 1st Jan.<br>Fine oz. |
|---|---|---|
| New South Wales .. | 9,332.07 | 52,920.44 |
| Queensland .. .. .. .. | 10,091.12 | 119,247.67 |
| New Zealand .. .. .. | 2,505.20 | 91,649.85 |
| Victoria .. .. .. .. .. | 77.97 | 77.97 |
| South Australia .. .. | nil | nil |
| Northern Territory .. | 58.24 | 140.47 |
| Tasmania .. .. .. .. | 90.98 | 138.20 |
| Western Australia .. | nil | 158.49 |
| Papua .. .. .. .. .. | 903.99 | 7,490.25 |
| Other Countries .. .. | 94.42 | 127.02 |
| Coin .. .. .. .. .. .. | 23.25 | 306.61 |
| Total .. .. .. .. | 23,177.24 | 272,256.97 |

Gross value of the above—£98,450 11s. 10d., £1,156,473 5s. 11d.

---

A licence under the new Explosives Act of 1905 has been granted to Messrs. Elliott Bros., Sydney, for the manufacture of rackarock at Rozelle. Mr. C. R. Mannell, Hilldale, has been granted a licence to manufacture rendrock.

## Commonwealth of Australia.

Postmaster General's Department,
Melbourne, 21st July, 1913.

TENDERS will be received at the Office of the Deputy Postmaster-General, MELBOURNE, until 3 p.m. on the 5th August, 1913, for the supply and delivery of 13 Ammeters. (S. 966.) See "Commonwealth Gazette," 19th July.

AGAR WYNNE,
(1232) Postmaster-General.

---

## Government Notices (V.).

Department of Public Works,
Melbourne, 15th July, 1913.

TENDERS will be received until Twelve o'clock on THURSDAY, the 31st JULY, for SUPPLY of 300 TONS of WIRE, for manufacture of wire netting at Penal Establishment, Coburg. Deposit, £50.

Particulars and conditions may be learnt at this Office. The lowest or any tender not necessarily accepted.

F. HAGELTHORN,
Commissioner of Public Works.

---

State Forests Department,
July 18th, 1913.

STATE FORESTS DEPARTMENT Melbourne.

TENDERS are invited for the MANUFACTURE, Delivery, and Erection, at the State Forests Timber Seasoning Works, Newport, in one position, of one (1) SIX FOOT SIX INCH DIAMETER HIGH-CLASS MULTITUBULAR BOILER. Tenders returnable at noon 28th of July, 1913, with £10 deposit enclosed, addressed to the Conservator of Forests, marked "Tender for Boiler." Plans may be seen at the Office of the engineer, I. W. Howard, 352 Collins-street, Melbourne, on Tuesday, Wednesday, and Thursday mornings.

H. MACKAY,
Conservator of Forests.

---

VICTORIAN RAILWAYS COMMISSIONERS.

STATE COAL MINES.

INDUCTION MOTOR.

TENDERS endorsed, "Tender for Induction Motor," to be addressed to the General Manager, State Coal Mines, Wonthaggi, and delivered at his Office at Wonthaggi, not later than 12 noon of 30th JULY, are invited for the SUPPLY of ONE 100 H.P. INDUCTION MOTOR, P.D. £2. Particulars and forms of tender at the Melbourne Office of the State Coal Mines, Robb's Buildings, Collins-street, and at the Office of the General Manager, Wonthaggi.

No tender will necessarily be accepted.

C. H. BROOME,
General Manager.

---

## CITY OF MELBOURNE.

Offers are invited for the purchase of certain SECONDHAND ELECTRICAL PLANT and MACHINERY, in accordance with specifications, obtainable at this Office.

Offers will be received until noon on 15th August for all or any portion of the plant.

Plant may be inspected upon application at the Office of the City Electrical Engineer, Town Hall.

JOHN CLAYTON,
Town Clerk's Office, Town Clerk.
Town Hall, Melbourne,
[illegible] July, 1913.

---

## ZEEHAN SCHOOL OF MINES.

APPLICATIONS are invited for the position of Lecturer in Chemistry (Theoretical and Analytical), Assaying, Geology, Metallurgy, and other subjects as may be required.

Salary, £325 per annum.

Applications, with copies of credentials, to be forwarded to the undersigned on or before August 2nd, 1913.

J. HARRISON,
Chairman.
Zeehan, Tasmania.

---

## Government Notices (Q.).

QUEENSLAND RAILWAYS

Commissioner for Railways Office,
Brisbane, 14th July, 1913.

SUPPLY OF SPIRAL BEARING SPRINGS.

FRESH TENDERS will be received at this Office until 2 p.m. on TUESDAY, 29th JULY, 1913, for the Supply of FIVE THOUSAND (5000) SPIRAL BEARING SPRINGS TO CODE DRAWING No. 9.

Tenders to be endorsed, "Tender for Springs," and accompanied by a preliminary deposit equal to one (1) per cent. of the amount of the tender (the minimum being £5).

Drawings and specification may be seen, and any further information obtained, at the Locomotive Offices at Ipswich and Brisbane, and at the Offices of the Secretaries to the Railway Commissioners at Sydney and Melbourne.

The lowest or any tender will not necessarily be accepted.

By Order of the Commissioner for Railways,

ARTHUR J. CROWTHER,
Secretary.

---

## MUNICIPAL COUNCIL OF SYDNEY.

OXFORD STREET LEASE.

CRECY HOTEL SITE.

TENDERS are invited for the LEASE of the Site at the Corner of OXFORD STREET and PALMER STREET, as shown on the Plan, to be seen at the Office of the Comptroller of Assets, Town Hall, Sydney.

The Lease will contain a Building Covenant of £5000 (Five Thousand Pounds), and no bonus will be required for the licence.

Term of Lease, Thirty Years (30 years).

Further particulars and Form of Tender and conditions of sale may be obtained from the Comptroller of Assets, Town Hall, Sydney.

Tenders, endorsed "Lease of Hotel Site, Oxford-street," to be deposited with the Town Clerk on or before 3 p.m. on WEDNESDAY, the 6th August, 1913. A deposit of £500 (Five Hundred Pounds) to be lodged with the City Treasurer on or before the date named, and any tender which may be accepted will be subject to the plan of the proposed building being approved by the City Council, and also by the Licensing Court.

TENDERERS, please note that they must pay their CASH DEPOSITS direct into the City Treasury, and NOT enclose same with their Tenders, otherwise their Tenders will be rejected as INFORMAL.

THOMAS H. NESBITT,
Town Hall, Sydney, Town Clerk.
8th July, 1913.

---

## MUNICIPAL COUNCIL OF SYDNEY.

IMPORTANT TO CONTRACTORS.

NOTICE is hereby given that the time for the receipt of TENDERS for the SUPPLY and DELIVERY of CURVE DRAWING AMMETERS and VOLT METERS has been extended from MONDAY, the 21st instant, until MONDAY, the 4th August, 1913, at 3 p.m.

THOMAS H. NESBITT,
Town Hall, Sydney, Town Clerk.
July 16th, 1913.

---

## MUNICIPAL COUNCIL OF SYDNEY.

TO CONTRACTORS.

SEALED and ENDORSED TENDERS will be received by the undersigned until 3 o'clock p.m. on TUESDAY, the 5th AUGUST, 1913, for the SUPPLY and DELIVERY of THREE MILD STEEL BODIES FOR MOTOR WAGGONS.

Copies of specifications, etc., may be seen or obtained upon application at the office of the City Surveyor, Town Hall, Sydney.

The lowest or any tender not necessarily accepted.

TENDERERS, please note that they must pay their CASH DEPOSITS direct into the City Treasury, and NOT enclose same with their Tenders, otherwise their Tenders will be rejected as INFORMAL.

THOMAS H. NESBITT,
Town Hall, Sydney, Town Clerk.
19th July, 1913.

---

## WANTED.

A FIRST-CLASS MILL MAN

familiar with

MILLING PRACTICE,

must thoroughly understand

MINING AND MILLING MACHINERY,

capable of handling men. Good salary paid to right man. References required.

Address—

Z, "Australian Mining Standard,"
Melbourne or Sydney.

---

## CORPORATION OF HOBART.

TENDERS FOR CAST-IRON PIPES.

SEALED TENDERS, addressed to the Mayor and Alderman, and superscribed as above, will be received at my Office until 4 o'clock p.m. on MONDAY, August 4th, for One hundred and five (105) Tons of STRAIGHT CAST-IRON PIPES, together with sundry special castings.

Full particulars obtainable on application at the Office of the Director of Waterworks.

**No Tender will be entertained unless sent in on printed form to be supplied, and accompanied by a deposit of Fifty Pounds (£50) in bank draft or marked cheque.**

**The lowest or any tender not necessarily accepted.**

W. A. BRAIN,
Town Clerk.
Town Clerk's Office,
Town Hall, Hobart,
July 5th, 1913.

---

## THE CARPATHIA TIN-MINING Company No Liability.

NOTICE is hereby given that the Directors have this day resolved that a DIVIDEND (the Second) of One Shilling (1s.) per Share be declared on all the Shares issued in the Company, payable at the Company's Office, No. 109 Pitt-street, Sydney, on and after THURSDAY, July 31st, 1913.

The Transfer Books of the Company will be CLOSED from 22nd to 31st July, 1913, both days inclusive.

By Order of the Board,
R. VERNON SADDINGTON,
Secretary.
Sydney, July 14th, 1913.

---

## BLACK RANGE MINING COMPANY No Liability.

A DIVIDEND (the 82nd) of One Shilling per share has been DECLARED, payable at the Company's Office, 47 Queen-street, Melbourne, on Friday, 15th August, 1913. Transfer books close on Friday, 8th August, 1913, at 4 o'clock p.m. until after date of dividend. WM. JACKSON, Manager.
Office, 47 Queen-street, Melbourne.

---

## THE CENTRAL RED, WHITE, AND Blue Mining Company, No Liability.

A DIVIDEND (the 39th) of Two Shillings per share has been DECLARED, payable at the Company's Office, City Chambers, High-street, Bendigo, and at the Bank of Victoria, Collins-street, Melbourne, on THURSDAY, 24th JULY, 1913. Transfer-books close on Tuesday at noon. J. H. McCOLL (McColl and Rankin), Manager.

---

## THE UNION BANK OF AUSTRALIA Limited.

Established 1837. Incorporated 1880.

| | |
|---|---|
| Paid up capital | £1,500,000 |
| Reserve fund | £1,500,000 |
| Together | £3,000,000 |
| Reserve liability of proprietors | £3,000,000 |
| | £6,000,000 |

A DIVIDEND of £1 5s. per share and a BONUS of 10s. per share, together equal to 14 per cent. per annum, having been declared at the Meeting of Proprietors held in London on 21st July, 1913, the same are NOW PAYABLE to Shareholders on the Colonial Registers on 30th June, 1913.

ALFD. H. CHAMBERS,
For the GENERAL MANAGER.
Melbourne, 22nd July, 1913.

## ESTATE OF E. L. LLOYD.

TENDERS are invited for the purchase of:—

(a) That well-known group of Mining Leases at Cue, on the Murchison Goldfield, Western Australia, comprising 30 acres, and known as "The Light of Asia" Mine, with Mining Leases 1148, 1151, 1252, 1362, 1498, and 1634, known as Light of Asia, Queen of the May, Queen of the May Extended, Asia Block, Queen of the May Extended No. 1, Light of Asia South Extended, together with the following plant:—

Poppet Head, Wire Rope, Pulley Wheel, Jackass Boiler (Langlands), Vertical Boiler (Norwood), Winding Engine Steam Pump, Tram Rails, Ore Bin.

(b) Gold Mining Leases Nos 1833 and 1858, known as Agamemnon and Agamemnon West, comprising 18 acres, situate at Cue aforesaid, on the Murchison Goldfield, together with the following plant:—

1 Vertical Boiler and Winder (Marshall and Sons), Poppet Head, Wire Rope, Pulley Wheel, 350 feet of 2in. Piping, Tram Rails, 3 Kibbles, 1 Baling Bucket, ½ ton Steel, Blacksmith's Shop, and Quantity of Tools.

(c) Tailings Area No. 11, and quantity of tailings situate at Monaro Gully, near Cue.

**Particulars and conditions of Tender,** working plans, etc., may be inspected at the Offices of the undersigned, and at the Office of Mr. A. Mitchell, Cue.

**The lowest or any tender not necessarily** accepted.

Each Tender must be accompanied by bank **cheque for £100.**

Tenders close the 31st day of August, 1913.

Mines may be inspected and sampled at any **time upon written authority from the undersigned, or Mr. A. Mitchell, at Cue.**

Tenders must be addressed to the Executors, c/o. NORTHMORE & HALE, Solicitors, Howard-street, Perth, Western Australia.

## DIAMOND CREEK GOLD MINING Co. No Liability, Diamond Creek.

NOTICE is hereby given that the Sixteenth HALF YEARLY GENERAL MEETING of Share**holders in the above Company will be held at the** Office of the Company (6th floor), Broken Hill Chambers, 31 Queen-street, Melbourne, on WEDNESDAY, 30th JULY, 1913, at 12 o'clock noon.

BUSINESS.—1. To receive and adopt Reports and Balance Sheet for Half year ending 18th July, 1913. 2. To elect Directors. 3. To elect Auditors. 4. To transact any other general business **that may be lawfully brought forward.**

GEO. B. GORDON, Manager.

**31 Queen-street, Melbourne, 22nd July, 1913.**

N.B. Nominations for the position of Director to be lodged at the Office not later than 12 o'clock noon on Saturday, 26th July, 1913. **Proxies must be lodged at the Office not later than** 12 o'clock noon on Tuesday, 29th July, 1913.

Books close on Saturday, 26th July, 1913, at 12 o'clock noon until after the meeting.

## NEW SALAK STH. TIN DREDGING Company No Liability.

NOTICE is hereby given that the Office of the New Salak South Tin Dredging Company No Lia**bility is at 317 Collins-street, Melbourne, and that Arthur Septimus Carroll has been appointed Mana**ger of the said Company.

Dated this 22nd day of July, 1913.

J. HODGSON, A, CLARKE. Directors. (Seal.)

## ALFRED RONALDS.

**Will the relatives and friends of the late Alfred Ronalds (author of Ronalds' "Fly-Fisher's Entomology") please communicate with—**

**Critchley Parker,**

**"Mining Standard,"**
**Melbourne or Sydney.**

## DIVIDENDS.

The following dividends and bonuses of mining companies in Australia have been declared, and **are payable on the dates noted:—**

**July.**

24th.—Barrier Wharf (N.S.W.), 10 per cent. **p.a. and supplementary 5 per cent. p.a., £3195.**

**24th.—Central Red, White and Blue, Bendigo (V.), 2s., £3200.**

24th.—Princess Dagmar, Bendigo (V.), 1s., £1700.

**24th.—Associated Gold Mines (W.A.), 6d., £12,500.**

**25th.—Wandiligong Dredge (V.), 1s., £300.**

**29th.—Ivanhoe Gold Corp., Kalgoorlie (W.A.),** 3s. 6d., £35,000.

31st. Ajax Central, Bendigo (V.), 1s. 6d., £2250.

**31st.—Blair Athol Coal (Q.), 6d.**

31st. Carpathia Tin, Ardlethan (N.S.W.), 1s.

**August.**

9th.—Amalgamated Zinc, 1s. 6d., £37,500.

13th.—Associated Northern Blocks, Kalgoorlie **(W.A.), 1s., £17,500.**

15th.—Tongkah Compound, Siam, 1s. and **bonus 2s., £7500.**

**20th.—Broken Hill Proprietary (N.S.W.), 1s., £48,000.**

---

It is reported at Selwyn, in the Mt. Elliott district, North Queensland, that a miner named Adams and his mate have discovered an important copper formation situated between Selwyn and Friesland. The outcrop is 9ft. wide and has been **followed for over 80ft. The discoverers took out** more than 3 tons of ore which is estimated to **contain 30 per cent. of copper.**

Stocks of explosives in store in public maga**zines in Sydney and Newcastle on 1st July were 11,473 lbs. sporting powder, 530,888 lbs. blasting** powder, 884,620 lbs. nitro-glycerine compounds, and 38,645 lbs. other explosives. During June there were issued 2054 lbs. sporting powder, **82,600 lbs. blasting powder, 135,900 lbs. nitroglycerine compounds, and 16,640 lbs. other explo**sives.

---

ONE HUNDRED AND THIRTIETH HALF-YEARLY REPORT OF

# THE COMMERCIAL BANKING COMPANY OF SYDNEY LIMITED.

Presented to the Shareholders at an Ordinary General Meeting, held at the Head Banking House, George-street, Sydney, on Friday, July 18, 1913.

The Directors submit to the Shareholders a Balance-sheet showing the Liabilities and Assets of the Bank on the 30th June, 1913, and present the following Report:

The balance at the credit of Profit and Loss Account, after deducting rebate on current bills and accrued interest on fixed deposits, reducing premises account, paying Note and other taxes, and providing for bad and doubtful debts, as well as granting to the officers a bonus on their salaries, amounts to £194,370 12s. 11d., out of which the Directors recommend the following appropriations:

| | | |
|---|---|---|
| To Payment of a Dividend for the half year at the rate of 10 per cent. per annum | £87,382 19 4 | |
| ,, Transfer to Reserve Fund | 50,000 0 0 | |
| ,, Balance being undivided Profit | 56,987 13 7 | |
| | | £194,370 12 11 |

This Meeting is called upon to elect a Director, consequent on the retirement, in terms of the Articles of Association, of A. J. Onslow Thompson, Esq., who is eligible for re-election, and has given the requisite notice that he is a candidate for the office. It also rests with the meeting to appoint Auditors **for the ensuing year.**

During the half-year a Branch has been established at Byron Bay, in this State, while the Branch at Gladfield, in the State of Queensland, has **been closed.**

The Dividend is now payable.

GEORGE J. COHEN, Chairman.

### LIABILITIES AND ASSETS.

(Including London Branch to 30th June, by Cable.)

| Dr. | | |
|---|---|---|
| Capital | £1,750,000 0 0 | |
| Reserve Fund | 1,580,000 0 0 | |
| Reserve Capital | 1,750,000 0 0 | |
| | £5,080,000 0 0 | |
| To Capital Paid-up | £1,750,000 0 0 | |
| ,, Reserve Fund | 1,580,000 0 0 | |
| | | £3,330,000 0 0 |
| ,, Notes in circulation | | 30,707 0 0 |
| ,, Bills in circulation | | 957,594 0 0 |
| ,, Deposits and other liabilities | | 20,013,372 7 8 |
| ,, **Profit and Loss Account** | | **194,370 12 11** |
| | | £24,526,044 5 4 |

| | | Cr. |
|---|---|---|
| By Coin and bullion in hand | £3,462,813 18 3 | |
| ,, Cash at Bankers | 123,364 14 11 | |
| ,, Australian Commonwealth Notes (Legal Tender) | 517,135 10 0 | |
| ,, Money at short call in London | 1,505,000 0 0 | |
| ,, British Consols and Government and Municipal Securities | 2,491,325 0 0 | |
| ,, Bills Receivable in London and Remittances in Transit | 1,860,405 19 4 | |
| ,, Notes and bills of other banks | 32,496 16 9 | |
| | | £9,992,541 19 3 |
| ,, Bills discounted, and all debts due to the Bank | | 13,993,999 6 1 |
| ,, Bank premises, furniture, etc. | | 539,503 0 0 |
| | | £24,526,044 5 4 |

### PROFIT AND LOSS ACCOUNT.

| | |
|---|---|
| To Dividend Account for payment of a Dividend for past **half-year at the rate of 10 per cent. per annum** | £87,382 19 4 |
| ,, Reserve Fund | 50,000 0 0 |
| ,, Balance of undivided profit carried to next half-year | 56,987 13 7 |
| | £194,370 12 11 |

| | |
|---|---|
| By Amount undivided for last half-year | £60,248 12 7 |
| ,, Profit for half-year ended 30th June, 1913 | 134,122 0 4 |
| | **£194,370 12 11** |

### RESERVE FUND.

| | | |
|---|---|---|
| 1913 June 30th | £1,580,000 0 0 | |
| By Transfer from Profit and Loss Account | 50,000 0 0 | |
| | | £1,630,000 0 0 |

Sydney, 11th July, 1913. GEORGE J. COHEN, Chairman. T. A. DIBBS, General Manager. W. R. SAYERS, Accountant.

We hereby certify that we have examined the bills, compared the balances, and counted the coin in the Head Office of THE COMMERCIAL BANKING COMPANY OF SYDNEY, LIMITED, and have compared the returns of the Branches, and have found the same as specified in the foregoing Balance-sheet.

E. S. CAPE, W. L. DOCKER, Auditors.

The following resolutions were carried unanimously:—

"That the Report and Statements of Account be received and adopted, and ordered to be circulated among the Proprietors."

"That A. J. Onslow Thompson, Esq., be re-elected a Director of the Bank."

"That E. S. Cape, Esq., and F. W. Hixson, Esq., be appointed Auditors for the ensuing year."

"That the thanks of the Shareholders be presented to the Directors, General Manager, and Officers of the Bank for their very satisfactory management of the affairs of the institution."

T. A. DIBBS, General Manager.

In moving the adoption of the Report, the Chairman, Mr. George J. Cohen, said:

"I am pleased to say that the Directors are again enabled to present to you a satisfactory Balance-sheet, and though the stringency in the money market, that I referred to at our last meeting, has been somewhat intensified with a consequent restriction in business, yet I think you will agree with me that the result of our operations for the past half year is gratifying. Naturally, there has been contraction in our figures, but without decrease in strength.

"In comparing the figures with those of June last year, I would first mention that, by payment of final instalments, our capital paid up now stands at £1,750,000, the limit authorised by general meeting. During the same period the Reserve Fund has been increased by £80,000, and if we take into consideration the appropriation recommended to-day, it will stand at £1,630,000.

**"Notes in circulation show a reduction of £18,000, and you will observe that** only about £30,000 remain unpresented.

"During the period under review, our deposits have decreased by £810,000, which is more than accounted for by reduced Government balances and the **withdrawal of Federal Government moneys at the beginning of the present year, to the extent together of over £1,100,000. In connection with this item I** may mention that our Fixed Deposits have increased during the twelve months, while our Current Accounts, though less in amount for the reasons stated, are much larger in [illegible]

"Profit and Loss shows a satisfactory increase of £24,000, and our total reserved profits will now stand at £1,687,000.

"These variations cause a net contraction in our total figures of £657,000.

"Our total Liquid Assets show a reduction of £275,000, yet, notwithstanding **this, the ratio of these assets to our total liabilities to the public is over 47 per cent., practically the same as it was a year ago.**

"Our lendings have been reduced by £384,000.

"The last item, Bank Premises Account, shows an increase of only a little over £2000, although we have expended a considerable sum in land and new buildings.

**"Realising how greatly the success of the Bank is dependent on the efficiency of the staff, and desiring that the officers should feel that their efforts are** appreciated, the Board have again voted them a bonus. In addition, special consideration has been given to the pay of the staff, and, as a result, the Board have fixed upon a tariff of salaries and increases on a scale more liberal **than has hitherto existed. The Board feel sure that they have the fullest** concurrence of the shareholders in this.

"It is intended to call the proprietors together at an Extraordinary General **Meeting before the end of the year to consider the advisableness of increasing** the paid up capital of the bank from £1,750,000 to £2,000,000, the new shares to be issued at par.

"I have much pleasure in moving that the Report and Balance-sheet be adopted, and that they be printed and circulated among the proprietors."

## CONTENTS.

THURSDAY, JULY 31.

EDITORIAL—
Westralian Mining in 1912 . . . . . . 79
Sunshine and Toil . . . . . . . . . . 79
Leaderettes . . . . . . . . . . . . . . 80
News and Notes . . . . . . . . . . . 81
Personal . . . . . . . . . . . . . . . 81
Industrial . . . . . . . . . . . . . . 81
Investor's Column—
Melbourne Tramway and Omnibus . . 82
Metal Quotations . . . . . . . . . . 83
Our Big Mines . . . . . . . . . . . 83
Mineral Returns . . . . . . . . . . . 84
Reports of Companies, etc. . . . . . 84
Tasmanian Mining . . . . . . . . . . 84
Queensland Mining . . . . . . . . . 85
Victorian Mining Activities . . . . . 85
Mining in New South Wales . . . . . 87
Mining in Western Australia . . . . . 87
Siberia's Mineral Wealth . . . . . . 87
Crustal Folding and Mountain Building 88
The Importance of Zinc . . . . . . . 88
Books Reviewed . . . . . . . . . . . 88
Two Bendigo (V.) Mines . . . . . . . 89
The "Coal Vend" Appeal . . . . . . . 89
The Coal Mining Industry . . . . . . 90
Eastern Coal Buying Association . . . 90
Motor 'Buses and Tramways . . . . . 91
British and European Developments . . 91
A N.Z. Hydraulic Scheme . . . . . . . 92
Godfrey Telephone . . . . . . . . . . 92
The Alignment of Machinery . . . . . 93
Municipal Electrical Conference . . . 94
N.S.W. Railways Growth . . . . . . . 94
Big Water Power Scheme . . . . . . . 94
Lithgow (N.S.W.) Industries . . . . . 94
N.S.W. Tramways . . . . . . . . . . 94
A Big Removal . . . . . . . . . . . . 95
Automatic 'Phones for N.Z. . . . . . 95
Miscellaneous . . . . . . . . . . . . 96
Electric Supply in Victoria . . . . . 96
Tenders Invited and Accepted . . . . 97
Poseidon Nuggets . . . . . . . . . . 99
Strike Insurance . . . . . . . . . . . 99

HENLEY'S
Electric Wires and Cables
AND INSULATING TAPES
ARE THE BEST.
W. T. HENLEY'S Telegraph Works Co. Ltd.
546 COLLINS ST., MELBOURNE.
61 YORK ST., SYDNEY.

BELTING!
Largest stock of all kinds of Machine Belting in the Commonwealth.
Conveyor and Elevator Belting for all purposes.
HOPKINS BROS. & ODLUM PY. LTD.
LEICESTER ST., CARLTON, MELBOURNE.
'Phone, Central 751 and 5202. Box 377 G.P.O.

COKE!
NORTH BULLI COLLIERY
Limited
Supplies best quality hard
SOUTHERN
SMELTING COKE.
(Weekly output 1250 tons.)
H. G. Hyde. Secretary.
Royal Insurance Building, 16 Spring-street,
SYDNEY.

AUSTRALIAN MINING STANDARD.
PUBLISHED EVERY THURSDAY.
Forwarded Post Free to any Address.

| | Per Annum |
|---|---|
| Australasia | 26/- |
| British Possessions | 32 6 |
| Foreign | 34 8 |

Payable half-yearly or yearly, in advance.

All amounts should be made payable to order of "CRITCHLEY PARKER, Bank of Australasia."

12 O'Connell-street,
Sydney.
Tel Central 2703
P.O. Box 331.

376 Flinders-lane,
Mebourne.
Central 7931 & 1838
P.O. Box 253.

### BACK NUMBERS OF THE "MINING STANDARD."

The following is the rate for back copies more than a month old. Applications by post must be accompanied with cash and postage added. In no case can we guarantee to supply copies, as our storage accommodation is limited.

A postcard will be sent if the number required is out of print.

For copies three months old, ninepence; six month, one shilling; and beyond that period, one penny per month per copy.

As there is a regular demand for back copies of the "Mining Standard," newsagents are requested to send back all returns uncut and in good condition, otherwise they will not be accepted.

All Returns from Newsagents must reach us by the end of each month (the whole paper must be sent). No credit will be allowed beyond this term

Postage — British, 1d.; Foreign, 1½d.; Australasia, ½d. per copy.

Stamps will be accepted as pre-payment.

Address communications: Publishing Department, "Mining Standard"

### CASUAL ADVERTISEMENTS.

The rate for this class of advertisement is governed by the position it occupies.

If it appears on leader page or amongst or next to reading matter, the rate is 15s. per inch (nonpariel) per insertion.

Towards end of reading section, set in brevier, 16 ems width, 6s. per inch per insertion.

If set in nonpariel the rate is 4s. per half inch.

### ALTERATION TO ADVERTISEMENTS.

As our publishing arrangements necessitate the "Mining Standard" being issued simultaneously in Sydney, Melbourne and Adelaide on the same day each week, advertisers wishing to change their advertising matter must supply same ten days in advance of publication.

### ADVERTISEMENT PROOFS.

Proofs are submitted to advertisers in order to give them an opportunity of going over the advertisements before printing

Advertising Copy must be typed and so arranged as to clearly indicate the display required for the more important features of the advertisement

Any departure from the original copy will be charged for. Advertisers are specially requested to instruct their publicity departments to give us clear and definite instructions respecting changes of matter or new copy in order to avoid incurring unnecessary charges.

AUSTRALIAN MINING STANDARD.
PUBLISHED EVERY THURSDAY.
ESTABLISHED 1888.

It is requested that all business communications be Addressed to Critchley Parker

THURSDAY, JULY 31, 1913.

## WESTRALIAN MINING IN 1912.

Better late than never is the arrival of the "Mining Statistics" for 1912 issued by the Department of Mines of Western Australia. These are so excellently compiled and so complete that it is a pity one cannot also compliment the Department on its celerity. It is indeed the slowest of all the States in the production of its mineral returns, with the solitary exception of dilatory and backward Victoria. At the same time it is not to be overlooked that the great size of Western Australia, and the remoteness of at least one of its fields, may be held to afford some measure of excuse for the Department's slowness. But, when all reasonable excuses have been made, it still remains a fact that these figures ought to be made available very much earlier than they are.

The statistics tell the same sorry tale of the decline of the gold-mining industry that has been told for the past nine years. In the year 1903 the output amounted to 2,064,801 fine ounces; in 1912 it amounted to only 1,282,658 ounces, a decline in nine years of 782,143 ounces, equal to very nearly 38 per cent. That is serious enough in itself; but what makes it doubly serious is the fact that the decline has been steady and unbroken during the entire period. The Westralian gold returns since the first discovery of the metal make in fact rather curious reading. With two solitary exceptions (the year 1888, when there was a decline of rather more than 28 per cent., and the year 1900, when there was a decline of less than 4 per cent.) there was from 1886, when the first discovery was made, to the year 1903, an unfailing increase in the output. It was not a steady increase, for sometimes the output went up by leaps and bounds, as, for instance, in 1889, when it advanced nearly 344 per cent. The year 1903 was not only the high water mark, but also the turning point. In most countries, as, for instance, in Victoria, there will be years of decline and then years of revival, and the best year does not stand by itself in solitary glory; but in the records of Western Australia the year 1903 is like a peak with an almost unbroken slope up on one side and a steady decline on the other, instead of being hidden away, as a topmost peak so often is, amongst a group of aspiring rivals. It is to be hoped that the long-continued decline in West Australian gold production will be arrested, but still it is not to be forgotten that even in its present declining condition the State is incomparably the greatest producer of the Commonwealth; in fact it turns out more gold than all the other States put together.

There are only three other minerals that are worth speaking of in connection with West Australian production. Coal has made an advance on last year's output, the increase amounting to a trifle over 18 per cent. on the quantity, and more than 22 per cent. on the value; tin has also improved its position, with an increase of over 16 per cent. in production, and nearly 28 per cent. in value; but copper has not maintained its standing, the export amounting to only 9556 tons of ore and 8 tons of ingot and matte, as compared with 9825 and 828 tons respectively in 1911, while the value of the total product has declined from £78,118 to £60,537, a decline of nearly 23 per cent. The minerals other than gold show, on the whole, an increase in value of production of nearly 40 per cent., the figures having grown from £222,778 to £311,822; but, as the value of the gold production is reckoned in millions, the effect of these other minerals on the total is not very marked. All the improvement in them has done is to reduce the decline, which in the case of gold amounts to rather more than 6 per cent., to a little less than 6 per cent. for the total. We would like next year to be able to congratulate Western Australia on having turned the corner, but we are not over sanguine of being able to do so.

## SUNSHINE AND TOIL.

The trouble that has arisen once again at the Sunshine Agricultural Implement Works at Sunshine, near Melbourne, is worthy of consideration because it illustrates so thoroughly the attitude of the Australian worker. The position has been explained, and well explained, in a statement given to the press by Mr. H. V. McKay. This is so clear, so concise, so straightforward that we cannot hope to make the matter plainer to our readers, and so we reproduce the statement, which is as follows:—"About 25 moulders in the No. 1 foundry have given notice that they will not resume work on Monday. For ten months past the employees in the No. 2 foundry have been on piecework. While the cost of production there has been steadily reduced, the men have been earning from 25 to 50 per cent. more than they made under the wages system. In the No. 1 foundry the cost of production has been steadily rising under the wages system. It has now been decided to give the employees in the No. 1 foundry the advantage of piecework. Piecework is provided for in the wages board determination. The question is whether the wages board determination or the rule of the union shall prevail. There is piecework practically all through the factory. I do not see why the moulding shop should continue practically behind every other department."

The objection of the workers in the No. 1 foundry to piecework is the objection of almost all "good" unionists throughout Australia to payment otherwise than by the hour or by the day. The usual procedure in any factory is to set the face sternly against payment by results. With all the hands working together, the employer is compelled to give way, and to establish the principle of a daily or weekly wage. This once conceded, he finds that his production goes steadily downward. Not only so; but. very soon he is faced with a demand for a higher wage. Grumbling, he is compelled to pay; and the more he pays the less value in work he receives. Then, when the production has come down to little more than a half of what it was under the piecework system, a proposal is made that payment should be by results—but with this important proviso, that the current output shall be assumed to be a fair day's work, and shall be paid for at precisely the same rate as is already being paid for it under the wages agreement. When this proposal has been accepted the employer finds that his output straightway advances some 50 per cent. Let us consider the net result. A man is paid 100s. for 100 articles on piecework; he gets put on to a wages basis that yields him the same amount in the same time; subsequently he has his wage increased 10 per cent., bringing it up to 110s., for which he turns out, let us say, 60 articles; then, on the basis of the production of 60 articles for 110s., he gets put on to piecework once more, and promptly proceeds to turn out 90 articles in the time, receiving in payment 165s. The employer is thus in the position of having to pay 1s. 10d. per article instead of 1s. per article. This is of course no loss to the manufacturer, for he takes good care to charge the public, not merely 10d. more, but 1s. or, if he dare, even 1s. 6d. more. It is always the public that pays; but that is another side of the question. The question that is before us at the moment is, Is the procedure of the trades unionists commonly honest? "Honesty" is probably the last word that anyone with a fine sense of honour would use to characterise it. It is not too much to speak of it as a sheer discredit to the general body of workers of the Commonwealth.

---

The outcome of the recent Labour Unity Congress in New Zealand was to stultify the whole scheme, for the delegates disagreed upon points which were fundamental to it, and both the Amalgamated Society of Railway Servants (which is 8000 strong), and the United Federation of Labour broke away en masse, while a few prominent men from amongst the more moderate sections took individual action, and notified the "Red Federationists" that they could not go with them. The reasons for these defections are easily seen (and to see them is to vindicate them) when the autocratic nature of the demands made by the leaders of the congress are borne in mind. It was definitely stated that absolute power was to be put into the hands of the "Red" executive; not only were the deputies to agree to sacrifice the liberties of those whom they represented, but they were asked to so completely abandon every claim to freedom of action and speech, that, having come to the congress as representatives of their several unions and leagues, they were to go back as emissaries of the congress, which, during its sitting, elected to style itself the Social Democratic Party. The probability is that if it had been known beforehand that the object of the congress was to disfranchise every union or league which sent delegates, the number of deputies would have been much smaller than it actually was. The secret ballot was to be tabooed; the press was to be excluded from the sittings; delegates were forbidden to give any information to the press for dissemination amongst the public; and delegates were to pledge themselves to return to their own people and advocate the measures which were proposed by the congress leaders. The first body to break away was the Railway Servants' Society. A former president and a life member of that society, Mr. W. A. Veitch, M.P., explained that, apart from any consideration of the public interest, upon which the present president, Mr. W. T. Wilson, laid stress, the men had done so much for their own betterment by employing constitutional means that it would be mere foolhardiness to jeopardise all they had won by consenting to work with the crowd which advocated "strike all the time," for there was no attempt to disguise the fact that the congress was called by men whose antipathy to arbitration or even conciliatory measures was absolute. It is something like three years now since this party's policy was first enunciated; and it is to the credit of the Dominion's intelligent workers that it has met with such little actual success. In this instance they succeeded in carrying their resolutions, because so many unions declined to be represented at the congress; but the result goes to show that the unity sought for is as far off as ever.

* * *

The announcement that a numerously signed petition representing the views of a large body of architects and engineers practising in Australia is to be presented to the new Prime Minister, requesting that a Royal Commission be appointed to inquire into and report upon matters connected with the building of the Federal Capital, giving particular attention to the departmental design which displaced those sent in in response to the late Government's invitation, will come as a surprise to most people. When the substitution of this local design was announced this journal spoke very strongly against the step taken by the Minister for Home Affairs, so that we are not now liable to be thought to favour it. The claim that it embodied the best points of the selected designs from other countries to which prizes were awarded, cannot be sustained for a moment; moreover, the action of Mr. O'Malley was a distinct breach of faith with the successful competitor to whom the first prize was awarded, and a breach of the terms and conditions on which designs were asked for. It may be admitted also that it would have been utterly hopeless to have asked the Prime Minister of that day to appoint a Royal Commission to review what his colleague had done. But finality must be arrived at some time or other, and it is clear that, if each new Government signalised its advent by undoing all that its predecessor did, very little progress would be made. The plan now adopted may not be an ideal one, but a worse might have been decided upon, and most of those who are now showing an interest in the matter have the satisfaction of knowing, or good reason for believing, that they will not live to see it carried out. It might have been more gratifying to have handed on to posterity a better planned city, but an eminent authority has reminded us that, as posterity has done nothing for us, it has no special claim on our consideration. Better let the work go on; it will be something for which Mr. O'Malley's name will be reviled in years to come when otherwise he will be in oblivion. The present Prime Minister has, however, promised that the winner of the first prize, Mr. Walter Burley Griffin, of Chicago, shall be invited to visit Australia and report upon the substituted plan. This will, at least, be some recognition of the conditions of the competition.

* * *

Consideration of the effect of a wages board decision is the natural consequence of a discussion in the Prahran (V.) City Council last Monday relative to the requirement of additional rolling-stock by the Prahran-Malvern Tramway Trust. Hitherto when new cars have been required, the bodies have had to be ordered from Adelaide, and it is not to be wondered at that objection should be taken to spending money in another State which should, in the ordinary way, be spent at home. There is no spirit of parochialism in this; it is nothing more or less than the spirit which moves everyone of us in our private affairs. Other things being equal, every man would rather spend his money with a friend than with a stranger. If the stranger can give a better article for value received than the friend offers, as a rule the stranger will be asked to supply it; but, if the friend's article be as good as the stranger's, the former will get the order. Now, there is no reason to suppose that Victorian coachbuilders are less able to turn out tramway car-bodies than they of South Australia; all indications point in the opposite direction. Yet, when tenders are invited, either Victorian manufacturers do not tender at all or their price is too high to compete with the quotations sent from the sister State. It appears, from a statement made to the Prahran Council by Cr. Naylor, that the trouble arises from the high rate of wages required by the Victorian wages board. The returns supplied to him were as follow:—New South Wales, for 48 hours, 60s.; South Australia, 60s.; Tasmania, 60s.; Queensland, 44 hours, 51s. 4d.; Victoria, 48 hours, 63s. and 66s. Considering that the cost of living, according to the Commonwealth Statistician, is no higher in Melbourne than in Adelaide, in fact is somewhat lower, it is not easy to see why the wages awarded such be so much higher as to convince business men that it is better to spend their money elsewhere than in Victoria. There are more wage-earners than wage-payers in the community, and it is certain that the majority desires to see wages as high as possible; but if the effect of this is to be, on the one hand to raise the cost of living, and on the other to drive work and wages to another State, there is obviously nothing gained by insisting on excessive rates of pay.

* * *

There is something almost fiendish in the avidity with which proposals are welcomed which threaten to clog the wheels of commerce and to reduce the industrial and financial affairs of nations to chaos. The latest proposal of the Industrial Workers of the World organisation partakes of this spirit in an extraordinary degree. It is not the first time that a universal strike has been advocated; but for callous indifference to the general ruin which is foreshadowed this stands pre-eminent; and Australia will not feel proud of the fact that she is nurturing men who are giving it serious attention. The Sydney branch of the I.W.W. has received a letter from a Bendigo miner (Bendigo again!) who has returned from Johannesburg, enclosing press clippings giving the opinion of London financiers that if the Rand was to be "held up" throughout July the outlook would be a serious one, seeing that the London bullion market counted upon the arrival of £3,000,000 worth of gold, which would, of course, not be available if the strike continued. The opinion was expressed by the experts that the Bank of England's share in the deficiency would be £2,000,000, and that the strike would be short lived, seeing that the South African Government derived great revenue from the mines and would consequently do its utmost to effect a settlement. The Bendigonian correspondent suggests on his own behalf that if the gold miners of Australasia and South Africa will act together to stop gold production, the cause of the workers will be won in a very short time, for if a month's strike on the Rand could cause financial embarrassment to European banks and stock exchanges and could force Governments to settle matters, then a strike of wider area would be more effective, and the "power of united labour would be vindicated." The public will not be seriously disturbed by these devil-may-care proposals, for it knows full well that such sentiments are not shared by the majority of workers in any industry. The general regret will be that a section of the community, which benefits every day by the social organisation which has been evolved during many centuries, but which it is moving heaven and earth to destroy, should feel itself strong enough to formulate a scheme so utterly regardless of the comfort and the well-being of all but themselves, and so inimical even to their own permanent interests.

* * *

The Melbourne Tramway Trust seems to have worked itself up into a state of nervousness in regard to the competition the Tramways are likely to meet with from the motor 'bus. Its members, or many of them, seem to have the idea that there is something iniquitous in the establishment of a system which is calculated to deprive the tramways of some of their passengers, and hint that steps ought to be taken to put a stop to this competition. In other words, they are clearly of the opinion that the tramways are run for the benefit of the company at the present time, and will be run for the benefit of the Trust in the future, and not for the benefit of the public. The competition may be very unfortunate for the Trust, but it is very beneficial for the public; and therefore for the Trust to attempt to crush it out of existence would be unjustifiable. There is only one proper way of meeting this competition, and that is by making the tramways meet the popular requirements in ways in which they do not meet them at the present time. If, for instance, the whole silly system of tickets were done away with, and a penny section plan adopted, the rush for the motor vehicle would be considerably lessened; and, moreover, if this were done, the tramways would no longer be open to the taunt that they fleece the stranger within their gates; for what is it but fleecing when, if it be not worth his while, owing to the shortness of his stay, to take tickets, or if he be ignorant of the company's peculiar methods, they force him to pay 3d for a service for which the resident pays only 1½d., and which, in almost any other city in the Empire, would be 1d.? Let the tramway company do a fair thing and it will be doing a wise thing.

## NEWS AND NOTES.

Some good crushings of small parcels of stone from the New Golden Hill G.M. Co., Fryerstown (V.), have been reported previously, the values ranging from 2 oz. to 6 oz. per ton; last week, however, a 10 ton lot was put through the Spring Gully battery, and this averaged 2 oz. per ton.

The best average from any considerable quantity of wash in the Duke lead, Havelock (V.), for the past 15 years, was reported last week when 100 oz. of gold were obtained from 89 fathoms at the Duke Extended mine. This mine was abandoned by an English company after paying dividends amounting to over £47,000. About one mile of the unworked lead was subsequently taken up by a Melbourne company.

A manager has been appointed by the Junction Gold Mining Co., operating in the Forbes district (N.S.W.). The shaft is now sunk to about 30ft., and the drift will shortly be cut through.

According to statement supplied to the South Australian "Register" by the secretary of the Wallaroo and Moonta Mining and Smelting Co., the output of refined copper for the six months ended June 30 was 3572 tons, or 137 tons per week, as against 2,951 tons for the corresponding period of 1912, an increase of 621 tons. Of this increase, 230 tons was due to the greater quantity of outside matte and ores purchased and smelted. The increased quantity of copper shown to have been placed in store in recent fortnightly reports was due to a third refinery furnace being at work to clean up accumulations for the half-year, but a normal rate of output has since obtained. While the flotation plants are both doing good work, delays in the delivery of fine grinding machinery have prevented full advantage bejng taken of the process.

The general manager of the Hampden-Cloncurry Company stated that mining operations had been resumed, and the small furnace blown in that morning, while he anticipated that the big furnace would be started at the end of the week. Some time will be required for the plant to work up to the capacity attained when operations were suspended. The manager of the Mt. Elliott mine also has reported that work has been resumed, but as it was anticipated that the water would rise in the lower workings during the strike it is unlikely that ore production will be resumed just yet.

The amount of gold received at the Melbourne branch of the Royal Mint for the week ended on the 26th inst. was 9902.13 oz.

Reporting on July 24 as to the prospects of the property, the manager of the Lord Roberts mine at Daylesford (V.), wrote:—"At a point 200ft. north of north shaft, in costeening, have discovered a well-defined reef, with eastern underlie. It is 20ft. east of reef where we crushed 13 dwt. to ton. It appears to be a matching east leg, as the other leg has a western underlie. Think it is a saddle formation. The stone is 2ft. wide; very solid mineralised, and shows payable gold for a length of 106ft." This favourable report was followed by considerable activity in the company's shares.

English capital is being applied to the working of the old Sailor's Hill mine at Dolly's Creek, Morrisons, in the Meredith district (V.), operations being carried on by sluicing, by which means it is thought that large quantities of ground can be dealt with every day.

From their Oriental mine, Fulton's Creek, Walhalla (V.), Messrs. Dedman and Spargo have won 77 oz. of gold from 75 tons of stone.

Our San Francisco correspondent writes:—A gas well was "brought in" in Kern County (California) recently, with a flow of 40,000,000 cub. ft. of gas daily, under 700 lb. pressure. The oil production of the State keeps steady at about 7,600,000 bbl net per month.—Affairs in Mexico are simply rotten, and nearly every railroad system is in disorder. The States of Chihuahua, Sonova, and vicinity are all up in arms, and would readily join with the United States.—I note that you made a few remarks on flotation in the "A.M.S." It is being tried on one of the copper ores of the Copper River district, Alaska. The U.S.A. Government is voting $40,000,000 for building railroads in Alaska.

Application was made to the Bright (V.) Shire Council on the 22nd inst. by Mr. P. W. Tewksbury for permission to work the No. 5 dredge of the Tewksbury Amalgamated G.D. Co. across a lane near the State School at Freeburgh. The application was granted on the payment of £30, the company undertaking to restore the roadway and to provide a temporary road in the meantime. Councillors admitted that the No. 5 dredge had turned the entrance to the Freeburgh reserve from a series of holes into a splendid approach.

A profit of £3364 is shown by the balance-sheet of the Australian Wood Pipe Co. Ltd. for the half-year ended with June 30. A dividend, at the rate of 10 per cent. per annum, absorbs £2500, the sum of £500 is written off goodwill, and the balance, £364, is carried to reserve fund, raising it to £2524. The capital is now £50,149, as compared with £43,198 six months ago. Property and plant stand at £22,422, against £14,623 on December 31, 1912; stocks at £22,263, against £15,430; sundry debtors at £16,911, against £13,796; and patents and goodwill at £3964, against £4710. The new factory at Port Adelaide is in working order, and a start has been made on the South Australian contract.

## PERSONAL.

Mr. J. W. Turner, Superintendent of Technical Education in New South Wales, died in Sydney last week. Mr. Turner had been for over 50 years in the teaching branch of the Public Service, and was Superintendent of Technical Education for five years. He leaves a widow and 3 children.

Out of 35 applicants for the position of Director of Lighthouses under the Commonwealth Government, Mr. Joshua Fielding Ramsbotham, of Western Australia, has been appointed, the salary being £800 per annum. Mr. Ramsbotham is 45 years of age, and has been in Australia since 1910. Prior to leaving England, Mr. Ramsbotham had long experience as an engineer at the Liverpool Docks, where he also gained an extensive practical acquaintance with harbour works and lighthouses. Recently Mr. Ramsbotham has been engaged upon the task of investigating the harbour requirements of Western Australia, and he has already furnished reports to the State Government with regard to Geraldton, Bunbury, and Fremantle. As an administrator and organiser, the new director of lighthouses has presented the best credentials, 1200 workmen having been under his charge at one time. His duties under Federal control will, to a large extent, be constructive.

At a meeting of the Victorian Institute of Electrical Engineers last Thursday, Messrs. E. Josephs (Brighton) and A. G. Baly (William-street, Melbourne) were elected members of the institute, and Messrs. C. C. Gallop (Australian General Electric Co., Melbourne) and N. B. Webster (Melbourne Electric Supply Co., Richmond) were elected associates.

Mr. Robert P. Roberts, of late associated with the Great Falls smelter of the Anaconda Copper Mining Co., Montana (U.S.A.), has been appointed to succeed Mr. A. L. Dean as chief metallurgist of the Mt. Lyell Mining and Railway Co. (T.). Mr. Roberts is expected to reach Sydney from Vancouver within a day or two, whence he will proceed to Tasmania and at once take up his duties.

Mr. James Campbell Dawson, son of Mr. W. F. Dawson, stock and sharebroker, was elected a member of the Stock Exchange of Melbourne on the 22nd inst.

Mr. F. T. Wimpney has been appointed a representative of the employers on the Coal-miners' Wages Board, in place of Mr. A. Boyd, resigned.

Mr. Hyman Herman, B.C.E., F.G.S., Director of Geological Survey in Victoria, last week passed an examination by thesis at the Melbourne University, securing the degree of Master of Mining Engineering.

## INDUSTRIAL.

Messrs. A. L. Campbell and Co., of 33 William-street, Melbourne, who are the sole agents in Australia for the Draeger life-saving apparatus and other appliances, have just supplied, to the order of the Sulphide Corporation Ltd., of Broken Hill and Cockle's Creek (N.S.W.), a set of the Draeger Pulmotor or automatic oxygen reviving apparatus for artificial respiration. The immense value of the pulmotor in effecting resuscitating men who have met with serious, and often apparently fatal accidents, is becoming increasingly appreciated, and as several big mining companies have now purchased one or more sets, there is every reason to hope that others will soon move in the same direction. Of course, its utility is not confined to mining industries; every trade has accidents peculiar to itself, and there is a wide range of accidents which are common to all industries, and in all the pulmotor claims to be the most efficient restorative on the market. Amongst Australian mining managements, which have already equipped themselves, may be mentioned the Mt. Lyell Mining and Railway Co. (two sets); the Victorian State Coal Mine, Wonthaggi; the Broken Hill South Silver Mining Co. (N.S.W.); the West Australian Chamber of Mines; the Sulphide Corporation (N.S.W.).

# THE INVESTOR'S COLUMN.

## Some Companies Attracting Attention To-day.

(By Our Exchange Reporter.)

### Melbourne Tramway and Omnibus.

For some time past the fluctuations in the price of shares in this great investment stock have been very noticeable—attracting a good deal of enquiry among the members of the Room. At first the cause assigned for the uneasiness indicated by number of selling orders, was the possibility of legislation for the purpose of bringing about a revision of fares. There has always been some anxiety on this account, but it should rather decrease than increase as the termination of the lease approaches, for there seems to be a **general feeling that the company should be left** to complete its career without Government molestation **or interference in the management of its** internal affairs. It may be said, also, that if a reduction in fares were brought about, the result **in all probability would be a decrease in the railway** receipts, wherever the two services enter into **competition. This is an eventuality which no** Victorian Ministry would contemplate with **equanimity, for our Railway service is at present** our principal revenue producer. Whether **an enactment for a revision of fares would materially** affect the company's receipts is very **doubtful also, for the reason that its regular passengers invariably, and its casual passengers very frequently, provide themselves with tickets, thereby** reducing their fares from 3d. to 2d. or 1½d. There is not much benefit, however, to be gained in discussing **this question at present, for the reason that the anxiety about the stock has been caused by the initiation of the Motor 'Bus services, and the likelihood of their increase. This anxiety seemed almost to develop into alarm.** When the publication of the monthly receipts showed that those for June were some £800 less than those **for the corresponding month in 1912, even some** of the members of the Exchange with whom the stock is a favourite form of investment selling **some of their holding. Such an occurrence well illustrates how a small incident which can easily be explained may have far-reaching results, for in this instance an apparent falling-off in the revenue-earning capacity, amounting to less than £1000 for the month, occasioned a shrinkage in the market value of the stock of nearly £200,000. The word "apparent" is used advisedly, and for this reason, the daily takings of the company** average about £2000, but on the winter Saturdays, **owing to the football matches and other sports, they run up to about twice as much. In June last year there were five Saturdays, as against four Saturdays in 1913, and this occurrence** would swell the revenue for the former period by £2000 or thereabouts. Making allowance for the fact of the additional holiday in June, 1912, it appears that instead of the takings for the same month this year being down £800, they **are really up £1200, so that the competition of the motor 'bus has not yet reduced the revenue of the company. Nor is it likely to do so to any serious extent during the remainder of the lease.** It is true that in London some of the motor 'bus concerns have been very successful, a great **increase in the price of shares having taken place,** but it should be remembered that the travelling **population in the great city itself is not served by tramways but by underground railways. The motor 'bus service would be absolutely inadequate** for the needs of such an enormous number of **people, and, for a similar reason, although on a much lesser scale, the motor 'bus is unlikely,** certainly to any very serious extent, to interfere **with the Melbourne tramways. The services of this latter concern and the suburban railways are for the citizens of Melbourne what the wonderful underground system of railways is to the people of London.**

But, even if the danger of ultimate rivalry **were as great as some people believe, it might nevertheless be largely ignored as far as the** present company is concerned—first of all, **because it is not improbable the tramways on some** of the lines are finding it nearly as much as they can do to cope with the existing demands upon them; and, secondly, because the remaining portion of the company's working operations is so soon drawing to a close that by the time the promoters of the motor 'bus concerns can obtain the **necessary capital for really serious rivalry, order the vehicles and have them built and delivered in** Melbourne the shareholders in the Tramway Company will not have much cause for great anxiety.

A brief outline of the position of affairs in this great investment stock may not be out of place at the present juncture. In 1884 the Melbourne Tramway Trust, representing the City of Melbourne and the great surrounding municipalities, was formed under Act of Parliament, being authorised and empowered to borrow £1,650,000.

This sum was then lent in two amounts of £1,200,000 and £450,000 to the Melbourne Tramway and Omnibus Company, which obtained a lease of the present roadway and the right to carry passengers on a specified scale of fares. Under the terms of the original agreement it was provided that at the conclusion of the lease the lines should revert to the municipalities, who were parties to the Trust; also that the period of the lease should be for 30 years, which if adhered to would have meant that it expired in July 1st, 1914, but as the company, at the request of the trust, made some advantageous and convenient concessions to the latter, mainly in the form of short extensions to the proposed lines, the trust as a quid pro quo agreed to an increase of a further **two years in the term of the lease. This increase** has a most important bearing on the financial **position, as will now be seen. When the** agreement was entered into, it was calculated that the company by paying an annual instalment of **£74,000 as a sinking fund, together with interest** on the borrowed money at the rate of 4 per cent., **would provide for the extinction of its indebtedness** at the conclusion of the lease. As this calculation **was based upon a thirty years' lease,** the company in 1914 would be in a position to **liquidate the whole of its liabilities to the trust,** so that the amounts paid away annually prior **to then for sinking fund and interest will for the last two years remain to increase the assets which the shareholders will divide at the conclusion** of the lease. What will that amount be? This is a question which has for years **excited the interest of investors and actuarial experts, and estimates varying from 40s. to 50s. per share have been made. Latterly, the general prosperity, in which the company has had its part, has justified a belief that the amount will be** rather above than below 45s. per share. The following figures, gathered from the balance-sheets **of the company, will give a basis for such a belief.** According to the statement of accounts on June 30th, 1912, there was a surplus of assets (mostly **liquid) over liabilities equal to 32s. 6d. per share. On September 30th, 1912, the Melbourne Tramways Trust held debenture securities to the value of £1,457,000, which, with interest at the rate of 4 per cent., together with the annual instalments for sinking fund of £49,500, will give on July 1st, 1914, a sum of £1,662,000. £1,200,000 will be then paid away on account of the loan falling due, leaving a balance to credit of £462,000. The** interest on this amount for the two remaining **years will come to about £37,700, making altogether just on £500,000. As the amount of the second loan and final payment to the trust is £450,000—the company will have a surplus in** hand of £50,000.

As previously explained the payment of the annual instalments for sinking fund and interest will cease on July, 1914. As these amount to about £123,750 per annum the company will save **£247,500, together with interest thereon, £10,000.**

**As the amounts paid into the reserve fund for the last 4 years have been at the rate of £67,000 per annum, and as the profits for the last year** have been £35,000 above those of the previous term, it may safely be assumed that this rate **of profits will be maintained for the remaining** four years, in which case these payments to **reserve fund will come to £269,000. Taking all these amounts together, namely—**

| | |
|---|---|
| Saving in interest and instalments sinking fund .. .. .. .. .. .. .. | £247,500 |
| Interest thereon .. .. .. .. .. .. .. .. .. | 10,000 |
| Surplus in trust .. .. .. .. .. .. .. .. .. | 50,000 |
| Amount added to reserve fund in four years from 1912 .. .. .. .. .. .. .. | 269,000 |
| They come to .. .. .. .. .. .. .. | £576,500 |

**equal to 12s. per share, which, with the 32s. 6d., already estimated, gives 44s. 6d. per share.**

When it is remembered that no allowance is **made in the above estimate for a probable increase in profits during the period 1912-1916, it will be** seen that the belief in a final payment to the **shareholders of 45s. or better is not unjustified.** Looking at one or two further points of interest, it may be pointed out first, that the credit balance of £95,000 brought forward after the last taking of accounts has not been taken into consideration in the above estimate, and may be regarded as partly a set-off against the increase in wages. **These have now been fixed by order of the judge of the Arbitration Court for the remaining period** of the company's lease, and will probably mean an average increased expenditure of £50,000 per annum.

With regard to the question of what the rate of dividends will be during the same period, the following figures seem to speak eloquently enough:

In 1908, 1909, 1910 and 1911 the shareholders received annually £96,000, equal to 20 per cent. or 2s. per share; for 1912, they received £144,000, equal to 30 per cent. or 3s.; since then the payments have been at the rate of 4s. per annum, and as the net profits last year were £269,000, and **£48,000 pays a 1s. dividend, it seems quite probable** that 4s. per annum will be maintained for **the remaining three years. If this be so, then the payments will be equal to a little under 9 per cent. on 45s. Should the dividend be less, then the shareholders will receive a proportionately greater sum in 1916, and 3s. per annum is equal to £6 13s. 4d. per cent.**

**A statement by the chairman of the company has been understood to imply that the recent high dividends should be regarded partly as a return of capital, and many investors are under this impression. This is, no doubt, a very safe view to adopt, but it may not be unseasonable to say that in 1905, when the net profits were £103,000, the dividends paid amounted to £60,000, or nearly 60 per cent. of profits. There was not any mention then of part of this payment being return of** capital. In 1912, the net profit was £269,000, and **the dividend payment £144,000. If, therefore, the paying-away of just under 60 per cent. of the net profits leaving a balance of £43,000 was not regarded in 1908 as partly return of capital, it is difficult to see how a payment to the share**holders of 53 per cent. of the net profits in 1912, **leaving a balance of £125,000, can be so regarded**

Other items of interest in connection with this **enterprise are as follows:—In 1895, the freehold properties, which were acquired in or about 1884, that is, before the land boom, were valued at £298,000; in 1912, the valuation is £220,000—£76,000 less. Cars, grips, etc., in 1895, were es**timated as worth £276,000 the last valuation was £163,700, a difference of £112,000.

**In Sydney, in 1912, the tramways owned by the State had total earnings of £1,018,000, and the net revenue was £187,000. In Melbourne, the** Tramway Company, in the same year, had total **earnings of £581,000, and the net revenue was £269,000.**

The working costs were—Sydney tramways, 11.24d. per mile; Melbourne tramways, 7.6d. per mile.

**Such is the difference in the management of a State-owned enterprise, when compared with one** owned and managed by a public company.

During the last few days the quotations for the **stock have shown more firmness, some good** support having been forthcoming. This is not unexpected, for despite the motor 'bus menace, the shares are probably as well worth buying for an investment as any on the Stock Exchange list.

---

# METAL QUOTATIONS.

## By Cable.

(From Our Correspondent.)

### London, Tuesday.

Those interested in the production of industrial **metals will have noted with satisfaction the general** improvement in values which occurred on the London market last week, and which was shared by all the most important lines. Copper rose higher every day, and the Mt. Lyell M. and R. Co. has received a cablegram which shows that the rise **was continued last Monday, when the price of g.m.b. copper was £67 7s. 6d. Tin rose for the** first three days and then receded, but the closing **price, like that of the opening day, was 45s. in advance of the previous Friday's; lead rose steadily** throughout, and though spelter showed no **advance** it nevertheless suffered no relapse.

COPPER.—The opening quotation for spot was **£64, showing a rise of 5s. per ton, and later rates** were £64 7s. 6d., £64 18s. 9d., £65 15s., and £66 **12s. 6d.**

**For three months' delivery the rates were £64** 2s. 6d. (a rise of 6s. 3d.), £64 6s. 3d., £65 1s. 3d., **£65 15s., and £66 13s. 9d.**

**Electrolytic, which had the week at £66 5s.,** rose to £66 17s. 6d., £67, £67 15s. and £68 10s.; yesterday the new week was opened with £69 10s.

TIN.—Monday's quotation for spot delivery was **£184 10s., showing an advance of 45s. per ton, then came £185 15s., £190 5s., £186 and £184.**

**For three months' delivery the opening rate was £185 2s. 6d. (a rise of 47s. 6d.), followed by £186, £190 and £185 15s.**

**LEAD opened with a rise of 6s. 3d. to £20 5s., after which the rates were £20 7s. 6d., £20 10s.** and £20 15s.

**SPELTER remained stationary at £20 15s.**

SILVER.—The daily quotations were 27 1-16d., **27 1-8d., 27¼d., 27 3-16d., 27¼d.**

ALUMINIUM.—Friday's quotation was £87, showing a fall of £2.

QUICKSILVER brought £7 5s., as compared with £8 at the end of May, for a 75 lb. bottle.

ANTIMONY.—"Star" brand was stationary at £30, and 50 per cent. ore at £9 per ton.

**WOLFRAM (70 per cent. ore) fell from 33s. 6d. to 32s. 9d. per unit, that is, from £117 5s. to £114 12s. 6d. per ton.**

MOLYEDENITE rose to 2s. 9d. per lb., equal to £308 per ton, as compared with £280 a week earlier.

MANGANESE (50 per cent.) was stationary at **9½d. per unit, or 39s. 7d. per ton.**

# OUR BIG MINES.

## Examinations of their Yearly and Half-Yearly Reports.

(By a Mining Accountant.)

### The Mount Morgan Gold Mining Co. Ltd.

For years past this famous mine has been undergoing a slow process of change, and the end is not yet. Its wonderful production of gold has excited admiration and envy the world over, yet since the discovery of copper and the erection of the first copper plant in 1906 the transition has been so complete that Mount Morgan is now primarily regarded as a producer of copper. Gold is still there, in more than plentiful abundance. In fact, were it not for the abounding presence of this metal, dividends, which have reached the stupendous total of £8,079,167, would have ceased with the advent of the first copper works. Following upon this important step came the abandonment of the West works, due to the exhaustion of the oxidised gold ore which this plant treated with such signal success. Then came a change in the metallurgical treatment of the copper ore, with the introduction of Many Peaks ore, in place of the barren ironstone flux formerly smelted. Hardly had this stage been reached before a still more radical change came into existence. It is with this period of the transition that this article is concerned.

Mount Morgan is now under almost entirely new masters. On the death of Walter Hall, only a brief few months ago, the administration passed into the hands of comparative strangers, as it were, and the technical management underwent a similar change. The circular recently issued to shareholders is testimony to the change, and so also is the report. The style of this latter is greatly altered. Inside the cover, which again is different, is to be found a galaxy of directoral talent, the services of whom have been disinterestedly offered for a lengthy period of years. The principle, which has been gaining ground, of fixing the appointment of directors for a number of years, is one to be deprecated entirely. If directors prove themselves useful and careful of the interests of shareholders—other than themselves—they should have no fear of being returned in future years. In directoral number, at any rate, Mount Morgan is well served.

The new administration has decided to make matters lively. About a quarter of a million sterling is to be spent in new plant, and in preparing the mine for a large output. So, for a few years, a greatly increased production may be expected. After that there will doubtless be further changes to record, both personal and material. But present chronicles are not concerned with that aspect of affairs. The leading features affecting the present are the progress of the new plant, and the results that in the meantime are being obtained from the copper works in existence. These latter have been patched up to make them temporarily suitable for the altered metallurgical practice or aim, which is pyritic smelting, as advised—and successfully achieved—by the Mt. Lyell management. The general design of the existing plant does not permit of the alteration required for this class of smelting, hence the need for the new plant. Preliminary preparations for this are well advanced, and the foundations for three blast furnaces, each of which is 28ft. long, are now completed. Both the buildings and furnaces are in course of erection, and it is anticipated that everything will be ready to "blow in" by March of next year. At the old plant several minor improvements have been made, all of which are claimed to have produced a beneficial effect. Mechanically operated slag ladles of large capacity are now employed on some of the furnaces. Specially lined converters have been erected, but these are not yet in use, as it is found that the existing power plant is not capable of producing sufficient blast for their proper working. So the improvement to be derived from this source must be postponed until the new plant is in operation.

So far, expectations have been confined to the new copper works. Future history may have much to relate concerning the operation of another, and different, class of plant also being erected. This is to be a concentrating plant, designed for a daily capacity of 500 tons of ore; and permitting of an expansion to 1000 tons a day. It is being built on the site of the old Mundic works, which have been dismantled since the new management took control. An experimental concentrating unit on a working scale has been running for some time, treating low grade ore that is not included in the published estimate. Results are claimed to be better than expectations, but exceptionally fine grinding has been proved to be necessary before any concentration is attempted. The experimental plant will continue to operate for some months. Some trial runs have been made with it on the tailings from the old Mundic and West works. It is believed that these tailings will be of value. The estimated cost of the new concentrating plant is £56,000.

As all who have been familiar with this company's reports are aware, very little information is granted concerning the position underground. The latest report shows a slight improvement in this respect. A re-estimation of those blocks of ore which are not taken into account in the published reserves has been made. The new figures are not made public, but the report states that, to exhaust this ore and the smelting ore simultaneously, the concentrating plant will require to treat a minimum of 500 tons a day. Diamond drilling has been conducted in the search for fresh ore. On the 850ft. level No. 45 bore, going horizontally in a south-westerly direction from the south end of No. 10 crosscut, at 565ft. intersected 40ft. of ore suitable for concentration. Another mill is now in progress to intercept this body at a point 200ft. above and 80ft. to the north-west. As it will be many years before it will be necessary to mine what ore is found there, the management does not intend to do much more work on this at present. Regarding the present extraction of ore from the mine, the following statement is made:—

| | Per Shift. |
|---|---|
| Tons of ore broken per miner and shoveller | 2.72 |
| Tons of ore broken delivered per underground employee | 1.32 |
| Average earnings per contract miner | 17s. 4d. |
| Average earning per contract shovellers | 12s. 11d. |

The cost per ton of extracting ore from face to chutes (explosives included) is given as 5s. 1.44d. To this cost must be added trucking, hoisting, pumping, timbering, and a host of other expenses incidental to ore extraction. Though these escape mention, a start has been made in the right direction. It is worthy of remark that the company has secured the services of a first-rate underground manager; he starts with an ample field for improvement.

At the Many Peaks mine the fire is not yet completely extinguished. In the central working in the 570ft. level, the westerly crosscut proved a width of 90ft. of ore, and a northerly drive proved a length of 75ft.: the face of this latter was still in ore. About a quarter, in volume, of this body is waste material. At the mine the tonnage of ore broken per miner per shift was 2.19, and per man employed underground 1.47. The following table deals with the underground history of the Mt. Morgan mine only, for the last two half-yearly periods:

Comparative Table A.—Underground History at Mt. Morgan Mine.

| | Half-year ended Nov., 1912. Tons. | Half-year ended May, 1913. Tons. |
|---|---|---|
| Mount Morgan ore extracted— | | |
| High-grade | 66,159 | 67,737 |
| Medium-grade | 29,787 | 15,576 |
| Low-grade | 26,811 | 24,901 |
| Total | 122,757 | 108,214 |
| Footage of development work— | | |
| Driving and recessing | 148 | 235½ |
| Sinking and rising | 303 | 424 |
| Tonnage of Ore Reserves— | | |
| High-grade | 1,433,000 | 1,365,000 |
| Medium-grade | 1,997,000 | 1,982,000 |
| Total reserves | 3,430,000 | 3,347,000 |

The assay values attributed to the various grades of the ore reserves are not stated in the report, but a year ago the following classification was given:—

| | |
|---|---|
| Ore averaging 3½ % copper and 10 dwt. gold | 1,499,000 tons |
| Ore averaging 2½ % copper and 5 dwt. gold | 2,027,000 tons |
| | 3,526,000 tons |

Whether the average represents the assay value, or the probable extraction-grade, is left to guess work. The second alternative would certainly be unusual, but the Mt. Morgan report abhors an assay value where ore is concerned. The low-grade ore referred to is not included in the published reserves, but hopes are held out that the omission will be repaired when sufficient data is obtained from the experimental plant. This delay may be for the purpose of determining what is profitable ore and what is not, or else it may be to allow of an estimation being made as to the future extraction-grade to be expected. Mount Morgan probably has an enormous amount of this low-grade ore. "Low-grade," of course, is only relative; Mount Morgan standards are not those of most mines.

Noteworthy features are a lower total output of ore. This half-year only smelting was practised, though in that respect it does not differ from the previous half-year About .30,000 tons less was smelted; on the other hand there was an extra 4000 tons of limestone flux required, while ironstone flux once more makes a notable and interesting appearance. It has evidently come to stay, as a contract has been settled for a supply of 100,000 tons. Very much less ore was used from the Many Peaks mine, a matter of considerable importance, and indicative of the change in metallurgical practice. Increased fluxes thus became necessary. As there are approximately 1,000,000 tons of very siliceous ore in the Mount Morgan mine, high in gold contents, it was considered advisable to make arrangements for a supply of fluxes to smelt this class of ore, rather than to rely on the concentration plant for its treatment, as the recoveries of the gold values by smelting would be greater than by concentration. The use of fluxes was preferred to Many Peaks basic ore. It will be seen, on reference to Table A, some of the low-grade ore was smelted, the amount for the half-year being 24,901 tons. The general manager considers that it is very gratifying to know that the smelters were able to treat this ore at a profit, and he intimates that it is quite likely that during the whole life of the mine a quantity of approximately the same amount from the unpublished reserves will be smelted each period. The amount mentioned is 51,712 tons; but this latest report deals with the full year ending May; throughout this article the half-yearly results are given, being obtained by deducting those of the first half-year from those of the full year.

Dealing with the gratifying fact, it is interesting to note that the average extraction per ton of Mt. Morgan ore smelted was 3.35 per cent. copper and 9.83 dwt. gold, which is considerably above the average of the mine. It is even above the average that should result if only high-grade and medium-grade ore were smelted, in the proportion shown in Table A, the two classes of ore being as classified for publication. Thus:—

| Class of Ore. | Tons. | Copper. % | Gold. dwt. per ton. |
|---|---|---|---|
| High-grade | 67,737 | 3.5 | 10 |
| Medium-grade | 15,576 | 2.5 | 5 |
| | 83,313 | 3.31 | 9.07 |

It is not at all sure whether these results should not be altered so as to represent the extraction. For if the reserves are published on a basis of assay value, the copper extraction would be approximately only 90 per cent. of that calculated; that is, it would be 2.98 per cent. copper. The gold would be slightly more than 1.08 dwt.; allowing 106 per cent. extraction, it would be 9.61 dwt; so even without the gratifying "low-grade" ore smelted it is obvious that the rich ore smelted was richer than the mine can stand for long. The lower the "low-grade" ore smelted the higher must have been the highness of the high-grade ore. Thus on the tonnage proportion shown in Table A, if the "low-grade" ore gave an extraction of 2 per cent. copper and 2½ dwt. gold, the high-grade ore must have averaged 4.04 per cent. copper and 13.63 dwt. gold. Such "low-

Comparative Table B.—Metallurgical History.

| | | Half-year ended May, 1912. | Half-year ended Nov., 1912. | Half-year ended May, 1913. |
|---|---|---|---|---|
| Mt. Morgan ore smelted | tons | 82,023 | 93,783 | 109,994 |
| Average copper extraction | % | 2.74 | 3.49 | 3.35 |
| Average gold extraction | dwt. | 11.34 | 9.11 | 9.83 |
| Many Peaks ore smelted | tons | 48,815 | 54,394 | 34,002 |
| Average copper extraction | % | 2.17 | 1.64 | 1.33 |
| Average gold extraction | dwt. | 0.16 | 0.15 | 0.14 |
| Siliceous gold ore treated | tons | 39,843* | 19,895† | — ‡ |
| Average copper extraction | % | 1.08 | 2.66 | — |
| Average gold extraction | dwt. | 12.29 | 18.93 | — |
| Total ore treated | tons | 172,681 | 172,424 | 143,996 |
| Purchased ore and miscellaneous products | tons | — | 4,351 | 5,679 |
| Limestone flux | tons | 25,538 | 34,363 | 38,511 |
| Ironstone flux | tons | — | — | 1,573 |
| Coke for smelting | tons | 14,530‖ | 20,702 | 22,870 |

*At Mundic Works.

†At Copper Works.

‡Amount not stated; if any, included in top line. line.

‖Estimated from information that 4.39 tons of coke was required per ton of copper (3310 tons) in blister.

grade" ore is not so very low after all; it is richer than the whole output of the Great Cobar.

If the copper percentage sank to 1½ per cent., the high-grade ore would be 4.22 per cent. extractable copper, and 4.69 per cent. copper assay value. The deduction is worth remembering, as there is not a great deal of such ore in the mine, whatever may be the actual assay value of the high-grade ore that was smelted to compensate for the inclusion of some of the "low-grade" ore under discussion.

Table B may be compounded as in Table C, which latter also shows the metal output:—

Comparative Table C.—Output.

| | | Half-year ended | | |
|---|---|---|---|---|
| | | May, 1912. | Nov., 1912. | May, 1913. |
| **Metal-bearing material treated** | tons | 172,681 | 176,775 | 149,676 |
| Average copper extraction | % | 2.17 | 2.90 | 2.80 |
| Average gold extraction | dwt. | 8.27 | 7.25 | 7.47 |
| For a product of— | | | | |
| Copper | tons | 3,742 | 5,004 | 4,276 |
| Gold | oz. | 71,378 | 62,553* | 55,935 |

*Excludes 7089 oz. gold from clean up Mundic Works.

The financial results from the above outputs were, of course, controlled by the prices of copper, and by the cost of production. The former has the bigger say in such matters; but Mt. Morgan costs should be capable of much reduction. As they are shown in the lamentable production termed "Profit and Loss," each ton of copper produced cost £88. But this "Profit and Loss" as a cost basis is a joke. In the "Mining Standard" (issue, January 16th, 1913) it was shown that the cost of stores, for instance, is based on the purchases each period, and not on the disbursements. So, if one half-year a very large amount of stores is bought, and not all used, the next half-year has the benefit of some "free" stores. No stores, or coke, or timber, or any such assets, are to be found in the balance-sheet. Again, the amounts charged to "Machinery and Plant," whether by writing-off, or by fresh expenditure, vary enormously. Just at present there is such an amount of constructional work proceeding—charged to revenue, part directly, part indirectly, being charged to certain funds—that a detailed examination is not worth while. Especially is this so, when it is remembered that new conditions should be in force within nine months, if estimates are correct. But though the costs are omitted, it is worth comparing the actual financial results with those calculated on a basis of uniform metal prices.

Comparative Table D.—On a Basis of Uniform Metal Prices.

| | Half-year ended | | |
|---|---|---|---|
| | May, 1912. | Nov., 1912. | May, 1913. |
| Net value of blister copper— | | | |
| Copper content | £196,455 | £262,710 | £224,490 |
| Gold content | 303,208 | 265,720 | 237,607 |
| | £499,663 | £528,430 | £462,097 |
| Cost,* including depreciation | 374,692 | 392,793 | 376,044 |
| Net profit | £124,971 | £135,637 | £86,053 |

*Copper, at blister stage, £52 10s.; gold (fine), 84s. 11½d.

The balance-sheet is the usual atrocity. It altogether fails to indicate the growth of capital, in comparison with the previous period. Also, this balance-sheet shows funds that vary, from £10,000 to £20,000, from the statements to be found in the revenue accounts. However, it is to be expected of the balance-sheet of this company. The following table shows the actual financial results for the last three periods:—

Table E.

| | May, 1912. | Nov., 1912. | May, 1913. |
|---|---|---|---|
| Revenue | £537,377 | £640,712 | £499,340 |
| Expenditure | 349,984 | 387,586 | 351,337 |
| Depreciation | 24,707 | 24,707 | 24,707 |
| Net profit | 162,686 | 228,419 | 123,296 |
| Dividend | 100,000 | 100,000 | 100,000 |
| To Reserves | 64,875 | 193,294* | 46,591 |
| Carry forward | 14,875 | 23,294 | 46,591 |
| Liquid Assets (surplus) | 326,541 | 491,003 | 520,325 |
| Capital | 1,000,000 | 1,000,000 | 1,000,000 |

## MINERAL RETURNS.

The value of minerals produced in Tasmania during the quarter ended with March 31st was £270,244, as compared with £329,734 for the previous quarter. Of these totals £116,830 and £169,774 represent the values of tin ore for the two quarters respectively, the next highest figures being for silver-lead ore, which in the March quarter amounted to £74,644, as against £71,995 for the December term. The gold won between January and March inclusive was valued at £37,507, as compared with £33,025 for October-December, while blister copper (the value of gold contents being deducted) produced £30,440, as compared with £43,698.

During the last half-year New Zealand exported 170,276 oz. of gold, valued at £672,270, a decrease of 29,005 oz., valued at £112,398, compared with the figures for the corresponding period last year. The export of gold last month was 17,822 oz., valued at £73,217, or 5115 oz. valued at £22,950 more than June last year. The export of silver for the six months was 498,030 oz., valued at £51,804, a decrease of 34,381 oz., valued at £2726.

The output of minerals, other than gold, coal and precious stones, from Queensland for the April-June quarter had a total value of £503,649, as against £535,412 for the corresponding quarter of last year. The principal figures were:—Copper, 5059 tons, valued at £344,584 (last year, 5521 tons, valued at £390,590); silver, 133,737 oz., valued at £15,277 (last year, 100,144 oz., valued at £11,503); lode tin, 436 tons, valued at £48,017 (last year, 647 tons, valued at £64,942); alluvial tin, 448 tons, valued at £62,207 (last year, 317 tons, valued at £40,037).

The official statement of gold production from the Transvaal mines for the month of May is as follows, the corresponding figures for May, 1912, being added in parentheses:—Stone milled 2,425,333 (2,227,532) tons, gold produced 794,306 (779,062) fine oz., valued at £3,373,998 (£3,311,794), averaging 6.41 (6.76) dwt., and 27s. 3d. (28s. 9d.) per ton milled. The total working costs amounted to £2,139,861 (£2,095,010), or 17s. 9d. (18s. 11d.) per ton; the total working profits were £1,141,202 (£1,110,463), averaging 9s. 5d. (10s.) per ton; and the dividends paid amounted to £100,250 (£46,000).

The values of minerals other than gold produced from mines in the Transvaal during April (with those for April, 1912, in parentheses) were as follows: Coal £95,854 (£88,918); silver, £9190 (£9525); copper ore (sales), £12,601 (£4300); tin ore (sales), £34,594 (£26,782).

## REPORTS OF COMPANIES AND CORPORATIONS.

### Etheridge Gold Mines Ltd. (Q.).

After a wait of many weary months the shareholders of the Etheridge Gold Mines (N.Q.) are at last gratified to know the worst and the best about their property. The delay, as the directors explain, through their secretary, was caused by a feeling that, to lay any statement before shareholders until the new manager, Mr. E. A. de Lautour, had time to examine into matters himself, and report fully upon them, would be useless, and probably very detrimental to all concerned. In order to thoroughly satisfy himself, Mr. de Lautour considered it necessary, amongst other things, to unwater the Queenslander mine. Mr. de Lautour's report is now in the hands of shareholders, and will not prove cheerful reading, although he is sufficiently confident of the future of the company's mines and works to lead the directors to ask the shareholders for 4s. extra per share, which will yield £24,000, and enable the company to pay its debts, and leave a balance in hand for resuming operations. Probably the greatest surprise will be caused by the remark that ''nothing was done to develop the company's mines,'' but the balance-sheet shows that £10,787 was spent on development. ''The report explains (add the directors) what was previously a very disturbing mystery to your directors—the great discrepancy which was found to exist, when the extraction of ore commenced, between the reported and actual values in the Nil Desperandum. The directors had great confidence in the late management, and accepted and published the reported values without hesitation or doubt, and they were much perplexed and disturbed when it was found that the values recorded in the published reports were not there, and that no satisfactory explanation or reason for the discrepancy could be obtained. This was all the more perplexing, as there was never the slightest reason to suspect any intention to mislead, and also because the reported values in the Havelock had been substantiated by the returns from actual work. The directors were, therefore, at a complete loss to account for what had happened, and they were all the more concerned as the company was then in debt, and relying on the Nil Desperandum ore to keep the mill going and provide relief. The explanation arrived at and now given by Mr. de Lautour is that the mine is 'patchy,' and that very high assays were included which, to make the estimated value reliable, should have been discarded.'' Mr. de Lautour found, on examination, that the Queenslander mine bears out the estimated value of its ore, and he has no reason to doubt the Big Reef estimates.

The returns show that 10,147 tons of ore were treated at the mill, at a cost of £17,074 for mining expenditure, and £10,064 for mill expenditure. It seems reasonable to believe, as Mr. de Lautour does, that in such costs there should be room for substantial reduction. This ore produced 1797 tons concentrates (wet weight), containing 6350 oz. fine gold, 4803 oz. fine silver, and 38.75 tons copper, showing an average recovery of gold of slightly over 12 dwt. 12 gr. per ton of ore treated, and an average value in concentrates of 3 oz. 10 dwt. 16 gr. per ton. The concentrates netted £20,984.

''The bright feature of the report is the clean recovery made at the mill. The costly cyanide appendage, it now appears, might have been dispensed with entirely, the loss in gold without its use being no more than 1½ dwt., and even this loss, the report states, can be further reduced by the more perfect application of the available methods of concentration. This means, in effect, that whatever else has happened, the company has solved the problem of successfully treating Etheridge ore—a problem which has, during the past 30 or 40 years, involved many costly failures in attempts at its solution. . . . The great fact, however, remains that results already obtained prove that the ore is susceptible of treatment by the methods applied, and that by those methods a high recovery can be made of the gold and other metals, which the ore of the field has been known for so long to contain, and that this can be done at a cost that can be borne by much of the ore.''

The ordinary general meeting of the company will be held on August 2, at 39 Queen-street, Melbourne.

### Diamond Creek G.M. Co. (V.).

The half-yearly meeting of the Diamond Creek G.M. Co., Diamond Creek (V.), was held at 31 Queen-street, Melbourne, yesterday. The reports of the directors and the mine manager, presented to shareholders, showed that during the term 2407 tons of quartz were dealt with for a return of 3107 oz. 4 dwt. of gold from the battery, or 3277 oz. 11 dwt. (including cyanide gold), averaging 27½ dwt. per ton. The pyrites from the battery have been accumulating for some time, and are now being roasted, with a promise of good results. Two dividends of 6d. each were paid during the half-year, amounting to £1750, the total dividends to date being 7s. per share, or a total of £12,250. Development work amounted to 1198ft, the outlay on which was £3981, and, in addition, about £772 was expended on plant and machinery, which included an extra pumping plant for the underlay shaft, which is giving every satisfaction. A new gas plant is being erected by the ''Trulite'' company for a trial of its capabilities for motive power and lighting. The value of machinery and plant, battery, poppets, buildings and air compressor is put into the balance-sheet as £12,181, while the company has a bank balance of £1542. The profit and loss account shows receipts from the half-year's operations amounting to £12,756. The greater portion of the new workings for the half-year were between the 700ft. and the 800ft. levels, but some progress has been made towards opening out the 900ft. level.

## TASMANIAN MINING.

### Mount Lyell District.

(From Our Correspondent.)

Queenstown, July 25.

The North Lyell mine continues to send out about 1800 tons a week of average grade ore, and with the extension of ore-breaking operations at the 1100ft. level, the tonnage should shortly be increased. At this level, both No. 41 and No. 35 stopes are in good producing order, while the timbering and mullocking necessary to put No. 36 stope on a similar basis is well advanced. The great bulk of the output is coming from the 850ft., 1000ft., and 1100ft. levels, with a small tonnage from the 700ft. level. There is a lot of ore, some of which is of high grade, yet remaining to be mined at the latter level, but the working conditions are extremely difficult, as a lot of ''picking up'' has to be done, and this work can only be carried out properly by thoroughly picked miners, of whom just at present there are not too many available. Consequently, for a time at least, the output from this level will be dependent upon the quantity of skilled labour obtainable.

The weather conditions since last writing have mproved considerably, and the output of pyrites from the Mount Lyell mine is again somewhere about 4000 tons a week, and, under ordinary circumstances, they will be able to keep this up, with a fair chance of increasing it.

The company's smelting return for last month, while it was highly satisfactory as far as the amount of ore furnaced is concerned, can hardly be considered so from the metal production point of view. A return of 325 tons of copper from 27,107 tons of material, made up of 18,351 tons of Mount Lyell, 4800 tons of North Lyell, and 2617 tons of Lyell Comstock ore, with 1339 tons of purchased ore and metal bearing flux, is exceedingly poor, and compares very unfavourably with the return for the preceding period, when 27,482 tons of material produced 322 tons of copper. Leaving out the 1339 tons of flux and purchased ore treated during last month's run, the average copper value of the 25,768 tons of ore from the mines was only 1.2 per cent., or just about half the value of the tonnage furnaced under previous normal conditions. Certainly, the proportion of North Lyell ore treated to that of Mount Lyell ore was very small, being approximately only 1 ton to 3½ tons, and it was also reported as being of lower grade than usual, but allowing for this, the 18,000 odd tons of Mount Lyell ore and the 2600 tons of Comstock ore must both have been of extremely low grade. However, they will, or they should, do a lot better from this out, and although only two furnaces have been in operation for the past fortnight, about 1800 tons a week of North Lyell ore is being treated. This means 7000 tons for the month, and assuming this to be of the ordinary 6 per cent. value, the production of copper from North Lyell ore alone should reach 420 tons.

From a financial point of view, last month's operations of the company were not anything to write home about. Taking copper at £65 a ton, silver at 2s. 3d. per oz., and gold at £4 per oz., the gross value of the four-weekly metal production is only about £27,000. And, as the disbursements for wages and salaries for the period would be close on £25,000, to which has to be added the cost of fuel, material, etc., the amount left, after paying expenses, would not assist to swell the next dividend to any appreciable extent. And a consideration of the above figures, roughly set out, should convince a lot of people that just at present the Mount Lyell Co. is a long way from making the big profits on its mining operations which it is generally credited with. And it may be said that if last month's smelting return demonstrates one thing more than another, it is the absolute dependence of the company on the North Lyell ore to provide the necessary means to ensure its operations at Lyell being conducted on profit-earning lines. Further, it also demonstrates the wisdom of the management in launching out some years ago into the superphosphate industry, and thereby having, in the stressful times which have lately been passed through, a second, and also a very profitable, string to its bow.

The process or business of "gathering in" to its fold the outside shows of the field by the Mount Lyell Co. continues slowly, but none the less surely. The latest property to be absorbed is what is locally known as the West Lyell, but which was floated in London some years ago under the grandiloquent title of "The Copper Mines of Mount Lyell West." The Mount Lyell Co. has easements over the property, which joins the open cut workings of the Big mine on the western side, and for years past portions of the leases have been used by the Mount Lyell Company for dumping their overburden on. The English company, after spending (or squandering) £15,000 or £20,000 in the lordly fashion characteristic of such concerns in the early days of Lyell, abandoned the property about twelve months ago. No one considered it good enough to take up, and lately the Mount Lyell Co., not because it wants it particularly, but probably to keep anyone else from getting too close to their workings, has re-pegged and applied for the lease, and their application is practically certain to be granted. The West Lyell, or, to give it the full title, "The Copper Mines of Mount Lyell West," was a great institution on the Lyell field about twelve years ago. It had a mine manager, an accountant, and a metallurgist, all imported from Britain, and the salaries of these three gentlemen aggregated about £2000 a year. Several thousand pounds' worth of plant was also brought out, but very little of it was used, and a lot of it was eventually sold for less than a fourth of what it cost. The staff had a great time for a couple of years, during which some thousands of pounds were spent in exploratory work, without striking a ton of payable ore, although the most glowing accounts of the prospects of the property used to appear regularly in the London mining journals. But the inevitable came at last, and with it went some £20,000 of English investors' money. And the manager, and the accountant, and also the metallurgist, returned to the land from whence they came. Yes, it was a great mining enterprise, was the Copper Mines of Mount Lyell West, for some people—but not for its shareholders.

It is persistently reported that negotiations are proceeding between the Mount Lyell Co. and the Tasman Crown Co. for the purchase by the former of the latter company's mine. Although nothing official is known publicly about the matter, the writer has very good reasons for believing that the negotiations are pretty certain to result in the Tasman and Crown mine changing owners within a very short time, and no surprise need be expressed if, within the next few weeks, the announcement is made that the Tasman and Crown has gone the way of all other outside mines (except one) on the Lyell field.

# QUEENSLAND MINING.

## North Queensland Fields.

(From Our Correspondent.)

Mareeba, July 19.

After being shut down for a week or so, the lead furnace at the Chillagoe Co.'s works will soon be again in commission. The Huntingdon Heberlein plant and the Dwight Lloyd process are also in full swing. Mr. Barclay G. Bell, of the Australian Metal Co. Ltd., Melbourne, who are agents for the above two processes, visited Chillagoe, and conferred with Mr. Horsburgh re the above plants. Mr. Horsburgh has a big proposition to face in the treatment of the many complex ores sent in to the works. He has proved himself equal to the task, and it is a great pity that larger supplies of ore are not available.

The Mungana Co. are still the principal suppliers of silver lead ores, although parcels are coming to hand from many outside privately-owned shows.

At Cardross, the Mammoth copper mines are developing exceptionally well, and there appears to be a successful future in front of the company. It seems almost a pity that they have erected smelters at the mine, in view of the fact that the Chillagoe Co. have such a large plant available not many miles away. It is anticipated that, owing to the splendid prospects of the properties at Cardross, that railway communication with Mungana must take place in the near future. Mr. Alexander Macdonald, managing director of the Mammoth copper mines, is at present in the old country, conferring with his co-directors re the future working of the property, and I would not be surprised to hear that they have decided on building the railway. The Cardross field appears to be a permanent one, as the lode has been proved for a fair length, and as sinking continues the ore body is maintaining its size and values.

Tin mining is fairly brisk at present, but a little anxiety exists at the slump in the price of the metal. For the month of June the Herberton mineral field produced 2983 tons of tin ore, which were crushed for a return of 108 tons of tin, value £11,286. 34 tons 11 cwt. of stream tin, valued at £4514, were also obtained. The returns for other metals were as follows: Wolfram, 6 tons 5 cwt., value £644; copper, 79 tons 11 cwt., treated for 13 tons 6 cwt. of metal, value £946; lead, 41 tons 9 cwt., treated for 12 tons, value £234; silver, 3237 oz., value £382. The principal producers of tin in the Herberton district were the following:—Vulcan tin mine, 319 tons 15 cwt. of ore, for 10 tons 12 cwt. of tin, value £966; Governor Norman, 801 tons 13 cwt., for 11 tons of tin, value £952; Good Hope mine, 190 tons of ore, for 8 tons 4 cwt. of tin, value £930; Lady Agnes, 19 tons 7 cwt., for 4 tons 5 cwt., value £508; Stella, 149 tons, for 6 tons 8 cwt., value £638.

At Stannary Hills, Messrs. John Darling and Sons treated 107 tons from the Dead Finish mine for a return of 7 tons of tin, value £749. The Extended mine gave a return of £218 from 243 tons treated. It is the intention of Mr. Darling to work these mines more extensively in future. Colonel Beach, who has interests in this district, and who has been on a visit to his properties, returned South last Saturday. He intends to form a company to work the Lass o' Gowrie mine, which has given such good returns in the past, and which is looking exceptionally well at present. He also intends to raise funds in order to give the "Sweet William," at Herberton, another trial, which, I think, it well deserves.

Another proposition which will be placed before the public shortly is the Lizzie mine, at Irvinebank. The owner, Mr. Busbridge, has placed his mine under option to Mr. C. A. Jenkinson, who has also secured an option over the United tin mines, which adjoin Mr. Busbridge's property. The proposition appears to be a fairly sound one, as good returns have been received from both properties, and the ore body is big, and is going down strongly. Irvinebank will welcome some more large producers in its midst.

At the Mareeba goldfields the London and Queen Constance leases, held by the Mareeba Goldfield Amalgamated Syndicate, are being actively developed. The lode in the 80ft. level of the Constance shaft is 1ft. wide, and is looking very well, and showing mineral freely. On the London lease the drive is being continued on 2ft. of laminated stone.

The Minnie Moxham mine is reaching an interesting stage, as the shaft is nearing the reef. The directors who visited the mine this week report that conditions are very favourable, as stringers of quartz are making their appearance. The country is is also becoming much softer. In another fortnight we should know whether the Northcote reefs live to a depth or not. If the reef is cut by the Moxham shaft, then this field has wonderful possibilities, and will give a big fillip to gold mining in this part of the world. The result of the developments are therefore being anxiously awaited.

# VICTORIAN MINING ACTIVITIES.

## Bendigo and District.

(From Our Correspondent.)

The gold production for the week ending July 26th, 1913, amounted to 3465 oz. 19 dwt. The principal producers were Golden Pyke, 350 oz. 17 dwt.; Central R., W. and Blue, 312 oz. 10 dwt.; Princess Dagmar, 235 oz. 10 dwt.; Carlisle, 216 oz. 3 dwt.; South New Moon, 172 oz. 17 dwt.; Great Northern, 164 oz.; Ironbark, 138 oz.; United Hustler's and Redan, 132 oz. 9 dwt.; Catherine Reef, 131 oz. 5 dwt.; Williams United, 123 oz. 3 dwt.; Garden Gully, 99 oz. 5 dwt. Four dividends were announced, totalling £3800 13s., viz.:—Golden Pyke, 1s., equal to £1372 10s, total to date £75,312 17s.; United Hustler's and Redan, 6d., equal to £1078 3s., total to date £179,303 17s.; Great Northern, 6d., equal to £750, total to date £167,950; North Bendigo, 6d., equal to £600, total to date £6000.

Carlisle maintained a highly payable average from the extensive fault reef and spurs allied to the faulting of the Victory east back, the yield of 216 oz. 2 dwt. from 477 tons being the more satisfactory from the fact of about 40 per cent. of the output coming from the 1200ft. north intermediate stopes. These stopes have opened up 20ft. of consolidated crushing material, from the foot of the rise connecting with 1140ft., at 140ft. north of the shaft, and a little gold has been visible throughout. This is nearly 50ft. below the top fault, and the extension of operations here should be interesting in view of the excellent prospects in the 1140ft. south level at 60ft. under the same break. It was the quality of this latter spurry quartz last week that accounted for the lucrative yield, as the overhead stopes north and south were not drawn upon to any extent. The 1140ft. south level is being continued from where the leading side stope was recently squared into the end of the original level, the former having been driven at 15ft. further east and along the Victory back. After each firing during the past term a good sample of gold has shown freely in this end and there is over 1000ft. of ground still available before reaching the Unity Co.'s lease. As it is known that stone of good quality extends to the fault, a good height of profitable material is assured southward. The overhead stopes will be resumed this term. Above the crosscut the workings extend to the fault, but the slide is probably 30ft. from the stope near the end of the timber in the south level. Another 6d. dividend was generally anticipated last week, but in consequence of an outlay of about £400 on new ropes, etc., and the payment of the previous dividend, through an error, when the funds scarcely warranted it, a further division of profits has been deferred till next Thursday.

Golden Pyke exceeded all recent results with 350 oz. 17 dwt. from 300 tons last week. This was due chiefly to the richness of the reef in the stopes south of the Nos. 1 and 2 rise, gold showing very freely in 18in. to 3ft. of crushing material. Very fair gold was also seen in the stope north of No. 1 rise, taking 18in. of reef. In taking up the bottom of the 543ft. north level to 30ft. from the Constellation boundary, the stone was small but of good value. At 447ft. the north level is meeting more quartz, and, from the favourable indications, it is likely that fair gold will be found in this end shortly, as the rich shoot in the rise at 200ft. north of the 543ft. crosscut is about due, if it extends so far. As the level is about 120ft. from the Constellation lease, the latter company's prospects would be enhanced by the entering of payable stone. The first and second stope reveal a few colours of gold, similar prospects showing at each breaking in the south stope. At 643ft., the outlook has improved in rising above the stopes. The rise is 150ft. from the shaft and 162ft. from the Golden Age lease. A height 40ft. has been attained above the stopes, leaving 30ft. of ground to penetrate before holing through to the 543ft. south level. For the last 40ft., the reef averaged 12in. and revealed fair gold throughout. This is believed to represent the continuation of the richer shoot traversed for a height of 40ft.

opposite the 543ft. main crosscutting, in rising from 643ft. The 643ft. south level is within 17ft. from the boundary. Though of a promising appearance the reef is small and of no value at present.

Lansell's Little No. 180 mine manager (Mr. A. Bennetts) resigned his position last week. Under Mr. Bennetts' direction during the past 6½ years the mine produced 37,000 oz. gold from 77,000 tons, principally from the massive formation first discovered at the 500ft. level and which is identical with the Central R., W. and Blue 318ft. reef. There is yet a large reserve of crushing material southward above 405ft., along the course of these backs; a width of 25ft. of solid stone in the 300ft. level, near the boundary, represents the extreme upper limits of the formation. North of the shaft the reef is untouched for a length of 150ft. Prior to meeting this formation, and before Mr. Bennetts took charge, good results were obtained from the necky reef at 300ft., which is the same as exploited successfully by the Ironbark Co. at 480ft. The shaft is down about 1100ft. and several reefs intervene from the 500ft. level, which have yet to be prospected. An important crosscut will be put out shortly from the bottom plat. This will test the reef channel below its intersection with a strong fault, which carries irregular quartz of an auriferous character in the eastern beds, in the last crosscut. The increased return of 377 oz. 15 dwt. came from last week's milling. The "500ft." reef having produced something like £200,000 worth of gold in the Central R., W. and Blue property, where it is still "going strong," this formation has an excellent record to date.

Great Northern reported a few colours of gold along the west wall of the larger formation at 800ft. in the 1184ft. north level. Hitherto the best prospects have been seen at a few feet from this back, the side stoping last week close to the end showing fair gold. From here to the Virginia Co.'s lease the reef remains to be opened for a length of 400ft., and is also intact for a greater distance under the level. At 1247ft. there is also a level on this wall, but it is about 400ft. behind the 1184ft. workings. Only a small vein of quartz is exposed, containing a little gold. The highest grade stone is along the McDuff back, and is of a spurry character. The parallel level on this back at 1184ft. is in 890ft., the stopes following taking 7ft. to 9ft. of stone. These spurs looked like pitching underfoot a few weeks since, but are now easing up and consequently may be worked for some time longer from the present base northward. Similar gold prospects show in the stopes further south. The yield of 164 oz. from 296 tons was above the standard of late and enabled another 6d. dividend being announced.

Constellation have brighter prospects in the 525ft. stopes, the "Golden Pyke" reef enlarging to 16in. and showing more gold than for several weeks past. This improvement is 90ft. ahead of the latter company's 543ft. workings and along the same shoot as produced the good returns in rising, but which subsequently depreciated in value. The 420ft. crosscut from the north or McBeth shaft should reach the reef early in July, and is well situated for tapping the portion of the back that has carried the best stone in the next lease. At 622ft. there is no material change in prospects.

Central R., W. and Blue met with a development of importance, payable gold, of fair sample, being found in rising through 5ft. of stone at 594ft. north of the 400ft. plat. The rise is going up close to the end of the 400ft. main level, and as the latter had failed to disclose anything of value, the company were nearly limiting the stoping to the intermediate workings. The recent discovery in rising will necessitate the extraction of the reef upward from the main level. The rise is up 30ft. and about 15ft. short of the intermediate level, but the latter will have to be extended about 40ft. to connect. A short distance from the face of the intermediate is the No. 5 winze from 318ft., in which gold showed very freely for a depth of 30ft. It is thought probable that the shoot in the rise is a portion of that traversed by the winze, which would increase the value of this end of the mine. Latterly the stopes north of the No. 3 winze have been getting very good stone close to the rails of the 318ft. main level, along the main eastern wall. As yet no stoping has been done from the No. 5 winze, this rich stone being reserved as long as possible. A few colours of gold continue visible in 2ft. to 3ft. of quartz associated with the inner west wall, in the north intermediate, but the more profitable material has been from the No. 3 stopes, the last fortnight. At 720ft. the company have started to break across the cap of the second saddle reef, and a few colours of gold are showing. Shaft sinking is proceeding below this depth, in order to follow the third saddle formation northward. A contract has been let to Messrs. P. Jorgensen and Sons, Bendigo, for the supply and installation of a new winding plant, etc. The machiery is expected to be under steam within 4½ months, and its erection will not delay underground operations to any extent. The small winch now doing duty may be transferred to the southern portion of the lease and some shallow prospecting carried out. There is a reserve fund of £1100 toward the expenditure on new plant.

South New Moon have seen nice gold in the 980ft. south-east stopes, in the old system of spurs, a few good specimens being extracted after Saturday's breaking. The milling proved very profitable, and it will not be long before the company's dividend aggregate reaches half a million sterling. Another division of profits may be anticipated during the next couple of weeks.

Clarence United improved their own position and did the adjoining New Argus Co. a good turn by resuming operations in the 2280ft. south level, at 80ft. from the boundary. From a rise on 2ft. of stone at this point, a profitable average was got from a trial crushing. The stone was previously tested and abandoned. The result has induced the extension of the main level to the New Argus boundary and created a demand for the latter company's scrip. The New Argus shaft is deep enough to permit of the stone being located. It is just possible that this company have given it some attention, as a few colours of gold were found in a couple of reefs in putting the 2080ft. centre winze through to 2300ft. The Clarence have a fair length of stoping ground south, but their best chance on this reef appears to be northward, where they are following a shoot from which tribs. formerly had excellent results. It is this stone that has increased the returns of the past month. At 980ft. there is 8ft. of spurry quartz allied to an east back, on which levels and stopes are in progress, revealing a few colours of gold. The 935ft. rise and the 835ft. crosscut, in search of the South New Moon 980ft. spurs, are still unproductive.

Langdon Co. report the finding of coarse gold by tributers in the footwall side of the old 390ft. north level, at about 200ft. from the shaft. The level was driven on the east back of an inverted reef, close to the cap, the company disclosing a few colours of gold in the spurs by breaking over west in the footwall beds. A couple of millings were considered sufficient prospecting, values not realising expectations. Work had been suspended for some time when the tribs. happened along. It is stated that the prospects are the best seen north of the shaft and warrant the expectation of a profitable average. The company's success was in working the main reef south of the shaft near the intersection of a deep fault.

## Castlemaine and District.

(From Our Correspondent.)

The directors of the defunct Francis Ormond mine are losing no time in placing the whole concern in the hands of a Ballarat firm for sale by auction. There has been a spasmodic attempt made to have it re-opened by local effort, but nothing has come out of it so far. There are still many good judges who think that by sinking gold may be got, but the trouble has been all along that nothing but driving and rising to catch certain elusive stone has been attempted, and the best work has all been done at a lesser depth than 1000ft.

For the past fortnight there have been three yields from quartz mines, and this is something unusual. Spring Gully did not do as well as was expected, and its return was barely payable. The reports go to show a large quantity of ore in sight. At 90ft. in the main 200ft. east crosscut, and 14ft. down the winze, stoping on east side of the intermediate south level is being done by two shifts. The stone is 3ft. thick, showing gold. It should improve as it goes east on watercourses and an indicator slate, which carried the gold in the north ground.

The 250ft. north stopes are showing stone 25ft. wide, 3ft. 6in. high, and showing gold right across. The stone is becoming more mineralised and is improving. In the end of stope cut across 12ft., mostly stone, and cut the east back. The return was 54 oz. from 236 tons.

New Golden Hill Co., recently floated, sent its first parcel of 10 tons to the Spring Gully battery, and the result was 20½ oz. This is a mine situated near Mopoke Gully, between Campbell's Creek and Fryerstown, and the present is the third company to work it within about four years. It has always been patchy, and some of the pockets have been very rich.

South Wattle Gully Co., which is at present the lodestar of Chewton, also patronised the Spring Gully battery with a consignment of 68 tons, and the encouraging return of 37 oz. 17 dwt. was the outcome. The stone was taken from the 230ft. level. The No. 2 rise from the 300ft. level has been put up 10ft., and a reef 6in. thick is showing, and a little water is making in the rise. The saddle should be cut within 20ft., and it is expected to cut the gold coming down from the north drive at the 230ft. level. In the No. 1 rise, the drive on the west leg is out 9ft., and the reef is 1ft. thick, nice-looking stone. The gold stone should be met to the westward. The stone from where the crushing came has gone under the level, and according to the underlie should give about 200ft. of backs.

Campbell's Creek bucket dredge is improving its already payable average each week. The last four weeks has seen the returns—87 oz., 77 oz., 83 oz., and 91 oz.

## Maldon.

(From Our Correspondent.)

The quarterly returns for the term ending June 30th have been issued by Mr. R. L. Nankivell, the mining registrar. They are tabulated as—Alluvial, 29 oz. 3 dwt.; quartz reefs (actual returns), 3841 oz. 19 dwt.; quartz reef (not accounted for in returns), 1592 oz. 8 dwt.; total, 5103 oz. 10 dwt. The return shows an increase of 746 oz. over the previous term, the totals then being 4357 oz. 2 dwt. The chief improvement came from the Oswald gold mine, 571 oz., being the advance by that company for the term. Prospecting work is being carried on at 400ft. and 1100ft. levels south of the shaft, and stoping is being done at 500ft. and 600ft. levels on a reef from 5ft. to 6ft. wide, averaging 15 dwt. per ton.

The work being done by the South German Co. is confined to the east reef, where an intermediate is being driven north from the winze at 150ft. below the 1750ft. level at a point 762ft. north from the shaft. The level is being put in with a view of locating the shoot of stone so profitably worked in previous years. The actual gold yield for the term reads:—Battery, 1062 tons, 293 oz. 11dwt.; concentrates, 11¾ tons, 66 oz.; cyanide, 2195 tons, 140 oz. 4 dwt.; total 499 oz. 15 dwt.; value, £1942 14s.

Derby United went up 56 oz., and the return reads: 920 tons, 174 oz. 19 dwt.; concentrates, 10½ tons, 36 oz.; cyanide, 1750 tons, 201 oz. 8 dwt.; total, 412 oz. 7 dwt; value, £1623 11s.

New Day Dawn had no crushings, but at the surface they have opened up two reefs, which each contain payable gold. Driving is being done to locate the same stone at lower levels.

The tributers who are working the Nuggety Extended ground had a rich crushing from 43 tons of stone, namely:—Battery, 191 oz. 5 dwt.; concentrates, 5 tons 13 cwt., 74 oz. 15 dwt.; total, 266 oz.; value, £1064.

Maloney's Red, White and Blue, at Gowar, had an improvement of 28 oz. for the three months. Stone is still being broken out between the 84ft. and 159ft. levels. From 257 tons sent to the battery, 74 oz. 8 dwt. was got, valued at £178 5s. Since the close of the term nearly as much has been got. The past fortnight has taken 13 oz. 14 dwt. from 63 tons, and the previous fortnight returned 22 oz. from 62 tons.

Blow Reef, at Newstead, are still sinking. Their gold receipt was a modest 3½ oz. from 10 tons.

Nuggety Co.'s return was 45 oz. 12 dwt.

Milne and party got 35 oz. 13 dwt. all told, and Dudley Bros. cyanided 590 tons for 31 oz. 9 dwt.

The promoters of the Oswald North Co. report satisfactory progress in placing shares, over a third having been taken up in a fortnight.

The last returns from the South German tribute parties were satisfactory, as follows:—Baxter and party, 148 tons, 89 oz. 9 dwt.; Best and party, 167 tons, 21 oz. 13 dwt.; Hansen and party, 87 tons, 16 oz. 17 dwt.; Merlo and party, 70 tons, 19 oz. 17 dwt.

## Daylesford.

(From Our Correspondent.)

Prospects at the Nuggety Ajax seem to indicate that they will soon be running the battery two shifts. In the rise on the vertical, at the No. 6, the body of quartz is quite 6ft., and carries a little gold throughout.

The North Ajax have followed the payable lode formation south, at 700ft. level, to 66ft., and it maintains its payable value. In the north end the stone appears to have gone away to the west, and will be followed. There is over 300 tons of payable quartz on the surface ready to go through the mill. It is probable that another milling will be put through the Ajax battery.

The Lord Roberts cut a new reef while costeaning north of the prospecting shaft. A party of Melbourne shareholders on Friday appeared well satisfied with the prospects. The reef is of saddle formation, and has been tested for over 100ft., proving strong at end, and prospecting equal to 10 dwt.

---

The Long Tunnel G.M. Co., Walhalla (V.), cleaned up last week, recovering 319 oz. of gold from a crushing of 1035 tons, while pyrites gave 70 oz., and the old mill refuse yielded 13 oz. 10 dwt. of gold, and pyrites assaying 24 oz., or a total of 426½ oz. for the four weeks. A request was made to the company for a tribute on the surface of the ground in the gully where the Long Tunnel and the old Extended companies' leases formerly joined. A big body of stone is outcropping at the spot. It is likely the present company will test it themselves before letting any tribute.

## MINING IN NEW SOUTH WALES.

### Broken Hill.

(From Our Correspondent.)

Broken Hill, July 25.

News in connection with the Broken Hill mines continues frightfully slack. Everything is going along smoothly in nearly all cases, and there is generally an abundance of labour, even though some of it be not first-class. But new finds underground, new lodes or off-shoots, seem to be things of the past only, though the market in the cities appears to be so dead that even a big discovery locally would not waken it.

The Junction North mill last week certainly did extra good work, producing 709 tons leady concentrates, as well as 323 tons zinc concentrates and 260 tons middlings. The leady concentrates averaged 52.9 per cent. lead, 32.7 oz. silver, and 14.7 per cent. zinc. The Junction mill, on the southern side, turned out a concentrate going 56.0 per cent. lead, 25.0 oz. silver, and 6.0 per cent. zinc. These respective figures compare poorly with the Central's 66.4 per cent. lead, 33.2 oz. silver, and 7.1 per cent. zinc. Each of these mills has a zinc concentrates to follow.

Developmental work is being persevered with on the Junction North, but results so far have not been too flattering. No. 12 level winze continues to deepen in low grade ore, with better grade stuff on the eastern side. The north main drive has not yet reached the point where the lode should be cut. A larger output is expected shortly from No. 10 level.

The Junction had a small fall at the 450ft. level the other day. This somewhat hampered operations for a time, but the trouble has been overcome. The drive north at the 1000ft. level is in ore. New Wilfley tables are being put into the mill.

A loss of 10½ hours during the 17 working days from July 1 to July 19 reduced the output of the British mill. A total of 12,403 tons of crudes was treated, which produced 1639 tons leady concentrates. The crudes were worth 12.8 per cent. lead, 7.6 oz. silver, and 12.0 per cent. zinc. A diamond drill bore (No. 206) put out on Thompson's No. 7 level disclosed nothing but quartz, quartzite and schist. Fair to low grade ore was the result of operations at No. 8 and No. 9 levels. The main crosscut on No. 11 level, at 475ft., showed sandstone carrying patches of mineral. Satisfactory progress continues to be made with construction work in connection with the new additional plants.

Some assays from the South Blocks (Zinc Corporation) for the past official week:—

| | Lead. P. c. | Silver. Oz. | Zinc. P. c. |
|---|---|---|---|
| 1050ft. level (north drive) | 13.7 | 2.3 | 8.7 |
| 1800ft. level (winze) | 13.5 | 2.1 | 8.3 |
| 650ft. level (south drive) | 11.0 | 2.5 | 1.8 |
| 522ft. level (south drive) | 5.9 | 2.1 | 14.2 |

The first two levels are on the main lode, and the latter two on the zinc lode. The mine continues to provide a healthy, steady output.

Mr C. F. Courtney, general manager of the Sulphide Corporation, paid a brief visit to Broken Hill this week.

His many friends will regret to hear of the serious illness of Mr. "Tom" Worseley, chief surveyor of the Proprietary Co. Mr. Worseley took ill at Port Pirie, and for a few days the worst was feared. However, he is now improving.

Block 14 continues on its steady routine, outputting regular quantities of sulphides and carbonates, both for despatch.

### Lithgow District.

(From Our Correspondent.)

Lithgow, July 25.

It is reported that Mr. Klug, of the Zinc Corporation, is to pay a visit to Sunny Corner shortly, and no doubt it will depend on his report whether the Corporation will continue operations at the mine or temporarily suspend work. Should the latter course be resolved on, there is good reason to believe that a financial combination, which is quite satisfied with the quantity of ore in sight, will take over and work the leases. The mine has really only been worked to a depth of a little over 300ft., so there is plenty of scope for further development.

Work at the Lloyd copper mine, Burraga, has been much retarded by the wetness of the season. For the last fortnight 1588 tons of 4.8 per cent. ore was raised, and 1500 sent to the mills. The return was 249 tons of concentrates worth 14.06 per cent. copper and 91 tons of picked ore worth 11.85 per cent. These products are smelted with slag, making a total of 339 tons, which returned 50 tons of matte containing 32.2 of copper, and low values for both gold and silver. The matte during the fortnight averaged 61.4 per cent. copper, and is now being shipped in that form to the refining works. Some concentrates will be produced when the Minerals Separation plant is complete; and, when this is done, the extraction of copper from crude ore assaying 4.8 per cent. should show considerable improvement. At present the loss in slimes, tailings, and slags is very heavy. Firewood is hard to procure in wet weather, and damp wood is not ideal fuel. But these troubles are small compared with the heavy and continuous loss of copper.

Good progress has lately been made at the New Burragorang silver mine, Yerranderie. In fact, a development of some importance has just been made, a strong body of ore being met at the 630ft. level in the main shaft. It carries good galena and silver, and is expected to assay quite equal to the last consignments forwarded to the smelters. Active operations are in progress to open out on the eastern side in the bottom of the shaft. The lode now being mined is undoubtedly the same lode that was worked by the Yerranderie Silver Mining Company with such profitable results. It is stated that the directors have completed arrangements to provide a new winding plant capable of winding 3000ft. if required. The present plant is nearing its limit of haulage power, and, with new plant, will be considerably reduced, and, on the other hand, greater speed obtained in sinking the main shaft to 1000ft. This will prove the whole of the western boundary of the company's leases of about 78 acres. The company deserves every success for the manner in which it has carried on development operations, which will be of importance for the future of Yerranderie's mining history.

---

Mr. W. A. Mercer, representing strong English capitalists, recently inspected the property of the New South Wales Diamond Pipe mine at Delegate with a view to reporting in connection with the exercise of an option.

Hughes and party at Yambulla are re-opening on an extensive reef on lease No. 14. Their last crushing yielded 30 dwt. per ton. Bowman and party, adjacent, are breaking good ore.

The wages dispute on the Ardlethan field has been settled. The Metalliferous (Consolidated) Board visited the field last week and took evidence, and have since stated that the terms of settlement include the re-instatement of the men and payment for lost time.

---

## MINING IN WESTERN AUSTRALIA

(From Our Correspondent.)

Kalgoorlie, July 21.

The Golden Ridge Co. has taken a six months' working option on the Yerilla King and Viola leases, at Yerilla. The Yerilla King has produced £14,800 from 3334 tons, and the Viola £7100 from 1216 tons. At the 130ft. level the reef in the Yerilla King has been opened for a distance of 400ft., the width being 2ft., of an assay value of 84s. per ton. The reef has also been cut in the shaft at a depth of 187ft., where it is 24in. wide, and assays 170s. per ton. The workings of the two mines are connected at 130ft., or water level. The price asked for the mines is £8000. The Golden Ridge mine is almost worked out, though the company is still earning a monthly profit of £1000, which is being hoarded with a view of acquiring a fresh property. The property now under option appears to be very promising, though the reef is too small for a highly capitalised company.

Dr. Malcolm MacLaren has arrived in Kalgoorlie, after making an exhaustive examination of the Great Fingall mine, at Day Dawn, and the Fenian, at Meekatharra. He is very well satisfied with the appearance of both mines, especially of the Great Fingall, where the new ore shoot has been opened up from the 13th to the 18th level, and it is estimated that 50,000 tons of ore, assaying 40s. per ton, are blocked out at these levels. The internal shaft at the 13th level is being equipped with headgear and a winding winch, and then the ore from the new shoot will be available for the mill. The equipment for this shaft is expected to be complete by September, when the Fingall returns should show a marked improvement. The ore reserves in the upper levels are estimated at 21,150 tons, assaying 26s. 5d. per ton, and are being depleted at the rate of 6000 tons a month. Dr. MacLaren is making an exhaustive examination of the Ivanhoe, and afterwards of the Sons of Gwalia, and in three weeks' time he expects to leave for Queensland, where he is to report on the Great Fitzroy copper mine. Dr. MacLaren is of opinion that the intrusion of graphite, which has caused an impoverishment of the lode at the three bottom levels of the Ivanhoe, is only temporary, and that, when the graphite peters out, the lode will show an improvement.

The first return from the Edna May's new mill of £2870 from 680 tons, or 84s. 5d. per ton, by amalgamation, is considerably better than M. T. Williams, the manager, anticipated, especially as 400 tons of 40s. ore were included in the parcel, and the tailings are said to be worth an ounce to the ton. Mr. Williams estimated the ore reserves at 20,000 tons, worth 85s., and Mr. A. E. Morgans at 12,000 tons, worth 87s. 8d. per ton. Both estimates seem to be absurdly conservative, as the 2100 tons treated to date have produced £14,290, or £6 16s. per ton, exclusive of gold in residues. The average width of the reef for the 240ft. driven at the 75ft. level is 14ft. The low market valuation of the mine compared to the Associated Northern is probably due to the fear that the lode may be cut off by granite, which is only a short distance away on each side of the reef.

The Oroya Links Co. is to sink their Croesus Prop. shaft another 150ft. to a vertical depth of 900ft. In a winze below No. 7 level, at a vertical depth from the surface of 814ft., the lode is 24ft., and assays 40s. per ton. The shaft is to be equipped with new head gear, and a more powerful winding engine to facilitate deeper sinking, as the company now holds the Levant lease to the north, into which the Eclipse ore shoot is rapidly dipping.

Mr. W. R. Grant, manager of the Siberia Consols, at Waverley, has now cut a plat at the 184ft. level of the mine, and started sinking below that depth to see if sufficient water is obtainable. If a sufficient supply is cut, a mill will be erected on the property to thoroughly test the lode by actual crushing. The Government mill, where the ore already treated was sent, is four miles away, and carting and crushing cost 17s. 6d. per ton, besides wasting time, as the water supply is only enough to run the mill one shift daily. This mill is only available at long intervals, as it is only started when 1000 tons of ore have accumulated, and this may take months, as only picked ore will pay expenses.

The Young Australia, at Mulline, which is being worked by a local syndicate, has cleaned up 260 tons for £2090. This brings up the total from this mine to 3317 tons for £41,098. The lode on the property has a very flat underlay, and the ore shoots are very short, so that a lot of dead work has to be done to pick up fresh lenses of ore. The Mulline district has been worked by prospectors for years, and although a large amount of gold has been won, no equipment worth mentioning has ever been erected. For instance, the Lady Gladys mine has produced £150,000, from 27,000 tons, yet the hauling is still done with a whim, and all the ore has been treated at the Government mill.

---

## SIBERIA'S MINERAL WEALTH.

Recent investigation shows that in addition to gold, Siberia contains immense deposits of tin, lead, and copper. Altai and the Steppe district can yield rich silver-lead ores. For example, according to the district engineer of the Steppe territory, Mr. Sborovsky, the mine of Kizil-Espe contains in the ore 0.225 per cent. of silver, 78.49 per cent. of lead, and 1.21 per cent. of copper, whilst the Gultatoff mine yielded from 49 tons of ore 22 tons of silver-lead, containing 76.89 kilogrammes of silver and 11 grammes of gold. As to copper, Siberia is still richer in this metal than in the others. Figures recently published show the progress that has been made in the copper production of Western Siberia—namely, from 68,900 poods of metallic copper in 1907 to 230,000 poods in 1911. And it is already known that the 1912 production will greatly exceed that of its predecessor. Thus, with the present unfavourable conditions, such as animal transport over hundreds of versts, to and from the nearest railway or water station, the Siberian copper-producing industry has improved fivefold in five years. Copper is particularly abundant in Altai, and in the Steppe district, where the ore contains 20 to 26 per cent. of copper. It has been known to contain 79 per cent. of copper glance in some parts. On the southern slope of Tarbagata ore is found containing 30 per cent. of copper; it is frequently found practically pure. But copper and gold are not the limits of Siberian mineral riches. The Karkaralinsky deposits of copper lie about 70 versts (46 miles) from the Kuutchekin deposit of coal, found in two mountains, where also iron ore is found containing 70 per cent. of pure iron. But particularly rich deposits of iron ore are found in the Altai mountain range, where the Telvesky iron ore mines were estimated on the first investigation to contain 1,225,000 tons of magnetic iron ore. Naturally, the exploitation of this exceptionally fine deposit will be much facilitated by the presence of coal in immediate proximity to it. The Minusinsk deposits of ore, with 70 per cent. of iron, are considered to be not less important than those mentioned above.

---

It was stated before the Arbitration Commission in Sydney that the timber industry was affected by eighteen different awards, the chief of which in their bearing on that industry were the sawmills and timber yards, trolley and draymen (two awards), carpenters and joiners, engine-drivers and firemen, and iron trades.

## CRUSTAL FOLDING AND MOUNTAIN BUILDING.

By Professor James Park.

All the principal mountain chains on the planet owe their existence to the uprising of crustal folds; and mountain-making may be defined as the result of localised folding in regions where the uplift is faster than the rate of denudation. If the rate of denudation were equal to the rate of uplift, it is obvious that the truncated and dissected folds would never form highlands or features of bold relief. A potential mountain-making fold suppressed by denudation would in time become buried in the waste derived from its own destruction, and the ultimate result would be a worn-down stump indistinguishable from the stump of an alpine chain worn down by long-continued sub-aerial denudation.

Alpine chains may, therefore, be regarded as the expression of relatively rapid folding.

It is seldom that a mountain chain consists of a simple synclinal fold. More often the great chains consist of a series of deeply dissected isoclinal folds forming a confused alpine complex, flanked by many more or less parallel ranges. The great height and rugged contours of the Pyrenees, Alps, Himalyas, Andes, and Rocky Mountains are an evidence of their comparative youth. Their uplift has been so recent and rapid that denudation has merely succeeded in eroding the crests of the folds into narrow serrated ridges, deep valleys, and profound gorges.

There is evidence that great alpine chains existed in the remotest geological ages. All of these chains were vigorously attacked by the contemporary agents of denudation, their waste furnishing the sediments that built up the latter formations. The only vestige that remains of these primitive alps is their worn down stumps, many of which have lain for countless eons buried beneath piles of sedimentary strata. Here and there the buried stumps have become exposed by recent denudation, or disclosed by deep boring.

When a renaissance of the folding movements takes place along the segment occupied by a worn-down and buried alpine chain, a second alpine chain may rise on the ruins of the first. Most of the existing mountain chains occupy the ruins of Palaeozoic chains, the stumps of which have sometimes become involved in the later folds.

In the complex structure of Europe, Lapworth and Suess have recognised three primary folded chains all overfolded towards the north, namely:—

(1) The Caledonian. S.W.—N.E. Pre-Devonian.

(2) The Armorican. N.N.W.—S.S.E. Pre-Permian.

(3) The Variscan. W.S.W.—E.N.E. Pre-Pliocene.

The Caledonian is the northernmost of these ancient alpine chains. It is composed of a massif of Archaean granites, gneisses, schists, and older Palaeozoic slates, sandstones, and quartzites that extend from the west of Scotland north-eastward to the northern limits of Scandinavia. It causes little surprise to find that rocks of such antiquity have been crushed into many complex folds, overthurst, and profoundly faulted.

The Armorican folded chain, so named from the ancient name of Brittany, is the result of movements that ridged up the Devonian and older carboniferous formations between the close of the early carboniferous and the advent of the Permian. The truncated remains of this western alpine chain can still be traced from Ireland to Central France, buried beneath a pile of Mesozoic and younger formations.

The Variscan, or eastern fold, is of Cainozoic date. It extends from the Atlantic border through Southern France to Northern Bohemia, and includes the Pyrenees, Alps, and Carpathians.

In Asia, the Caucasus, Hindu Kusch, Altai, Thian Shan, and Himalaya Mountains are composed of folds of the Variscan type, the axes of which lie approximately parallel with the Equator.

The great Ural chain consists of folds running north and south.

In the American continents, the Pacific Ocean is bordered by high mountain chains that are surmounted by many active and extinct volcanoes. These are typical folded chains of the meridional type, but turn their folds towards the abysses of the sea. The segment of the Aleutian Islands forms an independent fold.

It is significant that all the great chains of Europe, Asia, and North Africa, with the exception of the Urals, are composed of east and west folds; while the Andes, Rocky Mountains, and Sierras, in America, run parallel with arcs of the meridian.

Volcanic activity is frequently associated with areas of vertical displacement resulting from faulting or intense folding; and all great earthquakes are due to the jolts propagated by the revival of movement along ancient fault-lines.

---

## THE IMPORTANCE OF ZINC.

Spelter is to-day occupying a more important place in the industrial uses of the world and is destined to play a still more important part in the future. As a protective agent in galvanising, it has reached an enormous tonnage consumption yearly; but even this, its greatest single use, is not yet developed to its highest possibilities. Its greatest future and the use upon which Joplin ores will secure the greatest benefit will come when zinc sheets will become a more common roofing material and displaces copper, the higher priced metal in all cornice work. This is coming just as certain as the facts spell the diminishing supply of shingle materials and the consequent need for cheap and durable roofing. That time is, in fact, not far distant and it would be almost immediate if the manufacturers of sheet zinc pushed the merits of their product one-half as energetically as do any of the great advertising companies who are constantly placing on the market cheap, patent fibre roofing. Tin roofing has for a century played an important part in the building operations of the world, but the abnormally high price of that commodity, coupled with its small period of usefulness, compared with sheet zinc, means a final substitution of this metal on all the roofs where tinplate formerly was the covering. Spelter is only beginning to enter into its own, and when its friends and producers really realise its importance and place in the industrial world, this present period, now falsely termed a "boom," will mark but one of the initial steps in the greater use of this metal.

The one suggestion that, if all the roofs now covered with tin, rubberoid, tar papers, or copper, were covered with zinc, will give one a slight idea of what is in store for the future of this metal. Then heed but the passing thought of the rapidly diminishing supply, and the final vanishing of shingle roofs and there is added still another wide horizon of development that is almost astounding. The combination of this metal with aluminium in a number of alloys has opened up a series of uses that means a tremendous field for future consumption.

Conservation Demands Use of Zinc.—It must be remembered, too, that the nations of the world are facing to-day as never before the problem of conservation of all of its materials, and few metals in the whole category answer so well this problem as that of zinc. Resisting oxidation as no other metal of equal or even treble its price does, it occupies the front row of desirable substitutes for many purposes in building construction where wood is becoming too high priced and short lived to use, and where copper and aluminium are too high priced to use. That era is just beginning and the future will show a tremendous growth in this department of the industry.

To-day the press and the whole business world are measuring the prosperity of the world by the increase in the use of steel. The very forces that are acting in making steel a larger factor in the world's various activities are at the same time acting to make zinc a greater factor. Zinc always will parallel iron and steel in its development and consumption, and just as there is a steady growth in this metal for additional uses, so will there be for zinc.

Zinc Consumption will pass Lead and Copper. The present advance in zinc prices should therefore not be construed entirely on the basis of a "boom," but as the logical result of a world movement in placing this metal on a new and different plane of greater usefulness and demand. Of course there will be recessions in price, perhaps even a few instances in the actual consumption, but these are but the incidents in the career of any great article of common consumption. Zinc will never again occupy as low a position as formerly. It will in all likelihood in another five years pass beyond its companion metals, steel and copper, in consumption. Its greater service and more extended uses will raise it rapidly in the favour of the world.

There have been some sceptics on the spelter market who have tried to point out that spelter seemed to be advancing too rapidly, compared with lead and copper. It is interesting to note that the world's production of lead in 1909 was 1,092,000 tons and of spelter 783,200 tons, or a difference of 308,800 tons. In 1911 the difference between the world's production of lead and spelter had gone down to 223,400 tons. In comparing the world's production of copper and spelter the increasing importance of spelter is just as pronounced. In 1909 the copper output of the world was 849,200 tons and of spelter 783,200 tons, a difference of 66,000 tons. In 1911, the difference between the production of copper and spelter had dwindled down to a mere 3000 tons. In other words, this comparative production shows in a measure the comparative demand for the metals, and is a criterion of why zinc is becoming such a greater factor in the metal world. From facts now at hand an analysis of the trend of metal uses seems to indicate that zinc will pass both copper and lead and thus stand next to iron and steel in the industrial uses and consumption.—Otto Ruhl in the Joplin "Tribune."

---

## BOOKS REVIEWED.

By Alter Idem.

EVERY MAN HIS OWN BUILDER, by G. Gordon Sampson; price, 6s. net. (Published by Crosby, Lockwood and Co.).

While it is generally admitted that if a man is his own lawyer, he has a fool for a client—the same cannot be said concerning this book of 330 pages.

The author in a chatty way discusses problems on socialism, on the establishment of a rural population, and on co-operative building societies, before he plunges into the subject of house building. The secret of Mr. Sampson's success as a builder is that he has belittled all difficulties by his confidence in himself, and he practically advises his readers to do the same.

Australians are intelligent and adaptable; they are frequently compelled to build farm houses, erect fences, make gates, and act as bush carpenters generally. The book would be of much value to many of our settlers and farmers. They will find many useful hints on brick-making and laying, mixing of mortar and concrete, painting, glazing, furniture-making and house-building. The tools necessary and their approximate prices are also listed and described. The author frankly states that the cost of labour amounts to half, or more, of the cost of a building, and indicates that the would-be house-owner might save the latter amount by following the instructions given in his work; he naively hints that he might avoid architects' fees by approaching the architect draftsman to do some evening work in drawing plans to be approved of by the local authorities "for a sovereign, or even less"!

The work is a useful one for those who are inclined to try their 'prentice hands at house-building, and for those whom necessity compels to build or add to their own homes.

Our copy is through Melville and Mullen Ppy. Ltd.

MINERALOGY: AN INTRODUCTION TO THE THEORETICAL AND PRACTICAL STUDY OF MINERALS. By Alexander Hamilton Phillips, D.Sc. (Published by the MacMillan Company, New York. 699 pages.)

Professor Phillips has given us a work which includes a synopsis of the excellent works of Dana, Miers and Penfield, as well as a considerable amount of up-to-date and original information.

Crystallography is treated by graphic methods. The othographic and clinographic methods are clearly described, and those interested in this branch of the subject will find it an easy matter to follow up this interesting branch of mineralogy.

The optical properties of minerals are fully described, and the chapter forms an excellent introduction to the study of petrology. The chapter on the origin of minerals is a synopsis of the investigations and results of many authors on the genesis of ore deposits. The commoner minerals are fully described, and the rarer ones more briefly dealt with. The chapters on determinative work, embodying, as they do, the author's investigations in this fascinating branch of work, will fully repay attention. The methods used are clear and systematic, and the student who has a knowledge of the subject will find but little difficulty in the identification of an unknown mineral. The work can be recommended to those who desire to obtain the most recent information on mineralogy.

* * *

MODERN PUMPING AND HYDRAULIC MACHINERY. By Edward Butler, M.I. Mech. E. (Griffin and Co.; 473 pages.)

No country in the world has faced more difficult problems with regard to pumping than Victoria. Underground seas of water have been pumped from the deep leads, while the problem of pumping water from the depth of over 4000 feet along lines of reef which for miles were opened up in Bendigo, was the prime factor in the cessation of deep sinking. Engineers will welcome any work which may suggest improvements on existing methods, or the introduction of more economical processes.

The whole subject of pumping is dealt with more or less exhaustively. Certain sections, such as that on Cornish mine pumps, has been dealt with scantily, while rotary and centrifugal pumps and hydraulic machinery, such as turbines, have been paid more attention to. The book contains descriptions of all types of pumps, and is very well illustrated. The author has endeavoured to make the work as complete as possible, but the subject is so wide that he has naturally stressed the more recent improvements in pumping plants and hydraulic motors. The methods applied to mines water supply, drainage, irrigation, dredging, and fire extinguishing plants, are all described. The work contains special sections on boring appliances for artesian wells, artesian well or borehole plunger and lift pumps, appliances for lifting petroleum from borehole wells, variable delivery pumps and variable transmission by hydraulic power, low lift and high lift centrifugal pumps and hydraulic power wheels.

The relative efficiencies of the pumps, and also the hydraulic machinery, are discussed both from a practical and theoretical standpoint. The results are of much value to hydraulic engineers.

---

Coal Deposits of Missouri, by Henry Hinds. (Missouri Bureau of Geology and Mines: Hugh Stephens Printing Co., Jefferson City, Mo.)

* * *

Preolenna Coal Field and the Geology of the Wynyard District (T.) By Loftus Hills, M.Sc. (Government Printer, Hobart.)

* * *

Our Artesian Waters: Observations in the Laboratory and in the Field. By R. S. Symonds. Fully illustrated. (Government Printer, Sydney.)

* * *

Geology of the Northern Territory of Australia. By Dr. H. I. Jensen and E. C. Playford. Prepared for the International Geological Congress, Toronto, and published under authority of the Department for External Affairs. (McCarron, Bird and Co., Melbourne.)

---

## TWO BENDIGO (V.) MINES.

(From Our Correspondent.)

### Princess Dagmar Co.

The continued success of this company in following the auriferous quartz in the 867ft. intermediate level—last week's milling averaging over 1 oz. 12 dwt. per ton—has established a feeling of greater confidence in the resources of the east back and synclinal fold with which the gold-bearing stone is closely associated. The level is advanced to over 100ft. from where the second shoot of profitable quartz was first entered after passing through the break in the hanging wall. The richest stone was found at about 40ft. ahead of this irregularity, rising south with the north pitch of the syncline. From where the prospects first improved, there is a length of nearly 250ft. of the trough portion of the stone intact, which it is proposed to open up later with the extension of the 867ft. main level northward, the opposite direction to which the intermediate is extending. The excellent results to date since entering this trough stone warrants the anticipation of a greater length of payable stone toward the Golden Age boundary, and suggests its continuity for a greater distance south than originally anticipated. At the outset it was expected that the highly auriferous quartz would be restricted to the hanging wall of the east back, but, with the rise of the bedded quartz overhead, less regular stone and several spurs of similar quality have been traversed in continuing the level along the trough of the syncline. This has materially increased the milling material, the footwall spurs affording an additional 3ft. or 4ft. of stone. For the last 90ft., there has not been a firing in the level without disclosing a coarse sample of gold freely, yet the managerial estimate is that the bedded stone in the two overhead stopes is of higher grade. The last breaking in these stopes at the close of the week was again satisfactory. It is, however, hardly to be expected that the exceptional standard of the last few millings will be maintained for very long, though the returns are likely to prove payable over a fair period. The level is still over 200ft. north of the shaft, having been driven from the Golden Age boundary, so that the east back and synclinal fold have also yet to be explored for a length of more than 230ft. in this direction. From a short distance north of the second stope, a rise has been started to connect the 781ft. No. 2 crosscut, driven off a level at 187ft. north of the shaft. This crosscut intersected a couple of east backs several years ago, and the more defined and westerly one is believed to represent the upward extension of that allied to the rich stone nearer the trough. Both of these backs carry auriferous quartz. The first was worked to some extent many years since, and a few months ago the stone allied to the second revealed a few colours of gold, but being small and the company having then no knowledge of its resources lower down, it was abandoned. On connecting these old workings with the rise from the 867ft. intermediate, the 781ft. No. 2 crosscut will be continued through centre to the west leg of the regular cap. As yet the back stopes on the first shoot of good stone have not been resumed. About 10 weeks have elapsed since these stopes, operating south from the rise near the Golden Age boundary, where the workings extend to 52ft. above the 867ft. intermediate level. In rising, the first milling from above the fault intersected in the level averaged 8 dwt. per ton, the second crushing returned 21 dwt. per ton, and the third about 2 oz. per ton. The crushings were broken exclusively in rising. In stoping subsequently, an average of about 1 oz. was maintained from the two top stopes, but the reef did not appear quite as profitable here just before the temporary suspension of operations. For the present it is likely that the millings will be drawn from the level and the side and overhead stopes within 60ft. from the end. This will ensure profitable returns, and, having something like £1100 to credit, another substantial dividend may be expected early in July. Though there is assurance of a fair quantity of high grade stone as far as the syncline has been opened, the company's prospects would be materially enhanced by a payable discovery in the Johnson's Reef crosscut, which is being extended into the same channel close to the boundary. This crosscut is through the syncline and according to the position of a reef, stated to be identical with the old Golden Age formation, in the main crosscut, it should be well situated for meeting important developments during the next week or two. No change of note has occurred in the Princess Dagmar 1845ft. north level, where a new reef on the "Pyke" fold is being tested. It will take a few weeks to bring these operations into an interesting position. With more money available the re-opening of some of the old formations, inadequately explored on the Garden Gully main centre, will be taken in hand, and the ensuing half-year promises to be a busy one in the history of the company, after a lengthy period of inactivity.

### Johnson's Reef.

This company's operations are attracting more attention, in consequence of the fillip given to share values recently in the ventures along the overlapping "Pyke" fold of the double arching of the Garden Gully line. Over all there is a length of about 600ft. of this "Pyke" centre in the Johnson's Reef No. 2 lease, to where it loses its identity opposite the old Rose of Denmark shaft. The crosscut now in course of extension to tap the same channel as the Princess Dagmar are working in is from a connection between the 781ft. and 680ft. levels, near the latter company's boundary. The rise being on the east side of the synclinal fold, in western strata, it has been necessary to crosscut west through the trough to determine if the auriferous quartz in the next mine extended so far south. For the first 15ft. or 20ft. after leaving the rise, spurs and irregular quartz were exposed, containing a colour of gold. A small vein of bedded quartz was also opened up close to the inverted fold, the strata showing a steep north pitch. A portion of the stone, following the underfolding of the beds, passed underfoot as the crosscut reached the centre of the syncline, and should be found recurring on the west side of the trough as operations progress. The present face is in eastern strata, denoting that the syncline has been traversed and quartz is therefore likely to be met at any firing. The position of the crosscut was fixed from the location of what is believed to be the old Golden Age reef, seen in the 781ft. main crosscut, and providing there has been no error in the identity of this inner east back, the crosscut should be well situated for the object aimed at, as it is 52ft. higher in the beds at the point of intersection with the trough. This is equivalent to about the same distance east of the Golden Age back, from which the adjoining company crosscutted 30ft. east off the rise, to connect the 867ft. intermediate level. Whether the crosscut reveals anything of value or not close to the trough, it will be continued to the inner formation.

On the Paddy's Gully line, the company are pushing on the 1735ft. south level at the No. 2 shaft, on the west leg of the "Collmann" reef. The level is in 100ft., leaving 200ft. of ground yet to traverse before holing through to the former stopes from the No. 1 shaft. Starting at 60ft. under the cap, there has been little stone on the back. The last firing showed galena and black jack in 4in. of quartz, and with the south pitch of the reef channel the leg should steadily enlarge till the connection is effected close to the cap. In working from the No. 1 shaft, the reef proved of low value in the later stages. This fact, combined with the unsatisfactory working conditions, caused a cessation of operations from that end, till the connection is made with the No. 2 shaft. From the latter the reef has been followed to about 70ft. of the rise, at 300ft. south of the main crosscut. The east leg and cap were of low grade, but fair prospects were occasionally met in the west leg. This work is suspended for the present. The company have a length of 1000ft. of virgin ground along the strike of this particular reef, for which the Golden Age are sinking their eastern shaft. Between these properties, there is a buffer piece of ground, some 500ft. or 600ft. in length, held by the Princess Dagmar, but without any shaft of note on it. At the Johnson's Reef No. 3 shaft, on the Derby reef channel, the prospecting programme has just been varied and may lead to more encouraging results. The most important item is the rise to be put up on the west leg of the new reef, exposed at about 65ft. east of the 1225ft. plat. This, the bottom crosscut, opened 4in. to 8in. of stone, on which the rise will be started. The top of the cap of this reef was intersected in the 1150ft. crosscut and driven on north for 70ft., a little gold showing. The turnover and backs are still intact. As the rise will prospect a height of about 90ft. of the west leg before reaching 1150ft., and the better grade stone is usually associated with the backs of saddle reefs, there is a possibility of payable development occurring. The 1225ft. crosscut has stopped near the western turnover of the reef channel, a small inner west leg showing close to the end. It will be necessary to crosscut another 70ft. to reach the east leg of the new reef. On the old reefs originally contained between the 1150ft. and 1030ft. crosscuts the outlook northward is not reassuring, but there is evidently a chance of better results attending stoping toward the Collmann and Tacchi boundary. The main 1150ft. north level was discontinued some time ago, being too low on the west leg of the rising reef, and the front stopes suspended shortly after as the stone was small and of inferior quality. An intermediate level is now being driven in the cap of the inner formation at 283ft. north of the shaft, which is greatly contracted and of low value. The outer west leg continues overhead, but is also smaller in this end. Stoping is in progress on the inner cap, from intermediate levels on the east leg, taking a fair width of crushing material, showing a few colours of gold. Southward the main level on the west leg is within 170ft. of the boundary, but has not been driven for several weeks. The west legs of both reefs are showing in the end, the inner one close to the cap. They are about 15in. to 18in. thick, favourable looking, but failed to show gold for the last 50ft. A couple of stopes are working along the turnover close to the end, in a full face of low grade quartz. As the pitch is nearly normal, and a reversal exists ahead, the upper limits of these reefs should be available to the end of the lease. At 25ft. from the face there is a crosscut 26ft. to the east leg, with levels in course of extension on the latter. A good show of quartz is exposed, but of little value at present. Greater possibilities evidently exist in the neck of quartz extending upward on the fault to the west leg of the overlying reef. The rise nearer the shaft reveals a lot of attractive stone along this slide and a few colours of gold. The indications point to the upper reef assuming greater importance in this direction, and the extension of prospecting work to the Collmann and Tacchi boundary will, therefore, be followed with interest. A few weeks ago, a rise was put through from 1225ft. on the lower extension of the west back, which forms the west leg of both reefs. Though several shoots of good stone were passed through in the 1150ft. levels and apparently continued underfoot, the rise failed to disclose much of value. It is now intended to put three winzes down on the back along the 1150ft. levels, to ascertain how far these shoots exist below the rails. Meanwhile, a main level is also going south at 1225ft., to determine whether the gold shoots in the 1150ft. south level have followed the south pitch of the reef channel.

---

## THE "COAL VEND" APPEAL.

### Reasons for Dismissal.

It was on May 28 that the Judicial Committee of the Privy Council dismissed the appeal of the Commonwealth Government against the decision of the High Court of Australia reversing the judgment of Mr. Justice Isaacs, who had found that an agreement made by certain shipping companies was in restraint of trade, and, therefore, contrary to Commonwealth law. Last Friday, the reasons for dismissing the appeal were delivered by Lord Parker, the Lord Chancellor (Viscount Haldane), Lord Shaw and Lord Moulton assenting.

Lord Parker said that their lordships were not able to accept the Crown's proposition that all contracts and combinations in restraint of trade and commerce which could not be enforced at common law must be detrimental to the public within the meaning of the Act, and that those concerned with the contracts and combinations must be taken to have intended to injure the public. If this were the true effect of the Act no trade union would be free from the risk of proceedings under section 4. They could not believe that the Legislature intended to make the existence of trade unions dependent on the economic views of the Government for the time being. Their lordships did not accept the view that the phrase "detriment to the public" meant to the "consuming public." No doubt the shipping agreement was a contract in restraint of trade. The question then arose whether the Vend's shipping agreements embodied an unlawful intention—that is, the intention to restrain trade to the detriment of the public.

The prices of coal at Newcastle had been disastrously low owing to the cut-throat competition prevailing for some years. It would not benefit the consumers that the colliery proprietors should carry on business at a loss, or that profit should depend upon the wages of the miners being reduced to the minimum. Any intention on the part of the Vend to raise prices to an unreasonable extent would be highly improbable, as the Vend did not include all the Newcastle and Maitland collieries nor the Southern and Western collieries. Therefore, competition was not eliminated. This was shown by the Vend's action in 1909, when it refused to advance the price of coal more than one shilling, despite pressure by the miners. There was no evidence that coal was supplied to the foreign trade at a price less than that at which it was sold in the interstate and home trade.

The Vend agreement did not disclose any intention to injure the public, or any intention to control the supply, or to raise the prices. The clauses in the shipping agreement not permitting collieries to sell coal for interstate trade to others than the shipping companies was quite common in contracts of exclusive agency. Their lordships considered that the other provisions in the agreement were really advantageous to the consumers, tending to ensure a reasonably steady supply. The only other question was whether it was possible to infer an intention to injure the public. If the agreements were regarded as parts of a single scheme, the answer was in the negative. If there was justification for a combination of the colliery proprietors, it was obviously reasonable to take precautions to secure a market for coal at increased prices.

Finally, it was impossible to infer illegal intention from what was actually done under the agreements. Their lordships agreed with the Court of Appeal on that point, and Chief Justice Griffith's criticisms upon Mr. Justice Isaac's conclusions were fully justified. The Crown tendered no satisfactory evidence that the prices were unreasonable, while there was evidence that with the hewing rate at 4s. 2d., which was the lowest consistent with fair remuneration of the miners, it was impossible to sell the best coal below 11s. f.o.b. It was improper to draw inferences regarding the intention of parties entering into an agreement from the subsequent policy of the colliery proprietors and the shipping companies towards competitors in the coal trade. Such policy was in no way foreshadowed by either agreement, though it must not be supposed that their lordships approved of everything done in pursuance of that policy.

# THE COAL MINING INDUSTRY.

## New South Wales.

### Northern District.

(From Our Newcastle Correspondent.)

The matter of chief interest to the miners and colliery owners of the Northern District during this week has been the announcement in a special issue of the "Government Gazette," that his Honour Judge Edmunds had been appointed chairman of the Coal Mining (North) Group of Boards, in place of Mr. C. Hibble, resigned. His Honour will act for the remainder of the period for which Mr. Hibble was appointed. The representatives of the colliery proprietors and the miners respectively are Mr. N. J. Clark and Mr. E. Peters. The miners of the district were becoming very restless over the delay in the appointment of a chairman, and the fact of the appointment having been made will give general satisfaction. His Honour has had considerable experience of mining matters in this and the Southern District, and there are many connected with the mining industry who consider that the appointment is one of the best that could have been made. It is probable that the Board will get to work almost immediately, and the opening sittings should be of an interesting character, for the colliery proprietors have ready a sheaf of claims which they are putting in as a counterblast to what the men are claiming in respect of the abolition of the afternoon shift, and payment for small coal. The men have regarded the appointment of the Board as a means whereby consideration would be given solely to their claims, and they are likely to be disagreeably surprised when they see the number of claims that the proprietors are bringing forward.

Recently the proprietors of Pelaw Main Colliery, in the Maitland District, obtained an injunction against the officers of the lodge, to prevent them doing anything that might bring about a stoppage of work at that pit. This had a good effect, and the lead thus given has now been followed by the proprietors of Stockton-Borehole Colliery, at which mine there has been a dispute and a stoppage of work for several weeks past. Last Thursday, an urgent application was made in the Industrial Court, Sydney, for a writ of injunction to restrain the secretary, chairman, and certain members of the Stockton-Borehole Lodge from continuing to instigate the employees of the mine to take part in a strike. The affidavit of the manager was to the effect that a dispute had arisen at the pit, in connection with the introduction of the piecework system in the hewing rate, and the majority of the men had left the mine. Some 22 men had, however, been retained on day work, to keep the mine in order, and it was stated that at the instigation of certain individuals a number of these had been induced to leave work without notice. His Honour Mr. Justice Heydon, President of the Court, granted a rule nisi for a writ of injunction, making it returnable on Tuesday next.

For about five years the miners of Centenary Colliery, Curlewis, in the Gunnedah district of New South Wales, have been working without an agreement, and during the past twelve months there has been considerable unrest amongst them over the matter. However, about ten days ago the representatives of the management and the men were brought together, and as a result, an agreement has been drawn up and signed, which will have a currency of three years. The company will pay 3s. 4d. per ton for hand-mined, fork-filled coal, on a basis of 8s. 6d. per ton as the selling price of the coal, and the hewing rate will increase 1d. for each increase of 3d. in the selling price. There are other concessions where timber has to be set, and where water is met with. But the chief points about the agreement, from the point of view of the men, are that eight hours from bank to bank is ensured to them, and they have the right of sending in representatives to inspect places, and say whether or not they are fit to go into the general cavil. The men are well satisfied with the agreement, and it is expected that it will ensure industrial peace in that district. Some little time ago, an agreement was come to between he management and men of Black Jack mine, the other colliery in the Gunnedah district, under the chairmanship of his Honour Judge Scholes, and that agreement is working satisfactorily.

The mines of Maitland and Newcastle, taken as a whole, are working well, and the output of coal per week is large. The fortnightly pay was lifted yesterday, and it is estimated that at least £50,000 was disbursed amongst the miners and other colliery workers. It is stated on good authority that one firm alone, Messrs. J. and A. Brown, at their mines and works, distribute nearly £8000 per fortnight.

### Southern District.

(From Our Wollongong Correspondent.)

Except for some squally weather, and the usual shortage of trucks, the mines of the district have had during the week full demands upon their time. The rough weather, which amounted to a second rate gale, was sufficient to make coal loading at Port Kembla impossible, and there were two steamers off the jetty lying in wait.

Mr. A. Waugh, industrial inspector, has now been directed by the department to reside permanently in the district, and attend to colliery complaints. This position was created, it was supposed, by the miners for Mr. James Russell, who was dismissed for alleged interference with the workmen as secretary of the Mt. Kembla Colliery Lodge. The department at the time said that the purpose was to have the work which Russell had been doing done by an industrial inspector, and thus avoid trouble between colliery managements and employees. It is a new departure in the manner of dealing with the disputes which arise in colliery work, and one which, if it works satisfactorily, will undoubtedly remove minor causes of strikes, while it will also revolutionise, to some extent, the dispute procedure. Formerly, when a dispute occurred, the employees concerned met and dealt with the manager by their own lodge or the general executive officers of the union. Now, the complaint will be sent driect to the inspector, who will inquire and endeavour to settle it; or if, in his opinion, a breach of the award has been committed, he will report to his department, who will send the case on to the court. Thus, the conditions of the employment of labour, at one time purely a concern of principals, is now a matter of law, administered by an official of the Government.

## Victoria.

### Powlett River District.

(From Our Correspondent.)

Only a week elapsed after the signing of the new working agreement before there was a strike at the State mine, but it only lasted a day. Nevertheless, it goes to show that, notwithstanding all that has been done in the drawing up of the new agreement to provide against laying the mine idle, no sooner does a difference arise than some of the men will resort to their old tactics. The wheelers were responsible for the latest stoppage, and they claim that they were justified in their action. The agreement provides that if the management considers it advisable the wheeling shall be done on contract in sections on the co-operative principle, the management to guarantee the wheelers a minimum rate of 9s. 2d. per shift. The contract rates were not set out in the agreement, but were to be agreed on subsequent to the signing of the agreement. On Thursday last some of the wheelers who went on to work in the morning were informed that the contract rates were to start from that day, but were not informed what the rates were. At the change of shifts the wheelers refused to go to work until they knew the rates to be paid. They were asked to continue, as they were guaranteed the shift rate of 9s. 2d., and were informed that the rates would be made known on Monday or Tuesday. The wheelers, however, were of opinion that they were started on contract work to see how much they could do before the rate was fixed, and consequently refused to go in. On Friday morning the wheelers held a meeting and decided to resume work in the afternoon. They will continue at work for a few days until the rates are fixed. The general opinion is that the carrying out of the wheeling by contract will be an incessant cause of trouble. The conditions throughout the mine vary to such an extent that the earnings of the wheelers will show great differences and this will cause trouble.

The adjusting of the rates to be paid for contract mining and filling for a period of two and a half years has already had the effect of materially increasing the output, and it now amounts to about 1900 tons per day. There is now no inducement for the miners to restrict the output, and a great many of them are determined to make hay while the sun shines. The management expects the output to reach 2000 tons daily in the very near future.

Development work in the Nos. 9 and 10 pits is proceeding satisfactorily, and in the former several new parties of men have been started. The driving of the McBride tunnel is being pushed on as quickly as possible, but it will be some months before it reaches the coal.

# EASTERN COAL-BUYING ASSOCIATION.

## 137,000 Tons Wanted.

The New South Wales Premier has received from Mr. F. B. Sutton a report giving particulars of the Philippine Coal Consumers' Association. The report states:—

"The object of the formation of the Philippine Coal Consumers' Association, which is composed of the Government of the Philippine Islands, Manila Electric Railroad and Light Co., Manila Railroad Co. and the Philippine Railway Co., was for the purpose of purchasing fuel in large quantities in the open market at a lower unit cost than it could be purchased by any of the individual members separately; to ensure constant and regular shipments of coal; to reduce handling charges; and to employ a manager and fuel expert, whose duties will not only be to recommend the purchase of certain kinds and quantities of coal, but also to advise the consumers thereof the best methods whereby the highest efficiency in combustion can be obtained, and to supervise the inspection and analysis of such coals purchased, the distribution, stevedoring, etc.

"The association is open to any concern which desires to enter as a member on the same basis as the original parties to the agreement. At the present time the association contemplates the purchase of about 137,000 tons of coal as follows:—

| | |
|---|---|
| Government of the Philippine Islands | 36,000 tons |
| Manila Railroad Company .. .. .. .. | 35,000 „ |
| Manila Electric R.R. and Light Company .. .. .. .. .. .. .. .. .. .. .. | 40,000 „ |
| Philippine Railway Company .. .. | 10,000 „ |
| Compania General de Tobacos de Filipinas .. .. .. .. .. .. .. .. .. .. | 16,000 „ |

"The association will be governed by a board of directors consisting of five members, two of whom will be nominated by the Governor-General of the Philippine Islands and three selected by the other members of the association. The five members in turn will elect a chairman who, in conjunction with the manager and fuel expert, will transact all business of the association. The organisation of the association is the result of the exhaustive investigations and report of Mr. E. Randolph Hix, as coal expert for the Government. Through these investigations, which began in 1910, Mr. Hix acquired a knowledge of the far eastern coals, which was valuable to the association, and he has been appointed manager and fuel expert. Mr. Hix is now on a visit to the coal mines of China, Manchuria and Japan, to take the preliminary steps for the placing of the 1914 orders. Twenty-five or thirty thousand tons of coal will be purchased to tide over the deficiencies for the present year, and to make steaming and chemical tests of coals which have not heretofore been tried.

# ENGINEERING AND ELECTRICAL SECTION

THE FAMOUS
"Brimsdown"
"Wirum"
BRITISH MADE Lamps.
The most popular, reliable and economic lamp on the market.
Sole Agents—
THE
LAWRENCE & HANSON
Electrical Co. Ltd.
465 LONSDALE ST., MELBOURNE.
33 YORK ST., SYDNEY.
and at WELLINGTON, N.Z.

## MOTOR BUSES AND TRAMWAYS.

In our last issue our London correspondent had something to say respecting the effect of competition of motor 'buses on the receipts of the London County Council from its very expensive tramway services. By the same mail, apparently, the annual report of that body's tramway committee was received by the Melbourne Tramway Trust, and the matter was brought up for discussion at last week's meeting. The Lord Mayor, Cr. D. V. Hennessy, recognised the possibility of the motor 'buses running the tramways off the streets, particularly as, within the next three years, which will terminate the lease of the Melbourne Tramway and Omnibus Co., great developments are sure to take place in the construction of the new vehicle, which is already causing alarm amongst the municipalities which are financially interested in the tramways.

It was pointed out that for the first time since the electrification of the main London tram routes, the London County Council tram service shows a decreased revenue and a decrease in the receipts per car mile. For the year ended 31st March last the traffic receipts from the electric trams—as distinct from a small subsidiary horse tram service—totalled £2,143,559, which compared with the previous year as follows:—

| | |
|---|---|
| Year ended 31st March, 1912 | £2,231,902 |
| Year ended 31st March, 1913 | 2,143,559 |
| Decrease in twelve months | £88,343 |

The car mileage average receipts also fell from [illegible] per mile to 9.73. After paying £730,687 interest on capital, the net balance of profit was only £497.

The unrestricted competition of the motor 'buses under a system which gives those vehicles free use of the streets, to construct which the trams contribute directly and indirectly, is entirely responsible for this state of affairs. The London County Council trams committee realises that what is really at stake is the solvency of a property in which £12,618,842 of the ratepayers' money has been sunk. As a matter of fact, the chairman of the Trust, Cr. Sir H. Weedon, said that the London County Council is now up against the biggest problem in this matter of street transportation that it has ever had to face. Although it has invested over £12,000,000 in tramways, it now actually derives more revenue from licenses granted to the rival motor 'buses than from its own well laid and well worked lines. It was readily recognised that a formidable rival had come upon the scene and had to be reckoned with, and this can hardly be done, as one councillor suggested, by the municipalities keeping motor 'buses off the tram tracks.

The same question also came before the Hawthorn City Council last Thursday, when a letter was received from Cr. P. J. Russell, who, though on a holiday trip in England, is keeping his municipal duties in mind and studying the question of street construction there. Cr. Russell stated he had ridden a good deal in motor 'buses with the object of ascertaining if they would do for Melbourne. For a good road he had no doubt those vehicles afforded an ideal way of dealing with the traffic, but for the Melbourne roads he had been forced to the conclusion they would not do. On wooden blocks and specially prepared roads the petrol 'buses ran smoothly and well, but directly they got on the ordinary macadam they shook the passengers very much, and did a good deal of damage to the roads. "I think," added Cr. Russell, "we shall have to construct trams for our traffic, unless we go in for wood blocking.'' Regarding motor water carts, motor street sweepers and dust carts, he thought it would not be long before all municipal work would be done by motor traction. As to wood blocking, although it was expensive to lay down, all the authorities were agreed that the method of street construction was the least costly in the end.

However, the advocates of tramways will find some grim satisfaction in the fact that the arrangements of the motor-bus company have not worked altogether smoothly, although no serious consequences have befallen them. A few weeks ago a double service was provided for North Melbourne, and some of the tradespeople, thinking that they would increase the shopping facilities of the district, subsidised the buses. The service between the railway station and Errol-street (the main business thoroughfare) resulted in a dead loss, and was soon discontinued, while the company found it necessary, in order to make the other line pay, to run it in penny sections to the city, whereupon the local shopkeepers declined to continue the subsidy, as the buses were actually taking shoppers away from them to the city. Whether this experience has been repeated in other suburbs is not yet known. As was mentioned in our last issue, there is a strong feeling in some suburbs of Melbourne in favour of the railless electric car, which combines the mobility of the motor-bus with the quickness of the electric tramway on a fixed line.

## BRITISH AND EUROPEAN DEVELOPMENTS.

(From Our Correspondent.)

London, June 27th.

The chairman of the India-Rubber Gutta-Percha and Telegraph Works Co. Ltd. had a far more pleasing duty to perform at the half-yearly meeting held here on Tuesday than was the case when he met the shareholders at this time last year. Then he had to give reasons why the board thought it imprudent to pay an interim dividend on the ordinary shares. I referred to the matter here at the time, and I have still a very clear recollection of the splendid way in which the chairman (Major Leonard Darwin) took shareholders into confidence, and the excellent effect produced upon the meeting. His profound belief in the company and its future has been justified in what has happened since. Then he expressed the opinion that they were getting into their normal stride, as the abnormal conditions were passing away. This time he said that they proposed to pay the customary dividends on both the preference and the ordinary shares; but he was careful to say also that the raw rubber market was subject to undue speculation, and the position of consumers of the product was somewhat dangerous, seeing that they could not be guided by the ordinary laws of supply and demand.

The Aron Electricity Meter Ltd. is able to report excellent results for the past year, trading both in electricity meters and in taximeters having been most satisfactory. The net profit was £32,653, and the ordinary share dividend is 7 per cent. Extensions to the works are being proceeded with.

The scheme brought forward by the directors of the Edison and Swan United Electric Light Co. Ltd. for re-arranging the capital so as to put the financial affairs of the company on to a more satisfactory basis, was strongly opposed by the first debenture-holders. The proposals were adopted at the meeting by only 9 votes to 8, but the opposition demanded a poll, the result of which is that there is not the necessary three-fourths majority in favour. The chairman at the meeting said, anticipating opposition which had been threatened in the press, that if the scheme was defeated ''he supposed that they would muddle along as heretofore with the stock unsaleable at 60.'' It was the intention of the board if the scheme went through, and it got the money that was required, to put down certain plant that was essential for the profitable handling of orders at the works at Ponders End, and to embark on a scheme of consistent advertising, as the proper bringing of Ediswan products before the public was an important matter.

Messrs. J. G. White and Co. Ltd. report very fine business for the year ending February, 1913, the net profit on trading being £88,797. In addition to 12 per cent. dividend on the ordinary shares, these also receive an extra dividend of 10s. per share (they are £1 shares, and there are 50,000 of them), making 62 per cent. for the year. The company is interested in many electrical undertakings outside Europe. The chairman at the annual meeting yesterday said that as a consequence of the present financial stringency there might be a falling off in business of their kind in the latter half of the year.

Messrs. R. Waygood and Co. Ltd. made a profit of £25,300 during the past year, and the ordinary dividend to be paid is 7 per cent. per annum.

Reference has occasionally been made in these notes to the excellent business that is coming on to many of the electric supply systems operating in Lancashire and other industrial districts in the country. One of the latest instances comes from Bury, where a paper-making company and a spinning company have each schemes on foot including 1000 h.p. of electric motors. In one case steam driving is to be abolished from the existing works, and in the other electricity is to be installed in the new mill from the start. It is expected that these two consumers will require together something like seven million units per annum.

Some of the trials that the year 1912 brought to the electricity works manager are revealed in the financial results of the Brighton undertaking. The net profit has fallen from £8450 to only £1406. The Early Closing Act, which was mentioned early in the year as one of the difficulties of the metropolitan electric lighting companies, and is still causing a good deal of friction among tradespeople in the provinces, lessened the electricity revenue at Brighton; there was also a decrease of revenue obtained from the tramways department for energy supplied; cost of fuel and taxation were both higher.

Glasgow Corporation electricity department has received applications for light and power equal to 12,000 kw. during the past twelve months, and a couple of 6000 kw. turbo-alternators and water tube boilers are on order to assist in keeping pace with the demand on the existing stations, while the plans for the Dalmarnock 100,000 kw. station are being proceeded with. The present intention is to carry this new station out in three sections, aggregating together the capacity mentioned. The output for the coming year of the plants at present installed is estimated at about 63 million units.

The Board of Trade has issued a notice allowing limits of error, as stated below, for electricity meters (approved) for ascertaining the value of supply on c.c. or single phase a.c. circuits:—Meters in which the maximum current for full load: (a) does not exceed 3 amperes, the error at any point from 1-10th to full load must not exceed 3½ per cent. plus or minus; (b) exceeds 3 amperes, but not 50 amperes, the error at any point from 1-10th to full load must not exceed 2½ per cent. plus or minus; (c) exceeds 50 amperes, the error at any point from 1-20th load to 1-10th load must not exceed 2½ per cent. plus; and at any point from 1-10th to full load must not exceed 2½ per cent. plus or minus.

The relations of the consulting engineer and the municipal engineer came under consideration at a meeting of the Institution of Municipal Engineers on Wednesday evening. Mr. H. C. H. Shenton opened the subject by saying that there ought to be no antagonism between these two classes of engineers. There were signs that the time was ripe for combination among engineers with the object of improving their standing and general welfare, and the paper was brought forward with the view of forwarding that end. There was no difference between the status of the two classes under consideration. The properly trained and qualified man, whether a municipal or a consulting engineer, looked with considerable dislike on certain classes of amateur engineer, and Mr. Shenton said that he would like to see the profession so organised that the incompetent person should find it as difficult to call himself an engineer as to call himself a lawyer or a doctor, but one must avoid coming to a false conclusion. There were many good engineers whose early training was that of a different calling, but who possessed such ability that they forced themselves, gaining experience, it might be, in a very humble position, and finally took their places in the profession as honoured members with absolute justice. It was therefore necessary to consider whether many of the men who caused so much annoyance by undertaking work for which they could show no proper qualifications, and by doing it for insufficient remuneration, were not often persons of considerable ability, whom it would be difficult and unwise to treat as being completely outside engineering ranks. Later in his remarks Mr. Shenton said it might be asked whether it was possible, after all, to make an exact distinction between the man who was an engineer and the man who was not. Personally he thought that there was no difficulty whatever in deciding whether a man was a qualified municipal engineer. It was not a question of examinations passed, of pupilage, or of membership of societies and institutions. It was simply and solely a matter of training and experience, and unless a man had been occupied for an extended period on municipal engineering work he could not by any possibility be rightly called an engineer. The consulting engineer was a “specialist,” which implied that he had made a special and extended study of some particular branch of engineering, such as waterworks, sewerage, or electrical work. Municipal engineers could help their consulting brethren by urging their authorities to see that their consultants on any particular work were really specialists for that work and not for something else. They could also assist very materially by joining energetically as a body in any scheme for combination which might be forthcoming for the better organisation of the profession.

The new Association of Electrical Station Engineers, to whose formation and objects frequent reference has been made here during the past six months, has so far advanced in its organisation of provincial sections that it has just held in London a general meeting attended by delegates appointed by the various “local sections.” Among the matters considered at this gathering was the need for opening its doors wide enough to admit the large number of electrical engineers who, while not being actually engaged in electric supply station or sub-station work, are very closely related in their callings, being engaged on private and other installations not covered by the generally accepted term “station men.” The list of objects includes the raising of the status of its members, securing adequate remuneration, a 48 hour week (maximum), to enforce the carrying out of Home Office Regulations in all stations, the abolition of employment of pupils and apprentices in responsible positions, establishing a labour bureau, giving legal assistance to members relating to their employment, securing 14 days' holiday (minimum), and so on. This will probably be regarded as an ambitious programme, but the association is young, and though it looks like becoming numerically strong, it has an uphill task before it. At the meeting one of the members (Mr. J. W. Thomas) read a paper on the status of electrical station engineers and the need of an association.

It was announced in the Court of Appeal this week that the National Telephone Co. and the Postmaster-General have settled their differences on the points appealed against respecting the terms of the purchase. All outstanding matters have been compromised, and the Courts will not be occupied with the matter further beyond a statement of the actual conditions of the compromise, that is to be made next week.

---

## A N.Z. HYDRO-ELECTRIC SCHEME.

The New Zealand Government has consented to grant a licence to the Dominion Portland Cement Co., of Whangarei, to generate hydro-electric power at Wairoa Falls. This arrangement is subject to agreements already completed with the Whangarei and Dargaville boroughs and adjoining county councils, under which the company will supply them with certain minimum quantities of current for lighting and power purposes. As for the company's own enterprise, it recently went upon the market to raise capital, and was successful in floating the whole issue in New Zealand, notwithstanding the stringency of the money market. The manager (Mr. Wilson) and a director (Mr. Winstone) are proceeding at once to America and Europe to purchase machinery, the directors' intention being to make the new works at Whangarei the most up-to-date in the world. An area of 2000 acres of limestone country has been acquired on Whangarei Harbour, and the company is on the eve of calling tenders for the supply of the hydro-electric plant and cement-making machinery. It is expected that the power plant and the works will be completed in time for business during the early part of the summer of 1914. An arrangement was made with the Whangarei Borough Council whereby the latter would be provided with electrical power at £9 per horse-power, in the event of their requiring it at any future date. It has been estimated by various electrical experts that the natural flow of water over the falls will provide 1500 horse-power, and that, by damming the waters above, a still greater power supply can be secured. It is considered that the big undertaking, which will probably cost something in the vicinity of £50,000, will be completed inside two years from date.

---

## GODFREE TELEPHONE.

About two years ago an automatic selective telephone was invented by Mr. E. G. Godfree, a Melbourne electrical engineer, and a service was installed under Government supervision for trial. The installation has given general satisfaction, and the utility and economy of the device when used in the “grouping” of telephones, on party lines, etc., have been amply proved. During the period of trial the machine has been greatly improved by the inventor, from both a practical and a commercial standpoint, and has now reached a stage that presents large commercial possibilities. Complete patents for the apparatus have been granted throughout the world. The large saving is made in initial capital cost, and maintenance costs are shown by a comparison of this system with the ordinary telephone system. If a group of 20 telephones, distant on an average one mile from a common centre, require to be connected, so that each place have intercommunication one with another, the respective costs would be (approximately) as under:—

“Ordinary System,” 20 Miles (Metallic Circuit).

| | | | | |
|---|---|---|---|---|
| 720 Brackets at 10d. each | £30 | 0 | 0 | |
| 720 Insulators at 6d. each | 18 | 0 | 0 | |
| 360 Poles at 12s. 6d. each | 225 | 0 | 0 | |
| 140 cwt. Wire at £10 10s. ton | 73 | 0 | 0 | |
| Nails, Ties, etc., at 5s. per mile | 5 | 0 | 0 | |
| Labour | 180 | 0 | 0 | |
| | £531 | 10 | 0 | |
| Supervision Charges, 10 per cent. | 53 | 3 | 0 | |
| | £584 | 13 | 0 | |
| 8 per cent. General Expenses on Labour only | 14 | 8 | 0 | |
| Total | £599 | 1 | 0 | say £600 |

New System (Say 5 Miles Metallic Circuit).

| | | | | |
|---|---|---|---|---|
| 180 Brackets at 10d. each | £7 | 10 | 0 | |
| 180 Insulators at 6d. each | 4 | 10 | 0 | |
| 90 Poles at 12s. 6d. each | 56 | 5 | 0 | |
| 35 cwt. Wire at £10 10s. per ton | 18 | 7 | 6 | |
| Nails, Ties, etc., at 5s. per mile | 1 | 5 | 0 | |
| Labour | 45 | 0 | 0 | |
| | £132 | 17 | 6 | |
| Supervision Charges, 10 per cent. | 13 | 5 | 9 | |
| | £146 | 3 | 3 | |
| 8 per cent General Expenses on Labour | 3 | 12 | 0 | |
| Total | £149 | 15 | 3 | say £150 |

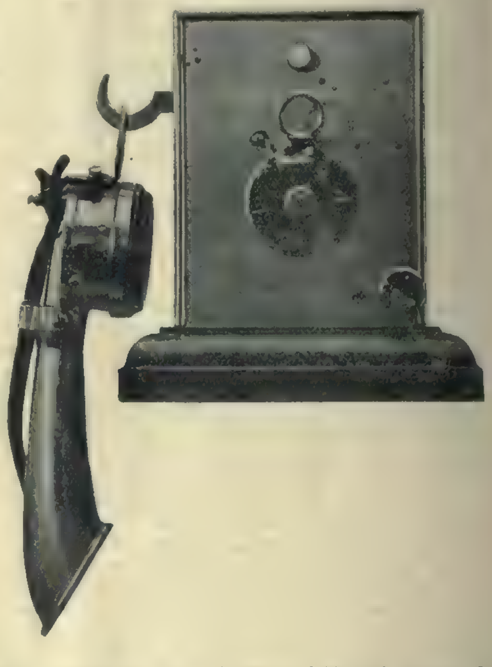
Summary—Ordinary System (not including instruments, etc., taken at same price).

| | | |
|---|---|---|
| Installation as above | £600 | |
| Switchboard and Fitting Operator | 60 | |
| | | £660 |
| New System. | | |
| As above | | £150 |
| Balance in favour of New System | | £510 |

When “grouping” telephones under the present system, the enormous cost of line wire required to give an effective service often outweighs the advantages gained; and where the use of “party lines” is resorted to, the telephone often becomes a nuisance, owing to business being hampered by impromptitude in answering calls, incessant ringing of telephone bells at other places than the place desired, time wasted in ringing code signals, frequent interruptions to line when engaged, etc. By the use of this new telephone a large number of telephones may be connected to one pair of line wires, and any one place connected to the line can automatically call any other place on the line, and can inter-communicate free from interruption and without fear of being overheard. This is accomplished without the aid of operators or the use of a switchboard, the mechanism for selecting the place desired, and the speaking apparatus being combined in each instrument.

The device may be used on a “one wire” circuit (grounded), or a “two wire circuit (metallic return). The former, however, is not recommended owing to the inherent inductive influences inseparable in telephony. The impedance offered to voice currents, and the attenuation of the current waves due to the insertion of electro-magnets, however, are overcome by the coils being wound to a very low resistance, and bridged with a non-inductive resistance. By the use of the metallic circuit, the voice currents traverse the line wires only, and the non-inductive resistances are not required. As is the case with all telephones, the extraneous inductive influences can be completely counteracted by the use of metallic circuits properly arranged; but clearer speech can be obtained by the use of this new system than by that of the ordinary telephone when operated under similar conditions. Only small power (which is drawn from one common battery) is required to operate the apparatus.

To operate the telephone an “indicator” on a dial is turned to the number desired, and a button depressed. The apparatus then automatically sends on to the line a number of electrical impulses, the number of these being determined by the position of the dial. These impulses in turn operate the “selectors” throughout the circuit, and a bell is brought into play at the place desired; a ring back signal is given from the place called, intimating to the person calling that the call has been effective. When the call is received, the transmitter is simply removed from the hook in the ordinary way, and replaced after the conversation is completed. This last operation restores the apparatus to “normal,” in readiness for the next call. The whole apparatus is “fool-proof,” and cannot be operated except in the correct manner. If the line be “engaged” the machine is locked and cannot be operated, and a lamp glows to indicate that the line is in use.



The most important and costly items in connection with telephone service—more particularly in country districts—are those of “line wire” and “switchboards”; and a great obstacle in the path of the extension of telephone facilities in sparsely populated districts has been the great expense which such service to be at all satisfactory entails in the way of attendants. An installation of, say, 12 telephones in a back country district, could not provide an attendant for the few calls daily that may be made. But when under this new selective telephone system each station may select any other station desired instantly, with the certainty of a prompt response, back country settlers will no longer feel isolation from the hub of things, or fear of not securing promptly necessary aid in those emergencies which have always to be reckoned with.

The systems at present in vogue for connections between towns in country districts and outlying stations, are chiefly by means of a single wire (grounded) connecting the various stations with a town office. Each station is called by means of “code ringing,” and all stations intervening have to bear the irritation and annoyance of hearing code bells ringing at all hours, day or night as the case may be. Further, any station intervening may hear whatever conversation is being carried on, and privacy is altogether out of the question. With the new selective system all these disabilities are entirely eliminated. The indicator on the instrument is simply turned to the number of the station required, the transmitter is taken off the hook, and simultaneously the bell rings at the station called, and at no other. No intervening station can possibly hear the conversation, as the line is completely locked to all but the “caller” and the “called,” and absolute privacy is secured. Again, any one station on the line may call and converse with any other station with exactly the same degree of certainty and privacy, as the apparatus is intercommunicative. It is expected that the introduction of the selective methods into country districts will prove a great boon to settlers generally, and the advantages set forth may be secured at considerably less cost than what is necessary for the installation of the unsatisfactory system at present in operation in many districts.

Not the least of the uses to which the new selective system may with great advantage and economy be applied, is that of accommodating large hotels, factories, workshops, mansion flats, office buildings, etc., where it may be necessary to have each room or office connected to a main office, and at the same time to be intercommunicative between the various rooms and offices. Each office may then call up any other office in the building without the necessity (as at present) of firstly ringing through the switching attendant for the necessary connection, and the whole system can be installed by the use of one or two line wires (whereas it takes two wires for each telephone at present), and where the switchboard and switching attendant (who may at present hear any conversation) are entirely dispensed with. The economy, utility, and complete privacy of the new selective system becomes at once apparent.

The system of “party line” telephone, which has considerable vogue in the United States of America (fully 40 per cent. of all telephones in that country are on party lines), on account of the economy attaching thereto, lends itself in a very positive manner to the selective system herein described. The absolute privacy, economy, certainty of intercommunication, and consequent relief from the irritation of “third party” interference, will be welcomed by all telephone users. Again, the great advantage of the new system may be taken advantage of by mining companies and others requiring a method of intercommunication between the various offices, shops, levels, etc., which will ensure a service at once efficient, private, and economical. The material construction of the apparatus may be sherardised for use in damp locations underground or otherwise. A company has been formed to take over the foreign rights, the rights for the Commonwealth and New Zealand having already been secured by a Melbourne syndicate.

---

# THE ALIGNMENT OF MACHINERY.

By William Sinclair.

(Concluded from issue of July 24.)

It sometimes happened that in soft ground the pump well became distorted. It was then imperative to test the shaft, and if it was not convenient to remove it and run the wire through the bearings, then two wires were necessary, making a triangle of the gauging points as shown in Fig. 6, the shaft forming the apex and the two wires the extremities of the base line. A flat iron gauge was then used, with the butt end having a V in it and the other end being pointed. The alignment was tested by this means at all the bearing points and if necessary in between also. By writing down the divergence from the truth on a drawing the whole of realigning became easy.

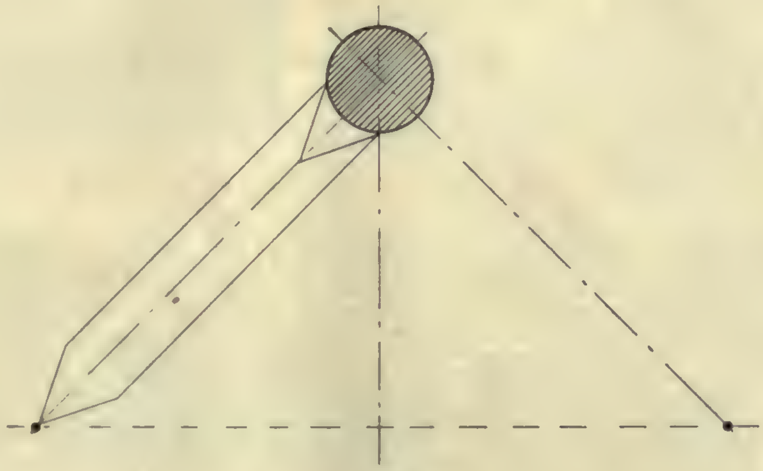


Fig. 6.

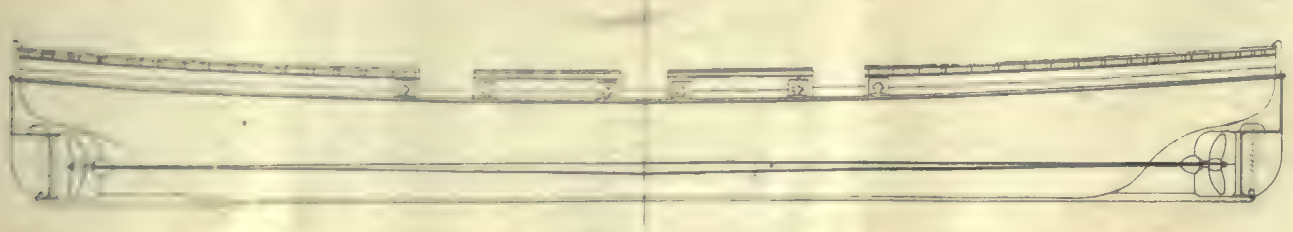


Fig. 7.

Vertical marine engines, the writer considered, were a class which called for different treatment to that accorded land engines. To his way of thinking there was more engineering skill expended on them than the other class, for in them there could be no running of wires in order to prove alignment. When first they were erected in the shop the important point of the alignment of each guide with its particular cylinder was of first importance, and with this and a crankshaft absolutely true everything else was built up and fitted together. Every part of these concentrated and powerful machines was a separate study—how much should be allowed in a H.P. guide, how much in an L.P., how close a fit must the crank brasses be for end play and running, anl so on. There was no doubt that the men who lined up marine engines first of all in the shop, and in after years when the engines were in place on board ship, used more or less individuality in doing so, and, as they all knew, the engines responded in such a way that each vessel's engines became known, sometimes for generations of engineers, as “good jobs” or “bad jobs,” and their weaknesses were discussed in mess-rooms and ashore just as if they were human, and many an epithet was launched at the head of some engineer in a far-away shop on the Clyde or Tyne about something he had or had not done, “Where first in store the new made beasties stood,” as our old friend McAndrew sang.

The lining of the machinery that was installed in vessels deserved a whole paper to itself, as the subject was such a special one, and, like everything else pertaining to ships, was the result of accumulated experience and in many instances of trial and error. Each part of the world had its own peculiar shipping, and here in New South Wales, up to the present, the work done consisted mostly of coasting craft built of hardwood, and ferry steamers of both steel and wood. The method adopted in these wooden steamers was to commence with a given height above the keelson and adjust or “humour” the line so as to make the best possible use of the deadwoods, and at the same time to get the necessary rake in the line of shafting. This gave the bedplate position, and the columns and cylinders follow in their turn. Where twin screws were used there was the additional bearing in the outer brackets to consider, but as a rule it was the practice to fit these after the other parts were adjusted and to use the tail shaft as the guiding factor. As most of these vessels had the machinery arranged aft, there was only a short length of propeller shafting to be fitted up in a very rigid part of the vessel and where very little distortion occurred.

Most of our ferry steamers, however, were designed with a screw at either end, the shafting running the full length of the vessel, and as some of the shafts were in the neighbourhood of 150 feet long a great deal of care had to be expended in the lining off.

It was found that all wooden vessels of the ferry boat type "hog" after launching—that is to say, that when afloat the ends drop a certain amount—so that if the line of shafting were laid absolutely fair, when the vessel was launched it would be under a stress tending to bend it; but if, knowing this, the lines were depressed a certain amount at the engine bedplate position, they would take up the direction shown in Fig. 7.

By using this line as a centre the deadwoods were bored out and stern tube fitted; the tail shafts were then put in position, and working upon the couplings of these as guides, the line shafting was coupled up, the various bearings fitted to come in, and when bolted up all hard face to face the case with which the whole line was fotated was proof of the lining off. Every vessel, of course, had its own amount of "hog," but generally speaking the line is depressed 2½in. or thereabouts, and as the natural depression might be anything from ½in. upwards it would be seen to what extent experience was in the guide of the man responsible for the correct alignment.

Another procedure adopted, which was generally done with steel steamers, was by the sighting method. This operation was done by means of peep holes of small diameter. These holes were drilled in blank pieces of plate placed at the ends of the vessel and at the different bulkheads, with allowance for adjustment. By working at night and shining a bright light at one end, and sighting from the opposite end, these holes could all be brought into line. Then, using the peep holes as a centre, circles were described on the bulkheads and stern frames, and the centres would then be picked up at any future time when placing the boring bars and bearings in position, for in future adjustments to allow for wear. In marine work there was so much vibration and so many stresses that shafting bearings had no close fitted caps, and so a certain amount of play was allowed for, but unfortunately no one could allow for all that might occur, and it was often found that the vessel, being in different trim, threw more weight on to one bearing than another, and very often additional adjustments were rendered necessary, so that the lining off could only be regarded as a starting point: then actual running tests were the final proof.

As the author stated at the outset, the subject he was dealing with was one of great scope, and he had really only dealt with it so far as it concerned shafting, and which might be considered the starting or basic point of erecting machinery. The multitude of arrangements that were possible with pulleys, belts (open, quarter twist, angle drives, and so on) demanded a full treatment and expert handling. The business of aligning toothed gearing and chain gear was also one that demanded the most careful treatment, and he trusted that members would touch on some of the many points that cropped up in these important subjects and which had not been referred to in detail in this paper. They were all more or less specialists nowadays, and it was not possible for any one of them to keep abreast of every branch of engineering even in such an elementary, although extremely important, subject as the alignment of machinery.

---

In addition to the contract entered into some time ago to manufacture points and crossings for the Victorian Railway Department, the Thompson's Foundry Proprietary Co., of Castelmaine (V.), has now entered into a contract for similar work, amounting to £7000, for the South Australian Government. The new building for the construction of locomotives is nearly completed, and the new machinery, ordered in Germany and England by Mr. David Thompson, is arriving. The shop adjoins the main Melbourne to Bendigo line, where the Department has made a new siding and laid a line of rails right through the locomotive shop, so that the engines can be built on the rails ready to steam right on to the main line.

## MUNICIPAL ELECTRICAL CONFERENCE IN LONDON.

(Concluded from Issue July 17th.)

Mr. C. E. C. Shawfield, late chief electrical engineer at Wolverhampton, in the "ex-presidential" address with which the meetings began on Tuesday last, had something to say on the enormous development of electric supply since the formation of the association eighteen years ago, especially in industrial service, and the rapidity with which its status had changed from being that of a luxury for a few to that of a necessity for the many. A cheap supply of electricity is now as necessary to the welfare of the community as a whole as is cheap and ample water supply or well-designed drainage. The purification of the atmosphere of industrial cities and the decreasing frequency of fogs consequent upon the use of electric power were touched in passing on to a brief discussion of the question whether municipal trading assisted or hindered electric supply enterprise—"a profitless discussion" too frequently, in his opinion. Mr. Shawfield went on to argue that Parliament having committed electric supply control to the municipalities it ought not to debar them from installing in a consumer's premises the apparatus which is necessary to enable that consumer to utilise the electricity which they have for sale. His own late borough, Wolverhampton, possessed such powers, and after 14 years' experience of their practical operation there, he unhesitatingly affirmed that both the electricity department and the local wiring contractors were in a flourishing condition. Restricted powers, by which wiring work could only be carried out through a contractor, he said, brought a result which was of very little use to either party. He urged the association, and the municipalities which it represented, to press for the general concession of those powers to all municipalities. Another point touched upon was the unwisdom of putting electricity profits to the relief of rates. He saw that whilst municipally-owned undertakings should be self-supporting, their surplus earnings should be allocated first to the accumulation of an adequate reserve fund; secondly, to the provision of working capital, and any balance remaining should be devoted to the extension and improvement of the undertaking. Next the speaker argued for a bold action in drastically reducing prices, contending that by doing this they would not only be more faithfully performing their duties to the community as a whole, but they would also reap a rich reward in the shape of increased output and better financial results. On the subject of competition between electricity and gas, he said that so far this had been beneficial both to the competitors and to their consumers, but he thought that the time had arrived when it might be in the interests of all that, instead of competition there should be co-operation, the suppliers of gas devoting their energies to the economical production of non-illuminating producer gas, which could be used by the suppliers of electricity for the production of electrical energy. In this way coal resources could be husbanded and a flat rate of a half-penny per unit—which now seemed Utopian—might be brought a little nearer. Mr. Shawfield recognises that the rates of pay of the technical assistants in some of our large undertakings are entirely inadequate to their duties and responsibilities. "The best asset that any electricity undertaking can possess is a loyal and zealous staff, who have at heart the commercial and technical well-being of the concern, and in order to secure this, it is necessary that every member of every grade shall be made to feel that he is a trusted and responsible official, and that he is adequately remunerated for his services."

The paper on "Electric Automobiles" by Messrs. W. H. L. Watson and R. J. Mitchell (introduced by Mr. A. Hugh Seabrook, borough electrical engineer of Marylebone) did not claim to be an original investigation. It was described as a resume of some of the salient features of the electric automobile industry, the authors hoping that by the presentation of some of the main facts relating to storage battery-road traction they would arouse interest "in a neglected subject." Reference was made to the work done by the Electric Vehicle Association of America in fostering an industry "that was destined to become one of the wonders of the twentieth century." Facts and figures were advanced showing the splendid progress that had taken place in this department of electrical effort in America. Power at a low price was stated to be a sine qua non for a really successful electric vehicle movement to become an actuality in England; therefore central station men had a most intimate interest in the new industry. On the American market there were more than 130 different models of electric vehicle available. One half of these were pleasure automobiles. The authors directed a good deal of attention in the course of a very lengthy paper to industrial vehicles. They expressed complete confidence in the present-day storage battery for such service, considered the question of batteries in general, and then dealt exhaustively with the Edison accumulator. Transmissions, features of electric vehicle design, tyres, electric vehicle motors, electrical transmission systems (the Crompton electric valve, the Thomas system), the F.R.A.M. front driven electric tractor, the pleasure automobile, and running costs were each discussed in their turn, and many tables were given showing cost of operation. A demonstration of electric vehicles followed after the reading and discussion of the paper. The day's proceedings were held at Kingston on Thames. To-day (Friday) the proceedings came to a close with the annual business meeting, though tomorrow there is an excursion to Chingford to see the Humphrey pump.

Not by any means the least important event in connection with this year's gathering was a dinner and discussion organised by the "Point Five" Club. Something like 120 persons were present, indicating the interest which is being taken in the movement in favour of cheaper electricity for domestic purposes. After dinner, held on Tuesday evening, some hours were devoted to a discussion on electric heating and cooking, which, together with electric vehicles, may be described as pre-eminently the "question of the hour" among municipal electric supply men in England. A very fine exhibit of cooking and heating apparatus was brought together at the meeting place (the I.E.E. Building) for the edification of those assembled.

## N.S.W. RAILWAYS GROWTH.

Mr. T. R. Johnson, Chief Commissioner for Railways for New South Wales, in addressing the delegates of the Farmers' and Settlers' Conference, recently gave some interesting information with regard to the progress of railways of the State during the past six years. He contrasted the two six-year periods ending June 30th, 1913, and June 30th, 1907. The passengers carried numbered 211,000,000 and 363,600,000 respectively, an increase of 72 per cent.; goods and live stock carried showed an increase of 50 per cent.; the figures for goods and live stock carried were 16,000,000 and 24,000,000, an increase of 50 per cent.; coal and coke carried aggregated 27,000,000 and 37,000,000 tons, an increase of 37 per cent. The passenger earnings were £9,000,000 and £14,500,000, an increase of 58 per cent. (notwithstanding a reduction in fares). Goods and live stock returned £12,000,000 and £17,500,000, an increase of 45 per cent.; coal and coke, £1,838,000 and £2,800,000, an increase of 52 per cent. The total earnings from all sources were £23,000,000 and £34,000,000, an increase of 50 per cent. As regards expenditure, complete figures were not available. The number of locomotives in use was now 998, as against 657 in 1907, the haulage power 21,500,000 lbs., as against 13,000,000, and the carrying capacity 213,311 tons, as compared with 111,452 tons.

In concluding his remarks Mr. Johnson said it would probably be the last time he would be before the Conference. Mr. Weatherspoon, M.L.C., in moving a vote of thanks to the Commissioner, expressed the opinion that he was the right man in the right place, and commended him for sticking to his guns, sentiments which found hearty endorsement amongst those present.

## BIG WATER POWER SCHEME.

The Pacific Light and Power Corporation (U.S.A.), which is supplying light and power to Los Angeles from plants aggregating a capacity of 70,000kw., has embarked upon the construction of a water-power scheme of 120,000kw. capacity. The first plant will be erected at an altitude of 6300ft., and will be situated 300 miles from Los Angeles. In preparation for the construction of this station the company has put in a siding-line, 50 miles long, connecting the site with the Southern Pacific Railway at a point 22 miles north of Fresno, which occupied them from January to July of this year.

The scheme comprises a dam of 120 million cubic meters capacity, and 2 stations of 640 and 580 meters respectively. The dam is situated just above the Big Creek Falls. The northern and eastern boundaries of the dam are mountain ranges of 9000ft. altitude, whilst the southern and western embankments are mountains of somewhat lower altitude, which do not prevent the warm and saturated sea breezes from coming in. The yearly quantities of rain in the river district gauges 200 centimeters, and the overflow is equal to nearly 130 centimeters rain gauge—i.e., 260,000,000 cubic meters per year. The dam has three concrete bars, two of about 90ft. and one of about 150ft. in height, which close all natural outlets. Below it the Big Creek River falls 1220 meters over a distance of 9 kilometers. This, and the enormous quantity of stored water, guarantees the maintenance of the full service of power-plants of great capacity, even in cases of drought, and proposals are made for the erection of plants with a total capacity of 120,000kw. From the dam the water is conducted by gravitation through a stope 1200 meters long, and then through a steel pipe-line of 2070 meters length along the mountain slopes to a point above the first turbine house, from which point it is conducted through pressure mains to the turbines. Behind the first station a second dam is formed by the erection of a bar of 21.5 meters height in the river bed. Thence the water is brought through a stope of 6.5 kilometers length to the incline above the second power-house, from which point pressure mains lead to the turbines.

The two power-stations are built for 60,000kw. each. In spite of the reduced head, sufficient power is obtained for the second station, as a tributary flows into the second dam, making up for the reduced head. The Mannesmann Tube Co. are supplying the pipe lines. The contract includes the delivery of several mains ranging between 42in. and 24in. in diameter, with thickness up to 1¼in. The total weight of the required pipe-lines is 3500 tons, and delivery has to be completed within five months.

It is noteworthy that the Big Creek hydraulic power plant ranks amongst the largest of its kind. The engine houses are built in ferro concrete, and provision is made to erect at each station 4 turbo-dynamos with a capacity of 60,000kw. Of these, two are to be installed at each station to meet the present requirements. As the first station can let pass the power-water unused, both stations can run independently of each other. Amongst further big hydraulic power plants for which the Mannesmann Tube Company are under contract to supply, are the following:—Hydraulic power scheme of A/S. Thyssefaldeno (Norway), about 1500 tons of pipes; hydraulic power scheme of Flumisell (Spain), about 1450 tons of pipes.

## LITHGOW (N.S.W.) INDUSTRIES.

(From Our Correspondent.)

Lithgow, July 24.

During the past week operations at Lithgow Iron and Steel Works assumed a somewhat quiet attitude, owing to a series of breakages, which have interfered materially with the working of the more important mills. Notwithstanding this, the "guide" mill put up a full week's work until Friday afternoon, when an accident occurred, and the mill will now be hung up for a few days pending repairs. The 18in. mill started work on Monday on ironwork required from the second blast furnace. The 27in. mill worked during the past ten days on rails and billets. It also was hung up for a few days through a breakage in connection with the "roughing" rolls. About 400 tons of rails have been despatched to Qeanbeyan, to be used on the short length of railway connecting up the Federal Capital with the main southern line. At least another 400 tons of rails are ready for despatch when trucks are available.

The want of railway trucks for the export of the products connected with the lime and cement industry throughout the Lithgow district, is being severely felt at the various works. At the Commonwealth cement works all the storage capacity is filled with cement, owing to no trucks being available to send the commodity away. The men engaged in the packing department, who work on the co-operative principle, can only keep going as the cement is despatched. The manager is making all possible efforts to keep the men going, but, unless sufficient trucks are forthcoming, the full complement of men cannot find employment. At the other works the same conditions prevail. At the North Sydney Company's works, when at least five trucks daily are required for the despatch of lime for the Sydney trade, large stocks of lime are on hand. On two days last week no trucks came forward, while on the remaining days, only one or two were available.

Quite a number of new coke ovens, recently erected by Messrs. C. and G. Hoskins Limited, of Lithgow Ironworks, have just been fired for the first time, and a few days ago a large quantity of good quality coke was drawn from the ovens. The ovens are situated convenient to the blast furnace, and it is expected that the whole of them—88 in number—will shortly be in full work. A good deal of work has yet to be done in the engine-house, on the tram-lines and sidings, and in other directions, before the works can be brought up to date.

## N.S.W. TRAMWAYS.

Mr. T. R. Johnson, N.S.W. Chief Railway Commissioner, gave some interesting information recently concerning the N.S.W. tramway system. The total capital expenditure to June 30th last was £6,721,000, the average rate of interest on which was 3.489 per cent. The earnings for the year ended with June 30th were £1,754,567, and the expenditure was £1,572,190, the difference not being sufficient to cover interest. That position was partly occasioned by the opening of new lines which were not yet remunerative, but by far the greatest factor was the increase of wages expenditure under awards of the Wages Boards, whilst

Removal of San Francisco Commercial High School: The Old Foundations.

the receipts remained stationary. So far as the city and suburban lines were concerned, after paying expenses and interest, they had returned a surplus of £5000, but the North Sydney lines made a loss of £10,544, and other lines £26,449. During six years £210,000 had been written off for depreciation, chiefly owing to the equipment at the Ultimo power-house becoming obsolete. In reply to a question as to the possibilities of supplying power for municipal purposes, Mr. Johnson said that they had equipment running only in the mornings and evenings, and these machines were available for the generation of current throughout the day. By so running that equipment they could charge batteries, situated in convenient places from which lighting could be drawn. This would involve no additional capital cost, and probably not much more labour cost, and it would mean improved economy in coal consumption, etc., over the whole running. Some equipment would be necessary, and it would probably consist of a battery or batteries. He did not think he could average up capital interest, because the machinery was there in any case, and anything he got from the municipality would be in the nature of a bonus. He knew that there was a loss of about 30 per cent. of power involved in the use of storage batteries, and he did not like storage batteries; he was merely considering the question of making use of the existing equipment in the way suggested. In reply to a question by a member of the commission, Mr. Johnson said that the possibilities of using this surplus power was not a matter weighty enough to sway the commission one way or the other in regard to the main question of taking over or not.

## A BIG REMOVAL.

An American correspondent sends particulars of a big job that was proceeding in San Francisco when he, the writer (on June 20), left. The work is the removal of the San Francisco Commercial High School, the removal being rendered necessary by the building of the Civic Center at a cost of 6,000,000 dollars. The following are the particulars supplied by our correspondent:—

Structure.—Steel frame, reinforced concrete, brick facing, 120 x 140 x 90.9ft., weighing 8000 tons.

Distance Moved.—1700ft., with rise of 28ft. in total.

Cost of Moving and Re-erecting on New Foundation, with all Connections Complete.—151,000 dollars.

Time Taken.—About 90 days.

Daily Movement.—Up to 60ft.

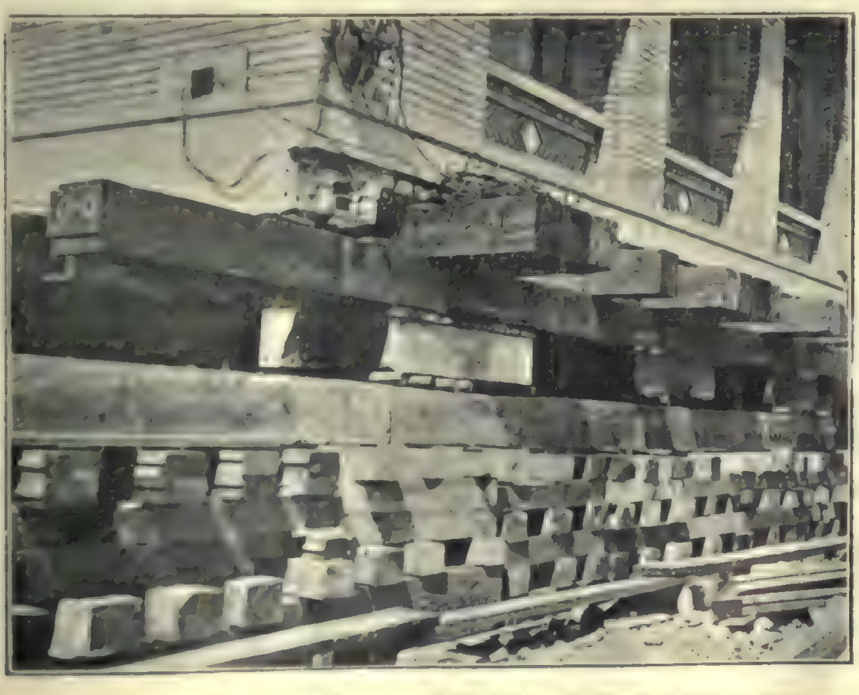
Haulage.—3 winches (steam) and geared block and tackle; pulling bridle, 2in. steel rope, with 1in. rope in tackle.

The three accompanying illustrations will give some idea of the work.

## AUTOMATIC PHONES FOR NEW ZEALAND.

The New Zealand Postmaster-General has accepted the tender of the Western Electric Co. of Australasia for the supply of automatic telephone exchanges at Auckland, Blenheim, Wellington, Hamilton, Oamaru and Masterton, for £89,555. The expenditure of this amount will be spread over four years, and the first payment will be due in 1914-15. The offer provides for full automatic switchboards at the centres named, with branch exchanges at Devonport, Takapuna, Onehunga, Ponsonby, Mt. Eden and Remuera, in the Auckland area, and at Courtenay Place, Newtown, Kelburne, Karori, and Khandallah, in the Wellington area. In the case of the Auckland and Wellington areas the work will be spread over three years. When the whole areas at Auckland and Wellington are converted to full automatic working, it is anticipated that the economies effected will enable a minimum uniform rate to be spread over a much larger area than would be possible under the manual systems previously in use in the dominion.

Removal of San Francisco Commercial High School: The Building en route.



Removal of San Francisco Commercial High School: The Building on Rollers.

The report of the Royal Commissioner, appointed to enquire into the pipes used by the Sydney Water and Sewerage Board, has been laid on the table of the N.S.W. House. The Commissioner found that the tests specified to be applied to pipes by the Board were adequate; that the tests were duly applied, and the specifications complied with; that the pipes used by the Board were, speaking generally, of good quality and well suited for their purpose. The Commissioner suggested that the pipes for the Water and Sewerage Board, and all Government pipes should be examined at the place of manufacture by an inspector appointed on behalf of the Board and the Works Department.

## ELECTRIC SUPPLY IN VICTORIA.

Since the passing of the Electric Light and Power Act 1896 (V.), according to the annual report presented to Parliament last week, 84 Orders in Council have been issued authorising the supply of electricity, and of these 40 were granted to municipal councils, 35 to companies or persons, one to the Defence Department, while eight have been cancelled. Two municipal councils transferred their powers to private companies. Within the boundaries of the city of Melbourne there are 2.75 miles of overhead high-pressure and 130 miles of low-pressure wires, while 12.87 miles of high and 11.5 miles of low pressure cables have been placed underground. The total number of consumers is 5419, and current is supplied to 2158 private motors. In the area served by the Melbourne Electric Supply Company there are 907 miles of overhead low-pressure and 11 miles of overhead high-pressure conductors, while 136 miles of high pressure and 4 miles of low-pressure wires are running underground. The company is taking electricity in bulk from the Prahran destructor, and supplies the whole of the requirement in electricity of the Prahran-Malvern Tramways Trust. During last year orders authorising the supply of electricity were granted to the councils of the following boroughs, shires, etc.:—Koroit, Karkarooc, Brunswick, Maffra, Horsham, Yea, Nunawading, McIvor, Wonthaggi, Port Melbourne, Mansfield, the Provincial Electric Development Co., the Coleraine and Western District Butter Factory Co., and the Melbourne Electric Supply Co. Orders were not granted in respect of applications made by Northcote, Wycheproof, Sea Lake, Shepparton, shire of Corio, Cobram and Tungaman, the necessary formalities not having been completed.

## MISCELLANEOUS.

Although an agreement was arrived at between the Perth City Council and the West Australian Government last December, under which the Government agreed to supply electric lighting to the City Council, nothing has yet been done towards completing the agreement. The acting mayor, Cr. Franklin, has therefore lately been urging the Premier to take immediate steps to bring the matter to finality. The position, said Cr. Franklin, might well be described as critical so far as the council is concerned, because since the agreement was made with the Government in December last, the council has abandoned its scheme of erecting a new power-house for its lighting requirements. Furthermore, when Mr. Merz was in that State last December, a provisional arrangement was made with him that his firm should act as consulting engineers to the council at a fee of £1000 per annum, contingent upon the agreement between the council and the Government being completed. The council is unable to complete its agreement with Messrs. Merz and McLellan until the agreement with the Government is in its hands.

* * *

A public meeting of residents of Wahgunyah (V.) decided last week to request the municipal council of Corowa (N.S.W.) to undertake to supply them with electric light for both public and private use. The two towns are on opposite sides of the River Murray, and but a few miles apart, so that there should be no physical obstacle to such an arrangement being carried out.

* * *

An electric lighting scheme has at last been completed at Rutherglen (V.), at a cost of about £3000, and last Thursday night the town was brilliantly illuminated for the first time, the ceremony of switching on being performed by Mrs. Jollings, wife of the mayor.

* * *

So satisfactorily have the electric tramway services of Geelong (V.) proved that the Tramway Conference has decided to request an extension of the system from the Pakington-street terminus, at Geelong West, to the golf links in Church-street, and from the terminus in Aphrasia-street, Newtown, to Fyans-street, Chilwell. The Conference has decided to grant the application of the tramway company for permission to duplicate the tram lines from Malop-street to the Moorabool-street wharf, and from Moorabool-street to the railway station. The company was also given authority to run a motor-bus along McKillop-street, between the Moorabool-street tram line and East Geelong.

* * *

Amongst the engineering works about to be undertaken in New Zealand is the construction of a fine, handsome bridge across Manukau Harbour to connect Onehunga with Mangere. The structure is designed to cost £25,000. It will be built in reinforced concrete, 820ft. long and 50ft. wide, with approaches of the same width, filled in with scoria, 1500ft. long at the Mangere end and 300ft. long on the Onehunga side, the total length of the bridge and its approaches being 2620ft. The present bridge is flat, but the new one will have a regular slope from the railway bridge at Onehunga to the Mangere shore of 1ft. in 100ft. The main structure will be built in spans of 50ft., the girders being 8ft. deep and 15in. wide, carried by columns 24ft. square at the top, and half that size at the base. The decking will be 12in. thick, and provision will be made for a double tramway track and footway 6ft. wide on each side of the carriage way. The balustrading will be formed of concrete piers and iron piping.

* * *

The Minister for External Affairs, Mr. Glynn, announced last week that the report of the surveyors, who had examined the proposed route of the railway from Pine Creek to the Katherine River, Northern Territory, had been approved of, and that he was favourable to the work being proceeded with as soon as the sanction of Parliament had been obtained. A Bill, authorising the construction of the line on the contract system, is to be submitted to Parliament early in the session.

* * *

The town of Corrimal is now urging the Council of the large municipality in which it is to ascertain the cost of a lighting installation. Corrmal adjoins the Bulli shire, in which electric lamps, lit by the surplus electricity of the South Bulli colliery plant, extend for many miles. The colliery company, it is understood, are ready to deal with North Illawarra. The electric power generated at the coke ovens now operates the Corrimal-Balgownie colliery machinery as far as the ventilating shaft, over four miles away. It now takes an hour and a quarter of walking to reach the most distant coal face in this mine.

* * *

The report of the Sydney and Suburban Hydraulic Power Co. for the six months ending June 30 shows the amount to credit of profit and loss account to be £7447 17s. 1d., of which it is proposed to place £1500 to plant renewal and contingency account (bringing the total to £37,125 14s. 5d.), and £4500 to the payment of a dividend at the rate of 8 per cent. per annum, leaving £1447 17s. 1d. to be carried forward.

* * *

The annual meeting of the Electrical Employers' Association of New South Wales was held at the Cafe Francaise, in Sydney, last week. Mr. S. Cox presided. The report and balance-sheet were adopted, and the following officers elected:—President, Mr. S. Cox; vice-presidents, Mr. R. J. M. Franki and Mr. W. Ramsay Sharpe; treasurer, Mr. J. N. Parry; auditors, Mr. A. Waddell and Mr. J. R. Hodson; committee, Messrs. A. Waddell, J. D. Handle, F. O'Donnell, A. Oxlade, and A. Kaleski. At the conclusion of the business, a smoke concert was held.

* * *

Mr. John Sulman, architect, giving evidence before the Greater Sydney Commission, said he considered that the proposed Greater Sydney Council would be a proper authority to carry out the North Shore bridge. The assumption hitherto had been that the bridge would be built by the State Government, and be free. If carried out on that basis, it would be making a handsome present to a small section of the population at the expense of the whole of the State. He could not see why the users of the bridge should not pay. It was contended that country bridges should be free, and hence that the North Shore bridge should be free also. The former were necessary to develop the country, and in the majority of cases it would not pay to collect the tolls. He hardly thought, however, that the abolition of the tolls was justified. It was useless to expect private enterprise to carry out a bridge of the kind desired. If, in this case, Sydney had to pay in full for all services by the bridge, as a matter of fairness between city and country tolls on ferries should be reimposed, and country shires and municipalities should find the money for the erection and maintenance of all road bridges, of whatever cost.

* * *

An ingenious electrical device has been manufactured at Schenectady, U.S.A., for use in the Panama Canal plant. The operators will have a complete model of the various parts of the canal, showing the entrance gates, locks, levels of the water, and by means of electricity the canal will be connected with the model so that it will show the exact position of the gates and locks and of the traffic proceeding through the canal. Out of sight of the canal the operators will control the gates and levels by means of this apparatus.

* * *

A new courthouse in New York is being constructed entirely of steel. It is circular in shape, and will be made to represent the Colosseum, at Rome. There will be eight floors above the ground floor. The courthouse will stand on 120,000 sq. ft., and cost, including the site, £2,250,000.

* * *

The Commonwealth wireless station at Esperance (W.A.), the twelfth of the coastal series of Australia, was opened for business last week, and it is expected that within the next few weeks stations will also be in working order at Broome (W.A.), Townsville (Q.), Flinders Island (Bass Strait), and Wyndham (W.A.). After these will come a series at Woodlark Island, Samarai, Lord Howe, and Norfolk Islands, King Island, Albany and Carnarvon. Applications are invited for the positions of officers in charge at the following stations:—Cooktown, Rockhampton, Thursday Island, Townsville, Darwin, Mt. Gambier, Broome, Esperance, Geraldton, Roeburn, Wyndham, and Flinders Island. The salary in each instance ranges between £216 and £240 per annum. Applicants must be capable of working at 25 words per minute, and must possess an elementary knowledge of electricity and magnetism.

* * *

Replying to questions in the New Zealand House of Representatives recently, the Minister for Railways, Mr. Herries, said: "The results of the experiments being tried in other parts of the world in connection with motor-driven railway vehicles are being closely watched, and the latest information obtained as each experiment is made. The results of oil fuel for electrically-driven vehicles have already been sent for. A petrol electric motor-car of a type which has already been found to give satisfactory results on the South African railways has been ordered for trial in New Zealand."

* * *

In the Queensland Legislative Assembly last week, Mr. Ryan moved an amendment to the Railway Consolidation Bill as follows:—"That the second reading of the Railway Consolidation Bill be postponed, with the object of appointing a Royal Commission to inquire into the general management of the Queensland railways, including the powers and duties of responsible officials, general efficiency and safety of the permanent way and rolling stock, methods of adjusting and preventing industrial disputes in the railway service; an advisory board to report on all new railways, fares and freights, and other matters pertaining to the several management." Upon this the debate was adjourned. The Great Western Railway Act Amendment Bill, on the second reading, was referred to a Select Committee.

* * *

The New Zealand Government is experiencing some trouble with the submarine cables in Cook Strait, owing to chemical action and the wearing effects of heavy weather, which have made the cost of maintenance a much more serious item than had been anticipated. All are showing signs of wear and tear, and it is asserted, says a Wellington paper, that the Government will have to seriously consider the question of replacing all or most of them in the near future. One of the cables (No. 4, between Lyall Bay and White's Bay, Marlborough) has just been repaired by the steamer Tutanekai. The Lyall Bay end was found to be very much damaged, and three miles of it had to be replaced. The steamer is now dealing with one of the cables running between Otorohonga and White's Bay, which was put out of action some weeks ago, and is finding the work particularly difficult. The tide-rip off Terawhiti has been very bad of late, and the handling of the heavy cable under such circumstances is proving a work requiring all the skill and ingenuity of Captain Post and the Departmental experts on board the vessel. When she has completed the repairing of the second broken cable the Tutanekai will lift another, which has been faulty for some time.

* * *

William Spence, 29, a fitter at Eveleigh railway workshops, has lost the sight of his left eye as the result of a piece of metal flying up and hitting him, whilst he was working on a piece of iron last week.

* * *

A proposal of the New South Wales Minister for Works to run a tram from Arncliffe to Brighton has met with scathing denunciation from the Rockdale Council, Rockdale being already connected with Brighton by a private tramline. "Such a silly proposal," the mayor said, " he had never heard of. If the time came when Brighton was cut off from Rockdale, it would be the fault of the Minister. If it was not competent for the Government to run the tram, what hope had the Council, who were given no power under the Act? If a private individual attempted to run it he could be indicted for creating a nuisance." Alderman Taylor, M.L.A., with a view to pouring oil on the troubled waters, suggested the Minister might re-consider his decision or that after the next election there might be another Minister for Works, and, cheered by this, to them, joyful prospect, the Council decided to await Cabinet's decision in the matter.

* * *

Krupps it is stated have succeeded in producing a material for safes that is not easily fused or penetrated by the oxy-hydrogen and oxy-acetylene burners now in use by scientific cracksmen. It is a variety of cast steel able to resist the best boring tools. It is estimated that to burn a hole 3.2in. in a plate of the material 1.6in. thick would take from 6 to 14 hours, and necessitate the use of 3000 gallons of acetylene and 3000 gallons of oxygen.

# Tenders Invited and Accepted

**It is particularly requested that the information regarding contracts open, and the successful tenderers, be forwarded to The Editor not later than Monday of each week.**

The following contractions are used throughout:—S—supply; D—delivery; M—manufacture; C—construction; E—erection; P—purchase; I—installation; R—removal. Where no contractions appear, supply and delivery is understood. **The date at the beginning of each paragraph refers to the closing of tenders.**

## INVITED.

### Commonwealth.

**Specifications, tender-forms, etc., for tenders invited for the Postmaster-General's Department of the various States under this heading may be had as follows:—Victoria—Various State G.P.O.'s. New South Wales—Departmental Stores, Sydney, and various G.P.O.'s in other States. South Australia—Adelaide, Melbourne, Sydney and Brisbane G.P.O.'s. Western Australia—Departmental Stores, Perth, and various G.P.O.'s in other States. Queensland—Various State G.P.O.'s. All States—Various G.P.O.'s. If the Specifications, etc., may be had elsewhere in addition the places will be given in parentheses.**

POSTMASTER-GENERAL'S DEPARTMENT, Melbourne.—5th August.—13 ammeters, as per schedule No. 966.

19th August.—105 miles of paper-insulated, lead-covered cable, as per schedule No. 906.

19th August.—S. and D. of stamps and type, for a period of two years, from the 1st July, 1913, to the 30th June, 1915, as per schedule No. 911.

26th August. — 460 coin-collecting devices, electrically controlled, as per schedule No. 916.

26th August.—S. and D. of general stores, for a period of two years, from the 1st July, 1913, to the 30th June, 1915, as per schedule No. 912.

16th September.—S., D., E., and I., at the Telephone Exchange, Collingwood, Victoria, of a common battery switchboard, as per schedule No. 860, or an automatic, or semi-automatic, switchboard, as per schedule No. 859.

16th September.—Galvanised-iron piping and fittings, as per schedule No. 951.

23rd September.—Sulphate of copper, as per schedule No. 956, in the undermentioned quantities.—New South Wales, 140 tons; Victoria, 25 tons; Queensland, 55 tons. South Australia, 20 tons; Western Australia, 60 tons.

23rd September.—500 letter-box fronts, small size, as per schedule No. 957.

23rd September.—General stores, for a period of two years, from the 1st July, 1913, to the 30th June, 1915, as per schedule No. 913.

30th September.—S. and D. of 1,017,000 pattern "A," and 1,768,800 pattern "B" insulators, at Sydney, Melbourne, Brisbane, Adelaide, Perth, and Hobart, during the years 1913-14, 1914-15, and 1915-16, as per schedule No. 974. (See advertising columns.)

7th October.—S. and I. of electrically-driven machinery for operating pneumatic tube services, Central Telegraph Office, Melbourne, as per schedule No. 900.

14th October.—S. and E., at the Telephone Exchange, Melbourne, of a common battery multiple switchboard, as per schedule No. 868.

4th November.—D. and E. of eight automatic telephone switchboards at the Ascot, Canterbury, Malvern, Cheltenham, Footscray, Oakleigh, Sandringham, and Williamstown Telephone Exchanges, as per schedule No. 953.

POSTMASTER-GENERAL'S DEPARTMENT, Sydney.—6th August.—62,300 lineal feet of conduit (6 and 9 ducts), as per stores schedule N.S.W. No. 321.

13th August.—140 tons of bolts and nuts, as per stores schedule N.S.W. No. 313.

20th August.—575 detectors, Q. and I., as per stores schedule N.S.W. No. 322.

20th August.—S. and D., at the departmental stores, Sydney, of 9200 dry cells, as per stores schedule N.S.W. No. 323.

27th August.—(1) Telephones to stores schedule N.S.W. No. 301, (2) switchboards to stores schedule N.S.W. No. 302, (3) lamps, electric, incandescent, to stores schedule N.S.W., No. 304.

15th October.—150 fire sheets (asbestos), as per stores schedule N.S.W. No. 326.

15th October. — Measuring instruments, to stores schedule N.S.W. No. 303; telephone parts, to stores schedule N.S.W. No. 314; switchboard parts, to stores schedule N.S.W. No. 315.

POSTMASTER-GENERAL'S DEPARTMENT, Perth.—6th August.—S. and D. of insulators, telegraph and telephone material, and iron poles, to W.A. schedules, Nos. 258, 261, and 264.

6th August.—Screws, coach.

6th August.—One motor car to the Postmaster-General's Department in Western Australia, in accordance with schedule No. 302.

13th August.—About 20 tons of bolts and nuts to W.A. schdule No. 300.

20th August (extended from 6th August).—Cable, lead-covered, paper-insulated—telephone.

20th August.—2 tons of salammoniac, to W.A. schedule No. 301.

8th October.—Expansion bolts and shields to schedule No. 297.

POSTMASTER-GENERAL'S DEPARTMENT, Brisbane.—27th August.—S., D., and E., at the Telephone Exchange, Brisbane, of 5 sections of switchboard, common battery, multiple, and other equipment to schedule No. 243, specification No. 458.

10th September.—Telephone Exchange, Brisbane, nine sections of a trunk line switchboard, to schedule No. 244, specification No. 461, and the general conditions, drawings, etc., attached thereto.

24th September. — Ironwork, as per stores schedule No. 264; pipes, cast iron, as per stores schedule No. 265; poles, iron, etc., as per stores schedule No. 266; wire, G.I., as per stores schedule No. 269.

POSTMASTER-GENERAL'S DEPARTMENT, Adelaide.—13th August.—Telephone parts, as per schedule No. 292, and switchboards, as per schedule No. 293.

12th November.—One lamp signalling trunk line switchboard, of five sections, one cable turning section, and one cable storing section, one two-position recording desk, and one chief operator's desk, as specified in specification No. 431, etc., delivered at the Telephone Exchange, Adelaide, as per schedule No. 296.

DEPARTMENT OF HOME AFFAIRS.—Federal Capital Power Plant.—15th September.—S. of sect. 1, main power-house switchgear; sect. 2, switchgear for Diesel engine plant.

DEPARTMENT OF HOME AFFAIRS.—Kalgoorlie-Port Augusta Railway.—2nd Septemberber. — M., S., and D. of 80 lb. steel rails and fishplates; M., S., and D. of iron dog spikes and steel fishbolts and nuts for 80 lb. rails.

DEPARTMENT OF HOME AFFAIRS. — Works Director for Victoria.—6th August.—S., f.o.w., or f.o.r., Geelong, of steel work for Commonwealth Woollen Mills, Geelong, Victoria.

DEPARTMENT OF HOME AFFAIRS. — Works Director for New South Wales.—I. of electric fire alarm at Ordnance Stores, Circular Quay, Sydney.

DEPARTMENT OF EXTERNAL AFFAIRS.—Pine Creek to Katharine River Railway.—19th August.—S. 80 lb. steel rails and fishplates; sleepers, (a) steel (b) timber (Powellised); iron dog spikes and steel fishbolts and nuts for 80 lb. rails.

DEPARTMENT OF TRADE AND CUSTOMS.—26th August.—S. and D. of eight (8) automatic flashing lights.

DEPARTMENT OF DEFENCE. — Royal Australian Navy.—25th August.—S. and E. of an oil storage tank at Garden Island, Sydney.

1st September.—S. and E. of a 500-ton oil storage tank at Flinders Naval Base, Victoria.

**P. & O. COMPANY'S ROYAL MAIL STEAMERS**
FOR MARSEILLES, PLYMOUTH, AND LONDON.

Leave Sydney on the subjoined dates, calling at usual ports.

FIRST AND SECOND SALOON ONLY.

| Steamer. | Tons. | Commander. | Noon. | Melb., 3 p.m. |
|---|---|---|---|---|
| MONGOLIA | 10,000 | Llewellyn | Aug. 9 | Aug 12 |
| MACEDONIA | 10,500 | Bennett | Aug. 23 | Aug. 26 |
| MALWA | 11,000 | Thompson | Sept. 6 | Sept. 9 |

PASSAGE MONEY TO LONDON—
Single, £41 16s to £82 10s.
Return, £69 6s. and £123 4s

Return Tickets between Inter-State Ports are available for return by Orient, Messageries Maritimes, and N.D.L. steamers having room.

SPECIAL HOLIDAY RETURN TICKETS to COLOMBO are now issued, available for two months. Fares from Sydney, £45 2s. first saloon, and £31 18s. second saloon.

A. GORDON WESCHE, Superintendent IN AUSTRALIA, 63 Pitt-street, Sydney.

**The COLONIAL MUTUAL FIRE Insurance Company Limited.**

Principal Office: 60 MARKET-ST., MELBOURNE

Branches in all the States.
Transacts Fire, Guarantee, Employers' Liability, Marine, Burglary, and Plate Glass, Accident, Workers' Compensation and Live Stock Insurances.

Send for Prospectus.
W. TUCKER, General Manager

**Harringtons Ltd**

**ANALYTICAL & METALLURGICAL DEPT.**

Lowest fees for all kinds of Assay, Analytical, and Metallurgical work.

Expert Advice on Ore Treatment, Bullion Refining, Smelting, etc., etc. Directed by a qualified Analyst from Messrs. Johnson and Sons, London; Assayers to Bank of England; H.M. Mint, The Council of India, etc.

**HARRINGTONS LTD.**
**386 George Street, Sydney.**

8th September.—S. of machinery and accessories for standard 25ft. motor launches, as may be required, for a period of two years from date of contract.

DEPARTMENT OF DEFENCE. — Military Forces of the Commonwealth. — 4th August.—Cordage and metalwork.

11th August.—Metalwork for the Commonwealth Harness Factory (brass and steel harness mounts).

### Victoria.

VICTORIAN RAILWAYS.—31st July.—Copper sheet, books, copper tubing.

31st July.—Batten sockets.

1st August.—Mica rings, etc.

4th August.—Twist drills.

4th August.—Electrification of the Melbourne suburban railways—(a) circulating water and sump pumps, with motors; (b) air and water extraction pumps and motors; (c) surface condensers, hot wells, piping, and sundries.

5th August.—M., S., and D. of 25 tons of 5-8in. W.I. pins for 60 lb. "T" rails.

6th August.—Small steel springs.

6th August.—S. of electrical energy for driving machinery, lighting, etc., at the Ballarat and Bendigo workshops.

6th August.—Steel channel bars.

13th August.—Best steel boiler plates for steel cranes, boilers, etc.

13th August.—30,000 lineal feet of wrought-iron steam pipe, 1in. diameter.

20th August.—C. and riveting of mild steel girders, etc., for first section, renewal of Moorabool Viaduct, Geelong to Ballarat line.

20th August. — C. and riveting of mild steel girders, etc., for second section, renewal of Moorabool Viaduct, Geelong to Ballarat line.

20th August. — C. and riveting of mild steel girders, etc., for third section, renewal of Moorabool Viaduct, Geelong to Ballarat line.

27th August.—Hollow chisels and bits.

3rd September.—S. of three petrol engines and pumps for use at Newport Workshops. (Fresh tenders.)

3rd September.—Steel faced machine knives.

3rd September (extended from 20th August).—M., S., and D. of (a) lathe, (b) sawing machine, (c) chisel mortiser, (d) cut-off machine, (e) moulding machine.

1st October (extended from 10th September). Neutral track relays.

12th November.—Flame arc lamps.

**Osborn's Truck Wheels & Axles**

**Osborn's Mushet High Speed Steel, Twist Drills, Mining Steels, Crusher Jaws and all classes of Castings.**

Samuel Osborn & Co. Ltd., Sheffield, are Standard Makers.

**Gibson, Battle & Co. Ltd.**

**535 Kent St., Sydney.** **486 Collins St., Melbourne.**

**S.A. Agent: C. C. Deland, Victoria Square, Adelaide.**

**NORD DEUTSCHER LLOYD**

REGULAR SERVICE TO EUROPE.

REDUCED FARES TO LONDON.

TO MANILA, CHINA AND JAPAN.

Via New Guinea and Yap.

Fares to Hong Kong, £40; II., £26.

Full particulars will be sent on application to—

LOHMANN AND CO., General Agents,
7-9 Bridge-street, Sydney.

Ostermeyer, Van Rompaey and Co., Melbourne; H. Muecke and Co., Adelaide; L. Ratazzi and Co., Fremantle; Thos. Brown and Sons Ltd., Brisbane

**A. U. S. N. Co. LTD.**

*Fast, Regular, and Comfortable Passenger Steamers*

(also carrying cargo) from and to

MELBOURNE, SYDNEY, ADELAIDE, FREMANTLE, BRISBANE, and all QUEENSLAND PORTS.

Passage Tickets interchangeable, with other Inter-State Companies, on certain conditions.

Full Particulars at

**COMPANY'S OFFICES**

**at all principal Australian Ports.**

**The Mount Lyell Mining & Railway**

**CO. LIMITED.**

Purchasers of Ores containing Copper, Gold and Silver. Rates obtainable on application to the Secretary

Manufacturers of Coke for Smelting and Foundry Purposes, Acids, Etc.

HEAD OFFICE—
30 QUEEN-STREET, MELBOURNE.

D. G. LUMSDEN,
Secretary.

The Human Life depends on the Reliability of the Mine Engine . . .

and when life is at stake you cannot afford to run any risks.
Be certain; select the Engine of known efficiency and reliability, that has been adopted by Mine Managers everywhere—

THE "ATLAS" DIESEL CRUDE OIL ENGINE.

No fear of the "Atlas" failing at a critical moment.
Every "Atlas" Engine is built of the highest-grade materials by expert workmen.
It runs on the very cheapest fuel—petroleum residue, etc. This, combined with its high efficiency, makes the running cost extremely low.
"Atlas" Engines are made from 15h.p. upwards in horizontal type.
Many other superior features to interest you.
Call and see the Engine running, or write.

STAWN LIMITED,

*Specialists in Mine Machinery and Tools.*

**343 KENT STREET, SYDNEY.**

HIGH EXPLOSIVES.

OBTAINABLE FROM ALL BOOKSELLERS.
224 pages. Price, £/1/.

**VICTORIAN RAILWAYS COMMISSIONERS.** —State Coal Mines.—31st July.—Mild steel and featheredge steel

31st July.—Metal round head screws.

4th August.—Brass skip tokens.

27th August (extended from 13th August).—S. of electrical equipment.

### New South Wales.

PUBLIC WORKS DEPARTMENT. — 5th August.—M. cages for edible offal for new Public Abattoirs, Homebush Bay, Sydney (fresh tenders).

11th August. — Steel bridge for Macleay River, Wauchope to Kempsey section, North Coast railway.

11th August. — Steel bridges for Hastings River and flood channel, Wauchope to Kempsey section, North Coast railway.

11th August.—25 five-ton steel gantry cranes.

3rd September.—Efficient steam tugs for use at Bellinger River and Cape Hawke, from 1st November, 1913.

RAILWAY DEPARTMENT.—6th August.—S. of one live steam feed water-heater for Ultimo power-house.

20th August.—S. of a pneumatic ash handling plant for White Bay power-house.

15th October.—S. of 13 direct-current motors.

### South Australia.

RAILWAYS DEPARTMENT. — 5th August.—C. of 12 refrigerator vans, 5ft. 3in. gauge.

5th August.—C. of a tank with reinforced concrete wall, etc., about four miles from Minnipa.

5th August.—C. of 12 refrigerator vans, 5ft. 3in. gauge.

12th August.—M. of wrought iron details for waggons, 5ft. 3in. gauge.

12th August.—C. of five or ten class "K" locomotive boilers, 5ft. 3in. gauge, the principal material for which, as detailed in the specification, will be supplied by the Railways Commissioner.

PUBLIC WORKS DEPARTMENT. — 5th August.—C. and E. of 52 sheds with 4 tanks, each in the hundreds of 499 and 502, about 30 miles south-east of Minnipa Hill.

ROADS AND BRIDGES DEPARTMENT.—11th August. — C. of steelwork for Redbanks bridge on the Wasleys and Mallala main road.

IRRIGATION AND RECLAMATION WORKS DEPARTMENT.—4th August.—S. and D. of 29,300 galvanised iron outlet pipes.

### Western Australia.

GOVERNMENT TENDER BOARD.—31st July.—3520 pairs of fishplates for 46½ lb. material.

28th August.—Copper firebox tube plates for Railway Department.

28th August.—Steel angles, tees, plates, etc., for Railway Department.

### Queensland.

RAILWAYS DEPARTMENT. — 19th August. — General supplies for 1914 and 1915, for Northern Division, schedule No. 1 (fixed quantities), to be for year 1914 only; schedules Nos. 2 to 30, inclusive, are for two years.

26th August.—General supplies for the years 1914 and 1915, for the Southern and Central Divisions.

TREASURY DEPARTMENT.—29th October.—C. and E. of central sugar mill at Babinda Creek, North Queensland.

### New Zealand.

RAILWAYS DEPARTMENT.—31st October.—S. and D. of stores for the period from April 1, 1914, to March 31, 1917.

### General.

CITY OF MELBOURNE.—1st August.—P. of scrap electric lead, accumulator materials, etc.

2nd August.—I. electric light in Melbourne Town Hall.

15th August.—P. of certain second-hand electrical plant and machinery, in accordance with specification obtainable at this office. (See advertising columns.)

9th September.—S. and D. of electricity recording meters and maximum demand indicators.

16th September.—S. and D. of (a) insulated copper cables, (b) three-phase transformers. (See advertising columns.)

MUNICIPAL COUNCIL OF SYDNEY.—4th August (extended from 21st July).—S. of motor stairwall, and platform.

5th August.—S. and D. of 3 mild steel bodies for motor waggons. (See advertising columns.)

5th August.—Street name boards. (See advertising columns.)

7th August.—S. and D. of coal to council's power-house, Pyrmont, for periods (a) one, (b) two, (c) three years. (See advertising columns.)

7th August.—S. of curve drawing ammeters and voltmeters. (See advertising columns.)

7th August.—Prepayment meters. (See advertising columns.)

7th August.—Motor generator and motor converter. (See advertising columns.)

CORPORATION OF HOBART (T.). — 4th August.—105 tons of straight cast-iron pipes, together with sundry special castings.

CITY OF CHRISTCHURCH (N.Z.). — 7th August.—S. and E. of a 13-panel E.H.S. switchboard.

CORPORATION OF KADINA (S.A.) (F. W. Harris, Town Clerk).—1st September.—One 60 kw. generator, driven from a 100-110h.p. engine, complete with suction gas producer, erected on foundations.

One 500 ampere-hour battery, erected and charged.

1 motor-driven booster (erected).

SHIRE OF SWAN HILL (V.) (A. W. D. Brown, Engineer).—12th August.—P. of fish point punt.

METROPOLITAN GAS COMPANY (V.) (A. E. Bradshaw, Subst. Secretary. Melbourne).—11th September.—P. of a total fixed quantity of 1800 tons of sulphate of ammonia, to be produced by this company during the twelve months ending 31st August, 1914.

METROPOLITAN WATER AND SEWERAGE BOARD, Brisbane (Q.) (Geo. Johnston, Secretary).—31st July.—41,000 casks Portland cement, under contract No. 10, 1913; and 41,000 casks Portland cement, under contract No. 11, 1913.

12th August.—S. and D. of brass fittings.

MUNICIPAL TRAMWAYS TRUST, Adelaide (W. G. T. Goodman, Chief Engineer and General Manager).—19th August.—M., S., and D. of steel poles.

Specifications relating to the S. and D. of copper cable and wire may be obtained on application to W. G. T. Goodman, Engineer and Manager. Tenders will be invited at 48 hours' notice, at a later date, and specifications are now issued to facilitate prospective tenderers obtaining quotations.

PRAHRAN AND MALVERN TRAMWAYS TRUST (V.) (W. O. Strangward, Secretary, 413 Colins-street, Melbourne).—4th August.—M., D., and E. of car bodies, contract No. 36a.

LAUNCESTON MARINE BOARD (T.) (Geo. S. Meredith, Secretary).—6th August.—S. of general stores and ironwork, which includes ropes, paint, and engine oil, leads, cotton waste, kerosene, motor spirit, shovels, brooms, soft soap, steel and wire nails, screw, dumb, and spike bolts, etc.

SOUTH AUSTRALIAN SILICATE BRICK CO. LTD. (in liquidation) (S.A.) (E. M. Twiss, Liquidator, 12 and 13 Alma Chambers, Adelaide).—14th August.—P., as a going concern, of the whole of the machinery, plant, buildings, land (freehold, 30 acres), and stock (comprising about 714,000 bricks), of the above-named company, situate at Osborne, on the Outer Harbour line.

TE AWAMUTU WATER SUPPLY (N.Z.).—21st August.—S. of cast-iron pipes and fittings; spiral steel pipes and fittings; drawn steel tubes and fittings.

BALLARAT WATER COMMISSIONERS (Alex. Fraser, Secretary).—13th August.—S. of about 44 tons of 12in. and 6in. cast-iron water pipes. (See advertising columns.)

ESTATE OF E. L. LLOYD (Executors, c/o Northmore and Hale, Solicitors, Howard-street, Perth, W.A.). — 31st August.—P. of mining leases, plant, etc. (See advertising columns.)

## ACCEPTED.

### Commonwealth.

DEPARTMENT OF HOME AFFAIRS —Federal Capital.—Materials required for substation equipment, Canberra, Federal territory,

Dunlop Mining Goods

Are now used with satisfaction in most of the Leading Mines of Australasia — Their QUALITY & WEAR are UNSURPASSED
Tenders & Samples submitted
Correspondence invited
Send for Illustrated Catalogue

The DUNLOP RUBBER Co. of AUS. Ltd.
108 Flinders St. MELBOURNE.
& ALL STATES

Dunlop Rubber Belting

Is more efficient than Leather belting for Outdoor & Wet Work.

Sample & Price on application

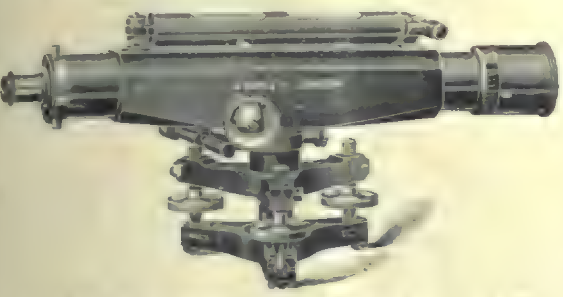
"FIBRO-CEMENT" Fireproofing

Everyone about to build should obtain full particulars of this cool, acid-proof, ant-proof and fire-resisting material. The slates for roofs and the sheets for walls and ceilings are specially suited for the Australian climate. Used by the Federal and State Governments and by all the leading Architects and Builders.

**ECONOMICAL AND EVERLASTING.**

Full particulars, etc., from Sole Agents and Importers—

**JAMES HARDIE & CO.** Melbourne & Sydney



**Surveyors - Architects - Engineers**

will be interested to know that

**W. F. Stanley & Co. Ltd.,**

the greatest instrument-makers of Britain, are now adequately represented in Sydney. We have an enormous stock of Theodolites, Levels, Staffs, Ranging Rods, Drawing and Drafting Instruments, Ink Tracing Cloth and Paper; in fact, every necessity in connection with your profession. We are showing these in our special first floor showroom, and are selling these goods at the English Catalogue Prices, plus only duty and importing expenses 15 per cent.

*We will forward Catalogues upon application.*

**Fairfax and Roberts Ltd.,**

Sole Agents in New South Wales,

**23 and 25 Hunter Street, Sydney.**

£137 7s. — The Australian Metal Co., Melbourne.

1000 black steel straight stalks for power lines, Canberra, Federal territory, £70 16s. 8d. —The Sherardising Pty. Ltd., South Melbourne.

1500 sherardised swan-neck brackets for power lines, Canberra, Federal territory, £226 5s. 6d.—H. Joyner, Melbourne.

DEPARTMENT OF HOME AFFAIRS.—Kalgoorlie to Port Augusta Railway.—Spring washers, 1,937,000 for Port Augusta, 11s. 8d. per 1000; 764,000 for Fremantle, 11s. 1½d. per 1000; £1552 17s. 10d.—Geo. Wills and Co. Ltd.

Boring for water, South Australian section, between Oldea Well and West Australian borders, [illegible] (maximum), 25s. per foot, £10,000 (approx.)—Johnston Bros. Ltd. The rate quoted is for boring all substances except granitic rock. The rate for the latter is 60s. per foot if ordered to be bored.

Timber for strengthening Port Augusta wharf, 13,398 lineal feet (turpentine, ironbark, and [illegible], various dimensions), schedule rates, £3838 15s. 3d.—Allen Taylor and Co. Ltd.

## Victoria.

PUBLIC WORKS DEPARTMENT.—Wire netting of British manufacture. Item 1, 500 miles, 27½ cwt. to the mile, 42in. x 1½in. x 17 gauge, at £21 17s. 3d. per mile—Philip Robinson.

Item 2, 250 miles, 27 cwt. to the mile, 42in. x 1½in. x 17 gauge, at £22 8s. 2d. per mile—Noyes Bros. (Melbourne) Pty. Ltd.

VICTORIAN RAILWAYS.—Miniature electric staff instruments type "M," patterns "A," "B," and "C," with 15 staffs each, at £35 17s. 6d. each, delivered at Spencer-street (not publicly advertised)—McKenzie and Holland Ltd.

Spring washers for 7-8in. fishbolts for railway construction branch, at 15s. 8½d. per 1000—Alfred Adams and Co.

Victorian coal, suitable for storage purposes, from 1st January, 1913, at 12s. 6d. per ton—Robert Kay.

Victorian coal, suitable for storage purposes, from 1st January, 1913, at 12s. 6d. per ton—J. Cook and Son.

C. and E. of the steel superstructure for bridge over railway at Hanover-street, Oakleigh, £3318 5s.—Dorman, Long and Co. Ltd.

C., riveting, etc. (on the site of the contract works) of the steel columns, etc., for Cromwell-road, Williams-road, and Mathoura-road bridges, Hawksburn, £201 10s. 5d.—Dorman, Long and Co. Ltd.

P. of a quantity of ingot steel, £94 13s. — McArthur Engineering Supply Co.

P. of certain automatic telephone wall sets, £87 7s. 6d.—Automatic Telephones (Australasia) Ltd.

TREASURER.—P., without calling for public tenders, of 1 ton of monotype metal and 4 tons of linotype metal, £163 16s. 6d. — Moreland Smelting Works Pty. Ltd.

## New South Wales.

SYDNEY WATER AND SEWERAGE BOARD.—S. of cast-iron covers, float gear, etc., delivered to pumping station, North Sydney, £16 2s. 8d.—A. J. Rowlandson.

S. cast-iron ladders, covers, platforms, travellers, float gear, etc., delivered at Fort Macquarie, £115—Blakemore and Goldie.

Construction pipe sewers for year ending 30th June, 1914. Northern District, 8.75 per cent. above schedule—W. Retshaw. Eastern Division, 12.25 per cent. above schedule — W. Retshaw. Southern Division, 3¾ per cent. above schedule—W. Retshaw. North-western Division, 8.75 per cent. above schedule—W. Retshaw.

Construction 6126 lineal feet stoneware and cast-iron pipe sewers, [illegible], North Sydney, £4340—J. Bromley.

C., 7395 lineal feet concrete pipe sewers, North Sydney, £4312 10s.—C. Harris.

PUBLIC WORKS.—S. and fixing steel window frames and sashes for new offices of the Public Instruction Department, Sydney, £2250—Dobson, Franks Ltd., Sydney.

## Western Australia.

WATER SUPPLY DEPARTMENT.—270 tons asphalt, £8 ton; 200 tons bitumen, £9 ton—Neuchatel Asphalt Co.

RAILWAYS DEPARTMENT.—Round copper bars—Item 1917, £80 16s. 4d. per ton; items 1918 to 1925, £76 18s. 4d. ton—Elder, Shenton and Co. Ltd.

Engine tyres—Items 792 to 795, £304 total cost—G. Wills and Co.

Two only, shunt motors, £19 18s. 6d. each—Leslie and Co.

## General.

TOWN OF PORT MELBOURNE (V.) (A. V. Heath, Town Clerk).—One 10-ton roller, fitted with scarifier, £1000—Austral Otis Engineering Co. Ltd.

SHIRE OF MANSFIELD. — One 37h.p. Tangye gas engine and plant, complete, £599 17s. 9d.—Dalgety and Co. Ltd.

Electrical equipment—one 20kw. generator and direct-connected booster, £168 7s.; switches, £12 18s. 9d.—British General Electric Co. Ltd.

One Hart battery, 280 amp. h., £365 6s. 4d.; portable ammeter and voltmeter, £4 12s. 6d.—Edison and Swan United Electric Light Co. Ltd.

Fuses, meters, consumers' meters, testing set, lightning arrestors, insulators, and street brackets, £123 18s.; erection of electrical equipment, £318 16s. 6d.—Wm. McLean and Co.

House service fuses, £10—W. T. Henley's Telegraph Works Co. Ltd.

Wires and cables, £201 5s.—British Insulated and Helsby Cables Ltd.

MUNICIPALITY OF LEICHHARDT (N.S.W.).—I. electric light, Town Hall, £130—Whittaker Bros., Leichhardt.

SHIRE OF DUNDAS (V.). — Road-making plant, including a traction engine, a portable engine, a stone-crusher, spawl elevator, six waggons, waggon mechanism, scarifier, grader, and water cart, £3291 17s. 6d. (not £3331 17s. 6d., as stated in "Mining Standard" of 10th July, 1913)—A. Leplastrier and Co., Sydney.

## DIVIDENDS.

The following dividends and bonuses of mining companies in Australia have been declared, and are payable on the dates noted:

July.

31st. Ajax Central, Bendigo (V.), 1s. 6d., £2250.

31st. Blair Athol Coal (Q.), 6d.

31st. Carpathia Tin, Ardlethan (N.S.W.), 1s.

31st.—Great Northern Co., Eaglehawk (V.), 6d., £750.

31st. United Hustlers and Redan Co., Bendigo (V.), 6d., £1200.

31st.—Golden Pyke Q.M. Co., Bendigo (V.), 1s., £1500.

31st.—North Bendigo G.M. Co., Bendigo (V.), 6d., £600.

August.

7th. Llanberris No. 1 Co., Ballarat (V.), 6d., £600.

9th.—Amalgamated Zinc (De Bavay's), Broken Hill (N.S.W.), 1s. 6d., £37,500.

12th.—Campbell's Creek Dredging Co., Castlemaine (V.), 3d., £400.

13th.—Associated Northern Blocks, Kalgoorlie (W.A.), 1s., £17,500.

15th. Tongkah Compound, Siam, 1s. and bonus 2s., £7500.

15th.—Black Range Mining Co. (W.A.), 1s., £4000.

19th.—Guildford Bucket Dredging Co., Guildford (V.), 1s. 6d., £525.

20th.—Broken Hill Proprietary (N.S.W.), 1s., £48,000.

## BANK CLEARINGS.

The report of the Melbourne Clearing House for the week ended 28th July was:—

| | | |
|---|---|---|
| Total Clearance | | £4,553,717 |
| Balances | | |
| Settled by certificates | £413,000 | |
| Settled in coin | 101,107 | |
| | | £514,107 |
| Total clearance for the corresponding week, 1912 | | £4,750,630 |

## POSEIDON NUGGETS.

Scratching the surface and then abandoning a mine was a prominent characteristic of mining operations in the early days of the Victorian goldfields; indeed, it is characteristic of most diggings when the country is new. Evidently, however, the custom survives to our own times, and on well-proved ground. Last March three prospectors, named Crapper, Ellerton and White, pegged out a claim on the Poseidon field, near Tarnagulla (V.), which in the early days of the Poseidon rush, just a few years ago, had been held by a Maldon syndicate which, having secured a 105 oz. slug, abandoned the search for more. Crapper and party had not been long in occupation before they came upon a 25 oz. nugget in the wash, besides a fair parcel of finer gold, and about the middle of this month their perseverance was rewarded by the recovery of an 80 oz. slug, which they have christened "Uncle Sam," and which yielded 50 oz. of smelted gold, besides others weighing 10 oz., 4 oz., and 3oz., and a good deal of coarse gold, the whole find, when smelted, giving 67½ oz. as one week's output.

The find has put fresh hope and life into district operations, which have been flagging somewhat of late. Poseidon Alluvial G.M. Co. has reduced its hands by about 30 men, and the Poseidon and Woolshed Reef companies have closed down for the present. The other claims along the lead are not doing very much. The Tarnagulla Gold Estate dredge has closed down.

## STRIKE INSURANCE.

### A Scheme Outlined.

Giving evidence before the N.S.W. Arbitration Commission, a witness outlined an ingenious scheme for deterring men from striking. In explaining his proposal, he said that it would require to be administered by a commissioner, and would provide a Government insurance scheme against loss by strikes, and, incidentally, for compulsory saving by workmen. He suggested that weekly deductions of, say, 10 per cent., should be made by every employer from the wages of every employee until the amount deducted was equivalent to two months' full wages. It would be necessary to open accounts with the Government Savings Bank, and these deductions would be placed to the credit of each employee weekly, and would bear interest at the rate of 4 per cent. per annum. Then he would require the employer to deposit periodically to the credit of every employee interest at the rate of 6 per cent. per annum upon the amount deposited. This money should not be lent out in the ordinary way, but should be available for investment with approved employers, and in proportion to the members employed in the industry. On all such advances he would require the employer to pay interest at the rate of 10 per cent. per annum. If at the end of 18 months any sum held on deposit on the part of any employee exceeded one month's wages (full time) the balance should be returned to the employee, with the full accrued interest, provided it was proved that he had not taken part in a strike during the period mentioned. On the other hand the deposit of any employee who had taken part in a strike should be forfeited and applied—together with any sums imposed as penalties—to the payment of any proved loss sustained by the employer. A special standing board should be formed to assess losses occasioned employers through strikes. All actions for the recovery of penalties or forfeiture of deposits should be instituted by a commissioner independent of the Crown. The commissioner could be provided with a legal staff, and it would be his duty to immediately institute actions in the case of a strike.

Speaking of the suggestion made, a subsequent witness said that he himself had put forward a suggestion in Melbourne some 18 months ago of a similar character. Personally he considered that strikes could not be avoided. And if the strike was a natural feature of present industrial conditions, why not have a strike insurance fund, to which both parties should contribute, and from which either side would be compensated in the event of a strike or lock-out.

## MIXED MEMS.

No tender has as yet been accepted by the Brisbane Metropolitan Water and Sewerage Board for the 5000 water meters recently advertised, and it is stated by the secretary that some time may elapse before a decision as to the successful tenderer is reached.

The dispute between the engineers of the R.M.S. "Niagara" and the Union S.S. Co., on a question of overtime, was settled in time to allow of that vessel's departure on her due date. Several conferences took place between the representatives of the two parties, and at one time it was feared that the important service maintained by this vessel would be held up.

Indulgence is asked from the public of Sydney on behalf of the Electrical Department, which is badly handicapped in its work at present by the absence of many of its responsible officers through the effects of vaccination. Much difficulty is being experienced, in consequence, in maintaining efficiency.

The quantity of blister copper consigned by the Mt. Lyell Mining and Railway Co. (T.) during the current half year has been 1213 tons.

It is announced that the directors of the Big **Bygoo Ltd. have completed arrangements with** the vendors, by which £8450, a portion of the cash purchase price of the mine, will be paid by the issue of £3000 in 6 per cent. debentures, **and of £5450 in shares. This will leave a sum of £4750 due in cash on the date of exercise of the option on January 27th, 1914.**

An arrangement has been made between the **Administrator of the Northern Territory, Dr.** Gilruth, on behalf of the Federal Government, **and the directors of the Great Carpentaria mine, 12 miles from Katherine, for a grant to the** company of £2500 on the £ for £ basis. A block **of 4000 of the reserve shares in the company** has been disposed of on what the board regards **as satisfactory terms, so that funds are now assured for carrying on continuous prospecting work for a considerable time. The latest authentic reports from the mine manager state that the mine is opening up satisfactorily.** Three shafts, each from 30ft. to 40ft. deep, have **reached sulphide copper ore, assaying up to 41 per cent. copper to the ton, together with 7 dwt. gold. The line of the lode has now been proved** for some 60 chains. A crosscut is being driven which at 140ft. in has passed through 2 per **cent. carbonate ore for the last twelve feet. This drive is yet 60ft. from the objective—the downward continuation of a lode which was 8ft. wide on the surface at a vertical height of 100ft. above the present crosscut, where the ore assayed 6 per cent. copper and 3 dwt. of gold per ton.**

**"Heroic rescue work by miners had been figuring very prominently in the society's awards** of recent years," said Mr. G. Lush, president of **the Royal Humane Society of Australasia, prior to the annual distribution of the awards at the Melbourne Town Hall last Monday. "The scope of the society's operations was shown by the following analysis of the awards made to the various States:—One gold medal, 9 silver medals, 15 bronze medals and 8 certificates to Tasmania, all, with the exception of one certificate, being in connection with the Mount Lyell case; 3 silver and 7 bronze medals and 7 certificates to Victoria; 3 bronze medals to New South Wales; 1 bronze medal and 2 certificates to Western Australia; 2 bronze medals and 8 certificates to Queensland; 1 bronze medal to Northern Territory, and 1 certificate to South Australia."**

**The statement was made in the Governor's speech at the opening of the South Australian Parliament last Thursday, that the loss on the** purchase and the working by the Labour Government of the Yelta copper mine was £35,500.

**Thirty thousand copper-miners at Calumet, in** the State of Michigan (U.S.A.), came out on strike last week.

The directors of the Francis Ormond G.M. **Co., Chewton (V.), are advertising as for sale the company's lease, freehold property and machinery. The company was registered early in 1884, and since then has crushed 60,280 tons** of quartz for a return of 15,039 oz. of gold, and **has paid £7500 in dividends. The property comprises 50 acres, and there is an 18-stamp battery.**

The officer who administers the New South Wales Miners' Accident Relief Fund Act has **reported to Mr. Edden, Minister for Mines, that** a widow who is a beneficiary under the Act, owing to her husband's accidental death at South Clifton colliery, called at the office and stated that she did not wish to receive any **further benefits from the fund. When asked for reasons, she stated that she had a little money left her by some deceased friend, quite sufficient for her needs, and she felt that she would be much more contented if she did not take the money from the fund, which she really did not need. "It was pointed out to her," the official wrote to the Minister, "that it was not a charity;** that her husband had contributed to the fund, and it was a legal right which she possessed. She, **however, was very persistent in her determination not to receive any more benefits. She has now voluntarily surrendered her claim to any further benefits. In view of Mrs. Corbett's expressed wish there appears to be no option but to meet her wishes.'**

**The annual report of the Bendigo (V.) School of Mines states that "at present there is little demand for metallurgical and mining students; consequently there has been a falling-off in the number taking these courses. More students are entering for the diploma of electrical engineering, in which branch there appears to be a larger avenue for employment." At the meeting of the administrative council last Monday, the director (Mr. J. R. V. Anderson) said that if the school wanted to retain its staff the salaries would have to be raised. Students graduating** from the school were stepping into positions in **the junior technical schools carrying salaries larger than those obtained by some of their tutors in the senior technical schools. The executive officers were instructed to report on the matter. Minutes were recorded expressing** appreciation of the work of Messrs. W. C. Vahland, **W. Hunter, and W. Abraham during their many years' service as members of the administrative council.** Messrs. D. W. Bayne, H. Dunn, **and J. Veale, and Dr. O. Penfold were re-elected as members of the administrative council.**

**The Royal Mint in Sydney was opened in 1855, the Melbourne Mint in 1872, and the Perth Mint in 1899. The total numbers of coins issued at the different mints since their opening till 1908 were:—Sydney, 112,419,500 sovereigns, 6,896,000 halves; Melbourne, 115,227,546 sovereigns, 1;681,793 halves; Perth, 38,490,991 sovereigns, 204,074 halves. These were of a total value of £270,528,970 10s. The largest issue in any one year from any mint was from Melbourne in 1899, when there were issued 5,579,157 sovereigns and 97,221 half-sovereigns, representing a value of £5,627,767 10s.**

Changes have taken place recently in the board of directors of the Ajax North G.M. Co., Daylesford (V.), **Messrs. T. F. Moran and T. T. Holloway** having resigned, and last Thursday Messrs. W. Dalrymple and Arthur Vickers were appointed **to fill their places.**

Thanks to Mr. McLeod's want of confidence **motion in the Victorian Legislative Assembly last week, the Premier made a statement in that Chamber last week respecting the amounts provided** by recent Governments for the assistance **of the mining industry in Victoria. Mr. Watt** said the Bent Ministry, in which Mr. McLeod **was Minister of Mines, "went out of office at the end of 1908, and the Murray Ministry took** office early in 1909. In 1904-5 the votes for boring, batteries, and assistance to companies **and the surplus revenue appropriations for the same period amounted to £25,000. In 1905-6** it was £33,000, 1906-7 £29,000, and in 1907-8 **£45,000. In the first year of the Murray Ministry** the vote was £60,000, in the next year £57,000, in 1911 £46,000, and 1912 £35,800. Then comes **a period with a broken year. We finished that year with considerable vigour. So vigorous was the present Agent-General, Mr. McBride, ex Minister of Mines, in distributing money for mining companies that we wondered when he intended to stop. During the four years the Bent Ministry gave £132,000 in mining grants, and in the ensuing four years we gave £198,000, or an increase of £66,000."**

Great interest has been taken for some weeks past at Bright (V.) and in the surrounding district in an action brought by the Tewksbury Amalgamated Gold Dredging Co. in the local Warden's Court, asking for cancellation and forfeiture of a residence area in the name of John Blair, at Freeburgh, on the ground that Blair had failed to comply with the provisions of the Mining Act 1904. Mr. D. E. Brayshay, of Melbourne, appeared for the company, and Mr. Thomas Graham, of Wangaratta, for the defendant. The two principal objections raised by Mr. Brayshay were that the defendant had not resided on the area for eight months during last year and this, and had allowed the registration to lapse for several months, between 1910 and 1912. For the defence, Mr. Graham argued that continued residence was not necessary, and that forfeiture should not be made to a company or corporation. The Warden, Mr. A. A. Kelley, in giving his decision, said that the issue was clear. Defendant had certainly allowed any title he had to lapse, and had endeavoured to renew it when the land was contained in a lease held for mining purposes by the company. The habitation clauses had not been carried out. He ordered **that the registration be cancelled, and the area forfeited, with £7 13s. 2d. costs.**

**The Steel Indent Company Limited has been registered in Sydney with a capital of £10,000 in £1 shares, to acquire the business of the Steel Indent Company, carried on at Sydney and elsewhere, by Robert Sands, Charles Dobson, William Franks, and Charles Stoll. The permanent directors are: Robert Sands, Charles Dobson, William Franks, and Charles Stoll. Registered office, Sydney.**

**The Board of Examiners of Enginedrivers appointed under the "N.S.W. Mines Inspection Act, 1901" have submitted to the Honorable the Minister for Mines (Mr. Edden) their report on the examination of candidates for Winding Enginedrivers' Certificates of Competency held in terms of the "Coal Mines Regulation Act, 1912;" at Newcastle on 13th and 14th June. Five candidates attended. Following is an alphabetical list of the passes:—W. A. Hawkins, J. H. Newson, W. B. Nelson, G. Purcell, W. W. Yates.**

**The new plant of the Main Reef G.M. Co., Maindample (V.), was started last week. The mine is situated on the side of a hill.. The stone is trucked from the main shaft brace 100ft. into large hoppers. The whole treatment is automatic, the stone being delivered into self-feeders, and the fall being sufficient to permit of the residues being carried to the concentrating tables and through the cyanide plant by gravitation. The battery has a capacity of 500 tons per month.**

A man engaged in carting gravel at Poseidon **(V.) last Friday had the good fortune to come** upon a slug containing 18 oz. of pure gold. Ap**parently this had come from the Old Star mine** of the Loddon Company on the Nick o' Time **lead, which mine yielded several nuggets of various sizes, the largest being 320 oz.**

**Mr. E. W. Turner, mines warden at Zeehan (T.) has recommended the forfeiture of lease 1796, held by the Comet Silver Mining Co., for non-compliance with the labour covenants. The company has also to pay the costs of the application**, which was made by H. Jenkins.

The small-pox scare in Sydney is seriously hampering transport and trade generally. Country people are loth to send to Sydney for supplies, and Suburbia remains at home. If trade does **not look up shortly, it is probable a number of** hands will be affected. The only people who **appear to be prospering at present are the doctors. Even the undertakers are having a very quiet time.**

A new cable is being laid between Land's End and Shanghai. The cables as far as Colombo will **be laid by the Eastern Company, while those be**yond will be laid by the Eastern Extension Com**pany. Colombo will therefore be the junction of** the two lines, and messages from Ceylon will reach London in ten minutes by the new route. The cable is already laid from Land's End to **off Alexandria, and it is calculated that the rest** of the distance to Colombo will be covered in a **few months. It is anticipated that by avoiding landing charges in India, and by effecting other savings in the laying of the cable, the charges for messages over the new route will be much re**duced.

**During the half-year ended on June 23rd, the** mill of the Kulumadau (Woodlark Island) G.M. **Co. crushed 11,613 tons of stone for a return of** 2725 oz. of gold, besides which 523 oz. of bullion **was recovered by cyanidation, the value of the total output being £13,614. The half-year's profit** was £420, and at the close of the period the bank **was owed £3796, against which there was the value of products in transit, estimated at £750. Costs for the term were mining 29s. 9.9d. per ton, milling 4s. 9d. per ton, and cyaniding 3s. 3½d. per ton, and the report of the general manager showed that after cyanide treatment the residues were worth 3s. per ton.**

**Machine-made horseshoes occupied the attention of the Arbitration Commission in Sydney last week, when the secretary of the Master Farriers' Association stated that they were as perfect as it was possible for them to be. Although the** practice was to make horseshoes in spare time, **the machine-made article had been forced on the city shop owing to shortage of labour. The witness voiced strong objection to competition from colliery shoers and farmers' handy men.**

CATHCART CENTRAL G.M. CO.
No Liability.

A DIVIDEND (2nd) of 2s. per share has been made, PAYABLE on THURSDAY, 21st AUGUST. 1913. Books for transfer close on Thursday, 14th August, 1913.

D. MURRAY, Manager.
430 Little Collins-street, Melbourne.

MAIN REEF GOLD MINING CO.
No Liability, Maindample.

A Half-Yearly General MEETING of Shareholders in above Company will be held at London House, 97 Elizabeth-street, Melbourne, on THURSDAY, 31st JULY, 1913, at 4.30 p.m. Business To receive and adopt reports and balance-sheet General.

S. J. PLAIN, Manager.
Equitable Building, Collins-street, Melbourne.

## Commonwealth of Australia.

Postmaster-General's Department,
Melbourne, 25th July, 1913.

TENDERS will be received at the Office of the Deputy Postmaster-General, MELBOURNE, until 3 p.m. on the 30th September, 1913, for the SUPPLY and DELIVERY of 2,785,800 INSULATORS FOR VARIOUS STATES (Sch. 974). See Commonwealth Gazette, 26th July.

AGAR WYNNE,
(1237) Postmaster-General.

## Government Notice (N.S.W.).

PUBLIC SERVICE BOARD.

4 O'Connell-street,
Sydney, July 25th, 1913.

**APPLICATIONS are invited for the Position of** Principal, Newcastle Technical College (Educational Division). Salary £450, ranging to £500 per annum. Applicants should have had experience in a responsible capacity in some branch of technical work, preferably Engineering, and must have a knowledge of educational methods.

Applications should reach the undersigned not later than Monday, August 11th, 1913.

By Order of the Board.
R. A. GILFILLAN, Secretary.

## MUNICIPAL COUNCIL OF SYDNEY.

TO CONTRACTORS.

SEALED and ENDORSED TENDERS will be received by the undersigned until 3 o'clock p.m. on THURSDAY, the 7th AUGUST, 1913, for the SUPPLY and DELIVERY of the following:—

(a) Curve Drawing Ammeters and Volt Meters.
(b) Prepayment Meters.
(c) Motor Generator or Motor Converter.
(d) Coal for Power House, Pyrmont, for a term of one, two, or three years.

Copies of Specifications, etc., may be seen or obtained upon application at the Office of the City Electrical Engineer, Town Hall, Sydney, upon payment of the sum of 10s. 6d. in each case.

The lowest or any tender not necessarily accepted.

TENDERERS, please note that they must pay their CASH DEPOSITS direct into the City Treasury, and NOT enclose same with their Tenders, otherwise their Tenders will be rejected as INFORMAL.

THOMAS H. NESBITT,
Town Hall, Sydney, Town Clerk.
25th July, 1913

## MUNICIPAL COUNCIL OF SYDNEY.

TO CONTRACTORS.

SEALED and ENDORSED TENDERS will be received by the undersigned until 3 o'clock p.m. on TUESDAY, the 5th AUGUST, 1913, for the SUPPLY and DELIVERY of the following:—

(a) THREE MILD STEEL BODIES FOR MOTOR WAGGONS.
(b) STREET NAME BOARDS.

Specifications, etc., may be seen on application at the Office of the City Surveyor, Town Hall, Sydney.

The lowest or any tender not necessarily accepted.

TENDERERS, please note that they must pay their CASH DEPOSITS direct into the City Treasury, and NOT enclose same with their Tenders, otherwise their Tenders will be rejected as INFORMAL.

THOMAS H. NESBITT,
**Town Hall, Sydney,** **Town Clerk.**
19th July, 1913.

## CITY OF MELBOURNE.

TENDERS will be received until 12 noon on TUESDAY 16th SEPTEMBER, for SUPPLY and DELIVERY of—

(a) INSULATED COPPER CABLES.
(b) THREE PHASE TRANSFORMERS.

Specification may be seen at the Office of the City Electrical Engineer, Town Hall.

JOHN CLAYTON,
Town Clerk's Office, Town Clerk.
Town Hall, Melbourne,
24th July, 1913.

## Government Notice (V.).

VICTORIAN RAILWAYS COMMISSIONERS.

STATE COAL MINES.

ELECTRICAL EQUIPMENT.

The TIME of receiving tenders for Electrical Equipment for the McBride Tunnel has been EXTENDED till WEDNESDAY, 27th AUGUST.

G. H. BROOME, General Manager.

## CITY OF MELBOURNE.

**Offers are invited for the purchase of certain** SECONDHAND ELECTRICAL PLANT and MACHINERY, in accordance with specification, obtainable at this Office.

**Offers will be received until noon on 15th** August for all or any portion of the plant.

**Plant may be inspected upon application at the Office of the** City **Electrical Engineer, Town Hall.**

JOHN CLAYTON,
**Town Clerk's Office,** **Town Clerk.**
**Town Hall, Melbourne,**
19th July, 1913.

## ESTATE OF E. L. LLOYD.

**TENDERS are invited for the purchase of:—**

(a) That well-known group of Mining Leases at Cue, on the Murchison Goldfield, Western Australia, comprising 30 acres, and known as "The **Light of Asia" Mine, with Mining Leases 1148,** 1151, 1252, 1362, 1498, and 1634, known as Light of Asia, Queen of the May, Queen of the May Extended, Asia Block, Queen of the May Extended No. 1, Light of Asia South Extended, together **with the following plant:—**

Poppet Head, Wire Rope, Pulley Wheel, **Jackass Boiler (Langlands), Vertical Boiler (Norwood), Winding Engine Steam Pump, Tram Rails, Ore Bin.**

(b) Gold Mining Leases Nos. 1833 and 1858, known as Agamemnon and Agamemnon West, comprising 18 acres, situate at Cue aforesaid, on the Murchison Goldfield, together with the following plant:—

**1 Vertical Boiler and Winder (Marshall and Sons), Poppet Head, Wire Rope, Pulley Wheel, 350 feet of 2in. Piping, Tram** Rails, 3 Kibbles, 1 Baling Bucket, ½ ton Steel, Blacksmith's Shop, and Quantity of Tools.

**(c) Tailings Area No. 11, and quantity of Tailings situate at Monaro Gully, near Cue.**

**Particulars and conditions of Tender, working plans, etc., may be inspected at the Offices of the undersigned, and at the Office of Mr. A. Mitchell,** Cue.

**The lowest or any tender not necessarily accepted.**

Each Tender must be accompanied by bank cheque for £100.

Tenders close the 31st day of August, 1913.

**Mines may be inspected and sampled at any time upon written authority from the** undersigned, or Mr. A. Mitchell, at Cue.

**Tenders must be addressed to the Executors,** c/o. NORTHMORE & HALE, Solicitors, Howard-street, Perth, Western Australia.

## ALFRED RONALDS.

**Will the relatives and friends of the late Alfred Ronalds (author of Ronalds' "Fly-Fisher's Entomology") please communicate with—**

**Critchley Parker,**

**"Mining Standard,"**
**Melbourne or Sydney.**

## GUILDFORD BUCKET DREDGING CO. No. Liability

NOTICE is hereby given that a DIVIDEND (the 1st) of Sixpence per share has been declared, due and PAYABLE at the Registered Office of the **Company, third floor, Broken Hill Chambers, 31 Queen-street, Melbourne, on TUESDAY, the 19th** AUGUST, 1913. Transfer books **close from 12th** August to **19th August, both days inclusive.**

A. F. SHOWERS, Manager.

## BALLARAT WATER COMMISSIONERS.

SUPPLY OF CAST-IRON PIPES.

TENDERS, addressed to the Chairman, will be received until 4 o'clock p.m. on WEDNESDAY, 13th AUGUST, for the Supply of about 44 tons of 12-inch and 6-inch Cast Iron Water Pipes. Particulars at the Office. The lowest or any tender not necessarily accepted. By Order,

ALEX. FRASER, Secretary.
Ballarat Water Supply Office, 25th July, 1913.

## WANTED.

A FIRST-CLASS MILL MAN

familiar with

MILLING PRACTICE,

must thoroughly understand

MINING AND MILLING MACHINERY,

capable of handling men. Good salary paid to right man. References required.

Address—

Z, "Australian Mining Standard,"
Melbourne or Sydney.

## THE VEGETABLE CREEK TIN MINING CO. No Liability.

NOTICE is hereby given that the Second Ordinary GENERAL MEETING of Shareholders in the above Company will be held on WEDNESDAY, AUGUST 6th, 1913, at 3 p.m. at the Offices of the Company, 7, 8, and 9 Australasia Chambers, Martin-place, Sydney.

BUSINESS.

1. To Receive the Directors' and Mine Manager's Reports and Statements of Accounts.
2. To Elect Three Sydney Directors in the place of Messrs. W. C. Goddard, G. H. Gordon, and L. Henderson, all of whom retire in accordance with the Articles of Association, but are eligible and seek re-election.
3. To Elect an Auditor in place of Mr. H. B. Jamieson, who also retires, and offers himself for re-election.
4. To transact any other ordinary business.

By Order of the Board,
J. E. COCKER, Secretary.
**Sydney, 22nd July, 1913.**

## ROSE OF DENMARK GOLD MINES No Liability, Gaffney's Creek.

NOTICE is hereby given that the Half-Yearly General MEETING of Shareholders in the above Company will be held at the Company's Office, 60 Queen-street, Melbourne, on THURSDAY, 31st JULY, 1913, at 12 noon. Business:—To receive and adopt reports and balance sheet. To elect three directors and two auditors.

THOS. HAMILTON, Manager.

## THE CAMPBELL'S CREEK DREDGING CO. No Liability

NOTICE is hereby given that a DIVIDEND (the 33rd) of Threepence per share has been declared, due and PAYABLE at the Registered Office of the Company, third floor, Broken Hill Chambers, 31 Queen-street, Melbourne, on TUESDAY, the 12th AUGUST, 1913. Transfer books close from 5th August to 12th August, both days inclusive.

A. F. SHOWERS, Manager.

## MINERS WANTED.

250.

FOR STEADY WORK ON INCREASED OUTPUT OF CONCENTRATING ORE.

**Contract Miners averaged last year 17/4 per shift.**

| | |
|---|---|
| Wages Miners (under agreement about to be executed) | 11/- per shift |
| House Rent | 8/- to 12/- per week |
| Meat | 5d. to 6½d. per lb. |
| Bread | 4d. per loaf |
| Milk | 4d. per quart |

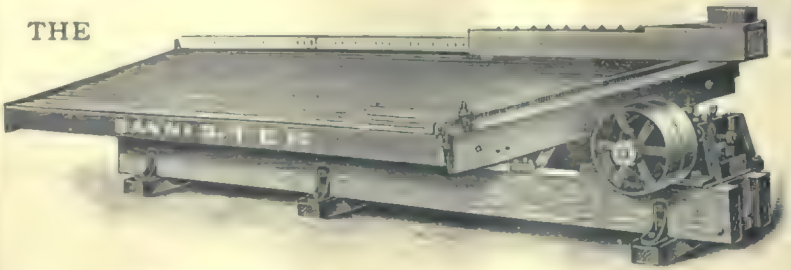
Living Conditions excellent.

Government School, High School, Technical College.

Good Contract Miners apply on Job at earliest.

MOUNT MORGAN GOLD MINING COMPANY LIMITED,

MOUNT MORGAN, QUEENSLAND.



MY CARD

THE CONCENTRATOR

4 "Bannister" Concentrators have just been installed at the Central Tin Mine, Renison Bell, Tasmania, similar in design to the Tables at Mt. Bischoff and other Tin Mines in Tasmania.

Victorian and Tasmanian Representative for Allis-Chalmers Co.

L. BANNISTER, (Late of N. Guthridge Ltd.),
'Phone 7354. 39 QUEEN STREET, MELBOURNE.

250 H.P. Turbine.
Showing Wheel and Guide Vanes.

G. Weymouth Pty. Ltd.

Electrical Engineers,

Neptune-street, RICHMOND, VIC.

Telephones:—
Office, 2651 Windsor.
Works: 2507 Central.

Manufacturers of all Classes of Electrical Machinery, Turbines, Pumps for Irrigation and Mining, Underground and Surface Mining Locos., Winches, Haulage and Winding Plants, Motors, Generators, etc.

Estimates submitted.

Correspondence invited.

"INGREY"

PATENT WEIGHING & RECORDING MACHINES

ARE

Installed in H.M. Dockyards.
Certified by the Board of Trade.
Accurate and Reliable.
Automatic in action and
Pay for themselves in a year!

H. A. HARVEY & CO. LIMITED, LONDON.

Australian Representative — LASCELLES PARRINGTON & BRACHE.
London House, 97 Elizabeth Street, Melbourne.
New Zealand Buildings, Pitt Street, Sydney.

The Union S.S. Co. of New Zealand has leased from the Sydney Harbour Trust a site on the western side of Ball's Head, and bounding what is locally known as Kerosene Bay. It is to be used for the erection of wharves and ship-repairing sheds.

BALLARAT
School of Mines

DEPARTMENTS:
CHEMISTRY and METALLURGY,
ENGINEERING and SURVEYING
ELECTRICAL ENGINEERING,
GEOLOGY and MINING
MATHEMATICS and PHYSICS.

Prospectus on Application.

F. J. MARTELL, Director.

DEPARTMENT OF MINES
SOUTH AUSTRALIA.

MINERS' RIGHTS are issued at the Mines Office, King William-street, authorising the holder to prospect for Metals and Coal, or Oil, and to peg out Gold, Mineral, Coal, or Oil Claims. Price, 5s., tenable for 12 months. Licenses to search for Precious Stones, Phosphates, Oil, Rare Minerals, Metals, or Earths are issued over specific lands, not exceeding five square miles, to each person, at 20s. per mile for 12 months; the holder has a right to a lease. Leases are issued of the following areas:-Gold, 20, Mineral, 40; Coal or Oil, 640; Salt or Gypsum, 640; Phosphates, 100; Precious Stones, Metals, or Earths, 40, Mineral Springs, 40; Mining Works, 10; Smelting Works, 10 acres respectively. Each lease is for 42 years. Gold, Mineral, Salt, and Gypsum at 1s. per acre per annum; Coal and Oil, at 6d. per acre per annum till Coal or Oil is found, then 1s. A royalty of 6d. in the pound on net profit must be paid in addition.

One man must be kept employed for every five acres held on gold lease; one man for every 10 acres on mineral lease; and one man for every 40 acres on coal or oil leases.

Any number of Gold, Mineral, Coal, or Oil Leases may be held by one person, and up to four Gold or Mineral leases may be amalgamated.

Business and Occupation Licenses are granted.

Subsidies are granted to assist the development of Mines, and Diamond Drills are loaned. Free assays are made of Ore from Crown Lands. Ore is treated at Government batteries — Mount Torrens and Petersburg—at 5s. per ton, and cyanided for 5s. per ton. Tarcoola—at 10s. per ton for parcels over 5 and under 25 tons, and cyanided at 7s. 6d. per ton for parcels over 5 tons. Assays are made of samples sent to the works.

Advances made on parcels delivered at batteries.

MINING ON PRIVATE PROPERTY.

Private Land can be Resumed for Mining or Proclaimed a Goldfield, or owners can be compelled to grant leases over their property on conditions.

The Minerals on all Leasehold Lands and on all Lands granted since 1888 belong to the Crown, and are available for mining on after the miner has arranged for paying for any damage he may do to the surface of the ground.

F. C. WARD,
Acting Secretary to the Minister of Mines.

MAX GORLER

Buyer of—

ORES, METALS, CONCENTRATES.

HEAD OFFICE—
60 Queen St., Melbourne.

And at Castlereagh House, SYDNEY.
Argent Street, BROKEN HILL.
FRIEZLAND (Cloncurry District), Aubrey C. Waight.

Sole Agency Australasia—
C.E.A.G. MINER'S ELECTRIC SAFETY LAMP.

WELDLESS TUBES

MANNESMANN

For Water, Steam, Gas, Air, Oil, Etc.

LAPWELDED TUBES

USED BY STATE GOVERNMENTS, MUNICIPALITIES & THE PRINCIPAL MINING COMPANIES IN AUSTRALIA.

Stocks carried by NOYES BROS. (SYDNEY) LTD.
(MELBOURNE) PTY. LTD.

## CONTENTS.

### THURSDAY, AUGUST 7.

EDITORIAL—
Industrial Dishonesty ... ... ... ... ... 103
The Ignoring of Shareholders ... ... ... 103
Leaderettes ... ... ... ... ... ... ... ... 104
News and Notes ... ... ... ... ... ... 105
Personal ... ... ... ... ... ... ... ... ... ... 105
Radium Hill (S. Aus.) Reports ... ... ... 105
Investors' Column—
South German Reef ... ... ... ... 106
Carlisle (V.) ... ... ... ... ... ... ... ... 106
Metal Quotations ... ... ... ... ... ... ... 106
Our Big Mines ... ... ... ... ... ... ... 107
Chamber of Mines of Victoria ... ... ... 108
Woah Hawp Prospects ... ... ... ... ... 108
Mining in New South Wales ... ... ... 109
Tasmanian Mining ... ... ... ... 109
North Queensland Fields ... ... ... ... ... 109
Mining in Western Australia ... ... ... 110
Mining in New Zealand ... ... ... ... ... 110
Victorian Mining Activities ... 111
Bendigo's Mining Troubles ... 112
Golden Age (V.) ... ... 113
Reports of Companies, etc ... 113
Oil Notes ... ... ... 114
Mineral Returns ... ... ... ... ... ... ... 114
Melbourne Tramway Services ... ... ... 115
Victorian Railways ... ... ... ... ... ... ... 115
British and European Developments ... 115
Electric Cooking ... 116
Miscellaneous ... ... ... 116
Tenders Invited and Accepted ... 117
Coal Mining Industry ... 120

WELSBACH
WIRE LAMPS,
BRITISH MANUFACTURE.
SEND FOR CATALOGUE.
Welsbach Light Co. of Aust. Ltd.
302 Pitt Street, SYDNEY.
300 Lonsdale Street, MELBOURNE.
Creek Street, BRISBANE.
102 Victoria Street, WELLINGTON, N.Z.

FIRE. . BRICK
Our Products have proved their superiority.
FIRE CLAY GOODS For Every Purpose.
Darley Fire Bricks will withstand the most intense heat, and will not shrink. Our bricks are made near Bacchus Marsh, Victoria, and we supply all the States.
Specialities
High-Grade Firebricks & Retorts.
Prompt Delivery. For Prices, etc., write to—
DARLEY F. B. Co.,
Oliver's Lane, Flinders St. Melbourne

COKE!
NORTH BULLI COLLIERY
Limited
Supplies best quality hard
SOUTHERN
SMELTING COKE.
(Weekly output 1250 tons.)
H. G. Hyde, Secretary
Royal Insurance Building, 10 Spring-street,
SYDNEY.

AUSTRALIAN MINING STANDARD.
PUBLISHED EVERY THURSDAY.
Forwarded Post Free to any Address.

| | Per Annum. |
|---|---|
| Australasia | 26/- |
| British Possessions | 32/6 |
| Foreign | 34/8 |

Payable half-yearly or yearly, in advance.

All amounts should be made payable to order of "CRITCHLEY PARKER, Bank of Australasia."

12 O'Connell-street,
Sydney
Tel. Central 2703.
P.O. Box 331.

376 Flinders-lane,
Melbourne
Central 7931 & 1838.
P.O. Box 253.

### BACK NUMBERS OF THE "MINING STANDARD."

The following is the rate for back copies more than a month old. Applications by post must be accompanied with cash and postage added. In no case can we guarantee to supply copies, as our storage accommodation is limited.

A postcard will be sent if the number required is out of print.

For copies three months old, ninepence; six month, one shilling; and beyond that period, one penny per month per copy.

As there is a regular demand for back copies of the "Mining Standard," newsagents are requested to send back all returns uncut and in good condition, otherwise they will not be accepted.

All Returns from Newsagents must reach us by the end of each month (the whole paper must be sent). No credit will be allowed beyond this term.

Postage — British, 1d.; Foreign, 1½d.; Australasia, ½d. per copy.

Stamps will be accepted as pre-payment.

Address communications: Publishing Department, "Mining Standard."

### CASUAL ADVERTISEMENTS.

The rate for this class of advertisement is governed by the position it occupies.

If it appears on leader page or amongst or next to reading matter, the rate is 15s per inch (nonpariel) per insertion.

Towards end of reading section—
Brevier, 16 ems width, 6s per inch per insertion.
Nonpareil, 8s per inch per insertion.

For the convenience of advertisers, we might state that—Brevier has approximately 7 words to a line, and 8 lines to the inch—6s. Nonpareil has approximately 8 words to the line and 11 lines to the inch—8s.

### ALTERATION TO ADVERTISEMENTS.

As our publishing arrangements necessitate the "Mining Standard" being issued simultaneously in Sydney, Melbourne and Adelaide on the same day each week, advertisers wishing to change their advertising matter must supply same ten days in advance of publication.

### ADVERTISEMENT PROOFS.

Proofs are submitted to advertisers in order to give them an opportunity of going over the advertisements before printing.

Advertising Copy must be typed and so arranged as to clearly indicate the display required for the more important features of the advertisement.

Any departure from the original copy will be charged for. Advertisers are specially requested to instruct their publicity departments to give us clear and definite instructions respecting changes of matter or new copy in order to avoid incurring unnecessary charges.

AUSTRALIAN MINING STANDARD.
PUBLISHED EVERY THURSDAY.
ESTABLISHED 1888.

It is requested that all business communications be Addressed to Critchley Parker.

THURSDAY, AUGUST 7, 1913.

## THE IGNORING OF SHAREHOLDERS.

We have had, on more than one occasion, to call attention to the way in which shareholders in mining companies have been left in the dark by those responsible for the management of the companies' affairs, and it is now our unpleasant duty to have to comment upon what is apparently a case of this character as indefensible as any that has come under our notice for many a long day. The victims are those interested in the Mount Oxide mine (Q.). This property has been, for some time past, under option to a group of English capitalists, and the option term expired on the 31st ult. It had generally been looked upon as absolutely certain that the mine would be taken over: but during the last month or so those who were acquainted with the state of the London market have been fearful lest the financial stringency might lead the syndicate to let go its chance of acquiring a property which promised to be highly valuable in the more or less distant future. It may, perhaps, have been with a view to the reassurance of those who were inclined to look less optimistically than did the bulk of the shareholders of the company at the prospect of the option being exercised that a statement was circulated to the effect that the management really did not care two straws whether the English syndicate went on or went out, inasmuch as there was a group of American financiers ready to take the mine over; in fact, that it would be to the interest of shareholders for the existing option to fall through. What was foreseen by the far-sighted amongst those who were well situated for the exercise of their power of distant vision would appear to have happened. As, though July 31 has come and gone, no announcement whatever has been made, the option has presumably not been exercised; for it is too much, surely, to assume that, had it been, this extraordinary silence would have been observed. Moreover, the readiness of certain unnamed American financiers to take the mine over appears to have evaporated; and, in all the circumstances, it is not surprising that the market price of shares has dropped from £44 to under £39. This drop has been, presumably, entirely due to the absence of information on the subject of the fate of the English option, and it is a debatable point whether, had the management done its duty and at once informed the shareholders of the circumstances, there would have been a rush to get out of the shares, with a consequent heavier drop than has already taken place, or a counterbalancing of the present uneasiness by an appreciation of the straightforwardness shown, the faith in the Directorate inducing shareholders to hold on by reason of their further belief in the potentialities of the mine.

The object of the management in adopting this policy of silence can only be guessed at. If it be to keep the shareholders in ignorance until the directors and other privileged persons have disposed of their shares, this is nothing less than an act of sheer and unpardonable dishonesty. If it be to avert the collapse that, as we have said, might follow such an announcement, we hold the policy to be unwise and to be unjustifiable. It is the duty of the directors and the duty of the management of the company to tell shareholders the truth. If the shareholders care to make a foolish use of it, that is entirely their own look-out. To withhold the information from them is to take a responsibility which no trustee (for it is not to be forgotten that a director of a public company is in the position of a trustee) has any right to assume. We believe we are correct in stating that shareholders did not receive any official notification of the granting of the option, but even if that be so, it affords no excuse for concealing from them the determination of the option. The concession to directors of the power to grant an option does not imply the concession of power to hide from shareholders what they have done. Having granted an option, it is their duty to see that every shareholder is acquainted with the fact as promptly as possible; and when an option falls through it is equally their duty to give every shareholder the knowledge which, if confined to themselves alone, would place them in a decidedly preferential position. There are good, honest men of high reputation on the Board of the Mount Oxide Options; and, the higher their reputation, the more it behoves them to lend themselves to no action calculated in any way whatever to prejudice the esteem in which they are held.

There are good grounds for the belief that, if the option has not been exercised (as we think there is every reason for assuming to be the case), the failure is not due to a disbelief in the mine, but to a realisation of the impossibility of putting off any big float upon the London market at the present juncture, and, perhaps, also to the grave doubt that exists as to whether the Government is going on with the construction of a railway line to the field. Without such a line, the mine, which is 150 miles from Cloncurry, has practically no value: and it is, therefore, perhaps significant that a paragraph has appeared in the press to the effect that "it was stated in Sydney financial circles," on Saturday, "that arrangements had been completed with a certain group to construct a railway from Mount Oxide to the Gulf of Carpentaria." This very uncertain "certain group," we are further informed, "has also undertaken to take up debentures guaranteed by the Queensland Government." If any doubt be entertained of the authenticity of this information, it need not be on the ground of the surpassing boldness shown by the "certain group" in its willingness to take up debentures fortified by a Government guarantee; but it is worthy of note that the Queensland Premier has since denied that either he or any other member of the Government has been approached on the subject, or that he knows anything about it whatever. Unless we are to regard the statement of the Queensland Premier as utterly lacking in veracity, the statement made in "Sydney financial circles" may, perhaps, most reasonably be regarded as a disreputable attempt to keep up the price of shares in the Mount Oxide Options, until certain privileged persons have got out.

## INDUSTRIAL DISHONESTY.

In the leading article which appeared in our issue of July 31, we sketched the usual procedure of workers in Australian factories in regard to the remuneration they exact for the work they do. In the course of that article, we declared that as a usual thing the worker, after forcing his employer to pay him by the day instead of by the piece, reduced his output 40 per cent., and then, getting on to piece-work again, promptly proceeded to turn out 50 per cent. more than he had done on wages. Before the ink was dry on that article, Mr. Justice Heydon, of the New South Wales Industrial Court, made certain remarks that served to show how entirely we had understated the position as it existed in some quarters at least. Mr. Justice Heydon referred to the evidence of one man who had appeared before him who had admitted that his average on bonus work was between six and seven times as much as when he was on day work. To the ordinary mind this might seem an absolutely disgraceful admission; but, in comparison with some others whose deeds were spoken of, this man seems to have been quite honest. Mention was made of cases in which the work done on the bonus system was 12 times what it was on wages, and it was said that cases occurred where the work done under the one set of circumstances was as much as 20 times what it was under the other set. One may look at it as one likes, but in any case it is difficult to look upon it as honest. Whether the worker be giving one shilling's worth of labour for which he is paid a sovereign, or whether we suppose that in his zeal to make money he really over-exerts himself to the extent of 50 per cent. when on the bonus system, it is difficult to see what defence there can be for his conduct. If we take the second of these alternatives as the correct one, it still remains true that at task work he was doing only one-tenth of the work he was paid to do. It is such dishonesty on the part of the employees that makes it so hard for their trades unions to induce the employers to concede a system of payment on day wages. If they were sure of a fair deal, the employers would more readily pay by the day than by the piece, for computation is saved thereby, and there is less opening for squabbles: but, in lack of any such security, they are bound to oppose the substitution of the day wage for the contract or piece-work or bonus system. If the trades unions wish to make the wage-payment system successful, they must insure the doing of a fair day's work by those whom they are supposed to control.

It is satisfactory to note the earnestness with which the N.S.W. Minister for Public Works, Mr. Arthur Griffith, is pushing forward the underground city railway scheme for Sydney. The work of surveying, preparation of plans, etc., for which a sum of £20,000 was some time ago voted, has been completed, and it now only remains to get Parliamentary sanction for the work to be gone ahead with, as it is intended to ask Parliament to dispense with the usual procedure of submitting the matter to the Public Works Committee, seeing that the scheme has already been so thoroughly thrashed out. This is undoubtedly a wise course and should meet with no opposition, as the work is one of such obvious urgency that anything tending to expedite it is to be welcomed. Commenting on the proposal last week, Mr. Griffith said:—"The urgency of the traffic problem is fully realised by the Government, and we do not intend to waste any time about it. The plans prepared by Mr. Hay, who came out here specially to report on the matter, were very elaborate, and have been modified in some respects by Mr. Bradfield, of my own department, in conjunction with the Railway Commissioners' officers. This modified plan has been fully considered by the Cabinet, and approved. It only remains to submit the matter to Parliament and get the necessary sanction to proceed with the work. Some time ago Parliament voted a sum of money—about £20,000—for the preliminary work, such as the preparing of the plans, surveys, etc., and this work has now been done. We are now ready to go ahead with the main project. My proposal is that the matter shall not be referred to the Public Works Committee, but that Parliament shall vote the necessary money and authorise us to proceed forthwith with the work."

* * *

There is something of the hopelessness of a Chinese puzzle about the problem of industrial legislation. In the main, the Victorian system of wages boards has worked admirably: the boards are so constituted that those actually acquainted with the details of a trade confer and decide upon the wages to be paid and the conditions of labour. It was not overlooked, however, that, at times, there might be a desire on one side or the other to appeal against the award of the board, and an appeal was provided for to a judge of the Supreme Court, as being likely to prove free from bias. Last week, however, Mr. Justice A'Beckett expressed himself as being far from pleased at having to review an award made by a wages board. "What is wanted for the satisfactory discharge of this duty (said his Honor) is a wide acquaintance with industrial undertakings and work done in them direct from personal observation, which a judge, secluded on the bench, does not possess and cannot acquire. Legal knowledge and judicial experience are comparatively of little value." The secretary of one of the unions has hailed this admission as an indication that the Court of Appeal is recognised as unworkable. To be sure, the appeal in the case before Mr. Justice A'Beckett was brought by the employer; had it been made by the employees' association the aspect of affairs might have been different. But not only the lay mind recognises incongruity of the present condition of affairs. In the Federal Arbitration Court last Monday, the President, Mr. Justice Higgins, referred to the utterance of Mr. Justice A'Beckett and to his subsequent action in reducing the wages and increasing the hours provided in the wages board's award "What impresses me," Mr Justice Higgins said, "is this: There was, in the fuel and fodder trade, first a wages board in 1910, which fixed the wage at 8s. 4d. for these men. Then in 1913 a wages board fixes 9s. Then a learned judge confesses to not knowing as much as the wages board representatives, and he knocks over both of the findings, and makes the wage 8s." Why not let the appeal be to a board similarly constituted to the original one, but with a judge as chairman, it being understood that from its award no further appeal will be allowed?

* * *

Another illustration of the very unsatisfactory condition of the laws which regulate labour in our midst was afforded recently in Western Australia. Mr. Justice Burnside had been for some time engaged upon appeals by persons employed in the Public Service, and was still so engaged when a member of the Legislative Assembly suggested to the honorary Minister, Mr. Dodd, that these should be hung up pending the delivery of the Court's award in the Kalgoorlie tramways case. It appears that the assistant Public Service Commissioner, Mr. Alcock, had intended asking for an adjournment of the Service cases, but, in view of the possibility that Mr. Justice Burnside might, in those circumstances, be prevented indefinitely from sitting again in that court, he refrained. His Honour also warmly resented the suggestion made to Mr. Dodd, and approved of by the Minister, saying that he would not release himself from the board until the work was finished, unless he were actually dismissed from the position, and adding that, owing to an unworkable addition to the Arbitration Act, he was required to go to Kalgoorlie to deliver an award in the tramway case, and that the tramway people were in the peculiar position of not being able to get an award until he could go to Kalgoorlie to deliver it. In other words, although the award was ready, it would not suffice that it should be made known at Perth, and the rights of the Public Service must take a secondary place when a trade union was concerned and awaited an award. Surely the arrogance of unionism could go no further, except to carry this theory into effect. This it did without delay, for next day his Honour announced that he had received official instructions to suspend the board's sittings in order to resume Arbitration Court work. The board was therefore abruptly dissolved, and Mr. Justice Burnside remarked that he did not think that he would be reinstated as chairman of the Public Service Appeal Board. Only a few days before these happenings strong representations had been made to Mr. Dodd, urging the appointment of a second judge for the Arbitration Court in order to clear away the large amount of business accumulating there. This, of course, is only a repetition of the experience of other States and of the Commonwealth. The settlement of industrial affairs is fast becoming the most expensive and the least satisfactory function of the judiciary.

* * *

In our issue of March 27 we commented in these columns on a proposal then before the Council of the Melbourne University to provide some means by which that centre of learning could bring itself into direct touch with the industrial, commercial, and professional world into which its alumni were about to be drafted: and we cited at some length the scheme advocated by Mr. H. E. Morgan, manager of W. H. Smith and Co., London, in an article on the Dignity of Business. The Council appointed a committee to report upon the scheme laid before it, and that report has been completed. In it the committee states that in the interests of past and present students of the University who are seeking employment for which they are qualified, and also of employers who are seeking properly-trained employees, there is need of an Appointment Board, with constitution and functions generally similar to those of the boards which have been working successfully for several years in Oxford, Cambridge, and other British and American universities. The board (says the report) should be constituted by Statute, and its members appointed annually by the Council. It should include members of the University, representative of such fields of activity as teaching, medicine, engineering, chemical industry, agricultural and veterinary science, etc., and also influential employers of labour who are willing to co-operate. In order to deal effectively with such diverse interests, the Board should be empowered to work largely through standing committees, each under the presidency of a specially qualified member of the University. There can be no room for doubt that both parties, whose interests are here recognised as reciprocal, will cordially welcome this very sane proposal for bringing them together in such a manner that the wants of the one and the qualifications of the other can be set side by side, and mutually satisfactory arrangements made

## NEWS AND NOTES.

The reports of the Great Cobar Ltd. (N.S.W.) for the last two months were as follows:—July: Copper produced for month at Cobar, 681 tons, containing by estimation:—Gold, 3377 oz.; silver, 11,653 oz. Concentrates on hand are estimated to contain:—Copper, 78 tons; gold, 67 oz.; silver, 603 oz. June:—Copper produced for the month at Cobar, 607 tons, containing by estimation—Gold, 2,264 oz.; silver, 10,300 oz. Concentrates on hand estimated to contain:—Copper, 107 tons; gold, 146 oz.; silver, 1,079 oz.

The gold purchased by the banks at Bendigo and Eaglehawk (V.) during July amounted to 14,850 oz., as compared with 14,084 oz. in 1912, and with 15,518 oz. in 1911. The amount purchased in June, 1913, was 13,607 oz.

The output of the Tongkah Compound Company, Siam, for the past four weeks was 54½ tons of tin from 54,000 cubic yards of material dredged. The results of the last fortnight were a great improvement of those for the previous two weeks, having been 32¼ tons from 25,750 c. yds., as against 22¼ tons from 28,250 c. yds.

The New Salak South T. D. Co., Straits Settlement, won 11 tons of tin during July as compared with 5 tons 18 cwt. in June.

An extraordinary telegram appeared in one of the Melbourne dailies last Tuesday stating that the Engine Drivers and Firemen's Federation had concluded an agreement with the Mount Lyell Company in regard to wages and conditions, and that the rates obtained are an increase upon those previously prevailing, while the company was responsible for a considerable amount of back pay. We are authorised to say that the whole statement is without foundation. The Mt. Lyell Company made an agreement with its engine drivers and firemen on February 8, 1912, the agreement being for a term of three years, and having, therefore, about eighteen months yet to run.

The Bendigo (V.) Mine Managers' Association has agreed, by 42 votes to 9, to the amalgamation of the mining managers' associations in Victoria. The president (Mr. Roberts), the retiring secretary (Mr. Eli Trewerne), with Messrs. G. Heyes and J. Langdon (Catherine Reef United) were appointed to represent Bendigo on the executive council until the next annual meeting of the association. The constitution adopted is that each association will conduct its own affairs as heretofore, and the federated executive council will only be called together to deal with questions of general interest. The presidents of the Bendigo and Ballarat branches will occupy the position of president of the council in alternate years.

A remarkable improvement in the market for South German Reef (Maldon, V.) shares took place on the Melbourne Exchange at the end of last week. For some time past few shares have changed hands, and prices have ranged between 1s. and 2s. Last week, however, sales improved greatly, thousands of shares changing hands, and as high as 15/3 being paid. The spurt is attributed to favourable reports respecting the attempt now being made to pick up the continuation of the shoot of stone which made the mine famous many years ago, but which was suddenly cut off. During the first quarter of this year the mine produced about 517 oz. of gold, valued at over £2000, bringing the output to date up to 161,326 oz. Dividends paid have totalled £341,100.

Mr. Scaddan, Premier of Western Australia, informed the State Legislative Assembly last week that the Government intended to re-introduce the Mines Regulation Bill, as it was determined not to allow the mines to be worked by Italians.

The total gold yield of the Blackwood division of the Ballarat mining district (V.) for the second quarter of the year was 614 oz 7 dwt., of which 592 oz. 18 dwt. was from quartz. The New Sultan Reefs crushed during the quarter 745 tons, which returned 486 oz. of gold. At the Easter Monday mine 100 tons of cyanide sand has been treated for a return of 17 oz. 6dwt., and 4½ tons of concentrates returned 22 oz. 10 dwt., and plates 33 oz., the total for the term being 73 oz. The sinking of the main shaft has been resumed at the Easter Monday; the winding plant has been completed.

During July the dredges of the Tongkah Harbour T. D. Co., Siam, worked 2,513 hours, dredged 286,300 cubic yards, and obtained 104 tons 19 cwt. tin.

The president of the General Labourers' Union of New Zealand is to be expelled from its ranks for having opposed the strike policy of the union during the recent Unity Congress.

The Commercial Commissioner for New South Wales in the East has reported that a contract for 80,000 tons of coal for the use of the United States army in the Philippines has been placed with the Japanese. Of the three bidders, the Japanese coal was quoted at 24/4 to 25/- per ton, the Chinese at 26/10, and the Australian at 32/.

The directors of the Lake View and Star Ltd. (W.A.) have declared an interim dividend of 5 per cent. (less English income tax 1s. 2d. in the £) payable on 27th August to all shareholders registered 11th August.

The quantity of gold received at the Melbourne branch of the Royal Mint during the week ending on the 2nd inst., was 11,389.2 oz.

The following resolution, forming the preamble to the constitution of the Labour Federation of New South Wales, was adopted by a meeting of the Amalgamated Miners' Association at Broken Hill recently:—"Industrial peace is impossible so long as the workers are exploited for profit. A struggle exists, as evidenced by the continuous bitter fight on the part of the working class to maintain decent industrial conditions. Therefore, seeing that industrial peace is constantly menaced by such a state of antagonism in society, and that the working classes are the sufferers, it is inevitable that the unions in the various industries must federate into one organisation, and utilise industrial, political, and co-operative action to secure industrial economic freedom."

The Austral Malay Tin Ltd. is now receiving, through its solicitors in Malay, the scrip and cash earned in connection with the recent flotation of the Kamunting Tin Dredging Co. Ltd. in London. Detailed boring plans and reports dealing with the Kampong property have been received from Messrs. A. W. Freeman, M. T. N. Bluck, F. W. Horton, R. L. Naish, and W. Bethune. The prospectus of the company for flotation in Sydney, which will shortly be prepared, provides for a total issue of 130,000 shares, of which 50,000 will be contributing, and 35,000 of these contributing shares will be reserved for Sydney, while the remainder will be taken in London and Malay. Boring is proceeding on the Kota options, and 70 bores over 160 acres give an average of about 1lb. of tin oxide to the cubic yard to a depth of 41ft. The Renong and Shemeyeh areas will be dealt with so soon as the Kota boring has been completed. The Tupai options have been rejected as unsuitable.

## PERSONAL.

Mr. Robert Cox, underground foreman at the North Mt. Lyell mine (T.) for eight years, whose heroism at the time of the disaster at that mine last October secured for him only a fortnight ago the silver medal of the Royal Humane Society of Australasia, died at the Hobart Hospital at the end of last week. Deceased was a native of Cornwall, and came to Australia to work in the coal mines at Newcastle (N.S.W.). He next worked at Broken Hill, which place he left to go to Mt. Lyell. When the Royal Commission was making its investigation into the causes of the catastrophe, Mr. Harold Crisp, counsel for the company, as well as some of the witnesses, paid an eloquent tribute to Cox's self-sacrificing bravery. Mr. Crisp said that there was proof that some 40 men had followed Cox to safety. "The story of his bravery," continued Mr. Crisp, "is thrilling. Here was a man well up in years who marshalled his men where they would be safe, and he himself took the dangerous post of bringing the cage down and sending the men up in it in batches. Although strongly advised to go to the surface he remained to the last, and when finally he reached the top he was so affected that he had to go to the hospital."

A cablegram received from London last week announced the death, at the age of 63, of Mr. John Milne, F.R.S., F.G.S., mining engineer and seismologist. Deceased worked for some time as a mining engineer in Newfoundland and Labrador, and was later appointed geologist to Dr. Beke's expedition into North-West Arabia. For twenty years he was employed by the Japanese Government as geologist and mining engineer, and he established the seismic survey of Japan, embracing 968 stations. He also established a seismic survey of the world, and was a designer of seismographs and instruments for the purpose of recording vibrations on railways, etc. Mr. Milne was the author of several scientific publications on mining, seismology, crystallography and geology.

Mr. Watson, underground manager of the South New Moon mine, Sailor's Gully, Eaglehawk (V.), has been appointed manager of the Cornish United mine, on the Garden Gully reef, Bendigo.

Mr. John Trudgeon, a pioneer of the mining industry at Beechworth (V.) died on July 25, at the age of 69 years, after a few days' illness.

Captain Johnson, the American expert engaged by the South Australian Government to advise with respect to the locking of the river Murray, is expected to arrive at Sydney from San Francisco, on September 15.

Mr. J. S. Forbes has been appointed manager of the Standard Glengonna mine, Lauriston, in the Kyneton district (V.).

Mr. Lewis Westcott, a former student at the Ballarat School of Mines, has been appointed manager at the Mount Morgan G.M. Co., Queensland.

## RADIUM HILL (S. AUS.) REPORTS.

Publicity has been given by the secretary of the Radium Hill Company, Olary (S. Aus.), to the following reports from Professor Rutherford, of Manchester University, Dr. A. S. Russell and Dr. Herman Lawrence, Melbourne, respecting samples of the ore obtained at the company's mine:—

"Dr. Russell examined the radium preparation and finds that it contains only radium as an active substance, and no detectable amount of mesothorium. This is an important point in connection with the sale of your product, since, as you know, it is very difficult to distinguish between preparations of radium and the cheaper product, meso-thorium. I enclose Dr. Russell's report on this question. He was able to make the determination without removing the radium from the emanation tube, and without any detectable loss of radium. I return to you herewith the radium tube newly sealed. It will reach its maximum activity in about a fortnight's time.—(Sgd.), E. Rutherford." "I have made a careful examination of one of the four samples of radium submitted to Professor Rutherford for examination by Mr. T. D. Jones, of the Radium Hill Company, Australia. I find that the only radio-active bodies it contains are radium and its disintegration products. The preparation is free from meso-thorium and other radio-active substances, which without a careful examination being made are likely to be mistaken for radium.—(Sgd.), A. S. Russell." A letter received from Dr. Lawrence, of Melbourne, who purchased 10 milligrammes of the company's radium bromide, is as follows:—"Enclosed please find cheque for £160 re radium specimen (10 milligrammes) supplied to me. This specimen has given me excellent therapeutical results, and as the price is much below what I have paid for imported specimens I am very pleased with it."

It was resolved last week at a shareholders' meeting in Sydney to increase the capital of the company from £40,000 in 4000 shares, to £80,000, by the issue of 4000 additional £10 shares. Of the 4000 original shares, 3148 were paid-up or credited as paid-up to £10; 768 were paid up to £9; and 84 remained unissued. The new shares, before issue, are to be offered to members of the company in the proportion of one new share for every old share held, at par, payable £2 on application and allotment, and the balance in calls of not more than 10s. per month.

A press cablegram from London, dated July 29, announced that the Mount Kembla Collieries Ltd., with a capital of £500,000, had been registered to acquire the properties of the Mount Kembla Coal and Oil Co. (N.S.W.). The former company had an authorised and nominal capital of £100,000, of which £50,000 represented the value of 5000 class A (vendors') shares of £10 each, and the other £50,000 an equal number of class B shares issued to the public, which were entitled to a cumulative preferential dividend of 5 per cent. per annum, and one-half of any surplus profits remaining after the A shares had received a similar dividend. The dividends paid since 1901 were as follows:—For 1901, 8 per cent. on both classes; for 1901-2, 10 per cent.; 1902-3, 10 per cent.; 1903-4, 10 per cent.; 1904-5, 12½ per cent.; 1905-6, 15 per cent.; 1906-7, 18 per cent.; 1907-8, 18 per cent.; 1908-9, 18 per cent.; 1909-10, 18 per cent.; 1910-11, 25 per cent.; 1911-12, 30 per cent. After paying £30,000 in dividends and bonuses, in March, 1912, a sum of £2806 remained to be carried forward. The company had a reserve fund of £110,000.

# THE INVESTOR'S COLUMN.

## Some Companies Attracting Attention To-day.

(By Our Exchange Reporter.)

### South German Reef.

For the last few weeks the observed of all observers in the mining market has undoubtedly been South Germans, and the turnover has been exceptional, many thousands of shares changing hands from day to day. The fluctuations in price have been sharp and severe, and any speculators who have had the luck both to buy and sell at the pyschological moment must have done remarkably well. It is probable, however, that such persons were not numerous. All the surroundings were favourable for the above state of affairs—in the first place, there has been a revival of public interest in Victorian gold enterprises, and, secondly, the record of this particular mine shows it to have been one of exceptional richness and consistency, no less than £341,000 having been received by the shareholders in dividends—the last (of 1s. per share) having been paid about four years ago. The market value of the stock had, however, been very materially reduced long before then, owing to a floor or crosscourse, which traverses the country in a lateral direction, having cut off the reef from which the dividends had been paid.

This adverse development occurred about thirteen years ago, and although for a long while afterwards attempts were made to again pick up the run of stone, they proved unsuccessful. The prosperous operations had been conducted on the eastern reef in the company's ground, the payable yields having been mainly obtained between 1000ft. and 1750ft.—the different levels probably paying about 30s. per share. It was then decided to work the western reef, and as some good yields were obtained, the shares once more came into prominence in the market, sales taking place up to close on 50s. This increase in price was based more on the past record of the company than on substantial mine developments, as (speaking from memory) the dividends amounted only to two or three shillings. Market operations at the time were also responsible to a considerable extent for the high range of quotations, for some of the dealers had the mine inspected by experts, and learned that the prospects disclosed very far from justified the price of the shares. They and their friends, therefore, "sold forward," and it may be said that this was one of the many instances where "Bearing" or "Specking" a stock should have been in the public interest, for the reason that it ought to have kept the shares at a price more in accordance with their true value. Unfortunately for the "Bears," the public support was so strong that the quotations rose rapidly, and a high range of prices was maintained for several months. In the end the expected happened, the bottom fell out of the bucket, and the stock slanted downward in price, with apparently but little chance of rising again. How bad the position became may be gathered from the fact that only a few months ago the forfeited shares in the hands of the company amounted to about 8000, and these were taken up by the existing shareholders at a price of 6d. It may be here remarked that the recent market rise must have been very tempting to those who had exercised the above opportunity, and it is not surprising that some profit taking has occurred. The reason for the revival of public investment in the stock was the announcement that the operations of a body of tributers who had acquired the right to work a block of ground on the eastern reef, at the 1750ft. level, had resulted in the discovery of the downward continuation (that is, below the floor or crosscourse) of the reef which had made the mine famous and its shareholders rich. This particular level had been left unworked for twelve or thirteen years, and was partly fallen in, when the directors, pursuing a policy of having prospecting work done by tributers, rather by making heavy calls upon the shareholders, let the block to Messrs. Baxter and party. The latter had about three months' work at their own expense in putting the drive in order, and they well deserve the reward for their enterprise which they are now obtaining in the form of very payable returns. The value of the stone runs up in places to about two ounces, but it is understood that no anxiety to keep up a high average return is being shown by the tributers, for the reason that the higher the value of the yield the higher the percentage of royalty to be paid.

The company has been putting in an intermediate level at 1900ft., with the object of locating the downward extension of the reef, which the tributers are working, and it was anticipated that it would be met with in about 80ft. of driving, and 60ft. of this had been accomplished when the first favourable change occurred—18in. of nicely-mineralised stone showing in the face, from which the drillings gave traces of gold, but not payable. This development occurred late on Thursday, and when it was announced the shares which were offered at 10s. strengthened on Friday morning with sales up to 11s. 6d. Later on the news came to hand that the next firing out had disclosed 2ft. of stone, worth 15 dwt. to the ton. The official report of this development caused both Bulls and Bears to rush in to buy, and after sales at 13s. 6d. had been recorded in the Room, there were transactions outside at midday up to 15s. 4d. The luncheon hour probably brought food for reflection, for in the afternoon, when buyers at 14s. 6d. and 14s. 3d. had been supplied, there was a great rush to realise—some thousands of shares changing hands down to 13s., with the seller prepared to go on, and the best buying offer at 12s. 7d. Saturday did not bring any improvement in the market, the downward movement in price continuing until 12s. was touched, after which a mild recovery ensued, the closing sale, however, being at 12s. 6d.

The course of these transactions shows that the market is in a highly-sensitive condition as far as this stock is concerned, a fact which should be given careful consideration by those who are inclined to buy. Under such conditions it is generally advisable not to buy until the shares have had one of the setbacks in price which may be expected from time to time. With regard to the prospects of the company, they must be regarded on the information to hand as decidedly promising.

The operations of Baxter's tribute party seem to establish the fact that the highly-payable reef which was lost has been found; and as the stone apparently retains its best characteristics both as to size and value, and as it is also well below the disturbance in the country, it is quite probable that it will continue to do so perhaps to a great depth.

It should be mentioned that the amount of reef remaining to be worked in the property is not great, a level having been driven at 2000ft. to within about 200ft. of the boundary of the Derby United Company, and without any discovery of importance being made. The reef appears, however, to be going away rather flat, and may be picked up in about another 20 or 30ft. of driving—that is, if the right track has been followed—a difference of opinion having been expressed upon this point.

Assuming, however, that there is a height of stone of 100ft. by 200ft. in length, this would not, even if equal to the best quality recorded by the mine, be sufficient to justify a price of more than 15s. or 20s. for the shares; but, fortunately for the shareholders, the directors some time ago made an arrangement with the Derby United Company, whereby it was provided that the South German Company should have the right to work the adjoining block of ground for a distance of 300ft. on a royalty basis of five per cent. This agreement places the company in a very much stronger position, and gives plenty of scope for work for several years to come.

South Germans, no doubt, make an attractive proposition, but it must be remembered that the market has for some time been ahead of the mine developments, for the announcement that the stone recently discovered was worth 15 dwt. was apparently incorrect, and it is probable that nothing of much value has yet been struck. It is plain, however, that the prospects have materially improved during the last week, and as there is another 15ft. or so to be driven before continuation of the payable chute of stone may be expected to be proved, the work of the next few days may bring an important change in the position of the company's affairs.

### Carlisle (V.).

It is often said by men well acquainted with the goldfield, that if an investor gets landed in Bendigo stocks, that he has always a chance of geting his money back if he can pay calls and hold on. Some of the old and once successful companies certainly have a happy knack, after years of dead work and call making, of suddenly coming again into prominence and embarking on another era of prosperity. This has been the case very noticeably during the present year, and, among others, the Carlisle is now rewarding its shareholders for their faith and outlay. Two months ago the shares were obtainable at 6s. 6d., and recent quotations have been 10s. higher, so that a substantial increase in price has taken place. This improved enquiry is owing to payable returns and a re-appearance on the dividend list, three disbursements of 6d. each having been paid during May, June, July, with another falling due on the 7th of this month.

The company has already a fair record in this important respect, the total figures being £54,900, but as the capital called up amounts to £5 2s. 3d. per share it will be seen that the original shareholders—that is, if any of them are left—are still owed a lot of money by the mine. As the lease is well situated on a very payable line of reef, it is probable that further dividends will be forthcoming for some time, for when payable stone is opened up under the above conditions it may generally be relied on to continue. The quotations have shown a slightly easier tendency lately, but this has been the case also with several other Bendigo stocks; it is not improbable, however, that the present prices may tempt some of the market operators who got in early to realise, but the shares may improve again later on. The present payable yields are being obtained between eleven and twelve hundred feet, from a large spurry formation.

---

# METAL QUOTATIONS.

## By Cable.

(From Our Correspondent.)

### London, Tuesday.

The metal market was very uneven last week, opening at a still further advance on the previous week's good values, then falling away only to revive as the week drew towards its close. On the whole rates were decidedly in favour of vendors, if lead may be excepted.

COPPER.—Monday's quotation for spot delivery was £67 10s., showing a rise of 17s. 6d., then came a fall to £66 5s., followed by £65 15s., recovering again to £67 5s. and £67 7s. 6d.

Three months' parcels brought £67 8s. 9d., a rise of 15s. on the rate of the previous Friday, but next day the rate was £66 5s., and on Wednesday £65 17s. 6d. was reached, followed, however, by rises to £67 5s. and £67 7s. 6d.

Electrolytic, which we quoted last Monday at £69 10s., dropped to £69 5s. and £69, but recovered to £69 5s. and £70 5s

The total supplies of copper for July were 49,285 tons. Total deliveries (including Chilian and North American for all Europe), 51,854 tons. Stocks in England and France and afloat (including quantity advised from Chili and Australia) 28,344 tons. Quantity advised from Australia by mail and cable, 5000 tons. The total European visible supply is 35,627 tons.

TIN.—The quotations for both spot and three months' delivery were the same each day during the week—viz., £184 10s., £185 15s., £180 5s., £182 5s., and £184 10s.

The total July stocks of tin (including stocks in America and quantity afloat) amount to 13,713 tons. The quantity of Straits and Australian on spot and landing is 1355 tons, and the quantity afloat 4688 tons. Deliveries in London and Holland during the past month were 2587 tons.

LEAD.—The market opened on Monday at £21, or 5s. in advance of Friday's rate, followed by rises to £21 5s. and £21 17s. 6d.; then came declines to £20 10s. and £20 7s. 6d.

SPELTER maintained its recent rate of £20 15s. per ton.

SILVER.—The quotations were 27⅜d., 27½d., 27⅜d., and 27 5/16d.

ANTIMONY.—"Star" brand still brought £30.

WOLFRAM improved to 33s. per unit, making 70 per cent. ore, £115 10s. per ton.

MOLYBDENITE still brought 2s. 9d. per lb., equal to £308 per ton.

MANGANESE (50 per cent.) was stationary at 9½d. per unit, or 39s. 7d. per ton.

---

The Secretary of the British Chamber of Commerce, Paris, has supplied, under date June 28th, the following prices then quoted on French markets for minerals which interest Australian ore-dealers:—Antimony, £40 13s.; copper, first quality, £71 2s. 6d.; tin (Havre), £227 11s.; lead (Rouen and Havre), £24 2s.; lead (Paris), £24 6s.; zinc (Havre), £25 8s.; zinc (Paris), £25 8s.

---

The Briseis Tin and General Mining Co., Ringarooma (T.) is again on the list of dividend-paying concerns, after an interval of five months. The distribution, which will be of 6d. per share free of English income tax, will amount to £15,000, payable on the 28th inst. This brings the total dividends to date up to close upon £400,000. The production of black tin for the quarter ending on June 30 was 135 tons, equal to about 98.55 tons of metallic tin, making the production for the year 1913 approximately 197.1 tons, of which 114 tons has been sold in London, realising £23,410 net, or an average of £205.35 per ton. The Wallace properties, Yackandandah (V.) yielded for the quarter 1525 oz. of standard gold, valued at £5890, making the total for 1913, 3275 oz., valued at £12,650. The estimated gross profit for the quarter was £8500.

A cable dated the 26th July has been received by the Golden Horse Shoe Estates Co. Ltd. from Mr. J. W. Sutherland, the general manager, stating that the Bromo-cyanide litigation resulted in a verdict for defendants (the G.H.S. Estates Co.) on the Sulman and Teed patent; and for the plaintiffs on the Goepner and Witter patent.

# OUR BIG MINES.

## Examinations of their Yearly and Half-Yearly Reports.

(By a Mining Accountant.)

### The Zinc Corporation Limited.

The twelve months ended December 31, 1912, is the first full year of this company since its amalgamation with the South Blocks. Shareholders, both preference and ordinary, have had good reason to congratulate themselves on the results achieved. They have had the luck of being blessed with high metal prices and of discovering that the South Blocks mine is likely to blossom forth into a mine worthy of the name not an encumbrance, as its previous history suggested would be the case. Man has done his fair share as well, for the improvement in the metallurgical practice is a noteworthy one. The net result is shown in a net profit of £225,640, and in a dividend distribution of £206,434.

Dealing first with the mine, it is pleasant to record the substantial improvement both in fact and in prospects. The principal work on the lead lode was the intersection of the lode by the main west crosscut at the No. 7 level, at a vertical depth of 1050ft., and the extension of the main north and south drives from this crosscut. The lode at this level, where intersected, proved to have an assay value of 14.1 per cent. lead, 2.4 oz. silver per ton, and 13.6 per cent. zinc, over a width of 18ft. This, however, pales in comparison with the discovery made since the end of the year. A similar crosscut was put out from the main shaft at the No. 8 level, at a vertical depth of 1180ft., and proved the lode at that point to have an average assay value of 14.8 per cent. lead, 2.3 oz. silver, and 10.7 per cent. zinc, over the greatly increased width of 50ft. The lode was exposed at a point 70ft. west of the shaft; to full width there is 85ft. The last 35ft. was not in such good ore as the first 50ft., as witness the following figures:—

| | Lead. Per cent. | Silver. Oz. | Zinc. Per cent. |
|---|---|---|---|
| First 50ft. | 14.8 | 2.3 | 10.7 |
| Followed by 5ft. | 4.1 | 1.3 | 4.8 |
| " " 15ft. | 3.6 | 1.6 | 5.8 |
| " " 10ft. | 10.7 | 2.6 | 10.2 |
| " " 5ft. | 12.5 | 2.9 | 8.6 |

They deserve full comment. Boring operations were conducted since the close of the year, in order to test the continuation of the lead lode south of a supposed fault zone. A drill-hole to the east was put out at a point 666ft. south of the main shaft, and passed through 32ft. of ore, assaying as follows:—

| | Lead. Per cent. | Silver. Oz. | Zinc. Per cent. |
|---|---|---|---|
| From 176ft. to 184ft. | 6.5 | 1.5 | 4.2 |
| From 184ft. to 189ft. | 16.9 | 3.4 | 13.3 |
| From 189ft. to 194ft. | 2.3 | 0.4 | 2.4 |
| From 194ft. to 208ft. | 15.1 | 2.7 | 11.3 |

It will be seen that two of the bands of ore are of excellent quality; their discovery is full of significance. A further drill-hole at 760ft. south of the main shaft intersected a body of ore 6ft. wide, of an average assay value of 18.5 per cent. lead, 4.11 oz. silver, and 11.8 per cent. zinc. Survey plans of the mine would not come amiss. It is interesting to recall the statement, made at the time of the amalgamation, that South Blocks was considered good enough on account of the prospects of the zinc lode. The lead lode, however, bids fair to justifiably lay claim to a good deal of consideration, and if the developments maintain their satisfactory nature, this company will need to revise its proposed programme.

On the zinc lode the development work was practically confined to the preparation of the Block 5 shaft, from which the lode is to be developed in future. The chairman, at the general meeting a year ago, stated that no final decision had been taken as to the actual plan of operations, that probably the zinc lode would be gradually developed with the object of blocking out reserves, so that by 1915, if the lode behaves as expected, there should be at least a quarter of a million tons. He pointed out that, according as circumstances dictated, the company could arrange to treat the ore, working it in with the remaining dumps. As there are good lead values in the ore, it is probable that some de-leading plant will be required, and, as mentioned, the final decision will doubtless be influenced by the developments at the lead lode. Regarding this zinc lode, it is worth noting that there is a stretch of about 1800ft. between the south end of the South Blocks workings and those of the Broken Hill South Extended. The ore may be continuous throughout. Its average, as so far proved, is about 19 per cent. zinc, 1.5 oz. silver, and 8.5 per cent. lead.

The ore from the zinc lode, it will be seen on reference to Table A, is not dissimilar in assay value to the zinc middling at present being produced by the lead concentration plant at the South Blocks mine, where the ore from the lead lode is being treated. While the two lodes are not yet sufficiently large and important to supply the demands of a largely capitalised concern like the Zinc Corporation, their prospects must be considered as full of promise. The ore reserves are given in Table A, which deals with this subject and the metallurgical results obtained at the South Blocks mine.

Table A.—Operations at South Blocks Mine.

| | Tons. | Lead. Per cent. | Silver. Oz. | Zinc. Per cent. |
|---|---|---|---|---|
| Lead ore treated .. | 138,284 | 15.3 | 2.57 | 9.16 |
| Lead concentrate produced .. .. .. | 25,227 | 67.34 | 9.05 | 6.28 |
| Zinc middling produced .. .. .. .. | 36,800 | 5.22 | 1.8 | 17.15 |
| Slime and Residue | Information not given. | | | |
| Ore reserves (lead lode) .. .. .. .. .. | 721,191 | 14.4 | 2.3 | 9.1 |

In the estimate of ore reserves no ore below the No. 7 level is included. It will be seen that a good-grade concentrate is obtained. The silver contents of the ore is low, characteristic of this end of the field. The zinc middling is treated at the tailings treatment plant, at the Zinc Corporation. No information is given regarding the tonnage and assay values of the slime or of the residue, which latter is sent underground for filling. The slime is stacked. The report states that experiments have been carried out in connection with a method known as the Lyster process, with a view to the concentration of the lead contained in the slime. The introduction of this method is claimed to have increased the present extraction of lead from the mine ore, and the erection of a complete unit of a capacity to treat the whole of the current and accumulated slime has been authorised by the board.

Turning to the metallurgical results being achieved at the mill of the original Zinc Corporation, it may be safely said that the improvement is remarkable. Full technical details are set forth in Tables B, C, and D.

Table B—Metallurgical Results During the Year.

I.—Re-treatment of Mixed Tailing at Zinc Corporation.

| Product. | Weight. Tons. | Average Assay Value. Lead. Per cent. | Silver. Oz. | Zinc. Per cent. |
|---|---|---|---|---|
| Flotation concentrate .. .. .. .. .. .. .. .. | 102,355 | 12.9 | 15.1* | 43.9 |
| Residue† .. .. .. .. .. .. .. .. .. .. | 243,070 | 2.4 | 3.4 | 2.1 |
| Mixed tailing .. .. .. .. .. .. .. .. .. .. | 345,425 | 5.5 | 6.94 | 14.41 |

II.—Re-treatment, by Tabling, of Total Flotation Concentrate.

| Product. | Weight. Tons. | Lead. Per cent. | Silver. Oz. | Zinc. Per cent. |
|---|---|---|---|---|
| Zinc concentrate .. .. .. .. .. .. .. .. .. | 85,354 | 7.4 | 12.5 | 47.2 |
| Lead concentrate .. .. .. .. .. .. .. .. .. | 10,881 | 57.9 | 32.2 | 14.8 |
| Zinc slime‡ .. .. .. .. .. .. .. .. .. .. | 5,971 | 14.9 | 25.15 | 38.7 |
| Flotation concentrate .. .. .. .. .. .. .. .. | 102,355 | 12.9 | 13.1 | 43.9 |

*Given in report as 13.1, but this latter figure would falsify two other statements.
†Calculated.
‡An extra 129 tons needed to balance total; probably lost by suspension in water.

Table D—Comparison of metallurgical recoveries and losses. On a basis of percentage distribution.

| | Lead. Previous Practice. | Lead. 1912. | Silver. Previous Practice. | Silver. 1912 | Zinc. Previous Practice. | Zinc. 1912. |
|---|---|---|---|---|---|---|
| Final zinc concentrate .. .. .. .. .. .. .. | 40.6 | 32.8 | 57.1 | 44.7 | 81.4 | 80.9 |
| Final lead concentrate .. .. .. .. .. .. .. | 29.6 | 32.8 | 13.4 | 14.6 | 2.4 | 3.3 |
| Zinc slime concentrate .. .. .. .. .. .. .. | — * | 4.6 | — * | 6.3 | — * | 4.8 |
| Recovery in flotation concentrate .. .. .. .. .. | 70.2 | 70.2 | 70.5 | 65.6 | 83.8 | 89.0 |
| Residue loss in flotation concentrate .. .. .. .. | 29.8 | 29.8 | 29.5 | 34.4 | 16.2 | 11.0 |
| Mixed tailing treated .. .. .. .. .. .. .. .. | 100 | 100 | 100 | 100 | 100 | 100 |

*Zinc slime included in the concentrates.

The improvement is apparent when it is observed that the grade of zinc in the material drawn from the dumps has dropped from 19.1 per cent., the average milled by a former process, to 14.41 per cent., the average for the period under review. The grade of silver is now about 1 oz. per ton less than formerly, whilst the grade of the lead remains the same. Although the material treated during the greater portion of the period was refractory, owing to many of the dumps being highly oxidised, the grade of the zinc and lead concentrates has been improved beyond that for any previous period. The zinc recovery has been maintained, whilst the distribution of the lead recovery has been improved to the extent, that whereas by a former process the proportions were 40.6 per cent. in the zinc concentrate, and 29.6 per cent. in the lead concentrate, the proportions for the period under review are 32.8 per cent. and 32.8 per cent. respectively, a desirable alteration when it is considered that practically no payment is made for lead in the zinc concentrate. The distribution of the silver is also better, though the net recovery is slightly less. On the other hand, the tailing was lower in silver. These distributions will be seen in Table D, which deals with the recoveries and losses.

Table C—Comparison of metallurgical results with those of previous practice.

| | | Previous Practice. Feb., 1908, to July, 1911 (inclusive). | Year Ended Dec., 1912. |
|---|---|---|---|
| Mixed tailing treated .. .. | tons | 714,399 | 345,425 |
| Average assay value— | | | |
| Lead .. .. .. .. .. .. | per cent. | 5.5 | 5.5 |
| Silver .. .. .. .. .. .. .. | oz. | 7.9 | 6.94 |
| Zinc .. .. .. .. .. .. | per cent. | 19.1 | 14.41 |
| Final zinc concentrate produced .. .. .. .. .. .. | tons | 241,710 | 85,354 |
| Proportion to tailing .. | per cent. | 33.8 | 24.7 |
| Average assay value— | | | |
| Lead .. .. .. .. .. .. | per cent. | 6.63 | 7.4 |
| Silver .. .. .. .. .. .. .. | oz. | 13.34 | 12.5 |
| Zinc .. .. .. .. .. | per cent. | 46.0 | 47.2 |
| Final lead concentrate produced .. .. .. .. .. .. | tons | 20,639 | 10,881 |
| Proportion to tailing | per cent. | 2.9 | 3.1 |
| Average assay value— | | | |
| Lead .. .. .. .. .. .. | per cent. | 56.57 | 57.9 |
| Silver .. .. .. .. .. .. .. | oz. | 36.76 | 32.2 |
| Zinc* .. .. .. .. .. .. | per cent. | 15.84 | 14.8 |
| Residue (exclusive of zinc slime) .. .. .. .. .. .. | tons | 452.050 | 243,070 |
| Proportion to tailing | per cent. | 63.3 | 70.6 |
| Average assay value— | | | |
| Lead .. .. .. .. .. | per cent. | 2.59 | 2.4 |
| Silver .. .. .. .. .. .. | oz. | 3.67 | 3.4 |
| Zinc .. .. .. .. .. | per cent. | 4.88 | 2.1 |

*Of no financial value; penalty probably incurred on account of high zinc contents.

The benefit of re-treating the original flotation concentrate is illustrated both in the above tables, and in the following statement, which is to be found in the pages of the report. The flotation concentrate, before tabling, was worth 69s. 5.2d. per ton, based on metals at the average prices for the year 1912. After tabling, the flotation concentrate, which was divided into the three products shown in Table B, was worth 87s. 8.9d. per ton, the enhancement as the result of re-treatment being £93,685. As the cost of re-treatment amounted to £16,089, the profit was £77,596. These figures make no allowance for the value of the zinc slime, which on the basis of previous sales, less cost of shipping, would realise a further £14,989. The re-treatment operations for the period (including the by-product, zinc slime) thus show a total net profit of £92,585.

In consequence of the favourable results obtained in the laboratory by using the Horwood process on zinc slime, and the results obtained from a 100-ton parcel of ore roasted in the Edwards furnace at Ballarat, and afterwards treated in the Zinc Corporation experimental plant, it was decided to erect a working unit of this process for the treatment of zinc slimes. A plant is now being erected.

The reserve of mixed tailings on hand at December 31st, 1912, amounted to £1,844,748 tons, equal to six years' supply for the zinc concentrator. The average assay is 14.7 per cent. zinc, 6 oz. silver, and 5 per cent. lead, much the same as that of the tailings treated during the year. What will be the value of this reserve is worth speculation, but it can not be reduced to an actuarial basis with any satisfaction, because of the changing conditions of the metallurgical practice, and, most of all, because of the uncertainty of the metal markets. The report fails to state the average prices either realised or credited to the year's production. This is an important omission. The average quotations for the year (obtained from a separate source) were:—

| | | | |
|---|---|---|---|
| Lead | £17 | 8 | 4 |
| Silver | 0 | 2 | 6.25 |
| Spelter | 26 | 3 | 0 |

They are given prominence because they are well worth consideration. The future prices will not always be so favourable to producers. Costs are another matter that exercise a large influence on the future. According to the published revenue account, the expenditure may be segregated thus:—

Table E—Revenue expenditure.

| | |
|---|---|
| Treatment of tailings | £147,503 |
| Redemption of tailings treated | 77,186 |
| Mining and ore purchase | 78,082 |
| Ore treatment | 35,400 |
| Mine development | 16,322 |
| Experimental and general | 14,328 |
| Head offices | 9,958 |
| Taxes | 4,741 |

In addition, there was incurred £2806 for obtaining expert advice, and £40,636 was written-off machinery, plant, buildings, etc. Concentrates are credited with £644,428. It is to be noticed that this company includes in its costs a redemption charge on the tailings treated. This amount was £77,186, which, being charged against profits, swells the liquid assets. Strange to say, no formal fund has been opened, to represent the money replacement of the tailings. The remaining tailings are valued in the balance-sheet at £263,245, while the liability under contract for purchase, payable by instalments over a period of years, is £100,798. The difference between the two is only a book entry, not to be taken as a probable guide. This liability is included in the following table, which gives the leading features of the financial progress since the amalgamation:—

Table F—Financial progress.

| | Half-year ended Dec., 1911. | Year ended 1912. |
|---|---|---|
| Revenue | £236.503 | £652,603 |
| Expenditure* | 163.259 | 386,327 |
| Depreciation | — | 40,636 |
| Net profit | 73,244 | 225,640 |
| Dividend | 69,511 | 206,434 |
| Carry forward | 3,734 | 22,940 |
| Issued capital | 572,261 | 572.261 |
| Capital expenditure | 10,857 | 15,228 |
| Liquid assets† | 221,205 | 437,789 |
| Liabilities | 146,396 | 217,578 |
| Surplus of liquid assets | 74,809 | 220,211 |

*Includes redemption of tailings treated.

†Exclusive of tailings, includes stores.

Note.—The liquid assets do not make allowance for final dividend.

Notes on General Meeting Held in London, June 25.

Sale of Concentrates.—55,000 tons of zinc concentrates at average price of year of delivery, namely, £26 3s. 4d.; 35,000 tons of zinc concentrates estimated at £23 for spelter. The 36,108 tons of lead concentrate was settled at the actual figure of £17 15s. 10d. for lead. This year included a surplus of £16,000, being the amount in excess of the estimate of last year's unsold zinc concentrates.

Calculation given by Chairman.—"At £23 for spelter and £13 for lead, we ought to make a profit sufficient to pay some dividends besides the preference 20 per cent., but not much—perhaps 6d. per share. Advance the price of each metal by £1, or either metal by £2, and you can increase the dividend by 1s., so that at £25 and £15 your dividend should be a full 2s., and at £26 and £16 a full 3s." This calculation was only given as a rough and ready clue to the value of the shares.

Hint to Future Policy Regarding Surplus Funds.—"We are in touch with some of the leading groups of trust companies, and from time to time have opportunities of remunerative underwriting."

H. C. Hoover stated that to make a profit of £150,000, the company required a combined price of lead and spelter totalling £39 per ton. If lead were £21 and spelter £21 the combined price would be £42; the £3 excess price would represent about £63,000 extra earning.

## CHAMBER OF MINES OF VICTORIA

The annual meeting of the Chamber of Mines of Victoria was held last Thursday at the rooms, 57 Swanston-street, Melbourne, the chair being occupied by Colonel F. G. Hughes, president.

The council's report, after expressing gratification at the prospect of the long-delayed amendment of the No Liability Companies Act being immediately brought before Parliament, and at the continued decrease in gold-stealing in spite of remissness of the Legislatures of neighbouring States in providing legislation similar to the Victoria Gold Buyers' Act, referred to the re-introduction of the Mines Act Further Amendment Bill 1912. There was one matter, at least, said the council, which should be strenuously opposed, should it find its way into the New Mines Bill, and that was the interference of the Minister of Mines in an agreement between the mine-owners and the tributer. The council had always held that there must be safe and healthy working conditions, also that in the matter of recompense for service the only principle that would stand the test in the long run was that of a fair agreement between the worker and the employer. With respect to the refusal of unionist miners to work with non-unionists and the attempts to coerce non-unionists, the report had the following:—"That no worker has a right to breathe and eat unless he wears the union label is the gospel preached by the executive of the Federated Mining Employees' Association, and, moreover, the worker must have no choice regarding which particular union he wishes to join. Although the law of the country says that no men and no body of men have any right to interfere with the employment of other men, still the law is being flouted every day. The present state of things at Bendigo, where the union bosses have caused a strike for no other reason than that it is disagreeable to their sense of British fair play that certain men have the temerity to think and act for themselves, proves the correctness of this statement. The dignified and firm stand taken by the mine-owners of Bendigo is an object-lesson to employers the world over, and, if the men would only realise it, is for their own good."

The chairman, in moving the adoption of the report, said the scarcity of labour and general industrial unrest had greatly affected the mining industry throughout Australia. It seemed extraordinary to read of an alleged outcry for employment when in almost every mining district there was a great scarcity of miners, and no able bodied man, if he were a willing worker, needed to look for work. Of industrial unrest mine-owners had more than their fair share during the year, and it raised doubts whether the present laws were sufficiently comprehensive to cope with this ever recurring difficulty. Theoretically, one would think that an Arbitration Act would be quite sufficient to prevent strikes, but when, during the past three years, no fewer than 350 strikes had taken place in Australia, it must necessarily prove that either the Act or the administration of it was greatly at fault. Comparatively speaking, one seldom heard of differences in business agreements being brought before the law courts, because they nearly all contained an arbitration clause, whereby each party appointed an arbitrator, and they appointed an umpire. Therefore the people to whom the dispute was referred were persons who were thoroughly cognisant of the nature of the business upon which they were called upon to settle the differences, and he thought this course must always be more satisfactory than having a dispute referred to a judge, whose appointment might be due either to party political influences, or on account of his ability as a lawyer—he was thankful to say, for the most part, that judges in Australia were appointed for their learning in law—but although he be an eminent lawyer, he had had little or no experience in business and business dealings, and therefore could not be expected to be able to grasp the difficulties involved in industrial disputes. If the Arbitration Act were so amended as to admit impartial jurisdiction on those lines, there would be far fewer disputes and eminently more satisfaction to both sides. The chamber had no objection to unions for protective purposes and as benefit societies, but when the bound of all possible reasonableness was exceeded, then it behoved every one to stand shoulder to shoulder against oppressions and attempted interferences with the civil rights of the community. In order to combat those attempts to undermine the foundations of business enterprise and industry, the council for the chamber of mines had for many months past been formulating a scheme whereby it would be able to act on behalf of its members in cases where disputes and differences arose. There were many initial difficulties to overcome.

It was undoubtedly owing to the causes referred to above, pursued the president, that the gold returns for the year show a great falling off. The gold won was the lowest on record—516,255 oz.—and the dividends paid away were also the lowest, viz., £216,782. Comparing these figures with, say, six years ago, they showed the returns in 1906 to be nearly 40 per cent. more gold, and the dividends paid that year were £484,793, or 123 per cent. higher, being considerably more than twice as much. The total number of men engaged in mining was 13,568, or 2420 less than the previous year. Greater attention was now being paid to the various mineral substances which were known to exist in some cases in large quantities in this State. Antimony in the form of concentrates, assaying 48 per cent. of the metal, and also valuable gold contents, was produced to the extent of 1475 tons at Costerfield. The amount stated to be received for the sale in England was £16,162. Tin production had increased from 33 tons to 48 tons, valued at £5733. An interesting test was being made by the Reform Dredging Company, Myrtleford, where a cyanide plant, costing £2500, had been erected to treat the sand as it was discharged by the dredge. If this should be a financial success there would be almost unlimited scope for the working of similar plants in Victoria.

The quantity of gold won during 1912 from dredge mining, added Mr. Hooper, was 73,214 oz., and from sluicing by gravitation 567 oz., a total of 73,781 oz., as compared with 81,594 oz. for 1911. Tin to the value of £2624 was also won. The dredging plants paid £32,320 in dividends, which showed a decrease of £18,619 compared with the previous year. During the past thirteen years the companes had distributed £434,627 in dividends. The quantity of material operated on during 1912 by dredge mining plants, comprising 56 buckets, 26 pumps and 12 jets, which gave employment to 1242 men, was 19,629,865 cubic yards, as against 19,743,335 cubic yards for 1911, for 72,314 oz. of gold, valued at £292,856, equal to 1.8 gr. per cubic yard of matter treated. The area dealt with was 672¾ acres, averaging 18 feet in depth. The average quantity of stuff turned over weekly per plant was 7444 cubic yards, and the average yield per week for each was 27.7 oz. The quantity of tin won during the terms by dredge mining was 16¼ tons, and by gravitation sluicing 4 tons 7 cwt. Since the inception of the dredge mining industry he calculated that 992,818 oz. of gold, valued at £3,971,272, was won, as well as 572½ tons of tin, worth £50,000. The Sludge Abatement Board stated that good progress had been made in controlling and directing mining companies and parties as to the disposal of infertile debris from mining operations, and denied many of the statements made in the press that great devastation had been caused by the dredges in the Ovens River valley.

The following committees were appointed for the seven mining districts of the State:—Bendigo: Messrs. S. H. McGowan, J. Craig, J. G. Stanfield, R. A. Rankin and G. A. Petrie. Ballarat: Messrs. W. D. Thompson and J. Pearce. Ararat: Mr. W. A. Rain. Beechworth: Messrs. R. N. Rothwell and J. H. Gray. Castlemaine: Messrs. Alex. Gordon and C. B. Longbottom. Gippsland: Messrs. R. B. Stamp and E. C. Dyason. Maryborough: Messrs. C. L. Smith and E. J. Hartley. Private: Mr. F. G. Hughes, and Messrs. H. E. Rowe and A. Capper Moore. Legal Managers' Association: Mr. William Jackson.

At a subsequent meeting of the council the following officers were elected for the ensuing year:—President, Mr. A. Capper Moore; vice-presidents, Messrs. F. H. McGowan (Bendigo), W. D. Thompson (Ballarat), F. G. Hughes and H. E. Rowe (Melbourne); treasurer, Mr. A. Gordon.

## WOAH HAWP CANTON PROSPECTS.

(From Our Ballarat Correspondent.)

The Woah Hawp Canton, owned by a plucky Geelong syndicate, appears to be on the eve of regaining lost prestige as one of the best gold producers among Ballarat East mines. For some months past developmental work has been in progress, embracing several levels, and principally in the 650, 850, and 1100ft. levels; prospecting work is now being carried on in the old adjoining Prince Regent lease acquired by the company two or three years ago, and the rise from the 1100ft. level is expected to very soon enter the 12ft. slates formation, which yielded the old Prince Regent Company a succession of good gold returns in its palmiest days. The quartz averaged in value from 6 to 18 dwt. per ton in the Prince Regent times, and but for the old, old fault of taking the profits out of the mine ere it is sufficiently developed, it might have been working, instead of idle, for 12 or 15 years past. The Canton has almost continuously been worked since it was originally held by a Chinese syndicate, which gave it its present name, and after the mine was visited by fire and the shaft badly damaged and the plant ruined, the mine was taken over by the Geelong party that at present controls the venture, and it was again placed in a satisfactory condition. The new owners soon "struck it rich," as a very payable vein was cut on the indicator, which paid 1s. dividends monthly for over a year. The best stone was broken from the 750 and 850ft. levels; but the vein appeared to give out below this depth. They are now trying to locate the upward continuation of the vein by extending the

650ft. level. But the indicator is ever an unreliable source of supply, though a much-appreciated one while the shoot of gold lasts. Hence the desirability of opening up the larger formations, such as the 12ft. and 4ft. slates and the "leather-jacket" reef, which are more uniformly gold-bearing. The management hopes to be in a position to very soon materially increase the output from these sections, where (1100ft. level) stone worth about 12 dwt. per ton was recently crushed for a trial test. They are rising further south, from which it is intended to open out east and west to work the masses of quartz known to exist thereabouts. The 850ft. crosscut has reached the big slate country, which in the neighbouring North Woah Hawp mine on the north side has proved consistently fair to good gold producing. It is intended to thoroughly prospect and exploit this line, and wherever desirable rock-breakers will be employed to expedite and economise the handling of ore. The board also contemplates deepening the old Corn Exchange shaft on the lease a lift of 100ft. below the present depth of 450ft., as it is in a good position to command the western reefs. In addition to calling up at the rate of 3d. per share monthly, the board has secured bank advances on the plant; and as most of this work should be remunerative henceforth an era of prosperity should soon be entered.

---

# MINING IN NEW SOUTH WALES.

## Broken Hill.

(From Our Correspondent.)

Broken Hill, August 1.

Block 10 has to some extent been rewarded for the pertinacity with which it has stuck to development work in the face of disappointments. First the lower levels failed to materialise as they should have done, to prove payable; then the 500ft. development from the Central, on which hopes were based, disappeared and couldn't be found again at least until the other day. The lode has now apparently been re-discovered on the 615ft., some distance north of the 500ft. position. The ore, when assayed early this week, went 14.0 per cent. lead, 4.0 oz. silver, and 10.0 per cent. zinc, very much the same as the ore proved in the drive from the Central. Appearances indicate that Block 10 has got something decent, as the drive now progressing on the ore shows the lode to be widening. The ore body on the 1465ft. level, strange to say, is also improving slightly, latest figures showing 9.8 per cent. lead and 11.3 per cent. zinc.

The latest official assays of the zinc lode in the South Blocks (Zinc Corporation) are:—635ft. south drive, 11.7 per cent. lead, 2.9 oz. silver, 7.2 per cent. zinc; 522ft. north drive, 3.2 per cent. lead, 1.5 oz. silver, 6.5 per cent. zinc; 522ft. south drive, 4.7 per cent. lead, 1.9 oz. silver, 11.6 per cent. zinc. In the main lode the main north drive on the 1050ft. level continues in satisfactory grade ore.

Steady developmental work proceeds in the North mine, generally with contenting results. The main crosscut on the 1400ft. level is in over 175ft., and completed for over 130ft.

The Junction North mill had another excellent run last week, producing 744 tons of leady concentrates, 528 tons zincs, and 310 tons slimes. The "leadies" averaged 52.8 per cent. lead, 32.3 oz. silver, and 14.9 per cent. zinc. The North mine concentrates averaged 69.6 per cent. lead, 22.8 oz. silver, and 6.7 per cent. zinc.

Block 14 increased its output last week, raising and despatching a total of 1220 tons of ore (carbonates and sulphides).

The British continues to shape well, though the lode hasn't yet been met at No. 11 level. This, however, is certain, and will be found before very long. Exploration will shortly be commenced at the South mines' 1270ft. level.

Interesting mining news seems to be very scarce for the moment—Broken Hill is suffering one of its periods of peace and steadiness

## Lithgow District.

(From Our Correspondent.)

Lithgow, August 1.

The recent developments in the New Burragorang silver mine, at Yerranderie, in the south-eastern portion of this district, is of very great importance, inasmuch as it settles all doubts as to the longitudinal and vertical continuity of the "white streak," which has proved such a fine dividend-earner for the Yerranderie silver-mine owners. With the same lode producing fine ore in the Silver Peaks mine, at the north end of the field now proved to be carrying values up to £21 per ton of ore at the other end of the field—it is impossible for any reasonable doubt to exist as to the continuity of the lode, with its rich shoots of ore. The directors and shareholders of the New Burragorang silver mine deserve every credit for the plucky manner in which they have stuck to the work of improving the mine and developing the lode at a considerable depth; and the development justifies them in deciding to erect a plant that will enable them to work down to 3000ft. on the underlay.

In the same locality, the Clarke shaft was sunk 30ft. for the fortnight, making a total depth of 651ft. The sinking here has been somewhat retarded owing to breaking-down ore, the quantity of which lifted to grass for the fortnight was 7 tons of firsts and 212 tons of seconds. Since starting to sink the last lift of 30ft. from 621ft., the ore body met with has been somewhat irregular in formation, varying from 9in. to 6ft. of lode, the foot wall carrying 6in. to 9in. of first grade ore right across the shaft, with at times patches of galena showing throughout, which will be stoped out in due course. The management intend to resume work in the No. 1 stope in a few days, and it is said by those who know the mine that the property never looked brighter. Another consignment of ore has been despatched to the smelters.

## Orange District.

(From Our Correspondent.)

Orange, August 1.

A four months' suspension of the labour conditions has been granted in respect to the Mount Bulga copper mine, situated near Orange. The applicant, Mr. N. Murray, of Sydney, asked for six months' suspension in order to admit of the raising of fresh capital to develop the mine, but the Warden, Mr. A. B. C. Burke, granted four months.

Matters at the Cadia copper mine are progressing satisfactorily. About 150 men are employed in and about the mine. Seven teams are engaged in carting coke from the Orange railway station to the property. Happily the comparatively dry winter has favoured the teamsters, otherwise the road would have been in a very bad state indeed.

The old Brown's Creek mine is proving a paying proposition under its new title "The Golden Springs Mine." Mr. J. W. Roberts is the manager. Additional capital has been expended in opening up the property, and new machinery has been installed. Development work has been proceeding vigorously for several weeks, and a commencement has been made with the unwatering of the shafts.

---

Stackpool's lease, formerly the property of the White Crystal Tin Mining Co., Ardlethan, has been sold to a Sydney syndicate. The lease is to be floated as the Carpathia North in 125,000 shares of 5s. each. The vendors take 25,000 shares paid to 3s. and £10,000 in cash, but of this £8000 is required for the purchase money for the lease. Expense incidental to the flotation of the company and brokerage at the rate of 3d. per share will be a charge on the new company. The public are invited to take 100,000 shares at 3s. each.

At the petition of Henry White Ltd., an order directing the winding up of the Conrad Stannite Mines Ltd., situated in the Inverell district, was made by Mr. Justice Street last week. Mr. C. F. W. Lloyd was appointed official liquidator.

The Goldsworth mine, in the Uralla division of the Peel and Uralla mining district, has crushed 4 cwt. of specimens, which yielded equal to 250 oz. to the load. General crushing has been commenced.

Yambulla, for some years after the finding of reef gold, a prominent mining centre on the further south coast (says our Wollongong correspondent), is now in much reduced circumstances. There are only two parties raising stone, and the warden's office has been removed to Eden. Mr. Grainger, late manager of the Yambulla mines, is now cyaniding tailings heaps.

---

# TASMANIAN MINING.

The wings in the second stope of E. lode in the Hercules mine, Rosebery, are carrying 8ft. of good value ore, and on the footwall side a large tonnage of payable ore is being won. In the sixth stope ore values are also good, while in the fourth stope of F lode the ore width has increased to 5ft., and the metal values are excellent. No. 1 bore at 41ft. intersected F lode, and the core shows massive iron pyrites.

The Comet Silver Mining Co., of Dundas, one of whose leases was recently forfeited by the Mining Warden at Zeehan for non-compliance with labour covenants, has spent nearly £200,000 in the last 20 years on the property, but up to the present shareholders had received no dividends from the mine. Tributers had worked the sections for nine years. It was about eight years (said the manager) since any mining work had been done on section 1796. The ore on this section was low-grade, suitable only for flux. To get it out would mean an expenditure of £1000 on a tramway. During the last nine years the company had received over £5000 in royalty from the tributers. The annual expenditure by the tributers for the last two years was about £7000, but previously it had been £14,000 to £15,000 annually.

A prospector named Purcell has reported the further discovery of osmiridium in lode matter at Whyte River, on land adjoining the leases of the Bald Hills Osmiridium Syndicate, but the width of the formation has not been declared. Osmiridium, it is said, can be clearly seen in the stone, and some of the material has yielded high values.

---

# MINING IN QUEENSLAND.

## North Queensland Fields.

(From Our Correspondent.)

Mareeba, July 26.

Some interest has been aroused in the district over the Gilmore Tin Mining Syndicate N.L. This company some time ago discharged the manager and let the mine on tribute. When this was done, the company was in a bad way financially and the manager was unable to locate payable bodies of tin. So soon as the tributers went to work they got excellent returns.

From the 9th January to 4th July, 1913, the tributers' returns were as follows:—Ward and party, 37 tons of stone treated for a return of 3 tons 11 cwt. 2 qrs. tin, valued at £372 3s. 7d.; McLelland and party, 45¾ tons of stone for 7 tons 4 cwt. 3 qrs. tin, value £886 6s. 4d.; Thompson and party, 28 tons of stone for 2 tons 5 cwt. 2 qrs. tin, value £259 15s.; Lynch and party, 51 tons 2 cwt. 3 qrs. stone for 13 tons 6 cwt. 1 qr. 1 lb. tin, value £1526 17s. 3d. Thus, in 6 months, the tributers raised 162 tons 12 cwt. of stone, which gave a return of 26 tons 8 cwt. 1 qr. 9 lb. of tin, valued at £3045 2s. 2d.

The stone raised averaged £18 15s. 6d. per ton, so it was not bad dirt.

The company received royalty amounting to £240 1s. 5d.

At the half-yearly meeting of shareholders, held on the 17th inst., the directors were taken to task by Mr. Ortt.

After the notice calling the meeting was read by the secretary, the directors' report and balance-sheet were then read, and the chairman, in proposing the adoption of same, said:—I do not know that there is anything I can add to what the report contains, except to say that if your directors had had the slightest idea that the amount of tin which has been won from the Gilmore mines by the tributers during the last six months had been available for so little work, the sinking of the main shaft would not have been stopped when it was. With the money which the tributers made, we would have been in a position to prove if payable tin existed in the deeper ground. If you refer to the last half-yearly report of the directors, you will find that prior to the cessation of work, efforts were once again directed to the upper levels. The directions given the manager were to put the whole of the men—thirteen in number—in any part of the mine where he thought there was tin. After four weeks' work he advised the directors that he was beaten, and that as far as he knew all the tin that would pay the company to remove had been taken out. You will see the manager had absolutely a free hand, which, as a matter of fact, he had from the time he joined the company, so far as working of the faces of ore was concerned, for no one should have known the Gilmore mines better than he did. I can assure you it was a surprise to the Board to see the tributers win the amount of ore they did durng their term.

Mr. Ortt then severely criticised the actions of the late manager and blamed the directors also. After a general discussion and explanations the retiring directors were re-elected.

It was then decided to procure a manager and the company to work the mine again, and any part of the leases not required for the company's own working to be let on tribute.

Local residents have great faith in the Gilmore, and one experienced man told me that tin would be won from the mine for the next 50 years. Apparently the present state of affairs is due to the fact that employees of the company have purposely passed or covered up payable dirt until the time came when they could get a tribute. This is not the first time this has been done in North Queensland.

There has been a demand lately for shares in Leisner's Wolfram Blocks at Wolfram, but so far I have been unable to learn the reason why. This mine is a block on the largest producers, namely, the Murphy and Geaney and Larkin and Wade mines. Apparently, after making about 300ft. through blank country, Leisner has good indications.

Mr. R. H. Miller, of the Almissa Tin Syndicate, Mt. Windsor, via Molloy and Mt. Carbine, is at present busy assembling the necessary machinery to enable him to sluice the big tin flats owned by his syndicate.

Developments in the Prince Alfred tin mine are being anxiously awaited. It was a tributed that on Thursday, 24th inst., the lode would be struck in the deeper level. On the success or otherwise of this development the future of the mine depends. Shares are, in consequence, fluctuating according to the opinion of the holders. However, no word has yet been received from the mine, but it may come any day.

---

## MINING IN WESTERN AUSTRALIA

(From Our Correspondent.)

Kalgoorlie, July 28, 1913.

The fact that the shaft on the new lode on the Greenfinch at Westons had cut granite at a depth of 44ft., although further sinking has proved that it was a comparatively thin layer, is very ominous, as it confirms the opinion, freely expressed by all miners who have worked in the district, that, sooner or later, the lodes will be cut off by granite. The fact that a spur of granite has cut off the lode at the shallow depth of 44ft. points to the possibility that the main body of granite is not far off. The lodes at Westons strike east and west, and underlie north, while the granite on the north has an underlay to the south towards the lodes.

Investors in the Edna May had better keep this fact in mind, especially as Mr. I. S. Hartrick, the first manager of the mine, who was one of the largest original shareholders of the company, sold out his interest when he retired from the management in March, as did also Mr. W. MacNamara, his accountant, who, with Mr. Frank Boyd, floated the mine in Melbourne. The present market valuation of the mine is, say £110,000, while Mr. A. E. Morgans valued the ore in sight above the 75ft. level at 12,000 tons, assaying 87s. 8d. per ton, or £52,000, and Mr. M. T. Williams at 20,000 tons, assaying 85s. per ton, or £84,000. Mr. Morgans estimated costs at 18s. to 22s. per ton, which would leave a net profit of £40,000, and, on the same basis, the profit on Mr. Williams' tonnage estimate would be £64,000. That both these estimates are on the conservative side is proved by the fact that the first run of the new mill gave an average of 84s. per ton, exclusive of gold left in residues and absorbed by the new copper plates, and also because the 1421 tons taken out during development returned £11,420, or fully £8 per ton, exclusive of gold in residues. It is also significant that, in his official report, dated January 5, 1912, Mr. I. Crabb, Inspector of Mines, wrote of the Myrtle Central, which adjoins the Edna May on the east, "that a shaft has been sunk in kaolin formation to a depth of 90ft. In this formation bunches of quartz occur, which, I am afraid, will, on further development, be proved to be very limited in extent." This was 18 months ago, and very little work has been done since.

The fact that the directors of Tindal's, Coolgardie, are to call up £3000, spread over three monthly calls of 6d. apiece, has not created much enthusiasm on the fields. For one thing, the amount is not sufficient to properly equip and develop the Perseverance section of the property, which is, rightly or wrongly, regarded as the most hopeful portion of the mine. Also local residents have grown callous through long familiarity with the past management of the mine.

Since penetrating the lode at No. 5 level on the Victorious mine, Mr. G. M. Roberts has been very reticent regarding developments. Although the crosscut showed assays of 110s. per ton for a width of 72in., immediately driving started, values practically disappeared, and, for the last three weeks, have been too low to be worth mentioning. A considerable amount of driving has been done in the interval, and, as it is estimated that each level contains 100,000 tons of ore, the reserves of low-grade ore, averaging 20s. per ton, must be rapidly increasing. To raise this grade to 28s. per ton, what it was during the first quarter of this year, when average monthly profits of £6800 were earned by stoping out the 3000 tons of rich ore above No. 4 level, would require 30,000 to 40,000 tons of similar high-grade ore to mix with the low-grade. Until this is obtainable, any increase in grade, brought about by stoping above the intermediate level from the winzes below No. 4 level, can only be temporary and another flash in the pan. There are big possibilities in the property, but treatment began too soon to give development a proper chance. Compare it with the Bullfinch, which started development 12 months earlier, and started crushing 7 months later.

A good deal of activity is being displayed at Speakman's Find at Block 50, Hampton Plains Estate. This is not a new find, as the writer visited it 8 or 9 years ago with the late Graham Price and W. Campion, then consulting engineer of the Hampton Plains Co. It was then called the Hampton Boulder, and consists of a large dyke of quartz-porphyry averaging 300ft. wide, and so hard on the outcrop that it can only be worked by "shooting." It is gold-bearing, but, at that time, it was too low-grade to be profitably worked, and, after being tested in a casual manner, was abandoned. Since then the firewood tramway has made the district more accessible, and improvements in mining practice, and the introduction of suction gas engines and other economy-effecting devices, have made the proposition an attractive one. A test crushing put through the Brown Hill Consols mill returned 5¼ dwt. per ton by amalgamation with 4½ dwt. left in the residues. Messrs. R. Hamilton and Syd. Yeo examined the property last week, but their trip was unofficial. The Hampton Plains Co., who hold the freehold, give better terms than Government, and Mr. Francis, the company's attorney, has gone to Melbourne in connection with the affair, as Melbourne investors are interested. There is a similar quartz porphyry dyke 120ft. wide at Balgarrie, 20 miles from Paddington, which has attracted the attention of investors for years, but has never been genuinely tackled.

As the reconstruction of Chaffer's has been agreed to, and a new sulphide plant to treat 6000 tons monthly is to be part of the new programme, a review of the mine's position may prove interesting. On December 31, 1911, Mr. J. Boyd Aarons, the manager, estimated the ore reserves at 104,500 tons of an assay value of 28s. 9d., and an extractable value of 25s. 9d. per ton. Against this Mr. Aarons estimated costs, with the proposed new plant, at 23s. 3d. per ton, showing an estimated profit of 2s. 6d. per ton, or £13,000. Since then, the ore shoot at No. 16 level has been proved on No. 4 lode for a distance of 298ft., and width of 77in., assaying 29s. per ton, or 26s. extractable, practically the same figure as the reserves. In addition, an ore shoot has been opened up at No. 16 level on No. 3 lode, and assays 120s. per ton over a width of 64in. for a length of 43ft. Until further development is done, the permanent value of this find is uncertain. The items of Mr. Aaron's cost estimate are:—Mining 7s. 6d., treatment 12s. 6d., realization of bullion 2d., development 3s., and general expenses 1d. per ton. The latter item is absurd. For instance, the Great Boulder charges 8d., the Ivanhoe 1s. 6d., and the Boulder Perseverance 1s. 4d. per ton, and they treat 20,000 tons monthly against Mr. Aaron's proposed 6000 tons. Then, again, the Great Boulder, during the first half of 1913, treated 17,680 tons monthly at a cost of 24s. 8d., including 2s. for development, and the Horseshoe 25,390 tons at a cost of 25s. per ton, including 3s. 6d. for development, and is it likely that a 6000 ton output can be operated cheaper? Judging from the way the Boulder and Horseshoe ore-shoots are dipping, Chaffer's must ultimately get them at depth, when a much bigger plant than now projected would be justified. With a 6000 ton plant, Chaffer's will only be a hand-to-mouth proposition.

---

## MINING IN NEW ZEALAND.

The directors of the Muddy Terrace Sluicing Co. Ltd., Waikaia, in the Province of Otago, have issued to shareholders a memorandum containing part of the report of the chairman of directors to the board after a recent visit. The memorandum states that there are 10 faces or sources from which returns can be got on the claims, and to which the plant has been laid. Of these 10, eight are already opened up and proved, and seven of them are ready to yield gold immediately the water is brought on to them. The whole of the faces already opened up, and which are now virtually being operated on, so far as the water conditions will allow, show good gold-bearing wash, and Long Gully, which has not yet been opened up, shows excellent prospects for development. The returns have so far been intermittent and under average, but considering all things have been consoling at a time when much discouragement might have reasonably been entertained. Commenting upon this the manager has stated that but for the flood disaster he would have sent forward returns for the first half of the year exceeding those of any previous corresponding period. When the full supply of water is again brought in, the first duty will be to get all this wash swept in and the Long Gully field opened up and a big endeavour made to pull up the leeway caused by the temporary set-back, and normal conditions resumed under what is firmly believed to be developments and auspices better than ever. Everything has been kept up to the best working standard, and constant vigilance observed at all points. The rains at the end of March and onwards would have enabled the management to sweep in such a large body of wash in April and May that by that time the records of previous years would likely have been topped. The temporary loss of the main supply of water, however, left them with a shortage of gold equal to 514 oz. as compared with last year at the end of June. The returns from the mine since the end of the last financial year (October, 1912), and to the end of June, 1913, were 465 oz. 5 dwt., valued at £1859.

There is a demand for deeper workings on the Coromandel goldfield, where such rich hauls were got from surface workings in the early days of that field, and again about 21 years ago in the Old Hauraki mine from Legge's reef. At the present time, says the "Otago Witness," mining is very dead at Coromandel, practically the only work in progress being in the Old Hauraki Reefs, Mount Welcome, and also at Bremner's Freehold on the Tiki section. In the latter mine coarse gold has just been reported from Tiernan's reef at the low level, and the Mount Welcome mine is at present driving the lowest level yet put in towards the main Tokatea reef, which is the backbone of the Coromandel Range, and should surely be well worth prospecting at a lower level than has yet been worked. This main lode stands out boldly on the range, and rich shoots of ore have been obtained in proximity to it, although the big reef itself is a "buck" one. What is required to properly test the field is for a strong company to be formed to acquire certain properties that are now lying idle, and then drive at a depth of 1000ft. from the lowest shaft on the flat hillwards, so as to intercept the Tokatea reef at what would be a considerable depth, seeing that it is on the top of the range. It is quite probable that although the Tokatea reef is not payable on the surface, yet when cut below the water level it might be found to have made gold downwards, added to which such a work might also intersect other payable lodes as it was pushed hillwards. Various subsidies have been granted by the Government towards the cost of the crosscut, at 1000ft. on the Thames field, and it is probable that, if a company was formed to undertake similarly important development work at Coromandel, it might also get a grant in aid. If this work were carried out, and payable ore discovered in the main Tokatea reef, it would mean a new goldfield at Coromandel, and result in many other companies being started with a similar object, as the Tokatea runs for miles along the hills.

During the four-weekly period ended July 5 last, the Waihi Gold Mining Company crushed and treated 14,568 tons of ore for a return of bullion valued at £25,279. This brings the total value of the bullion won from the mine to date (corrected to December 31, 1912) to £10,277,295. The management cabled to the London office on July 21st giving the values of ore now in sight on the property:—Royal lode, east, 17s. per ton; Empire lode, west, £2 1s. to £2 19s. 6d. per ton; Martha lode, 6s. 6d. per ton; Dreadnought lode, south crosscut, 6ft. in width and worth £12 10s. per ton; eastward, £3 3s. 4d., and westward, 18s. 4d. per ton. The Welcome lode was cut at 56ft. from No. 2 shaft: First 2ft., the value per ton is 14s. 4d. It is expected to reach the Trout winze in about seven weeks.

The Waihi Gold Mining Company's plant at Horahora is nearing completion, and is expected to be ready to put into operation by the end of the present year. At Horahora itself, the work of constructing the water-race and erecting the turbines, generators, dynamos, and other portions of the plant, has been practically completed, and an early reduction in the number of hands employed may be anticipated. Trial runs have been made with portions of the machinery. The transformers for increasing the current from 5000 to 50,000 volts are also nearing completion. Work remaining to be done in connection with the scheme includes a certain amount of wiring, and also the installation of motors, etc., at the mine.

With the Government subsidy of £1000 just granted, the companies will be able to complete the low level crosscut for the development of the Thames field at 1000ft., a work upon which the mining future of the district largely depends. The contractors for the extension of the main crosscut at the 1000ft. level have driven a total of 288ft. for the present contract. The country is still of an easy nature for driving, but requires to be kept close timbered to make it secure.

Extensive alterations and improvements to the battery recently purchased by the Watchman Co., from the Day Dawn and Norfolk Co., are now in hand, also the construction of a tramway from the Sunbeam Creek level to the battery, a distance of about 1400ft., which will enable the ore from the mine works to be conveyed direct to the mill for treatment at small cost. It is expected that the whole of these works will be completed in time for the plant to start permanent crushing operations about October 1. In the meantime, the mine itself is being further opened up, and the main rise is being put upon the middle parallel reef above the Sunbeam main level, so as to open up further blocks for stoping operations. This rise is now up a total distance of 135ft. above the Sunbeam main level, and excellent prospects are being met with, the reef proving to be of good grade for the whole distance. The blocks being opened up in this direction, taken in conjunction with the extensive blocks previously opened up throughout the mine, promise a steady output of payable ore for some years to keep the reduction works steadily employed after the improvements and connections are completed.

A telegram was received from the New Waitaia mine, Kuaotunu, on July 22, stating that 95 tons of ore had been crushed and treated for a return of 479 oz. of melted gold, of an approximate value of £1400.

# VICTORIAN MINING ACTIVITIES.

## Ballarat and District.

(From Our Correspondent.)

The South Berry board has decided that after extracting all the payable wash from the present workings it will recommend that the company suspend operations, the irregular value of the wash being the contributing factor. Probably two or three months' work is in sight. Shareholders should be in a position to get a final dividend of about 1s. or 1s. 3d., as the plant is a fairly good one and the company owes very little.

The syndicate that is boring for the lost Berry lead in the old Berry United lease has started another bore, some distance to the east of the last one, which bottomed at 363ft., about 60 or 80ft. too shallow for the lead. It is thought by competent authorities that the trend of boring should be more westerly, though the last bore, which was the westernmost bore put down, proved shallower ground than the more eastern bores did.

The position at the Hope mine seems to be more satisfactory. High grade wash was opened up for about 40ft., when it became a little poorer, and the men were shifted to the blocking section off the No. 1 rise. It is expected that any day the good wash that dipped away from the north drive, from the No. 2 rise, will be met north off the main west level. The quality has improved appreciably in the last few feet driven.

The position at the North Woah Hawp is more encouraging. The 1400ft. east crosscut has reached the 12-foot slates country, and it is hoped to open up some good supplies of stone on this line. The crosscut is to be pushed on to the line of country now producing good bodies of ore in the New Normanby 1500ft. level, which should be reached in another 120ft. of crosscutting. The stone in the New Normanby is rising into the North Woah Hawp. This reef is being opened up by the North Woah Hawp from the end of the New Normanby 1500ft. south drive, and 2ft. of good stone is being stoped. A vein of inferior quality is being driven on above the 950ft. level, and they are rising from the 750ft. level. The western stone at 950ft. is better, and the stopes at 1400ft. (inter level) show fair gold. About payable ore is being stoped at the 1300ft. level.

In another 120ft. or thereabouts the big break beyond which in the level above the long shoot of gold made should be reached at the Williams Fancy No. 7 level. There is a mixture of veins and slate on the east side of the drive, and this is being broken out to see if better stone exists behind. The rise just holed through to No. 6 opened up payable ore until nearing the level, when the stone became poorer, but the long shoot of gold had not made in the No. 6 level until the drive had been extended some distance further along. The stopes at No. 6 continue to look healthy. The first stope has been taken out for a height of 6ft. on the run 60ft. back from the face. Its width averages 18in., and its value 5 dwt. per ton. The board at its last meeting had almost the equivalent of a dividend of 1s. 6d. on hand, and following the practice of the past two months a dividend of 6d., and a bonus of 6d., were agreed on. The appearance of the shoot of gold in the No. 7 level will very likely be followed ere long by the flotation of the South Williams Fancy lease, which is held by a Ballarat Syndicate.

## Bendigo and District.

(From Our Correspondent.)

The gold production for the week ending August 2nd, 1913, amounted to 3429 oz. 14 dwt. The principal producers were Central Red, White and Blue, 310 oz. 2 dwt.; Golden Pyke, 308 oz. 9 dwt.; Ironbark, 213 oz. 1 dwt.; Carlisle, 192 oz. 4 dwt.; Princess Dagmar, 178 oz. 15 dwt.; South New Moon, 157 oz. 8 dwt.; Spring Gully, 142 oz.; Williams United, 137 oz. 7 dwt.; New Chum Goldfields, 110 oz. 15 dwt.; Great Northern, 99 oz. 14 dwt. Five dividends were announced aggregating £5239 13s., viz.:—South New Moon, 1s., £1600, total to date, £498,400; Ironbark, 1s., £1239 13s., total to date, £121,955 18s.; Carlisle, 6d., £900, total to date, £55,800; New Chum Goldfields, 6d., £800, total to date, £20,800; Nell Gwynne, 6d., £700, total to date, £5600.

Johnson's Reef met with an encouraging development in crosscutting for the Princess Dagmar stone, uncovering 6in. of bedded quartz, containing galena and several colours of gold. The stone was reached at 38ft. from the rise, and is dipping west with the strata, the crosscut having just passed through a small anticlinal fold, formed by the double folding of the syncline beds. This quartz represents either the continuation of the "Dagmar" auriferous stone on the east side of the trough, or is connected with another trough formation at 30ft. above the latter reef, known to exist further north. It is conforming to the north pitch of the beds, and enlarging underfoot. These conditions suggest the existence of an inverted cap below the crosscut, and that the corresponding east leg will be met shortly, as the back recurs on the other side of the second trough, where it will exist in the extreme eastern beds of the "Pyke" fold. There is a small counter fault in the end of the crosscut, which may be responsible for the auriferous character of the stone, but the chances are that the formation will prove gold-bearing beyond the influence of the fault. If it proves to be the trough quartz higher in the beds than the "Dagmar" stone, this and the adjoining company will have an additional chance of locating another run of payable quartz. As the bedded vein is due to recur in a few feet more of crosscutting, more important developments are likely to be met during the next few days. With the extension of the crosscut to the "Pyke" fold, the east back of the old Golden Age reef will also be intercepted in a favourable position.

Princess Dagmar prospects have been enhanced by the discovery of auriferous quartz, bedded on the east side of the synclinal fold, in the Johnson's Reef 781ft. intermediate west crosscut. This crosscut is 20ft. south of the south boundary, the latter being nearly 240ft. from the face of the 867ft. intermediate level, in course of extension from the north boundary. The trough stone and the bedded quartz accompanying the east back are intact between the level and the south boundary. Whether the quartz in the next company's crosscut be the continuation of this shoot, or a similar reef existing at a short distance above it, the outlook is much improved by the development. At present it looks as if the Johnson's Reef crosscut had intersected the present formation where it recurs on the east side of the trough, while the company are getting their excellent results from the western portion and in the centre of the trough, the eastern side being as yet unexplored. To the north the whole of the trough is intact for a length of 250ft., so that if the present shoot is continuous there is a good length of ground still available. The week's milling, broken in driving and stoping, produced 178 oz. 15 dwt. from 142 tons. The average of about 1¼ oz. per ton was not up to the standard of the preceding term, but is yet highly profitable. Having about £1500 in hand, there is every probability of another 1s. dividend being declared next Saturday. There are four stopes operating above the level, and the footwall spurs are being side stoped in driving the level. From 6in. to 2ft. of crushing material of payable quality continues in the trough, gold showing more freely in stoping. It is expected that the level will shortly get through the stone, which is rising overhead, but the stopes will be following the higher grade quartz for some time.

Hustler's Reef temporarily discontinued the important centre winze from the main 1605ft. crosscut, in order to extend the latter into the eastern beds, in search of the auriferous east backs existing in the Great Extended Hustler's shallower workings on the south end. The crosscut is out 44ft. from the level on eastern anticline, passing through a small east back during the term. The backs sought for are about 100ft. further east, but other auriferous shoots are likely to be disclosed before reaching the main objective. The No. 2 centre winze, at 230ft. north of the shaft, is down 23ft., through well mineralised spurs, one vein revealing several colours of gold. This winze was started to pass through the caps of the reef formerly worked till they pitched underfoot, but it is evidently too far west. A hole bored in the east end has indicated more stone in that direction, and after a few weeks more sinking, a crosscut will be driven in that direction, to ascertain the dimensions and quality of the reefs. It has been the experience that the centre formations enlarge going north, and the management is hopeful that more crushing material will be found by extending operations northwards from the winze, along the pitch of the beds.

South New Moon are within £1600 necessary of the amount to bring their total dividends to half-a-million sterling; an excellent record. This should be accomplished about the end of the month, or early in September. At 980ft. the old south-eastern spurs continue to reveal a nice sample of gold. A crosscut is being put out from the old workings nearer the shaft to the same channel, and a little gold is seen in an 8in. spur exposed last week, at 140ft. south of the shaft. A few colours of gold are visible in the eastern spurs at 900ft. The side stoping at 1060ft. also shows similar prospects. At 1140ft. there is no change to record in advancing the south level to 614ft. A little gold is seen in under-stoping the crushing material nearer the faulting in the level north of the south crosscut. A few spurs of no value show in crosscutting near the New Moon boundary at 500ft. At the eastern shaft on the Paddy's Gully line, work has been suspended for a time, the 200ft. crosscut having failed to disclose anything important in passing through centre. A party of tributers, working on the old reef at 440ft., milled 59 tons for 41 oz., of which the company receive half.

South Johnson's, one of the newer ventures on the Derby line, reported 10in. to 2ft. of stone in the 240ft. winze, which is being sunk to reach the cap of the saddle formation, found by the Derby Reef Co. at a depth of 300ft. The stone is believed to be the cap of the reef sought for, but has not yet proved of value. From the stated position of the winze, it is quite possible that the quartz exposed in sinking is irregular and associated with the faulting of the eastern beds. At 240ft. a level is going north in spurs, and should ultimately reveal the bedded reef.

Constellation arrested more attention by reaching the Golden Pyke reef at 75ft. east of the 420ft. plat, in the north or McBeth shaft. This east back is only exposed for a few feet in the bottom of the crosscut, where it carries 3in. of quartz and two or three colours of gold. The squaring in of the crosscut preparatory to the extension of levels north and south on the reef may improve prospects. The fact of the stone being gold bearing at this depth is very promising, though the reef is small. The formation has been found to rapidly contract at frequent intervals in the next mine, and it may be anticipated that similar conditions will here obtain as the opening up work progresses. The reef is untouched between 300ft. to 420ft., and formerly showed gold at the higher plat. It is proposed to also drive on the stone at 300ft., where operations will not be far below the cap. The stoping above 525ft. has been done from the main shaft. Recently the quality of the reef improved in these workings, but the enrichment proved fleeting, last week's return showing a big reduction. A rise is being extended to connect with the 420ft. crosscut off the north shaft, when the levels will be pushed on northward at 300ft., 420ft., and probably 525ft. The back also carries stone in the 622ft. crosscut off the main shaft, but it is of lower grade. At the latter depth the best chance appears to be in following the stone south toward the Golden Pyke boundary, the overlapping portion of the lease giving the company a greater length of the formation at this level.

Unity, having completed the 920ft. plat, will push on with the east crosscut to the spurs previously worked to some extent below 825ft. These spurs are associated with the folding of the reef channel and the Victory east back, not far below the cap, and are often confounded with the system the Carlisle company are working so profitably lower on the back, allied to faulting. The top fault is showing in the 1018ft. rise, and with it are several large spurs, on which a short intermediate level was driven a few months ago. Finding no auriferous quartz, and the system pitching out of reach in this end, an intermediate was started in the opposite direction. These spurs have a favourable appearance, and may show gold at any firing. On the Paddy's Gully line the 1145ft. is entering the eastern beds, where the east back of the "Sea" reef is likely to be reached in the next few weeks.

Catherine Reef still have a full width of good looking stone associated with the fault and the lava, in extending the 2300ft. south level to 453ft. The reef is stated to have reversed its pitch in this end, which, it is anticipated, may lead to an improvement in quality. It is rather remarkable that in a fault reef that has proved very productive along its upper limits nearer the east back, the lower portion should prove of so low grade, not a colour of gold having been seen in the south level to date. There is still a good strength of ground available before reaching the Williams United boundary, and any improvement in this end would greatly enhance the value of the mine. The leading south stope is being filled up. In the next, operating off the No. 1 south winze, the formation is being taken for a width of 30ft., and reveals a little fine gold. The third south stope is close to the main crosscut and close up to the rails of the 2200ft. level. There the western side of the reef is receiving attention, but no gold is seen in the solid quartz. Better results may be obtained as this stope advances. In the three uppermost stopes above the north level, the whole of the workings are along the spurs to east of the main reef, and within a few feet of the 220ft. level, a little gold showing. The crushing material here is rather limited. North of the No. 3 winze the spurs are also being extracted. Further ahead the main portion of the formation is being stoped near the Nos. 4 and 5 winzes, with a few colours of gold visible at intervals. The stope further north is beyond the No. 6 winze, where the top of the reef is of lower grade. In the open cut, to the south of the main shaft, the eastern spurs will be drawn upon more extensively in future. Up to the present these surface operations have been very disappointing.

Central Red, White and Blue are drawing the most productive stone just now from the 318ft. north intermediate stopes, close to the main level along the east back, gold showing freely last week. This shoot appears limited, but there must be a fair reserve of good ore further north near the No. 5 winze. The western intermediate still furnishes a fair quota of profitable stone, assisting toward maintaining a very remunerative average. The north intermediate level off the No. 5 winze should reach the 400ft. rise this term, and provide more working faces on payable stone. At 800ft. the plat is being formed prior to completing another 80ft. lift of shaft sinking. There is nearly £2000 to credit of the current account.

New Moon Consol crushing of 80 tons from the 1080ft. stopes produced 20 oz. 15 dwt. This is disappointing, owing to gold having been reported as showing rather freely in stoping at 245ft. north of the shaft. A width of 6ft. to 10ft. of crushing material is being taken here, and the official report states that nice gold is seen in breaking. Nearer the shaft the reef is of much lower value, which may account for the inferior average.

New Chum Goldfields, after a lapse of about 3½ years, reappeared as a profit distributing venture. This is due chiefly to the better quality of the stone allied to the east back of the 1076ft. reef, in the north intermediate. For many months the company drove north in the upper limits of the faulted neck stone, barely paying crushing costs. As the backs rose into the level the outlook brightened for a time, but like most of the gold shoots of this reef, the enrichment was short. It is in a similar position on the same back that the best results are now being got. The formation is identical with the North Bendigo 1000ft. reef, but the gold is more evenly distributed through the stone in the latter mine. Low working costs have contributed largely toward the success of the New Chum Goldfields in the present instance.

Williams United had about £1500 in hand after Saturday's improved yield of 136 oz. 7 dwt. from 407 tons. Of this sum £1000 has been placed in reserve for new machinery, on which an expenditure of over £6000 has been contemplated for some time. If recent averages show any permanency, it is probable that disbursements of profit will be made contemporary with the creation of a larger reserve fund. At 2100ft. the south level is in 640ft., with spurs and a little gold still in the face. On the hanging wall of the Catherine fault, the parallel level is advanced to 455ft., opening up a few small spurs of no value, the quartz improving in quality at a few feet overhead. The stopes are taking a width of about 70ft. of crushing material, fair gold showing in the spurs coursing through the eastern sandstone beds. At 2000ft. the prospects are a little brighter, a few colours of gold being visible in 8ft. of well mineralised quartz, at 260ft., in the south level. A colour or two of gold have been seen in making the connection with the south shaft at 1644ft., through 18ft. of crushing material.

Garden Gully, in extending the 494ft. north level to 510ft., have 6in. of well mineralised stone, carrying a few colours of gold. A small fault is exposed. As a rule this east leg is of better quality in the vicinity of the faulting. Stoping is in progress from the rise at 300ft. north, on 6in. to 9in. of reefy stone, of payable quality. North of the No. 1 rise, located near the shaft, the stopes extend to the 440ft. level, and have been squared to the old face at 55ft. north of the plat. In future the stoping will encompass the cap stone, which means increasing the height of workable quartz from 50ft. to 70ft., and gives a greater width of crushing material in the back stopes. The south level near the fault, across the Victory back, is traversing 2ft. 6in. of favourable looking quartz, without showing gold. Having about exhausted the payable stone in the 1552ft. north level, a level will be driven south toward the No. 3 shaft, from the crosscut 300ft. away. A winze is being started at 252ft. in the 2039ft. level to test the value of the stone along the backs of the South Garden outer reef. Work above 2180ft. has been suspended, and more attention will be paid to the shallow ground at the No. 3 shaft, where, it is believed, the reef now being worked above 494ft. at the north shaft has not been prospected.

### Castlemaine and District.

(From Our Correspondent.)

Spring Gully had a payable crushing last week. A parcel of 200 tons was treated for 142 oz. This is a great improvement on the previous four weeks. Included was a rich specimen weighing 25 oz. in the rough, which was picked out. The stone in sight is about the same value as that crushed. In the north level at 240ft. good prospects are also being obtained. As the profit of this last crushing will add considerably to the substantial balance already in hand, shareholders are commencing to talk about a dividend. The most of the stone that has given four successive payable crushings has been taken from the stopes south of the level that has been extended along Thomson's slide. The extreme eastern system of spurs are associated with the fracturing of the rocks to the east of the old workings, and are expected to extend for some distance.

South Wattle Gully reports a continuation of fair prospects. The drive from 300ft. on the west leg has been extended 17ft., showing a reef 2ft. thick, carrying a lot of pyrites. The No. 2 rise is up 22ft., stone coming in 12in. thick. The signs are all in favour of the saddle being cut by next report.

The two bucket dredges of the Campbell's Creek Co. had a better return than previous weeks, 94 oz. 10 dwt. being the yield. After a long spell, during which many big yields have been got, a dividend of 3d. per share was declared during the previous week. The Guildford dredge, operating in the Loddon, and which is chiefly owned by the same people as the Campbell's Creek, also entered on the dividend list. It declared a 6d. one.

### Maldon.

(From Our Correspondent.)

The great mine of Maldon, the South German Reef Co., is giving signs of once more taking its place near the top of the list of the State's gold producers. At the half-yearly meeting, held last week, the directors' report spoke very hopefully of the outcome of work done by Baxter and party. In order to make the northern portion of the mine accessible from 1750ft. a tribute was let to a party of six. Their ground is 300ft. in length, and starts 662ft. from the shaft, by a height of 500ft., or from 1600ft. to 50ft. below the 1750ft. level. They have been breaking stone from stopes above and in the winze below the level. The first crushing of 113 tons yielded 26 dwt. to the ton, and the next of 148 tons gave 89½ oz. From this the company gets 33 per cent., and 20 per cent. from the residues (value yet unknown). When that development was disclosed the company decided to at once extend the intermediate level north at 1900ft., or 100ft. below where the tributers are getting gold. This is being done by contract, and at the end of last week, the very day of the half-yearly meeting, the expected reef was in very truth intersected. There is 2ft. of mineralised stone showing, and the management reports it to be worth 15 dwt. to the ton. This development is looked upon as of great importance, as it was from the east reef that the handsome dividends were paid years ago. The total gold returns for the term was £4612. Mr. J. Finlayson resigned as mine manager, and Mr. H. Gonsal took his place. The latter recommended for the coming term the exploration of the east reef at 1730, 1900 (intermediate), 2000, and 2100ft. levels, by extending drives north on the lode channel. There are also points of interest at 1100, 620 and 440 levels that need investigating. The gross income was £6610 10s. 3d., and the overdraft was reduced from £1805 to £1502. The board fees were fixed at £40, to be divided amongst the local directors, and £2 10s. each per visit for Melbourne directors. Messrs. Calder, Bowe and Somer (Maldon), and Messrs. Moon and Kilsby (Melbourne) were unanimously re-elected to the board, and heartily thanked for their services. In the face of the results from the operations of the tributers all criticism of the tributing policy was silenced. Messrs. Webster and Gibson were re-appointed auditors at a fee of £2 2s. each per audit. Since the previous half-yearly report the capital of the company had been increased by 20s. per share, and all the shares had been taken up. There is still £29,625 of the capital to be called up.

Maloney's Red, White and Blue Co. also held its half-yearly meeting on the same day. This shows that the whole of the stone crushed for the term (with the exception of a few tons from the north end of the 84ft. level, that went 4 dwt. per ton) was taken from between the 84ft. and 159ft. levels, and although the drives and stopes in that part of the mine showed good value at times, the yield has been rather poor. A total of 584 tons yielded 181 oz. gold. Stopes and intermediate levels are being extended north and south from the No. 1 winze on low-grade stone. As the stone treated for the half-year has just about paid expenses, an improvement in the value of the ore would show a profit. The gas engine and crusher are working well, and showing a capability of treating a larger amount of stone. The manager hopes to get the desired improvement by extending the main levels at 84ft. and 159ft. northward. Receipts amounted to £851, and the expenditure was about £5 more, leaving a Dr. balance of £650. During last week 53 tons were crushed for 16 oz. 3 dwt., the stone being taken from the locality last named.

### Lauriston and Blackwood.

(From Our Correspondent.)

The Standard Glengonner mine at Lauriston has secured as manager Mr. J. S. Forbes, who has managed the Blackwood mine, near Mount Margaret, the West Australian at Bonnievale, and the Western Chief at Tambough, near Marble Bar, all in West Australia; and the Nil Desperandum at Myrtleford, Red Parrot at Harrietvale, and Try Again at Taradale. He professes to be so impressed with the possibilities of this mine that he has decided to accept the management of it.

The Lloyd's A.1. has been placed in the hands of Messrs. McColl and Rankin, of Bendigo, for flotation. During last week some fine specimens were broken out, containing more gold than stone.

In the Blackwood district the Golden Hope (Blakeville) has had a disappointing time. After a fair test, the directors called the shareholders together and explained to them that they had decided to stop operations on the present site, and had acquired the Undaunted mine, some miles to the westward. The company had a complete hauling and crushing plant on the mine, well worth £1500, and the total liabilities were under £500. It was their intention, subject to the approval of the meeting, to shift the plant to the Undaunted property, which had only been worked down to 200ft. After discussion the required permission was given.

New Sultan returns continue satisfactory. For the half-year ending June, 745 tons were treated for 486 oz. gold, and that average of stone is being taken from the stopes. The mine has installed rock drills throughout, and the result has been a considerable saving in cost of working.

The success of the New Sultan Reef mine is helping to maintain the Blackwood district returns, but in spite of that there is a gradual fall. Last quarter's gross total was 614 oz. 7 dwt. 15 gr., including 21 oz. of alluvial. This was 167 oz. less than the previous quarter, which was in turn about 200 oz. less than the December quarter.

Improving mining prospects are reported from the Kyneton district. Last week the Lloyd's A1 Syndicate (Lauriston) obtained three nice-looking specimens. One, about 3in. in length, contained nearly 3 oz. A revival is taking place at Metcalfe. Messrs. Reid and Keath have put through a quantity of what they regarded as second-rate ore, and which yielded 115 oz. They have installed an eight-head battery. Mr. Sorenson brought into Kyneton 21 oz. from a crushing of seven tons. Mr. A. Bennie has a promising show in Mr. Gamble's paddock. He has opened the reef in two different places.

When cutting a road in connection with the Ivanhoe gold mine, at Sunnyside, 30 miles from Omeo (V.), the workmen cut a small reef, and from this a 12-ton crushing has just been treated which gave 1½ oz. per ton. Messrs. Haycox and Sampson, who own the Con mine, at Gum Forest, report having obtained 81 oz. from 65 tons of stone.

## BENDIGO'S MINING TROUBLES.

### Linking Up All Australia.

That the managements of the gold-mining companies should be doing all they can to defeat the men employed at Bendigo (V.) on the question of "open mine" v. "union mine," is held to be a grievance, and that the union officials are in doubt as to the immediate prospects of the issue is apparent in the violence of their language. Mr. Jude, general secretary of the F.M.E.A., informed an adjourned half-yearly meeting at Ballarat last week that before six months they expected to get an award for the miners from the Arbitration Court, but he supposed the first to take advantage of that award would be the "servile, crawling creatures, who were parasites on other people." Then the general president for Victoria, Mr. T. Howes, said that unionists must stick together. There must be compulsory unionism, and the man who did not believe in it must be regarded as an outlaw in the sight of the law. The secretary of the Australian Workers' Union had told them that if the miners wanted a levy the A.W.U. were prepared to make a levy of £1 on every shearer. That would bring in £4000. The battle had begun in Bendigo, but it was going to be fought throughout Victoria. The battle was also going to be fought in Tasmania. At Bendigo he had been looking for a non-unionist, and met a Chiense. The Chinese told him that the miners were not going the right way about the strike. If a Chinese found a man who would not join a union, he was given a week to join. If he refused he was given another chance. If he still refused then a couple of Chinese would be told off to give him a beating. Next night he would get another beating if he did not join. They would also go to the employer and tell him that if he did not make the man join the union then they would all go on strike. The Chinese said:—"We would not spend money in strike pay—we would kill them beforehand." Has it come to this, then, that the general president has had to go to a despised Chinese to learn what his union should do when men prefer to call their souls their own? Or is it only that by merely relating what a Chinaman had told him Mr. Howes cannot be held to have incited his fellow unionists to violence!

Mr. Jude has also made a statement to the effect that steps were being taken to link up the whole of the mining organisations of Australia with the federation. In the present federation there were about 12,000 members. Mr. J. R. Little, secretary to the federal body, was, he said, at present in Western Australia, where it is hoped about 6000 men would signify their willingness to join the federation, and from 4000 to 5000 miners were expected to join in Queensland. It was likely, he added, that before the end of the present year the miners' federation would embrace the whole of the States, and would number about 25,000 members.

There is no prospect of an early settlement of the Bendigo dispute, although the men generally are behaving themselves peaceably. Some of the places vacated by unionists have been filled by independent workers, but there appears to be no great hurry to fill them all. On Wednesday of last week an engine driver at the New Prince of Wales mine, who is a member of the Eaglehawk branch of the Australian Engine Drivers' Association, refused to lower two non-union miners, and was thereupon dismissed, and his place was filled by a non-unionist driver. In spite of the general peaceable appearance of the neighbourhood, the non-union miners have still to be driven to and from their work in a cab.

## GOLDEN AGE (V.).

(From Our Bendigo Correspondent).

Having placed a winch winding plant on the old Johnson's Reef Extended, or north shaft, it is intended to make this shaft the base of operations on the continuation of the Golden Pyke productive reef in future, through the northern portion of the property. The old workings of the defunct Johnson's Reef Extended Co. have not been accessible for over two years prior to Tuesday last, and a good deal of curiosity had been evinced as to the location of the stone and the extent of previous operations. An inspection of the 655ft. west crosscut revealed two well defined east backs of the ''Pyke'' anticline, each carrying quartz, the second back bearing the closer resemblance to the Golden Pyke formation. On this back there are north and south levels for a total length of 98ft., the north end being 38ft. from the shaft, and, it is estimated, about 165ft. from the Golden Pyke lease. There is 3in. to 6in. of bedded quartz along the footwall, of a well mineralised character. Large spurs extend eastward to the hanging wall, greatly increasing the crushing material. There is little or no stone on the hanging wall in the crosscut, and as the level kept to the foot wall it will be necessary to increase the width of the workings in continuing it, to ascertain the full dimensions of the formation. There is 2ft. more of spurry quartz in the south face, of similar character, the hanging wall having also been disregarded in this direction. A rise of about 70ft. on the east legs connects with a crosscut off a winze from 521ft. The old stopes are not more than 50ft. in length, and as the cap is below the 521ft. crosscut, the reef is almost intact through this northern holding. Old records show that the returns varied from a few dwt. to 15 dwt. per ton, taking 6in. to 2ft. of reef, but it is evident that the quality of the stone was inferior just prior to the abandoning of the reef by the previous company. From the fact of the back not being visible in the 521ft. crosscut, and the winze from the latter depth is in western strata at about 50ft. down, it is fairly certain that the cap stone has not been opened up, but is encompassed between 521ft. and the east crosscut off the winze. It may be anticipated that the upper limits of the formation will be found faulted, as a strong slide is leading toward the cap in the top crosscut. This is apparently one of the larger faults visible in the Golden Pyke mine. The extension of the 655ft. north and south level will be proceeded with this week, and stoping may be commenced shortly. With the connection through to 521ft., no difficulty should be experienced in working the formation. The north level is expected to be at about the same depth as the Golden Pyke 643ft. south level at the boundary, and will be driven the more rapidly to connect. It is a curious fact that payable stone is not exposed on the boundary in the Golden Pyke mine, either in stoping to 35ft. over the 543ft. level, or in driving at 643ft. The 447ft. level is still some distance from the Golden Age ground. However, there is every promise of better prospects in prospecting the intervening portion of the reef. The first back seen in the 655ft. crosscut, and already referred to, carries a few inches of favourable looking quartz, and may be the continuation of the middle back known in the next mine. It is here untouched beyond the crosscut, and has evidently a trough cap, also unprospected below this depth. Both formations present greater possibilities, and with the inducement of splendid returns further north in the Golden Pyke, they will be more adequately prospected during the next few months. From the Golden Age main shaft to the north boundary is a length of something like 1000ft. along the ''Pyke'' fold at this depth. In driving and stoping north from the main shaft, operations on what is considered to be the same back opened up the stone for a length of approximately 250ft., and to a height of less than 50ft., so that there is a large extent of solid ground yet to exploit between these two points.

South of the main shaft the work of the past few weeks has given disappointing results. To the stopes from the north boundary have investors looked for higher grade stone, relying on the data of the Princess Dagmar workings off the rise. This rise is but a few feet south of the Golden Age lease, and averages of 8 dwt. to 2 oz. per ton were got from it in the first 40ft. above their 853ft. intermediate, which represents 50ft. over the Golden Age intermediate. The two first stopes above the latter were rather unproductive, but it was confidently anticipated that the third stope, started during the term, would disclose more gold. These calculations were upset by the first breaking, only a little fine gold being found. It will take two more stopes to reach the top of the richer shoot stoped by the Princess Dagmar right to the boundary, and it will be even more remarkable if much better quality stone is not dislodged on gaining the additional height. South from the main crosscut there are five stopes, running to 85ft. above the main 853ft. level. The reef averages less than 18in. throughout, with the best prospects in the two middle stopes. The leading stopes would be about 70ft. from the boundary, where the stone is improving in character, though still of low grade. The length of the stoping south of the main shaft is over 230ft. North of this shaft, an intermediate level has been started at 75ft. over the main crosscut, in expectation of meeting with an enrichment between the uppermost and middle faults.

On the Paddy's Gully reef channel the eastern shaft is being deepened to reach the ''Collmann'' reef. Sinking is close to the reef channel, but there have been no indications of a bedded reef for some time, and on the law of averages, another formation should shortly be uncovered in these workings.

# REPORTS OF COMPANIES AND CORPORATIONS.

## Chillagoe Co. Ltd. (Q.).

The following table shows the production of the Chillagoe Co. Ltd. (Q.) for the two four-weekly periods indicated:—

| | | Terms ended June 20. | July 18. |
|---|---|---|---|
| Ore treated . . . | tons | 8,433 | 5,869 |
| Produced | | | |
| Copper .. . .. . | tons | 249 | 302 |
| Lead .. . .. | tons | 506 | 169 |
| Silver .. .. | oz. | 45,582 | 22,866 |
| Gold .. .. . . | oz. | 389 | 318 |

During the June term the copper and lead furnaces ran 28 days; during the July term the copper furnace ran 28 days, and the lead furnace 9 days only.

## Broken Hill Water Supply.

The half-yearly report of the Broken Hill Water Supply Ltd. for the term ended with June 30th, which will be presented to shareholders on the 12th inst., shows a profit of £42,393, and by adding the balance brought forward (£26,116) the directors find themselves with £68,509 to dispose of. The 77th and 78th dividends of 1s. 6d. per share absorb £30,000, the sinking fund will receive £5000, £937 is written off for depreciation, which leaves a balance of £32,572 to carry forward.

No arrangement has yet been arrived at with the Government of New South Wales respecting the Umberumberka scheme, which is likely to be completed in about 18 months, and a curious position seems near at hand. On the one hand the Water Supply Company has its reticulations throughout the town, and the Government has asked on what terms the company will cede these to the Crown. On the other, the directors have decided that it would be unwise to dispose of any vital portion of the company's works, and that the only course was to sell the undertaking as a whole, or continue to supply water in competition with the Government. They, therefore, submitted proposals to the Government for the sale of the entire works, but as an alternative offered to carry on the Umberumberka scheme in conjunction with the company's undertaking, but neither proposition has yet been accepted. The company was not able to make any return to the shareholders until some considerable time after the completion of the scheme, and as it will remain under onerous obligations to supply water to the town and mines until the termination of the lease, it is manifestly unjust that its position should be seriously injured some four years before the lease expires. Mr. E. A. Whitehead, the engineer, in his report to the directors, states that the quantity of water consumed in the half-year was 216,275,500 gallons, an increase of 44,393,000 gallons on the consumption of the previous half-year, and an increase of 43,754,200 gallons on the quantity consumed in the corresponding period of 1912.

## Sulphide Corporation Ltd.

The output of the Sulphide Corporation (N.S.W.), for the past four weeks and for the previous six weeks, compare as follows:—

During the four weeks ended July 26th 17,648 tons of crude ore were milled at the Central mine, Broken Hill, producing 3149 tons of lead concentrates and 5545 tons of zinc concentrates. During the same period at the Cockle Creek works 3641 tons of leady concentrates, purchased ores, etc., were smelted, yielding 1389 tons of lead, containing 3450 oz. gold and 104,954 oz. silver.

During the six weeks ended June 28, 26,496 tons of crude oil were milled at the Central mine, Broken Hill, producing 4,472 tons of lead concentrates and 7,961 tons of zinc concentrates. During the same period at the Cockle Creek works 5,128 tons of leady concentrates, purchased ores, etc., were smelted, yielding 1,659 tons of lead, containinging 5,019 oz. gold and 163,883 oz. silver.

## Rose of Denmark Gold Mines.

The half-yearly meeting of the Rose of Denmark Gold Mines, Gaffney's Creek (V.), was held at 60 Queen-street, Melbourne, last Thursday, Mr. H. J. Whiting presiding.

The chairman said that 3305 tons of quartz had been crushed during the half-year for a return of 1534 oz. The shaft had been completed to 620ft., and the No. 6 level had been opened out. An important development had just occurred in this level, where improved prospects had been met with in 2ft. of stone on the west wall. The stone was being saved for crushing. He considered the prospects of the current term as decidedly promising.

The balance-sheet was adopted, and the retiring directors were re-elected.

## Broken Hill Prop. Co. (N.S.W.).

The following table gives the refinery returns of the Broken Hill Proprietary Co. during the last two four-weekly periods:—

| | Four weeks to July 2. | July 30. |
|---|---|---|
| Own ores, silver, oz. .. | 325,740 | 160,978 |
| ,, ,, lead, tons .. | 5,393 | 2,519 |
| Purchased ores, silver, oz. | 68,746 | 191,211 |
| ,, lead, tons .. | 2,012 | 3,855 |
| Antimonial lead, tons (estimated) .. .. .. .. .. .. | 58 | 28 |
| Zinc concentrates, tons | 6,634 | 7,000 |
| contg. silver, oz. .. . | 85,567 | 90,214 |
| ,, lead, tons .. .. | 488 | 524 |
| ,, zinc, tons .. .. | 3,054 | 3,227 |

## Broken Hill Block 10.

The following was the output of the Broken Hill Proprietary Block 10 Co. (N.S.W.) for the last two four-weekly periods:—

| | Term ended June 25. | July 23. |
|---|---|---|
| Crude ore treated, tons .. .. | 7,618 | 7,881 |
| Assay value— | | |
| Silver, oz .. .. .. .. .. .. | 9.6 | 10.1 |
| Lead, per cent. .. .. .. .. | 11.9 | 12.0 |
| Zinc, per cent. .. .. .. .. | 13.6 | 14.1 |
| Concentrates produced, tons .. | 975 | 1,043 |
| Assay value— | | |
| Silver, oz. .. .. .. .. .. | 34.0 | 34.3 |
| Lead, per cent. .. .. .. .. | 64.5 | 64.3 |
| Zinc, per cent. .. .. .. .. | 6.7 | 7.0 |

## Mt. Morgan G.M. Co. (Q.).

The smelting returns of the Mt. Morgan G.M. Co. for the past two months were as follows:—

| | June. 29 days. | July. 28 days. |
|---|---|---|
| Crude ore treated, tons .. | 16,648 | 19,776 |
| Many Peaks ore, tons .. .. | 6,457 | 3,929 |
| Production— | | |
| Blister copper, tons .. .. | 631 | 766 |
| Contents— | | |
| Copper, fine, tons .. .. .. | 625 | 758 |
| Gold, oz. fine .. .. .. .. | 8,203 | 9,384 |
| Approximate production from Many Peaks ore— | | |
| Copper, tons .. .. .. .. | 72 | 48 |
| Gold, oz. .. .. .. .. .. | 45 | 28 |
| Do. from secondary products— | | |
| Copper, tons .. .. .. .. | 5 | 9 |
| Gold, oz. .. .. .. .. .. | 106 | 242 |
| Estimated value of blister copper (with copper at £80 per ton) .. .. .. .. .. | £72,018 | £84,968 |

## OIL NOTES.

### Oil in New Zealand.

Mr. Okey, who represents Taranaki in the New Zealand House of Representatives, informed that Chamber recently that there are fourteen oil companies now attempting to develop the oil industry in his district, and he asked for further assistance from the Government while it was in its infancy. No one, he said, had yet made any money out of the oil industry, although hundreds of thousands of pounds had been expended in trying to develop it.

Mr. J. D. Henry, the English expert employed by the Taranaki Oil Wells Ltd. to represent the English capital which is invested there, said recently:—"The oil industry is now making great and satisfactory progress. New companies are starting drilling at Moturoa. A feature of this part of the work will be the running of two of the new type of rotary machines in a few weeks. The first rotary failed in heavy boulder country, but this has now almost been passed through by the percussion rig and the rotary will be reinstalled in a few days. The second rotary, properly bitted, is ready for a start. In a week or so some five new wells will be going down in the Moturoa field alone. Drilling is also proceeding in the Bell Block district, and new wells are to be put down at Inglewood and other points in Taranaki." A cable message from Wellington received in Melbourne last week stated that the refinery of the Taranaki Oil Wells Ltd., which had cost £36,000, had been formally opened, and that its erection had given a great impetus to prospecting for oil in the district.

A few weeks ago Mr. H. R. Cooke applied to the N.Z. Minister for Mines on behalf of an Auckland syndicate for a lease of 1000 acres of land near Waiotapu, in the Rotorua district, with the view of prospecting for petroleum. He stated that oil had been flowing in a locality within a few miles of Rotorua, during the past 40 years, but until within the last three years no attempt has been made to turn it to commercial advantage. The syndicate's proposals have been delayed owing to the hesitation on the part of the Government to sanction boring operations, as it was feared they might affect the thermal activity of the district. These difficulties have been overcome, and Mr. Cooke stated an order-in-council will probably be issued shortly. A sample taken from the surface flow has been analysed by Dr. J. S. McLaurin, Dominion analyst. He reported that the sample was composed of:—Benzine and light oils (distilling below 150 degrees centrigrade), 2 per cent.; burning oil (distilling between 150 degrees and 300 degrees C), 30 per cent.; lubricating oil (distilling above 300 degrees C). 62 per cent. and residue (pitch, etc.), 6 per cent. Commenting on the analysis, Dr. McLaurin wrote:—"The oil contains a very high percentage of lubricants, and is deficient in benzine and light oils, these probably having evaporated from the crude oil owing to surface exposure. It resembles in general character the oil obtained from Waitanga Hill, Gisborne, and is a crude petroleum of good quality. The sediment in the bottles was mainly pumice, with a little infusorial earth, and, as pumice land is not usually oil-bearing, the petroleum has probably come from underlying rocks of a different nature." No difficulty is anticipated in obtaining sufficient capital in England to develop the field.

Some little time ago an Auckland syndicate obtained permission from the Whangarei High School Board of Guardians to bore for oil on the school reserve. The syndicate commenced operations with a primitive plant, and obtained a liquid strongly impregnated with oil and with a heavy gas pressure which, when ignited, burnt freely and was extinguished with difficulty. This gas, it is thought, probably indicates the presence of coal in the vicinity. The syndicate, realising that it was impossible to thoroughly develop the discovery without proper boring apparatus, sent Mr. Isaac Coates to England with the view of securing sufficient capital to provide an up-to-date plant for proving the property. Mr. Coates has now sent a cablegram stating that he has formed a syndicate which is finding £10,000 capital. In the event of the boring operations confirming the promising results already obtained by the local syndicate, the English syndicate will undertake to form a company with a working capital of not less than £50,000.

A press cablegram from London dated July 30th, was received in Melbourne last week, to the effect that Mr. Justice Neville had made an order for the compulsory winding-up of the New Zealand Oilfields Ltd. The company was registered on April 5th, 1910, to acquire 44 concessions, having a total area of 147,900 acres, near Gisborne, in the Hawke's Bay district, on the east coast of the North Island. The authorised capital was £200,000, in shares of 2s. each, all fully paid up, but including 743,340 shares issued as fully paid to the vendors.

### Papuan Prospects.

Acting on instructions received from the Minister for External Affairs (Mr. P. McM. Glynn), the High Commissioner has selected an English expert to make investigations and further experiments with respect to the oilfields of Papua, the appointment having been given to Dr. Wade, who has been engaged for a period of twelve months, and is expected to arrive in the Commonwealth some time in September.

### Queensland Shale.

The report of Mr. Lionel C. Ball, assistant Government Geologist in Queensland, respecting the shale formations of the central district of that State, has caused some disappointment. Two separate areas were inspected, one extending through The Narrows almost from Gladstone to Rockhampton, the other being a smaller isolated patch on Baffle Creek, between Bundaberg and Gladstone. The strata comprise mostly clay shales, with some bands of very fine grained sandstone, and in view of the narrowness of the basins it is not likely that the total thickness will exceed a few hundred feet. Certain of the shales are rich in carbonaceous matter, which, under destructive distillation, breaks up into liquid oily and gaseous hydrocarbons. The quantity of oil produced is low compared with the yields of the kerosene shales of New South Wales, but is hoped that better results will obtain than is the case with the Scottish oil shales. Samples have been secured, and will be subjected to close examination. No attempt is being made to prove the extent and value of the oil shales. The location of the deposits on and near the sea-coast is a favourable economic feature, and will go some way to offset their desperately low grade. Still their exploitation is not a matter for the small capitalist. There are no positive signs of natural oil, petroleum, in either district.

### Worthless Options in Northern Territory.

The full report of Mr. Alex. D. McDonald on the supposed oil-bearing leases of the Victoria River Coal, Shale and Oil Co., which was formed in Melbourne some months ago, confirms and elaborates the depreciating comments sent by telegraph a few weeks ago. In the course of his report, Mr. McDonald says:—"The main concession, with the minor blocks over which the company's rights extend, has a frontage on the Victoria River of over 40 miles, and extends therefrom eastward to near the West Australian border. In the vicinity of Holdfast Reach, a block of 2500 acres was taken up on the east side of the river. Samples of petroleum oil of a superior quality, known as a paraffin base, and capable of producing an illuminating oil after refining, having been brought to Melbourne some seven years ago, and, under sworn declaration, were stated to have come from a gorge 10 miles from Rocky Bar, a large tributary running into Shoal Reach, as shown in the British Admiralty chart of the Victoria River. We found no difficulty in locating the locality designated in the declaration, after travelling thereto by saddle and pack horses from the Victoria River depot, situated some 90 miles from the mouth of the river. After careful and close investigation of this neighbourhood, I could not discover any indication whatever either of petroleum oil or oil-bearing formation. . . . We visited other localities in the vicinity of Sullivan's Creek and Crawford's Springs, covering altogether some 500 miles of overland travelling, and I have not the least hesitation in writing down this proposition as one that, in my opinion, is not in the least likely to afford oil in payable quantity, I, as a matter of fact, having failed to locate a solitary trace of crude oil, or of anything to indicate mineral oil, either in the vicinity of the specific places mentioned in the declaration or elsewhere in the concessions."

Mr. Glynn, the Minister for External Affairs, is not disposed to abandon hope that, in spite of the failure of private enterprise to find shale or oil, such may yet be discovered in payable quantity. The negative results secured through their enterprise, he says, did not prove conclusively that there were not oil fields to be found in the Territory, and neither could he claim that there were, for the reason that no systematic investigation had been made by the Government parties. In boring for coal, however, Mr. Glynn proceeded, traces of shale had been discovered, but the indications were not sufficiently pronounced to warrant him in affirming that oil would be found there in payable quantities. Private advices seemed to show that there were signs of oil that might warrant commercial development later on.

### Labour's Appeal for Capital.

With the object of securing further assistance from the Federal Government for the shale oil industry of New South Wales, or at least a renewal of the bonus which expired on June 13th, Mr. O. Rogers, president of the Newcastle Trade and Labour Council, visited Melbourne last week, and on Thursday night addressed delegates at the Trades Hall, on the Australian shale oil industry. The Newcastle Chamber of Commerce had determined on national grounds to advocate an increase in the bounty on all Australian-produced crude oil. Mr. Rogers then outlined the fight that was taking place between the "Octopus" (the Standard Oil Company) and the "Nigger" (the Royal Dutch and Shell companies). The latter companies had a powerful asset in the quantities of benzine available; while the Standard Oil Trust was all powerful in kerosene. Both companies were represented in the Commonwealth, and the country had to choose between the Octopus, the Nigger, and the white-labour Australian shale oil industry. He emphasised the growing need for oil for war-ships, and the claims of the local industry, which had already passed through many vicissitudes, for ample and adequate protection. An example was to be found in Scotland of the manner in which the oil industry had been choked by the Standard Oil Company being allowed to get a grip in the country. Out of some hundred companies operating in the early sixties only seven were now left. The shale areas of New South Wales were situated in the mountains and in inaccessible positions, and much capital would be needed, as well as liberal support, to develop the industry. Shale was mined in the same way as coal. The by-products were valuable and numerous, and were obtained from the shale in the following order:—Benzoline, motor spirit, benzine, heavy benzine, best kerosene (150 test), second-grade kerosene, cleaning kerosene, fuel oil, lubricating oils, greases, paraffin wax, sulphate of ammonia, bricks and gas. The Scotch companies had reduced their costs of working until the profit was now 3s. 6d. per ton of shale. The Australian industry was some way distant from this result at present, but with grit, perseverance and Government protection it could do the same. Mr. Rogers outlined the help given by the Government under the Shale Oil Bounties Act, which provided the sum of £50,000 spread over three years. This Act expired on 30th June of this year. It gave a bonus of 2d. per gallon on all refined kerosene made in Australia, and 2s. 6d. per cwt. on refined paraffin wax. The Government's intention had been to give assistance to the industry to the extent of £50,000, but the fact that less than £9000 had been earned by or paid over to the companies pointed to the fact that the scope of the Act was not as generous as the good intention at the back of it. The Commonwealth Oil Corporation, working in the Wolgan Valley (N.S.W.), and the British-Australian Oil Company, at Murrurundi and Newcastle, had expended nearly £2,000,000 in the industry, of which amount about £800,000 had gone in wages, and the Federal Government had received £40,000 in duty, on machinery. It was the intention to ask the Government to provide a bonus of 2d. a gallon on all crude oil produced in the Commonwealth. The companies had not asked for a duty on kerosene, recognising that for years to come they would be only able to supply 1,000,000 gallons of the twenty-four required for consumption in the Commonwealth. The companies were not asking for increase in the duties on motor spirits, benzines, naphthas, oil fuel or paraffin wax. Residual oil from the east of America and mineral lubricating oils should be taxed, and the latter placed on a level with castor and other oils, and taxed at 6d. a gallon. If the Government would help, work would be provided for 1100 men in a group of townships on the western fields. The companies had summed up the position thus:—"We find that although these oils are required in Australia the foreign importer, by reason of his cheaper labour, can keep us out of the markets. We therefore ask the Government to give us a hand." Speaking of the Australian products, Mr. Rogers added that the benzine had been found a more powerful motor fuel than the American product; the kerosene had a bigger illuminating flame area (and the State railways are using a large quantity of the kerosene), and as oil fuel it had been tried and proved in the war-ships. The Australian paraffin wax was of the highest grade. Too much stress could not be laid on the need for a supply of fuel for the navy, for oil was contraband in war, and if the fleet had to depend for its supplies in the future on the industry in the northern islands and Papua, it would be a grave matter.

---

## MINERAL RETURNS.

As supplied by the Department for External Affairs, the mineral returns of Northern Territory (exclusive of the Arltunga field) for 1912 were as follows:—Copper ore, 377½ tons, valued at £3998; silver-lead ore, 108 tons, valued at £820; wolfram ore, 39 tons, valued at £3330; tin ore, 270¾ tons, valued at £27,001; gold, 7413 oz., valued at £20,150. The Arltunga returns bring the gold value of the field up to £22,671, making the total value of the minerals won £57,820.

# ENGINEERING AND ELECTRICAL SECTION

Australian
General Electric Co.
217 Clarence Street, Sydney.
Tel.—Central, 3405, 4307; City, 2381.
"Penfold House," Cr. Queen and Little Collins Sts., Melbourne.
Tel.—Central, 2647.
Representing—
GENERAL ELECTRIC CO., U.S.A.
The
BRITISH THOMSON-HOUSTON CO. LTD., of Rugby, England.
The GUARANTEE of EXCELLENCE on GOODS ELECTRICAL

## MELBOURNE TRAMWAY SERVICES.

The various proposals which have been made incessantly for the past two or three years by residents of different suburban areas about Melbourne for extensions and improvements in the tramway services, have all along had to face the possibility that the Railways Commissioners might raise objections to any particular route, on the ground that it would prejudicially affect the interests of their department. There was also the possibility that the Melbourne Tramway and Omnibus Co. might object to certain lines on similar grounds, their agreement with the Tramways' Trust having given them exclusive rights in certain suburbs. As a matter of fact, however, that company has not been seriously threatened until just recently, but the case is different with the proposed lines through Hawthorn to Burwood, and through South Melbourne to Middle Park and St. Kilda. The M.T. & O. Co. has, therefore, forwarded a formal protest against the construction of those lines. It is pointed out, however, that both schemes were duly considered by the Railways Standing Committee, which took all the evidence tendered before recommending that the lines be sanctioned, but that the tramway company raised no objection at that stage. It is also pointed out that so far as one portion of the Hawthorn line is concerned, the tramway company not only objects to anyone else making a highly desirable improvement, but refrains from doing so itself, namely, in the way of replacing the antiquated horse tramway from the Hawthorn Bridge along Burwood-road, Power-street, Riversdale-road, and so on to Deepdene. The Hawthorn City Council has even offered to purchase that section of the company's line, but has not been able to come to any agreement, although the company confesses to a heavy annual loss upon it. The whole position, while aggravating to those directly interested in the new lines referred to, promises some interesting developments to those who can look on dispassionately.

The traffic receipts of the Melbourne Tramway and Omnibus Co. for the year ended on June 30 amounted to £755,092 as compared with £720,910 for the previous year, showing an increase of £34,182. With interest and other revenue, the total receipts amounted to £795,000, as against £760,793, an increase of £34,297. Working expenses, depreciation, rates and taxes, etc., amounted to £413,263, as against £367,484, showing, therefore, an increase on that side of the account amounting to £45,779, and leaving the net earnings at £381,827, as compared with £393,309, showing a decline of £11,482. As before the sum of £123,750 has to be deducted for debenture interest and sinking fund, leaving a net profit of £258,077 as compared with £269,559 last year, but the balance brought forward (£95,991) brings the divisible funds up to £354,068, as against £307,306. It is proposed to add £105,741 to the reserve for return of capital, making it £480,000 and completing it, and £7314 for renewal reserve, while dividends and bonuses will total £192,000, leaving £49,013 to carry forward. The annual report contains the following:—"Your directors have thought best to complete the allotment to the reserve for return of capital on this occasion, transferring for that purpose the balance of profit earned this year after paying 1/- per share in dividends and bonuses and taking the further sum required for the purpose from the amount carried forward from last year's profits. The interest earned on the investment of this reserve will in future be included with the income from other investments. Shareholders should remember that these large dividends and bonuses mean, of course, a reduction in the amount of the final distribution of the assets of the company, but the directors think they probably prefer this method to their being now paid moderate dividends and larger sums when the company is wound up."

The returns for July were:—

| | |
|---|---|
| Receipts .. .. .. .. .. .. | £58,903 |
| Increase over July, 1912 .. | £1,142 |
| Passengers .. .. .. .. .. .. .. | 7,083,627 |
| Increase over July, 1912 .. | 171,590 |
| Mileage .. .. .. .. .. .. .. .. | 1,026,211 |
| Increase over July, 1912 .. .. | 31,464 |

The mayor of Kew, Councillor J. S. Weir, made the announcement last Monday evening that after many conferences the Kew Council had now come to an arrangement with the Melbourne Tramway Company, which meant that the Kew horse tramway would soon be electrified.

The July returns of the Prahran-Malvern Tramways' Trust, with the corresponding figures for last year in parentheses, were as follows:—Car-miles, 118,805 (60,073); passengers, 979,718 (497,051); revenue, £6452 (£3150).

## VICTORIAN RAILWAYS.

### Decrease or Increase?

The receipts of the Victorian Railways for the financial year 1912-13, according to the State Treasurer's Department, amounted to £5,204,796, or £14,171 less than the record revenue of 1911-12. A statement made available by the commissioners last Thursday gives a comparison of the traffic during the financial years ended June 30, 1900 and 1912. Details are as follows:—

| | Year ending June 30, | |
|---|---|---|
| | 1900. | 1912. |
| Mileage open for traffic | 3,218 | 3,622 |
| Total train mileage .. .. | 10,107,549 | 13,836,375 |
| No. or passenger journeys | 49,322,809 | 104.234,732 |
| Total tonnage of goods and live stock .. .. | 2,998,303 | 5,297,685 |
| Revenue from passenger, etc., traffic .. .. | £<br>1,469,910 | £<br>2,711,985 |
| Revenue from goods and live stock traffic .. .. | 1,555,252 | 2,506,982 |
| Gross revenue .. .. .. | 3,025,162 | 5,218,967 |

The Railway Commissioners, however, state that a substantial increase will probably be shown when the Departmental return is made available. As only money handed over is accounted for by the Treasury, the decrease indicated in the State return is easily explained.

### The Electrification Scheme.

Tenders which had been invited in England and in the Commonwealth for the large condensing plant required by the Victorian Railways Commissioners for the large power station at Yarraville in connection with the electrification of the Melbourne suburban railways, were returnable last Monday. In order to afford encouragement to Australian tenderers, the Railways Commissioners liberalised the terms of payment, and arranged for the free carriage by rail of the plant from the contractor's works to the site of the power station, and for the benefit of tenderers whose works are situated in the country, they made the further concession that the materials required for the construction of the plant will be carried free by rail to the station nearest to the contractor's works. The contract will be let in three sections, the total cost being estimated by Mr. Merz at between £40,000 and £50,000. The branch line from the present Williamstown railway to the power-house site has been completed; it is about three-quarters of a mile in length, and two temporary sidings have been erected to facilitate the traffic. Before the power-house is completed, however, more substantial sidings will be built. There will be four siding tracks, and a circular siding to carry the trucks round one end of the station, and allow them to turn between the main building and the coal store. Under this arrangement, coal will be discharged from hopper trucks into the pit, whence it will be raised and carried to the coal store, or wherever required. There has been an unexpected delay in the arrival of the plans from London; they were expected by the end of July, but, according to latest advices, they will not reach Australia until about the end of this month. Soon after their receipt, however, a start will be made with the work. Mr. E. P. Grove will arrive about the middle of September to supervise the whole of the work, on behalf of Mr. Merz. No responsibility will be borne by the electrical engineer of the Department (Mr. Stone) until the scheme has been completed. The generating machinery to be installed at the power house, for which contracts were let some time ago, is in course of manufacture. Advice has been received from Mr. Merz that the contractors are making good progress. Delivery of the plant, however, is not required until the foundations are ready for its reception. Although the construction of the cars for the new scheme is not regarded by the authorities as a matter for urgent consideration, all suburban carriages now being built at Newport are designed in such a way as to facilitate alterations to the undergear when necessary.

## BRITISH AND EUROPEAN DEVELOPMENTS.

(From Our Correspondent.)

London, July 4.

The Marconi Committee has at last finished its work. The Postmaster-General has again appeared before it this week and intimated that the Government does not intend to raise objection to the Marconi Company's repudiation of the Imperial Wireless Chain contract. There is, therefore, now no contract in existence, and the way is clear for a new one. The Postmaster-General was about to tell the Committee about some things that the Government had been considering respecting future action on the matter, but objection was raised by a member that what might happen in the future had nothing to do with a committee appointed to investigate certain events of the past, in other words, was outside its reference. The feeling is that a new contract will have to be entered into with the Marconi Company, but it would be unwise to state here anything about the possible terms or conditions, or whether some Government Department or other will do part of the work, for really nothing is known. The Marconi position has been strengthened by the approving of the agreement between the company and the Norwegian Government, which, like other foreign agreements, was understood to be hung up pending the completion of the British inquiry.

An excellent report has just been issued by the General Electric Co. Ltd., of London and Witton. The paid-up capital is £799,976 in preference and ordinary shares, and £200,000 in 4 per cent. debenture stock. These figures include £150,000 of 6 per cent. preference shares issued less than a year ago. The net trading profits and income from investments, at £145,261, have increased by some £12,000 or £13,000, over those of the preceding year, and £32,050 was brought in from the last account, making £177,311. Debenture interest and depreciation absorb £32,543; 6 per cent. preference dividend takes £19,878; managing director's and employes' bonuses, £9,284; expenses of the new preference issue, £10,275; reserve account, £30,000; staff benevolence, £3000. The dividend on the ordinary shares is to be 10 per cent. for the year, as compared with only 7½ per cent. for the preceding year. This requires £40,000, and £32,331 is to be carried forward. The above allocation to reserve brings this item up to the substantial figure of £170,000. We congratulate the company on this further advance in the net result of a year's trading. The works are all fully employed, and have been throughout the year. Further extensions are stated now to be in contemplation. The investments' account shows further increase on account of the development of the company's overseas undertakings. Its activities in most foreign and colonial countries, through the medium of subsidiary companies, form a well-known feature of its present-day trading.

Mr. J. A. Bell, the city electrical engineer of Aberdeen has, after several days' hearing, been awarded the sum of £250 as damages in his slander action against the hon. secretary of the Aberdeen Branch of the Electrical Contractors' Association.

The slander was contained in a letter sent to the Town Clerk of Aberdeen, in which the secretary, as representing Aberdeen contractors, quoted circumstances relating to certain tenders for contracting work, adding, in conclusion: "Matters have now come to such a pass that steps must be taken to safeguard the interests of the contractors. They consider that they are being most harshly and unfairly treated by the city engineer, and they respectfully beg that the members of the Council will take such steps as they deem best for the protection of the contractors and the safeguard of their interests." Mr. Bell had referred to the prices charged for installation work in Aberdeen as being immoderate and higher than at Edinburgh, and the letter above mentioned charged him with making "very grave and slanderous charges against the Aberdeen contractors, reflecting upon their honesty," and said that his attitude toward the contractors had not been conducive to harmonious working between ratepayers and an official of a public department. It was also said, as part of the slander, that Mr. Bell's knowledge of electrical contracting work was very elementary. The letter was written in November last, and the case, in which Mr. Bell claimed £1000 damages, has only just been heard. A mass of very interesting evidence has been given, as can be imagined would be the case in such an action, and the matter has ended in favour of the city electrical engineer as stated above.

In an action just heard in the Lancashire Chancery Court respecting infringement of trolley wire designs, judgment stands reserved. The British Insulated and Helsby Cables Ltd., of Prescot, have claimed damages against Messrs. the London Electric Wire Company and Smiths Ltd., of Salford, also an injunction to restrain the latter from further infringement of their copyright. The plaintiffs say that in 1908 they registered two designs for trolley wire showing a groove on two sides, dividing it into two sections, and described it as non-fouling, and they allege that defendants have sold, or offered for sale, such wire to certain municipal corporations. The defendants say that the said designs were neither new nor original, and that the plaintiffs had no copyright in the designs, and they also deny any infringement or threatened infringmement.

The Marylebone (London) municipal electrical undertaking, of which Mr. A. H. Seabrook is chief engineer and manager, shows a gross income for the past year amounting to £212,564, and the working expenses were £94,555, plus £114,350 for financial charges, leaving a net profit of £4000 odd. Over 15 million units were sold. The lighting load has only slightly advanced during the year, due to several causes, one of which was the Early Closing of Shops' Act, to which reference has recently been made here. Higher prices for coal being another factor. The great and gratifying advance is shown in the heating and cooking department of the business, towards which Mr. Seabrook has long devoted himself with enterprise and energy. The connections under this head now stand at 6321 k.w., as compared with only 3922 k.w. a year ago, and they include cooking equipments numbering 620, and aggregating 2047 k.w. There are also 2401 electric radiators on circuit, representing 2820kw., the other items being over 600 electric irons, 524 electro-medical installations, and nearly a thousand sundry apparatus or devices for purposes coming in the same category.

## ELECTRIC COOKING.

The advantages of electricity over gas and coal or wood fuel for cooking purposes have long been recognised; the complete freedom from dirt, the absence of offensive, if harmless, fumes, the comparative coolness of the kitchen, so welcome to mothers and their servants in hot weather, have all contributed to secure for the electric stove a ready welcome. The greatest obstacles to its general adoption hitherto have been the high cost of electric energy, and of laying on the supply, and the fact that no completely satisfactory stove has been put upon the market. In Melbourne, however, the first of these difficulties has been practically overcome by the Electric Supply Department of the City Council reducing the charge for electricity for cooking purposes to 1¾d. per unit, and there appears to be a hope that at last the greatest obstacle of all has now been overcome by the introduction of the C.C. Cooker. A demonstration of the effectiveness of the new stove was given before a gathering of commercial men and electricians last week at the offices of the Silvertown Telegraph Co. Ltd., 380 Flinders-street, Melbourne. The stove is a Melbourne invention, and at present the Silvertown Company are arranging for putting it upon the market. A cook who had previously been accustomed to using a gas stove and to whom electric cooking is a novelty, was engaged for the occasion, and the result was highly satisfactory to all concerned. The dinner prepared comprised 3 dozen scones, 6¼ lb. of beef, 8 baked potatoes, 2 braized onions, 6 lb. boiled potatoes, 2 cauliflowers and a 5 lb. apple pie, and the whole was thoroughly and perfectly cooked by the use of just 2 units of electricity, at a cost of between 3d. and 3½d. When it is remembered that in electric cooking the loss by evaporation is considerably reduced, that the meat juices are therefore proportionately preserved, and that the joint is evenly cooked all through, it will be recognised that the actual cost is really less than the apparent cost. By ordinary cooking methods, about 25 per cent. of a roasted joint vanishes, so that of an 8 lb. joint only about 6 lb. comes to the table, whereas the 6¼lb. joint cooked by the C.C. stove lost only about half a pound, that is about 8 per cent. Those who witnessed its preparation and subsequently partook of the meal were unanimous in their praise of the new stove.

One of the secrets of the success of the C.C. cooker is that the series of wires usually employed for the supply and distribution of heat have been replaced in it by a number of rods made of a cheap and very durable material, capable of taking and remitting almost any degree of heat without suffering any detriment. Moreover, as each rod has its own switch, should anything go wrong with any of them they can be easily replaced, and when once the highest temperature required has been reached only a few rods need be kept in operation. These satisfactory results have been proved by months of testing, and the manufacturers are ready to give a five years' guarantee with each stove. Only a few of the stoves have been made as yet, and these were mainly hand-made; it is proposed, however, to erect a factory properly equipped for turning them out more rapidly, and when this has been done, it is believed, the cost of the stove to the public will be little higher than that of a gas stove. They are made of various sizes and design, some being adapted for standing on the breakfast or tea-table, so that the meal may be served piping hot, and at a cost, for a small family, of about three-halfpence.

## MISCELLANEOUS.

An examination for certificates as electricians under the Coal Mines Regulation Act, 1912, was held at the Technical College, Sydney, on the 15th July, by direction of the New South Wales Minister for Mines, the Hon. A. Edden. Fifteen candidates presented themselves, of whom the following were successful:—D. Atkinson, H. Bewes, A. Gillam, D. Hotchkis, J. Johnson, J. Meggitt, E. Peel, W. Tatters, A. Wilson, and S. Yates.

* * *

At the usual monthly meeting of the Northern Engineering Institute of N.S.W., held on the 26th ult., a paper was read by Messrs. Monat and Davis on "Engineering Experiences in the South Seas, 1906-1910." The authors dealt in an interesting manner with the geographical features of the islands of Tonga, and described the surveying, road-making, wharf construction, hospital building, and water supply work carried out.

* * *

The Kyneton (V.) Shire Council has authorised the representatives of the Town riding to engage the services of an expert to report upon the proposal to substitute electric lighting for gas in the municipality.

* * *

At a large public meeting held at Rushworth (V.) last week, the Shire Council was instructed to formulate a scheme for electric lighting as early as possible.

* * *

The Minister for External Affairs, Mr. Glynn, has been informed by Messrs. Lawrence and Chalmers, of South Australia, with whom an arrangement was made some time ago to carry out surveys of likely routes for railway construction in the Northern Territory to give communication between the north and south coasts, to the effect that one of the routes already traversed was from a point on the Port Augusta to Kalgoorlie line, joining up with Coward's Spring in the centre of Australia. From Oodnadatta to Alice Springs a preliminary survey has been completed, and the country in the vicinity of the Roper River had all been mapped out. The survey party is at present at Newcastle Waters, and will be divided later on into three sections. One of these will work to the Roper River, one towards Camooweal, and the third to Alice Springs.

* * *

The Wellington (N.Z.) City Council recently announced that from October it would reduce the price of electric current from 7d. to 6d. per unit. Thereupon the Gas Company lowered its charge for gas from 5s. 6d. to 5s. per 1000 cubic feet, to commence from September.

* * *

The Shire Council of Wycheproof (V.) has accepted a number of tenders for electric light and power for that town and Sea Lake. The tenders for the Wycheproof service alone amount to £1933, and those for Sea Lake will reach about the same figure, plus additional freight.

* * *

A public meeting was held at Maryborough (V.) on July 24 to discuss the supply of electric light or gas for the town. The Provincial Electric Development Co., who are asking for power to put in a private electric plant at Maryborough (V.) was represented by Mr. Lascelles, and Mr. McCarty, of McCarty, Underwood and Co., consulting engineers to the Provincial Electric Development Co., was present, and explained the advantages of electric light and power. A poll of the ratepayers was taken on July 30, and resulted favorably to the agreement allowing the Provincial Electric Development Co. to install a plant in the town, the figures being: For, 505; against, 145; majority, 360.

* * *

The Rodney (V.) Shire Council has decided to borrow £3000, with the object of installing an electric lighting plant in Mooroopna. In addition to the lighting of the streets and the local hospital, the scheme includes the pumping of water for the reticulation of the town. Mooroopna is a town of 1432 inhabitants, according to the last census, and amongst its industries are a flour mill, a butter factory, fruit preserving works, etc. It has also a water trust, whose pumping plant is capable of raising 12,500 gallons per hour from the Goulburn River, its storage tank having a capacity of 28,500 gallons.

* * *

The increased wages demanded by employes of the Metropolitan (Melbourne) Gas Co. would involve a total addition of £27,410 a year to the wages sheet, or 24 per cent., and nearly 3d. per 1000 cubic feet on the sales.

* * *

At a meeting of the Public Works Committee, held in Sydney on the 29th ult., it was announced that the construction of a railway line from Dubbo to Werris' Creek had been recommended, and that the proposed lines from Wellington to Werris Creek and Gilgandra to Curlewis had been negatived. Mr. T. R. Johnson's report in connection with the proposed line from Canowindra to Engowra dealt with an alternative route from Billimari to Grawlin, and gave it as his opinion that the line offering the best advantages would be one running from a point between Billimari and Canowindra along the southern side of the river to a point on the line between Stockinbingal and Forbes. The proposal also to construct a line from Warren to Quambone was negatived, but the Committee recommended the construction of the Gilgandra to Quambone line as far as Collie.

* * *

Many provincial towns in Victoria are now being lighted electrically by local industrial companies, such as butter factories, which have thus been enabled to light their own premises, operate machinery, etc., at less expense to themselves and to the benefit of all parties. The case of Tatura is in point. The total population is but 1230, and though a flourishing township it could hardly have looked for the benefits of electric light and power but for some such arrangement as this. The permission of the Supreme Court was obtained by the Tatura Butter Factory Co. to amend its articles of association so as to enable it to supply electric current to the public, and the scheme is proving a profitable venture for the company. The financial statement for the year ending June 30, 1913, shows that the year's operations realised a profit of £122 3s. 8d., after providing for the interest on the total cost of the plant (£2,500), amounting to £125. The gross revenue amounted to £837 1s. 1d.

* * *

At a conference of representatives of the municipal and shire councils of the Sydney northern suburbs, a resolution was passed to the effect that the construction of the North Shore bridge should be a national enterprise, and that the Government, as distinct from the municipalities, should carry out the work.

* * *

It is proposed, writes our Wollongong (N.S.W.) correspondent, to utilise the fall of the water supply from the dam to the reservoir, which is considerable, for the generation of a supply of electric current for the town of Wollongong. Mr. Wragg, who is putting the idea forward, says that enough could be got to run tramways, as well as to light the town, and also to work a crushing plant in a quarry. The Metropolitan Water and Sewerage Board are, it seems, to have the control of the water supply, in despite of the local preference for a district board, and the board are to be asked if the installation of an electrical plant would be permitted. The engineer who reported on the water supply when first proposed mentioned this capacity for making electric current as a recommendation.

* * *

Our Lithgow correspondent writes under date August 1.—"The 18in. mills at the ironworks have been working well for several days past; as has also the 27in. mills. The latter mills are engaged on rails and billets. The 'Muck' mills were also started during the past few days. Steady work has been done on the steel furnaces. One of the busiest sections of the industry is the iron and steel moulding department, where huge castings for extension work are being turned out in large quantities. In the fitting department, too, a large number of mechanics are engaged turning out spacious iron trucks, as well as small skips for the new coke ovens.

* * *

The New South Wales Cabinet has approved of the plans prepared for the Sydney underground railway, and the matter is to be brought before the State Parliament as early as possible, so that the work may be put in hand at once.

# Tenders Invited and Accepted

It is particularly requested that the information regarding contracts open, and the successful tenderers, be forwarded to The Editor not later than Monday of each week.

The following contractions are used throughout:—S—supply; D—delivery; M—manufacture; C—construction; E—erection; P—purchase; I—installation; R—removal. Where no contractions appear, supply and delivery is understood. The date at the beginning of each paragraph refers to the closing of tenders.

## INVITED.

### Commonwealth.

**Specifications, tender-forms, etc., for tenders invited for the Postmaster-General's Department of the various States under this heading may be had as follows:—Victoria—Various State G.P.O.'s. New South Wales—Departmental Stores, Sydney, and various G.P.O.'s in other States. South Australia—Adelaide, Melbourne, Sydney and Brisbane G.P.O.'s. Western Australia—Departmental Stores, Perth, and various G.P.O.'s in other States. Queensland—Various State G.P.O.'s. All States—Various G.P.O.'s. If the Specifications, etc., may be had elsewhere in addition the places will be given in parentheses.**

POSTMASTER-GENERAL'S DEPARTMENT, elbourne.—19th August.—105 miles of paper-sulated, lead-covered cable, as per schedule o. [illegible]

19th August.—S. and D. of stamps and type, or a period of two years, from the 1st July, 913, to the 30th June, 1915, as per schedule No. 911.

26th August. — 460 coin-collecting devices, ectrically controlled, as per schedule No. 916.

26th August.—S. and D. of general stores, for period of two years, from the 1st July, 1913, o the 30th June, 1915, as per schedule No. 912.

26th August.—45,000 swan neck spindles, as er schedule No. 967.

26th August.—500 letter-box fronts, as per hedule No. 972.

2nd September.—1000 protectors, as per schedule No. [illegible]. (See advertising columns.)

16th September.—S., D., E., and I., at the Telephone Exchange, Collingwood, Victoria, of common battery switchboard, as per schedule No. [illegible], or an automatic, or semi-automatic, switchboard, as per schedule No. 859.

16th September.—Galvanised-iron piping and fittings, as per schedule No. 951.

23rd September.—Sulphate of copper, as per schedule No. 976, in the undermentioned quantities:—New South Wales, 140 tons; Victoria, 25 tons; Queensland, 55 tons; South Australia, 20 tons; Western Australia, 60 tons.

23rd September.—500 letter-box fronts, small size, as per schedule No. 957.

23rd September.—General stores, for a period of two years, from the 1st July, 1913, to the 30th June, 1915, as per schedule No. 913.

30th September.—S. and D. of 1,017,000 pattern "A," and 1,768,800 pattern "B" insulators at Sydney, Melbourne, Brisbane, Adelaide, Perth and Hobart, during the years 1913-14, 1914-15, and 1915-16, as per schedule No. 974.

7th October.—S. and I. of electrically-driven machinery for operating pneumatic tube services, Central Telegraph Office, Melbourne, as per schedule No. [illegible].

14th October.—S. and E., at the Telephone Exchange, Melbourne, of a common battery multiple switchboard, as per schedule No. 868.

14th October.—Cable boxes, as per schedule No. 877. (See advertising columns.)

4th November.—D. and E. of eight automatic telephone switchboards at the Ascot, Canterbury, Malvern, Cheltenham, Footscray, Oakleigh, Sandringham, and Williamstown Telephone Exchanges, as per schedule No. 953.

POSTMASTER-GENERAL'S DEPARTMENT, Sydney.—13th August.—140 tons of bolts and nuts, as per stores schedule N.S.W. No. 313.

20th August.—575 detectors O. and I., as per stores schedule N.S.W. No. 322.

20th August.—S. and D., at the departmental stores, Sydney, of 9200 dry cells, as per stores schedule N.S.W. No. 323.

20th August.—220 telephone cabinets, to stores schedule Nos. 329 and 330.

20th August.—Oil engine, switchboard, and accumulators, as per stores schedule N.S.W. No. 331.

27th August.—(1) Telephones to stores schedule N.S.W. No. 301; (2) switchboards to stores schedule N.S.W. No. 302; (3) lamps, electric, incandescent, to stores schedule N.S.W., No. 304.

15th October.—450 fire sheets (asbestos), as per stores schedule N.S.W. No. 326.

15th October. — Measuring instruments, to stores schedule N.S.W. No. 303; telephone parts, to stores schedule N.S.W. No. 314; switchboard parts, to stores schedule N.S.W. No. 315.

POSTMASTER-GENERAL'S DEPARTMENT, Perth.—13th August.—About 20 tons of bolts and nuts to W.A. schedule No. 300.

20th August (extended from 6th August).—Cable, lead-covered, paper-insulated—telephone.

20th August.—2 tons of salammoniac, to W.A. schedule No. 301.

8th October.—Expansion bolts and shields to schedule No. 297.

POSTMASTER-GENERAL'S DEPARTMENT, Brisbane.—27th August.—S., D., and E., at the Telephone Exchange, Brisbane, of 5 sections of switchboard, common battery, multiple, and other equipment to schedule No. 243; specification No. 458.

10th September.—Telephone Exchange, Brisbane, nine sections of a trunk line switchboard, to schedule No. 244, specification No. 461, and the general conditions, drawings, etc., attached thereto.

24th September. — Ironwork, as per stores schedule No. 264; pipes, cast iron, as per stores schedule No. 265; poles, iron, etc., as per stores schedule No. 266; wire, G.I., as per stores schedule No. 269.

POSTMASTER-GENERAL'S DEPARTMENT, Adelaide.—13th August.—Telephone parts, as per schedule No. 292, and switchboards, as per schedule No. 293.

12th November.—One lamp signalling trunk line switchboard, of five sections, one cable turning section, and one cable storing section, one two-position recording desk, and one chief operator's desk, as specified in specification No. 431, etc., delivered at the Telephone Exchange, Adelaide, as per schedule No. 296.

POSTMASTER-GENERAL'S DEPARTMENT, Hobart.—15th September.—S. and D. of telephone material, as per schedules Nos. T.72 and T.73.

22nd September.—S. and D. of 3 motor cycles, as per schedule No. T.77.

DEPARTMENT OF HOME AFFAIRS.—Federal Capital. — 18th August.—S. and D. f.o.r. Queanbeyan, N.S.W., of materials for power transmission lines.

15th September.—S. of sect. 1, main powerhouse switchgear; sect. 2, switchgear for Diesel engine plant.

DEPARTMENT OF HOME AFFAIRS.—Kalgoorlie-Port Augusta Railway.—2nd Septemberber. — M., S., and D. of 80 lb. steel rails and fishplates; M., S., and D. of iron dog spikes and steel fishbolts and nuts for 80 lb. rails.

DEPARTMENT OF EXTERNAL AFFAIRS.—Pine Creek to Katharine River Railway.—19th August.—S. 80 lb. steel rails and fishplates; sleepers, (a) steel (b) timber (Powellised); iron dog spikes and steel fishbolts and nuts for 80 lb. rails.

DEPARTMENT OF TRADE AND CUSTOMS.—26th August.—S. and D. of eight (8) automatic flashing lights.

DEPARTMENT OF DEFENCE. — Royal Australian Navy.—25th August.—S. and E. of an oil storage tank at Garden Island, Sydney.

1st September.—S. and E. of a 500-ton oil storage tank at Flinders Naval Base, Victoria. (See advertising columns.)

8th September.—S. of machinery and accessories for standard 25ft. motor launches, as may be required, for a period of two years from date of contract. (See advertising columns.)

DEPARTMENT OF DEFENCE. — Military Forces of the Commonwealth.—11th August.—Metalwork for the Commonwealth Harness Factory (brass and steel harness mounts).

### Victoria.

VICTORIAN RAILWAYS. — 7th August.—Cement, slates, zinc discs, eccentric sawing machine.

8th August.—S. of a theodolite, with adjustable tripod head, and a Dumpy level.

8th August. — 4 light clusters, with round globes.

13th August.—C. and E. of steel verandahs at Malvern station.

13th August.—Best steel boiler plates for steel cranes, boilers, etc.

13th August.—30,000 lineal feet of wrought-iron steam pipe, 1in. diameter.

20th August.—C. and riveting of mild steel girders, etc., for first section, renewal of Moorabool Viaduct, Geelong to Ballarat line.

20th August. — C. and riveting of mild steel girders, etc., for second section, renewal of Moorabool Viaduct, Geelong to Ballarat line.

20th August. — C. and riveting of mild steel girders, etc., for third section, renewal of Moorabool Viaduct, Geelong to Ballarat line.

27th August.—Hollow chisels and bits.

27th August.—S. and D. of balls and ball races for 70ft. turntables. (Time extended.)

3rd September.—S. of three petrol engines and pumps for use at Newport Workshops. (Fresh tenders.)

3rd September.—Steel faced machine knives.

3rd September (extended from 20th August).—M., S., and D. of (a) lathe, (b) sawing machine, (c) chisel mortiser, (d) cut-off machine, (e) moulding machine.

1st October (extended from 10th September). Neutral track relays.

12th November.—Flame arc lamps.

VICTORIAN RAILWAYS COMMISSIONERS.—State Coal Mines.—7th August.—S. of Tirrell regulator contacts and condensor; morganite brushes, brake wheel, coupling, rope wheels and bracket, C.I. gear wheels and bed plate, C.I. pinion, carbon brushes.

1st October.—S. of rope road haulage engine and electrical equipment for McBride tunnel. (See advertising columns.)

27th August (extended from 13th August).—S. of electrical equipment.

PUBLIC WORKS DEPARTMENT. — 14th August. — S. of refrigerating plant for cool stores, Ringwood.

**P. & O. COMPANY'S ROYAL MAIL STEAMERS**
FOR MARSEILLES, PLYMOUTH, AND LONDON.
Leave Sydney on the subjoined dates, calling at usual ports.
FIRST AND SECOND SALOON ONLY.

| Steamer. | Tons. | Commander. | Noon. | Melb., 3 p.m. |
|---|---|---|---|---|
| MONGOLIA | 10,000 | Llewellyn | Aug. 9 | Aug 12 |
| MACEDONIA | 10,500 | Bennett | Aug. 23 | Aug. 26 |
| MALWA | 11,000 | Thompson | Sept. 6 | Sept. 9 |

PASSAGE MONEY TO LONDON—
Single, £41 16s to £82 10s.
Return, £69 6s. and £123 4s
Return Tickets between Inter-State Ports are available for return by Orient, Messageries Maritimes, and N.D.L. steamers having room.
SPECIAL HOLIDAY RETURN TICKETS to COLOMBO are now issued, available for two months. Fares from Sydney, £45 2s. first saloon, and £31 18s. second saloon.
A. GORDON WESCHE, Superintendent IN AUSTRALIA, 63 Pitt-street, Sydney.

**The COLONIAL MUTUAL FIRE Insurance Company Limited.**
Principal Office: 60 MARKET-ST., MELBOURNE
Branches in all the States
Transacts Fire, Guarantee, Employers' Liability, Marine, Burglary, and Plate Glass, Accident, Workers' Compensation and Live Stock Insurances.
Send for Prospectus.
W. TUCKER, General Manager

**Harringtons Ltd.**
**ANALYTICAL & METALLURGICAL DEPT.**
Lowest fees for all kinds of Assay, Analytical, and Metallurgical work.
Expert Advice on Ore Treatment, Bullion Refining, Smelting, etc., etc. Directed by a qualified Analyst from Messrs. Johnson and Sons, London; Assayers to Bank of England; H.M. Mint, The Council of India, etc.
**HARRINGTONS LTD.**
**386 George Street, Sydney.**

**SPECIAL NOTICE !**
**The Mount Morgan Gold Mining Co. Ltd.**
ARE PREPARED TO PURCHASE Ores, Concentrates and Furnace Products, containing Gold and Copper, at most favourable rates.
ALSO TO INSPECT MINING PROPERTIES with a view to Developing, Financing, or Purchasing same.
Address:—MR. B. MAGNUS, GENERAL MANAGER, MOUNT MORGAN, QUEENSLAND.

**NORD DEUTSCHER LLOYD**

REGULAR SERVICE TO EUROPE.

REDUCED FARES TO LONDON.

TO MANILA, CHINA AND JAPAN.
Via New Guinea and Yap.
Fares to Hong Kong, £40; II., £26.

Full particulars will be sent on application to—
LOHMANN AND CO., General Agents,
7-9 Bridge-street, Sydney.

Ostermeyer, Van Rompaey and Co., Melbourne; H. Muecke and Co., Adelaide; L. Ratazzi and Co., Fremantle; Thos. Brown and Sons Ltd., Brisbane.

---

**A. U. S. N. Co. LTD.**

*Fast, Regular, and Comfortable Passenger Steamers*
(also carrying cargo) from and to
MELBOURNE, SYDNEY, ADELAIDE, FREMANTLE, BRISBANE, and all QUEENSLAND PORTS.

Passage Tickets interchangeable, with other Inter-State Companies, on certain conditions.

Full Particulars at
**COMPANY'S OFFICES**
at all principal Australian Ports.

---

**The Mount Lyell Mining & Railway**
CO. LIMITED.

Purchasers of Ores containing Copper, Gold and Silver. Rates obtainable on application to the Secretary

Manufacturers of Coke for Smelting and Foundry Purposes, Acids, Etc.

HEAD OFFICE—
39 QUEEN-STREET, MELBOURNE.
D. G. LUMSDEN,
Secretary.

---

THE
**-PACIFIC CABLE BOARD-**

Cablegrams should be Marked
"VIA PACIFIC."
(Not Charged for.)

The quickest and most accurate route for Cablegrams from Australasia to United Kingdom, Canada, United States, Germany, New Zealand, and Pacific Islands.

This route is owned by Great Britain, Australia, New Zealand, and Canada. Australia being the largest part owner (having one-third interest), the public are urged to support the National Cable.

RATES—

| | Ordinary. | Deferred. |
|---|---|---|
| UNITED KINGDOM .. .. .. .. | 3/- | 1/6 |
| GERMANY .. .. .. .. .. .. | 3/- | 1/6 |
| CANADA .. .. .. .. .. .. .. .. | 2/4 | 1/2 |
| UNITED STATES .. .. .. .. .. | 2/4<br>to 2/8 | 1/2<br>to 2/4 |
| NEW ZEALAND .. .. .. .. .. | 4½d. | Nil |
| FIJI .. .. .. .. .. .. .. | 8d. | Nil |

DEFERRED RATES (IN PLAIN LANGUAGE ONLY) have now been arranged to most Countries where ordinary rate exceeds 10d. per word.

Enquiries for further information, pads of cablegram forms, maps and tariff cards, address to—

The Superintendent, SOUTHPORT, QUEENSLAND;
The Officer in Charge, 408 Collins-street, MELBOURNE, telephone 2588;
The Officer in Charge, 42 Hunter-street, SYDNEY; telephones, City 1346, City 3684;
J. Milward, Manager in the Pacific, 64 Pitt-street SYDNEY; telephones City 1346, City 3684.

---

HIGH EXPLOSIVES.

OBTAINABLE FROM ALL BOOKSELLERS.
224 pages. Price, £/1/-.

### New South Wales.

PUBLIC WORKS DEPARTMENT. — 11th August.—Steel bridge for Macleay River, Wauchope to Kempsey section, North Coast railway.

11th August. — Steel bridges for Hastings River and flood channel, Wauchope to Kempsey section, North Coast railway.

11th August.—25 five-ton steel gantry cranes.

18th August.—I. of mechanical ventilating apparatus, post office, Newcastle.

3rd September.—Efficient steam tugs for use at Bellinger River and Cape Hawke, from 1st November, 1913.

RAILWAY DEPARTMENT.—20th August. —S. of a pneumatic ash handling plant for White Bay power-house.

15th October.—S. of 13 direct-current motors.

METROPOLITAN BOARD OF WATER SUPPLY AND SEWERAGE, 341 Pitt-street, Sydney. — 18th August. — Centrifugal pumps and electric motors to No. 1 pumping station, Ultimo, for Manly low level pumping stations. (See advertising columns.)

SYDNEY HARBOUR TRUST, Circular Quay, Sydney. — 11th August.—I. of electric light and fittings in the sheds, approaches, etc., at No. 1 wharf, Dawes' Point. (See advertising columns.)

### South Australia.

RAILWAYS DEPARTMENT.—12th August. —M. of wrought iron details for waggons, 5ft. 3in. gauge.

12th August.—C. of five or ten class "K" locomotive boilers, 5ft. 3in. gauge, the principal material for which, as detailed in the specification, will be supplied by the Railways Commissioner.

ROADS AND BRIDGES DEPARTMENT.— 11th August. — C. of steelwork for Redbanks bridge on the Wasleys and Mallala main road.

### Western Australia.

GOVERNMENT TENDER BOARD. — 28th August.—Copper firebox tube plates for Railway Department.

28th August.—Steel angles, tees, plates, etc., for Railway Department.

### Queensland.

RAILWAYS DEPARTMENT. — 19th August. — General supplies for 1914 and 1915, for Northern Division, schedule No. 1 (fixed quantities), to be for year 1914 only; schedules Nos. 2 to 30, inclusive, are for two years.

26th August.—General supplies for the years 1914 and 1915, for the Southern and Central Divisions.

TREASURY DEPARTMENT.—29th September.—S. about 1687 tons of cast-iron spigot and faucet water pipes, special castings, and valves, for Maryborough waterworks.

29th October.—C. and E. of central sugar mill at Babinda Creek, North Queensland.

### New Zealand.

RAILWAYS DEPARTMENT.—31st October. —S. and D. of stores for the period from April 1, 1914, to March 31, 1917.

### General.

CITY OF MELBOURNE.—8th August.—S. and D. of insulated copper cables.

8th August. — S. and D. of 10 arc lamp brackets.

15th August.—P. of certain second-hand electrical plant and machinery, in accordance with specification obtainable at this office.

9th September.—S. and D. of electricity recording meters and maximum demand indicators.

16th September.—S. and D. of (a) insulated copper cables, (b) three-phase transformers.

MUNICIPAL COUNCIL OF SYDNEY.— 7th August. — S. and D. of coal to council's power-house, Pyrmont, for periods (a) one, (b) two, (c) three years.

7th August.—S. of curve drawing ammeters and voltmeters.

7th August.—Prepayment meters.

7th August.—Motor generator and motor converter

CITY OF CHRISTCHURCH (N.Z.). — 7th August.—S. and E. of a 13-panel E.H.S. switchboard.

CORPORATION OF KADINA (S.A.) (F. W. Harris, Town Clerk).—1st September.—One 60 kw. generator, driven from a 100-110h.p. engine, complete with suction gas producer, erected on foundations.

One 500 ampere-hour battery, erected and charged.

1 motor-driven booster (erected).

SHIRE OF SWAN HILL (V.) (A. W. D. Brown, Engineer).—12th August.—P. of fish point punt.

METROPOLITAN GAS COMPANY (V.) (A. E. Bradshaw, Subst. Secretary Melbourne).— 11th September.—P. of a total fixed quantity of 1800 tons of sulphate of ammonia, to be produced by this company during the twelve months ending 31st August, 1914.

METROPOLITAN WATER AND SEWERAGE BOARD, Brisbane (Q.) (Geo. Johnston, Secretary).—12th August.—M., S., and D. of cast-iron pipe specials, cast-iron outlet, floating arms, and other castings.

12th August.—S. and D. of brass fittings.

MUNICIPAL TRAMWAYS TRUST, Adelaide (W. G. T. Goodman, Chief Engineer and General Manager).—19th August.—M., S., and D. of steel poles.

Specifications relating to the S. and D. of copper cable and wire may be obtained on application to W. G. T. Goodman, Engineer and Manager. Tenders will be invited at 48 hours' notice, at a later date, and specifications are now issued to facilitate prospective tenderers obtaining quotations.

SOUTH AUSTRALIAN SILICATE BRICK CO. LTD. (in liquidation) (S.A.) (E. M. Twiss, Liquidator, 12 and 13 Alma Chambers, Adelaide).—14th August.—P., as a going concern, of the whole of the machinery, plant, buildings, land (freehold, 30 acres), and stock (comprising about 714,000 bricks), of the above-named company, situate at Osborne, on the Outer Harbour line.

TE AWAMUTU WATER SUPPLY (N.Z.).— 21st August.—S. of cast-iron pipes and fittings; spiral steel pipes and fittings; drawn steel tubes and fittings.

BALLARAT WATER COMMISSIONERS (Alex. Fraser, Secretary).—13th August.—S. of about 44 tons of 12in. and 6in. cast-iron water pipes.

ESTATE OF E. L. LLOYD (Executors, c/o Northmore and Hale, Solicitors, Howard-street, Perth, W.A.). — 31st August.—P. of mining leases, plant, etc. (See advertising columns.)

CAMERON AND SUTHERLAND, Queen's Bridge-street, South Melbourne.—For sale, complete, sluicing plant. (See advertising columns.)

## ACCEPTED.

### Commonwealth.

POSTMASTER-GENERAL'S DEPARTMENT, New South Wales.—12,500 binders, copper, for 150 lb. copper wire and pattern "B" insulator, 3s. 7d. per 100; 16,000 binders, copper, for 200 lb. copper wire and pattern "A" insulator, £5 8s. per 100; 35,000 binders, copper, for 300 lb. copper wire and pattern "A" insulator, 7s. per 100; 16,000 tapes, copper, for 200 lb. copper wire and pattern "A" insulator, 5s. 1½d. per 100; 35,000 tapes, copper, for 300 lb. copper wire and pattern "A" insulator, 5s. 10½d. per 100; 7000 coppers, with insulated connecting wire for gravity cell, 6d. each; 35,000 zincs, Leclanche, 6in. x ¾in., rolled, 1.85d. each; 10,000 zincs, for gravity cells, star pattern, 1s 6¼d. each—The India Rubber, Gutta Percha and Telegraph Works Co. Ltd.

12,500 tapes, copper, for 150 lb. copper wire and pattern "B" inulator, 3s. 1d. per 100; 5 miles of wire, tinned, copper, L.S.W.G., No. 22 rubber insulated, cotton covered, and braided (black), £2 17s. 6d. per mile; 60 miles of wire, tinned, copper, No. 20 L.S.W.G., rubber insulated, cotton covered and braided (black), £3 13s. per mile; 45 miles of wire, two twisted conductors, tinned, copper, rubber insulated, cotton covered, braided, flame resisting, £4 12s. 6d. per mile; 35 miles of wire, two twisted, tinned copper conductors, wool insulated and braided, £3 13s. 6d. per mile; 20 miles of wire, three twisted conductors, tinned copper, rubber insulated, cotton covered, braided, flame resisting, £6 5s. per mile; three miles of wire, three twisted, tinned, copper conductors, wool insulated and braided, £5 5s. per mile—The British Insulated and Helsby Cables Ltd.

Dunlop Mining Goods
Are now used with satisfaction in most of the Leading Mines of Australasia—Their QUALITY & WEAR are UNSURPASSED
Tenders & Samples submitted
Correspondence Invited
Send for Illustrated Catalogue

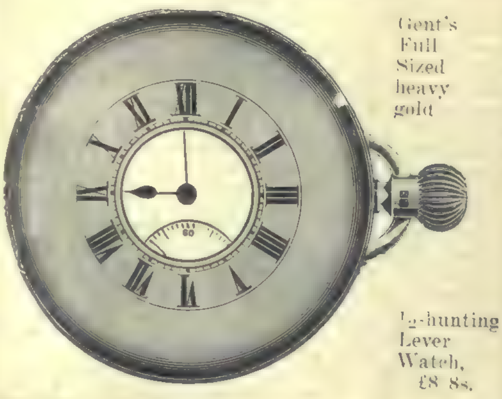
The DUNLOP RUBBER Co. of AUS. Ltd
108 Flinders St. MELBOURNE.
& ALL STATES

Dunlop Rubber Belting
Is more efficient than Leather belting for Outdoor & Wet Work.
Sample & Price on application

Be sure you get
"DICK'S"
We know there are numerous imitations. Dick's maintains its high reputation for strength and efficiency. Every belt guaranteed. Sole agents:
JAMES HARDIE & CO.
Melbourne and Sydney.

Note this on every belt.

THE BEST VALUED WATCHES IN SYDNEY.
are the "Fx. & R." Solid Gold, ½-hunting, three-quarter plate lever watches at £8 8s. 0d.
They have heavy solid gold cases. They will go with profound accuracy. They have 15 jewels. They have compensated and adjusted balances. They have breguet overcoil balance springs. They have jewel Ruby Rollers. They are guaranteed for 15 years, and kept in order free of charge for two years (breakages excepted).
FAIRFAX and ROBERTS LTD.,
The oldest Jewellery House in Sydney
— 23 and 25 HUNTER STREET. —


Gent's Full Sized heavy gold
½-hunting Lever Watch, £8 8s.

Five tons of wire, hard drawn copper, 100 lb. per mile, £83 9s. 3d. per ton; 40 tons of wire, hard drawn copper, 150 lb. per mile, £83 9s. 3d. per ton; 45 tons of wire, hard drawn copper, 200 lb. per mile, £83 9s. 3d. per ton; 150 tons of wire, hard drawn copper, 300 lb. per mile, £83 9s. 3d. per ton—R. Johnson, Clapham and Morris Ltd.

175 miles of wire, tinned copper, No. 18 (L.S.W.G.), vulcanised [illegible] insulated, taped and braided (black), £8 [illegible] per mile; 350 miles of wire, tinned, copper, No. 20 (L.S.W.G.), vulcanised, indiarubber, insulated, taped and braided, £7 per mile—Noyes Bros. (Sydney) Ltd.

250 miles of wire, twisted pair, outside distributing, £21 2s. 6d. per mile; 325 miles of wire, twisted pair, tinned and [illegible] copper, vulcanised indiarubber insulated, taped and braided, £15 5s. 2d. per mile—W. T. Henley's Telegraph Works Co. Ltd.

1000 bridle rings, pattern "A" size No. 1, 10s. 6d. per 100; 1000 bridle rings, pattern "A" size No. 2, 14s. per 100; 3000 bridle rings, pattern "A" size No. 3, 1[illegible] per 100; 3000 bridle rings, pattern "A" size No. 4, 18s. per 100; 3000 bridle rings, pattern "B" size No. 1, 14s. 3d. per 100; 2000 bridle rings, pattern "B" size No. 2, 14s. 3d. per 100; 2000 bridle rings, pattern "B" size No. 3, 14s. 3d. per 100—Boehme and Owen, Melbourne.

2700 cells, local battery, [illegible], 2s. 1d. each—R. J. [illegible], Leichhardt, N.S.W.

10,000 connectors, battery, brass, with two clamping screws, 12s. 6d. per 100—British General Electric Co.

10,000 corks, main battery, 4s. per 100—Cork Manufacturing Co. of Sydney.

20,000 leads, for Meidinger main battery with connecting wire, 2.75d. each; 2000 suspenders, brass, for gravity cells, 11d. each; 10,000 zincs, main battery, [illegible] each; 1800 bottles solution, soldering, Baker's, 5.2d. each—The Lawrence and Hanson Electrical Co. Ltd.

30,000 pots, porous, [illegible], 4.75d. each; 20,000 tubes, glass, main battery, 2s. 6d. per 100—The India Rubber, Gutta Percha, and Telegraph Works Co. Ltd.

15 tons sal-ammoniac, crystals, £31 per ton; 25 tons sulphate of magnesia, £9 2s. 6d. per ton; 6 tons tape, white paper, for Morse registers, £35 5s. per ton—Theodore Zwicker and Co., Melbourne.

1200 bottles ink, black, for telegraph instruments, 3½d. per bottle—The Joplin Manufacturing Co. Ltd., Sydney.

1500 bottles oil, instrument, 2½d. per bottle—H. A. [illegible], 38-40 Little Albion-street, Surry Hills, N.S.W.

975 drums coal tar composition, 7s. 9d. per drum—Bitumen Layers Ltd., Flora-street, Erskineville, N.S.W.

1000 lb. tape, black, adhesive, insulating, 1s. 2d. per lb.—W. G. Watson and Co. Ltd.

2450 backboards for automatic wall sets, 3s. 1d. each—Standard-Waygood Ltd., Sydney.

150 brass office seals, 2s. each; 175 steel date stamps, face 1½in. diameter, with five revolving type wheels, each with twelve faces engraved as per schedule, the letters "N.S.W." to be engraved on the lower half of the face of the stamp, £1 3s. 9d. each; 65 steel date and time stamps, face 1½in. diameter, with eight revolving type wheels, each with twelve faces engraved as per schedule, the letters "N.S.W." to be engraved on the upper half of the face of the stamp, £1 16s. 3d. each—C. G. Roeszler and Son, Melbourne.

1800 hardwood [illegible] type, 2½d. each; engraving date stamps per letter, not exceeding eight letters, 5½d. per letter, each additional letter for names exceeding eight letters, 3½d. per letter—Miller and Morris, Sydney.

30 registers, Morse, [illegible], £5[illegible]—Siemens Bros. Dynamo Works Ltd.

POSTMASTER-GENERAL'S DEPARTMENT (Tasmania).—11,000 insulators, porcelain, pattern "A," [illegible] each; [illegible] insulators, porcelain, pattern "B," 2½d. each; [illegible] insulators, porcelain, pattern "A" (special), 7.35d. each; 3000 insulators, porcelain, pattern "B" (brown), 3.25d. each; 1500 tubes, porcelain, leading in, 6s. 3d. per 100—Theodore Zwicker and Co., Melbourne.

2000 insulators, shackle, 6 7-8d. each; 2000 shackles, galvanised iron, 7d. each — Bullers Ltd., London, by their agents, A. J. Chamberlain and Co., Melbourne.

10 cwt. tape, white paper, for Morse registers, £19 10s. the lot—Siemens Bros. Dynamo Works Ltd.

1 switchboard, magneto, 100 lines, £40 15s.; 1 switchboard, magneto, 25 lines, £14 9s. 6d.—J. Bartram and Son Pty. Ltd., Melbourne.

20 tons wire, hard drawn copper, 200 lb. per mile, £87 5s. 6d. per ton—R. Johnson, Clapham and Morris, Sydney.

## Victoria.

VICTORIAN RAILWAYS. – P. of certain Westinghouse brake material, £1918 11s.—Westinghouse Brake Co. of Australia Ltd.

P. of 10 cwt. of Nicro copper stays, £62 10s.—Royle and Co.

P. of a quantity of felt body blocks, £77 18s.—J. G. Black.

Oil for gas making, from 1st August, 1913, to 30th June, 1914, at 8¼d. per gallon delivered direct from ship, and 8¾d. per gallon delivered from stocks held by contractor—Vacuum Oil Co. Pty. Ltd.

Brass locomotive boiler tubes for maintenance, at £4 per cwt., delivered at Spencer-street railway station—Gilbert-Lodge and Co.

Oil for gas making, from 1st August, 1913, to 30th June, 1914, at 8d. per gallon, delivered from stocks held by contractor—W. C. Ashton and Co.

C., riveting, etc. (on the site of the contract works), of the steel girders, etc., for Cromwell-road, Williams-road, and Mathoura-road bridges, Hawthorn, Caulfield line duplication, £1053 2s. 3d.—Forman and Co. Pty. Ltd.

S. and E., etc., of strong-room doors, £1842—Chubb's Australian Co. Ltd.

Victorian coal suitable for storage purposes, from 1st January, 1913, at 13s. 8d. per ton—Jumbunna Coal Mine No Liability.

Victorian coal suitable for storage purposes, from 1st January, 1913, at 13s. 8d. per ton—Peter Hudson.

M., S., and D. of linseed oil—Item No. 1, oil, linseed, raw (Australian manufacture), at 3s. 3d. per gallon; item No. 2, oil, linseed, boiled (Australian manufacture), at 3s. 5d. per gallon—Meggitt Ltd.

Copper plates for steam cranes, at £82 17s. per ton, delivered at Spencer-street railway station—Edward Duckett and Sons.

Rail bonds—Item No. 1a, stranded cable plug terminal bonds, length 41in., at 2s. 11d. each; item No. 2a, stranded cable solid terminal bonds, length 41in., at 2s. 11d. each; item No. 3, stranded cable plug terminal bonds, length 16ft., at 13s. each; item No. 4, stranded cable plug terminal bonds, length 12ft., at 11s. each—British Insulated and Helsby Cables Ltd.

One continuous petrol-driven concrete mixer, including petrol motor, tools, paddles, and accessories, at £300—C. E. Wadey.

PUBLIC WORKS (PORTS AND HARBOURS).—15 tons 2 qr. 11 lb. of steel plates, £161 11s. 5d.; 250 ft. of lap-welded steel tubes, £128 2s.—Stewarts and Lloyds Ltd.

## Western Australia.

WATER SUPPLY DEPARTMENT.—One automatic time recorder, £29 10s.—Denson, Vautin and Co.

Steel pipes, schedule No. 131A, item 1045, 1s. ft.—Stewart's and Lloyds Ltd.

Items 1046-11, 500ft., 9 15-32d. ft.; 10,500ft., 8 31-32d. ft.—Strelitz Bros.

C.I. pipes and specials for Albany water supply, rates obtainable on application—Hoskins and Co., Monteath Bros., Leslie and Co., G. Kent Ltd.

Specials for stock purposes, rates obtainable on application—Tyler and Sons Ltd., G. Kent, Hoskins and Co. Ltd., Leslie and Co.

COLONIAL SECRETARY'S DEPARTMENT.—Double-ended ferry steamer, £7715—Denny Bros. Ltd.

List of material purchased outside contracts by Railway and Tramway Stores—1 case metallic packing blocks, £32 19s. 7d.—Elder, Shenton and Co. Ltd.

3 tons 1 cwt. 0 qr. 10 lb. Broken Hill pig lead, £22 7s. 6d. per ton—Elder, Shenton and Co. Ltd.

162 No. 1 porous pots, 40 No. 1 Leclanche cells, 458 No. 1 glasses for Leclanche cells, £26 3s. 9d.—General Electrical Engineering Co.

2500 hex. tapped nuts, 1 1-8in. r.h., 40s. gross; 2500 hex. tapped nuts, 1 1-8in., lh., 41s. 6d. gross—Levi Green.

114 sheets G.C. ripple iron, 9ft. by 28G, £21 15s. a ton; 45 sheets G.C. ripple iron, 1ft. by 28G, £22 10s. a ton; 10 sheets ripple iron, 7ft. by 28G, £21 per ton; 5 sheets G.C. ripple iron, 6ft. by 28G, £21 per ton; 114 sheets G.C. ripple iron, 9ft. by 28G, £21 15s. per ton; 45 sheets G.C. ripple iron, 10ft. by 28G, £22 10s. per ton; 10 sheets G.C. ripple iron, 7ft. by 28G, £21 per ton; 5 sheets G.C. ripple iron, 6ft. by 28G, £21 per ton—Geo. P. Harris, Scarfe and Co.

5000 pairs fabious hendrions carbons, 11s. 9d. per 100—India Rubber, Gutta Percha and Telegraph Works.

One water end for Worthington pump, £32—Geo. Kent Ltd.

25 cwt. 5in. by 6in. Ewb. nails, £23 7s. 6d. per ton; 4½ dozen Fay's machine bits, 5in., ¾in., and 1 1-8in., £46 3s. 9d.; 166 2-3 doz. r. and l.h. hex. nuts, 1 1-8in., 47s. a gross; 12 emery wheels, 24 x 2 x 1¼, 72s. 6d. each; 2 tons hex. coach screws, 5 x ¾, £27 10s. a ton; 3730½ sq. ft. spark arrester wire, 5s. 5¾d. doz. sq. ft.—McLean Bros. and Rigg.

3½ rolls sheet lead, 1 ton 9 cwt. 2 qr. 24 lb., 24s. 6d. per cwt.; 55 cwt. Ewbank spikes, 6in. x 9in., £23 13s. 6d. per ton; 345 sheets iron, various sizes, £33 11s. 4d.—W. Sandover and Co.

24 tons 15 cwt. 3 qr. 11 lb. snap head rivets, £385 10s. 7d.—Geo. Wills and Co.

16 cwt. 0 qr. 7 lb. steel castings, 11 cwt. 3 qr. 3 lb. steel castings, 29 cwt. 3 qr. 13 lb. steel castings, 34s. a cwt., £47 6s. 6d.; 35 cwt. 2 qr. 1 lb. steel castings, £111 2s. 9d.; 43 cwt. 3 qr. 6 lb. steel castings, £74 0s. 10d.; 22 cwt. 0 qr. 1 lb. steel castings, £37 8s. 4d.—John Dawson.

1 ton 0 cwt. 0 qr. 18 lb. ingot tin, 99 per cent. purity, £218 per ton—Denson, Vautin and Co.

60 C.I. main pipes, 5in. x 9in., 24s. each, £72; 174 C.I. main pipes, 4in. x 9in., 13s. 8d. each, £118 18s.—Hoskins and Co. Ltd.

## General.

SHIRE OF WYCHEPROOF (V.).—The tenders for the engines for both Wycheproof and Sea Lake have been deferred. WYCHEPROOF.—One 20kw. A.E.G. dynamo and booster, including spares, £200 8s.; switchgear and equipment for switchboard, including lightning arrestors, insulators, and street brackets, £95 1s. 10d.—Australian Metal Co. Ltd.

One Hart battery, £398 17s. 4d.; testing instruments, £27 2s. 6d. — Edison and Swan United Electric Light Co. Ltd.

Consumers' meters, £63—Warburton, Franki, and Co. (Melbourne) Ltd.

Service fuses, £10—W. T. Henley's Telegraph Works Co. Ltd.

Erection of electrical equipment, £392 9s.—Australian Metal Co. Ltd.

Aluminium cables, £173 17s. 7d.—British Insulated and Helsby Cables Ltd.

Poles, £68 5s. — H. Hyatt and Son (S. R. Groom, agent). SEA LAKE.—One 20kw. dynamo and booster (without spares), £158 8s.; switchgear and equipment for switchboard, including lightning arrestors, insulators, and street brackets, £97 16s. 2d.—Australian Metal Co. Ltd.

One Hart battery, £409 5s. 3d.; testing instruments, £27 2s. 6d. — Edison and Swan United Electric Light Co. Ltd.

Consumers' meters, £63—Warburton, Franki and Co. (Melbourne) Ltd.

Service fuses, £10—W. T. Henley's Telegraph Works Co. Ltd.

Erection of electrical equipment, £408 2s. 6d.—Australian Metal Co. Ltd.

Aluminium cables, £189 9s. 7d.—British Insulated and Helsby Cables Ltd.

Poles, £86—H. Hyatt and Son (S. R. Groom, agent).

MELBOURNE AND METROPOLITAN BOARD OF WORKS (V.). — Crane, winches, and lifting gear for screens at various service reservoirs, £114 4s.—C. Ebeling.

MELBOURNE HARBOUR TRUST COMMISSIONERS (V.) (R. Rudd, Secretary). — S. and D. of 36 cast-iron bollards, with 144 bolts and 72 washer plates, £130 14s. 6d.—Dallimore Bros., South Melbourne.

AUSTRALIAN FARMS LTD., 446 Collins-street, Melbourne—S., D., and E. of pumping plant, complete, consisting of 2 high-speed vertical engines, each working direct coupled centrifugal pumps. Steam supplied from multitubular boiler, provided with superheater, £3139—Thompson and Co. (Castlemaine) Pty. Ltd.

## DIVIDENDS.

The following dividends and bonuses of mining companies in Australia have been declared, and are payable on the dates noted:—

August.

7th.—Ironbark Co., Bendigo (V.), 1s., £1350.

7th.—Nell Gwynne G.M. Co., Bendigo (V.), 6d., £700.

7th.—South New Moon G.M. Co., Eaglehawk (V.), 1s., £1600.

7th.—Llanberris No. 1 Co., Ballarat (V.), 6d., £600.

9th.—Amalgamated Zinc (De Bavay's), Broken Hill (N.S.W.), 1s. 6d., £37,500.

9th.—New Chum Goldfields Co., Bendigo (V.), 6d., £800.

12th.—Campbell's Creek Dredging Co., Castlemaine (V.), 3d., £400.

13th.—Associated Northern Blocks, Kalgoorlie (W.A.), 1s., £17,500.

13th.—Williams' Fancy G.M. Co., Berringa (V.), 6d., and bonus 6d., £1200.

15th.—Caledonia Collieries (N.S.W.), interim on ordinary and cumulative pref. shares, at rate of 8 per cent. per annum.

15th.—Tongkah Compound, Siam, 1s. and bonus 2s., £7500.

15th.—Black Range Mining Co. (W.A.), 1s., £4000.

19th.—Guildford Bucket Dredging Co., Guildford (V.), 1s. 6d., £525.

20th.—Broken Hill Proprietary (N.S.W.), 1s., £48,000.

21st.—Cathcart Central G.M. Co., Ararat (V.), 2s., £5000.

21st.—Porepunkah G.D. Co., Bright (V.), 1s., £250.

27th.—Lake View and Star, Kalgoorlie (W.A.), interim, 5 per cent. less English income tax.

28th.—Briseis Tin and General Mining Co. (T.), 6d., £15,000.

## THE COAL MINING INDUSTRY.

### New South Wales.

### Northern District.

(From Our Newcastle Correspondent.)

The first sitting of the wages board for the miners of the Northern District of New South Wales was held at the Courthouse, Newcastle, on the 30th of July. His Honor Judge Edmunds is chairman of the board, and Messrs. N. J. Clark and E. Peters are the owners' and miners' representatives respectively. Mr. A. J. Kelynack appeared for the Hunter District Colliery Proprietors' Association, and Mr. A. Lewis for the Colliery Employees' Federation.

His Honor said he had received an application from Mr. J. Brown, of Messrs J. and A. Brown, chairman of the Colliery Proprietors' Association, to determine what is a fair average wage to be earned per day by a miner, any award not to apply to Mr. Brown's employees at the Back Creek and Duckenfield collieries. A notice had been filed that Messrs. J. and A. Brown were members of the Hunter District Colliery Proprietors' Defence Association. He had also an application from Mr. W. Brennan, secretary of the Colliery Employees' Federation, to determine matters in a claim for payment of 1s. 6d. per ton on all small coal; and secondly, that the second or afternoon shift be abolished, and a further application, from Mr. Waller, secretary of the Colliery Mechanics' Association, for the variation of an award.

Mr. Lewis asked the board to take into consideration the exclusion of the legal element, but his Honor said he did not know of any ground upon which he could refuse to allow any person to be represented by counsel or attorney.

Mr. Kelynack said the claims of the proprietors embraced that of the right to work as many shifts in a mine as the manager of that mine considered advisable. As to the payment for small coal, that was included in the payment for round coal. Five collieries paid for small coal as though it were a separate agreement, and the other collieries paid a consolidated rate. All the questions submitted to the board should be taken into consideration, as each had a bearing on the other. The proprietors would certainly object to these matters being taken piecemeal, for if that were done it would have an injurious effect on the industry. It was highly important that all matters affecting such a large industry should be gone into thoroughly, and considered as a whole. The joint committee had decided against the men on the question of the abolition of the afternoon shift, and the claim for the payment for small coal was one that would come up necessarily and incidentally during the hearing of the claims before the board. It could not be taken separately.

Mr. Peters suggested that, as the joint committee had almost completed the hearing of the claim for the payment for small coal, a conference might be held between the parties, and an agreement come to over it.

Mr. Lewis said the feeling with regard to the abolition of the afternoon shift was so strong in the Maitland district, that if the board gave precedence to other questions he would not say what the consequence would be.

His Honor said it did not matter what the consequences would be. The board would consider what it believed to be right and just, and as long as the board was satisfied that its own conduct of the case was just and proper, it did not matter what the consequences might be.

After further discussion, and the adjournment of the board for about an hour, his Honor announced that the claims of the employees, and so much of the claims of the employers as related to the same subject matter, would be taken together. The evidence of the employees would be taken first.

The board then adjourned until the 5th inst. It will sit five days in the week, and will continue until the claims submitted have been dealt with.

---

A fortnight ago an application was made to the Industrial Court for an injunction to restrain the chairman, secretary and certain members of the Stockton-Borehole Lodge from continuing to instigate the employees of the Stockton-Borehole Colliery to strike, and from aiding them to strike. The matter came before the Court again last week, when there was no appearance of respondents. In reply to his Honor, Mr. Justice Heydon, counsel for the applicants said the men had not yet returned to work. The application for making the rule absolute was granted.

An injunction was granted recently to restrain the three of the officers of Pelaw-Main Lodge from instigating a strike of the men at that mine. Mr. W. Brennan, secretary of the Miners' Federation, is now making application to have the rule set aside. The application will come before the Court on the 5th inst.

### Western District.

(From Our Lithgow Correspondent.)

A local colliery manager states that the Lithgow coal trade still continues very satisfactory so far as orders are concerned, "but," said he, "the supply of railway trucks is very bad indeed. This truck question is simply sickening. A day or two ago I spent nearly half-a-day at the telephone, dealing with the inadequate supply of trucks. A number of orders are being delayed owing to the failure of the Railway Department to fulfil its obligations." The same trouble is experienced at other district collieries and mineral industries.

### Southern District.

(From Our Wollongong Correspondent.)

The session's programme of the State Government has in it the providing of model dwellings for workers in the city and also country. It is assumed here that Clifton is specially in view as a country site. The discomforts endured by the employees of the Coalcliff colliery and loss by the company for lack of house accommodation have, at all events, been impressed upon the Minister, and a couple of years ago an official of the Government made an inspection and recommended an area for resumption for the purpose.

The feud between the two chief executive officers of the Miners' Union, the president, Mr. A. C. Willis, and the secretary, Mr. P. Bowling, is going strong. Mr. Willis resigned his office on the ground that he could not act with Mr. Bowling. The resignation occurred at a meeting of the delegate board, and, according to Mr. Willis's statement of the matter, his resignation was in the form of a challenge that each should do so, which Bowling had accepted, but when the point arrived "renigued." The resignation of the president was accepted by the board, and with the other proceedings of the meeting, is now going the round of the lodges for confirmation or otherwise. Several of the lodges have rejected the accepting motion. As the officers are now supposed to be busy preparing for the wages board or conference the differences occur at an awkward time. The trouble existing had its origin in the late lamentable good-for-nothing strike, and is perpetuated by the ambition of the president, who has been hardly three years in Australia, to enter Parliament as the representative of Labour.

A colliery manager of the district proposes, as a solution of the deficient place problem, the system of special hewing rates for these places instead of, as now, the making up of wages to 11s. per day. That, he contends, would get rid of the practice of taking it easy in these places on the assurance of getting made up to 11s. It is stated, on the miners' side, that in the new claims for the wages board, 12s. 6d. per day is set down as the wage to be made up to.

### Victoria.

The Victorian Mines Department boring plant, operating 3½ miles from Morwell, which recently revealed a seam of brown coal 262ft. 6in. thick, from 492ft. deep to 744ft. 6in., has been continued to a depth of 860ft., cuting three further seams of 55ft. 5in., 9ft. 4in., and 9ft. respectively. At present the bore is in clay.

### New Zealand.

The New Zealand Government has just undertaken the development of a new coal mine, situated at Mount David, at the head of Coal Creek Valley, six miles from the State mine at Dunollie, and about nine miles from Greymouth. Two large seams are already opened up, and are being worked. The coal is said to be the best gas coal in the dominion, and there is practically an inexhaustible supply. The binns that are being erected are the largest in New Zealand, and the plant, which is thoroughly up-to-date, will be worked by electricity.

The Hikurangi Coal Company's mine, in the Auckland district (N.Z.), has been on fire for the past nine months, but on the 20th July it broke out more vigorously than usual, when flames and smoke were seen to be issuing from the fan shaft, and shortly after a building at the top of the shaft, where the air-fan machinery was housed, burst into flames, and was completely destroyed. Vigorous efforts were made for several days to extinguish the fire, but up to the date of publication of our last exchanges these had been ineffectual. The mine manager admitted that the position was serious, but he was confident that the outbreak would shortly be suppressed.

---

John Mayes, an opal miner, had a sensational escape from death at White Cliffs recently, when, owing to the loose mullock in a large opal dump giving way, he slipped down the side into an abandoned shaft, and the mullock, loosened by his fall, continued to run in, threatening at every moment to completely bury him. The efforts, however, of some thirty men who for three hours worked frantically to keep his head free, succeeded at length in stopping the run and effecting his release, though at one time he was entirely submerged for several minutes.

ESTATE OF E. L. LLOYD.

TENDERS are invited for the purchase of:—

(a) That well-known group of Mining Leases at Cue, on the Murchison Goldfield, Western Australia, comprising 30 acres, and known as "The Light of Asia" Mine, with Mining Leases 1148, 1151, 1252, 1362, 1498, and 1634, known as Light of Asia, Queen of the May, Queen of the May Extended, Asia Block, Queen of the May Extended No. 1, Light of Asia South Extended, together with the following plant:—

Poppet Head, Wire Rope, Pulley Wheel, Jackass Boiler (Langlands), Vertical Boiler (Norwood), Winding Engine Steam Pump, Tram Rails, Ore Bin.

(b) Gold Mining Leases Nos. 1833 and 1858, known as Agamemnon and Agamemnon West, comprising 18 acres, situate at Cue aforesaid, on the Murchison Goldfield, together with the following plant:—

1 Vertical Boiler and Winder (Marshall and Sons), Poppet Head, Wire Rope, Pulley Wheel, 350 feet of 2in. Piping, Tram Rails, 3 Kibbles, 1 Baling Bucket, ½ ton Steel, Blacksmith's Shop, and Quantity of Tools.

(c) Tailings Area No. 11, and quantity of Tailings situate at Monaro Gully, near Cue.

Particulars and conditions of Tender, working plans, etc., may be inspected at the Offices of the undersigned, and at the Office of Mr. A. Mitchell, Cue.

The lowest or any tender not necessarily accepted.

Each Tender must be accompanied by bank cheque for £100.

Tenders close the 31st day of August, 1913.

Mines may be inspected and sampled at any time upon written authority from the undersigned, or Mr. A. Mitchell, at Cue.

Tenders must be addressed to the Executors, c/o. NORTHMORE & HALE, Solicitors, Howard-street, Perth, Western Australia.

BOURKE'S HILL TIN SLUICING CO.
No Liability, Emmaville, N.S.W.

A DIVIDEND (the 13th) of Sixpence per share has been declared in the above Company, PAYABLE at the registered office, 125 Queen-street, Melbourne, on Tuesday, the 26th August, 1913. Share Register will be Closed from 20th to 26th August. JAMES MACKAY, Manager.

MINERS, non-unionist, 9s. 6d.; Bracemen, 8s.; Laborers, 8s. per day, for Geelong sewerage contract. Stone and Siddeley, 60 Market-street, Melbourne. or Ryrie-street, Geelong.

## Commonwealth of Australia.

Postmaster-General's Department,
Melbourne, 1st August, 1913.

TENDERS will be received at the Office of the Deputy Postmaster-General, MELBOURNE, until 3 p.m., on the undermentioned dates:—

2nd SEPTEMBER.—1000 PROTECTORS. (Sch. 964). See Commonwealth Gazette, 2nd August.

14th OCTOBER.—CABLE BOXES. (Sch. 877). See Commonwealth Gazette, 2nd August.

AGAR WYNNE,
(1239) Postmaster-General.

---

Department of Defence.
Melbourne, 25th July, 1913.

TENDERS FOR THE SUPPLY OF A 500-TON OIL STORAGE TANK FOR FLINDERS NAVAL BASE.

TENDERS will be received, subject to the conditions of tendering, until twelve noon on MONDAY, 1st SEPTEMBER, 1913, for the Supply and Erection of a 500-ton Oil Storage Tank at Flinders Naval Base, Victoria.

Drawings and specifications may be seen at the Office of the Director of Navy Contracts, Navy Office, Melbourne, and at the Naval Staff Office, Sydney, Brisbane, Largs Bay (S.A.), Fremantle, and Hobart.

Copies of specification only may be obtained on payment of a deposit of £5 each, which will be refunded on receipt of a bona fide tender and the return of the documents.

Tenders to be endorsed, "Tender for 500-ton Oil Storage Tank," on top left hand corner of the envelope, and addressed (if by post, prepaid) to the Director of Navy Contracts, Navy Office, Melbourne, or to the Director of Navy Contracts, care District Naval Officer, Sydney, Brisbane, Largs Bay (S.A.), Fremantle or Hobart, as the case may be.

The lowest or any tender will not necessarily be accepted.

The tenders are to be in all cases on the printed form, which can be obtained as above.

E. D. MILLEN,
Minister of State for Defence.

---

Department of Defence,
Melbourne, 25th July, 1913.

TENDERS FOR THE SUPPLY OF MACHINERY AND ACCESSORIES FOR STANDARD 25FT. MOTOR LAUNCHES.

TENDERS will be received, subject to the conditions of tendering, until Twelve noon on MONDAY, 8th SEPTEMBER, 1913, for the Supply of Machinery and Accessories for Standard 25ft. Motor Launches, as may be required, for a period of two years from date of contract.

The estimated requirements for the period of two years are ten (10) sets of machinery and accessories. Delivery to be made either at Sydney or Melbourne, as ordered.

Specifications may be seen at the Office of the Director of Navy Contracts, Navy Office, Melbourne, and at the Naval Staff Office, Sydney, Brisbane, Largs Bay (S.A.), Fremantle, and Hobart. Copies may be obtained on payment of a deposit of £5 each, which will be refunded on receipt of a bona fide tender and the return of the documents.

Tenders to be endorsed, "Tender for Standard 25ft. Motor Launches" on top left-hand corner of the envelope, and addressed (if by post, prepaid) to the Director of Navy Contracts, Navy Office, Melbourne, or to the Director of Navy Contracts, care District Naval Officer, Sydney, Brisbane, Largs Bay (S.A.), Fremantle, or Hobart, as the case may be.

The lowest or any tender will not necessarily be accepted.

Tenders are to be in all cases on the printed forms, which can be obtained as above.

E. D. MILLEN,
Minister of State for Defence.

---

## CITY OF MELBOURNE.

TENDERS will be received until 12 noon on TUESDAY, 16th SEPTEMBER, for SUPPLY and DELIVERY of—

(a) INSULATED COPPER CABLES.
(b) THREE PHASE TRANSFORMERS.

Specification may be seen at the Office of the City Electrical Engineer, Town Hall.

JOHN CLAYTON,
Town Clerk.
Town Clerk's Office,
Town Hall, Melbourne,
24th July, 1913.

---

## Government Notice (V.).

MINING AND FACTORY ENGINE-DRIVERS.

EXAMINATIONS will be held in Melbourne and Gippsland in September next, commencing in Melbourne during the first week, and in Gippsland (at any of the undermentioned places where there are sufficient applicants—Bairnsdale, Maffra, Sale, Traralgon, Moe, and Wonthaggi) during the third week. Applications for Melbourne should be lodged before the 19th August, and for Gippsland before the 27th August. Forms of application and copies of the regulations may be obtained at this Office, or from the Inspectors of Mines, and Inspectors of Factories.

R. U. BIRRELL,
Secretary to Board of Examiners.
Office of Mines, Melbourne, 28th July, 1913.

---

## Government Notices (N.S.W.).

Sydney Harbour Trust Office,
Circular Quay, 1st August, 1913.

TENDERS FOR THE INSTALLATION OF ELECTRIC LIGHT.

TENDERS will be received at this Office up to 2 p.m. on Monday, the 11th August, for the installation of electric light and fittings in the sheds, approaches, etc., at No. 1 Wharf, Dawes' Point.

Forms of Tender and full particulars may be obtained on application to the Engineer-in-Chief of the Trust.

HAROLD F. NORRIE,
(7a6) Secretary.

---

METROPOLITAN BOARD OF WATER SUPPLY AND SEWERAGE.

TENDERS for the Works specified below will be received up to 2 p.m. on the 18th August, 1913. For particulars see "Government Gazette."

AUGUST 18th, 1913.

CONTRACT 1199.—Supply and Delivery of Centrifugal Pumps and Electric Motors to No. 1 Pumping Pumps and Electric Motors to No. 1 Pumping Station, Ultimo, for Manly Low-level Pumping Stations.

WILLIAM HOLMES,
Secretary.
341 Pitt-street, August 1st, 1913.

---

## WILLIAMS' FANCY GOLD MINING CO. NO LIABILITY, Berringa.

A DIVIDEND (the 41st) of Sixpence a share, with a bonus of Sixpence a share, has this day been declared PAYABLE at the Office of the Company, Lydiard-street, Ballarat, on Wednesday, the 13th day of August, 1913. Transfer Books will Close on Saturday, 9th inst., at 12.30 o'clock p.m.

S. STRETCH, Manager.
Ballarat, 1st August, 1913.

---

## THE BRISEIS TIN AND GENERAL MINING CO. LTD.

A DIVIDEND (No. 22) of Sixpence per share (free of English income tax) has been declared, PAYABLE at registered offices, London, and 70 Elizabeth-street, Melbourne, respectively, on Thursday, 28th day of August, 1913. Transfer Books will close 6th August. By Order of the Board, T. P. HUSBAND, Melbourne Secretary.

Melbourne, 30th July, 1913.

---

## EDNA MAY GOLD MINING COMPANY NO LIABILITY.

A Special MEETING of shareholders will be held at the Board room, 7th floor, Broken Hill Chambers, 31 Queen-street, Melbourne, on Monday, the 11th day of August, 1913, at 2 o'clock in the afternoon, to consider and order on the following business:—

1. To authorise the directors to sell or dispose of the unissued shares on such terms, for such purposes and subject to such conditions as they shall think fit.
2. To confirm the minutes of the meeting.

Dated the 31st day of July, 1913.

By Order of the Board,
FRED. TRICKS, Manager.
31 Queen-street, Melbourne.

---

## ARTHUR H. HASELL,

GYPSUM, PHOSPHATE, GUANOS, MAGNESIA, WHITING, DOLOMITE, INFUSORIAL EARTH, TIMBER, HEMP, SULPHUR, Etc.
ANALYSES MADE FREE.

HEAD OFFICE: Lombard Buildings, 17 Queen-street, Melbourne.

Branches: 2 Bridge-street, Sydney. 1 Lipson street, Port Adelaide. Factories: Pt. Adelaide, S.A.; Newport, Vic.; Newcastle, N.S.W. Mines: Kapunda and Marion Bay, Daly Head, S.A.; Boort, Vic.; Cooma, N.S.W.

---

## CITY OF RICHMOND.

TENDERS will be received until 4 p.m. on Monday, 11th August, for supplying and delivering one RIGHT HAND DRIVING WHEEL, of Australian manufacture, for steam roller.

Specification at the Town Clerk's Office.

C. C. BLAZEY, Town Clerk.

---

## BROKEN HILL SOUTH SILVER MINING COMPANY NO LIABILITY.

NOTICE is hereby given that the fortieth Half-Yearly Ordinary General MEETING of Shareholders in the above Company will be held in the Board room, Collins House, 360 Collins-street, Melbourne, on Friday, 29th August, 1913, at 12 o'clock noon.

Business:

1. To receive and consider accounts and balance sheet and the reports of the directors and auditors.
2. To confirm the appointment (made by the directors) of Mr. James Counsell, F.C.P.A., as auditor in place of Mr. W. E. Dalton, deceased.
3. To consider any business of which due notice has been given to the board of directors, and approved of by them.

By Order of the Board,

FRANK G. HICKEY, Secretary.
360 Collins-street, Melbourne, 25th July, 1913.

Transfer books will close on Wednesday, 27th August, 1913, at 4 p.m., and will remain closed until after the meeting.

---

## SILVERTON TRAMWAY CO. LTD.

An interim dividend of One shilling (1s.) and bonus of One shilling (1s.) per share, will be payable at this Office on and after Monday, 1st September, 1913. The Transfer Books of the Company will close 4 p.m. on Thursday, 14th August, 1913, for above dividend, but will be open again for transfers on Friday, 15th August. By Order of the Board, C. F. MACDONALD, Secretary, Equitable Building, 314 Collins-street, Melbourne, 1st August, 1913.

---

COMPLETE SLUICING PLANT, by Thompson and Co., Castlemaine, comprising 10in. Gravel Pump, 12in. Water Pump, Compound Engines 10in. and 20in. x 24in. stroke; internally fired Boiler, 18ft. x 7ft., working pressure 120lb., with necessary nozzles, piping, sluice boxes and fittings complete; only short trial since erected, in excellent order; three miles from railway station, level road. Inquiry and inspection invited.. CAMERON and SUTHERLAND, Queen's Bridge-street, South Melbourne.

---

## WANTED.

A FIRST-CLASS MILL MAN

familiar with

MILLING PRACTICE,

must thoroughly understand

MINING AND MILLING MACHINERY,

capable of handling men. Good salary paid to right man. References required.

Address—

Z, "Australian Mining Standard,"
Melbourne or Sydney.

---

## MINERS WANTED.

250.

FOR STEADY WORK ON INCREASED OUTPUT OF CONCENTRATING ORE.

Contract Miners averaged last year 17/4 per shift.

| | |
|---|---|
| Wages Miners (under agreement about to be executed) | 11/- per shift |
| House Rent | 8/- to 12/- per week |
| Meat | 5d. to 6½d. per lb. |
| Bread | 4d. per loaf |
| Milk | 4d. per quart |

Living Conditions excellent.

Government School, High School, Technical College.

Good Contract Miners apply on Job at earliest.

MOUNT MORGAN GOLD MINING COMPANY LIMITED,

MOUNT MORGAN, QUEENSLAND.

## Commonwealth Bank of Australia

**HEAD OFFICE** **SYDNEY**

**Branches** are open for the transaction of **GENERAL BANKING BUSINESS** at **Federal Capital**—Canberra. **New South Wales**—Sydney. **Victoria**—Melbourne. **Queensland**—Brisbane and Townsville. **South Australia**—Adelaide. **Western Australia**—Perth. **Tasmania**—Hobart. And at 36–38 NEW BROAD STREET, **London.**

Cable remittances made to, and drafts drawn on foreign places direct. Foreign bills negotiated and collected. Letters of credit and circular notes issued to any part of the world. Bills negotiated or forwarded for collection. Banking and Exchange business of every description transacted within the Commonwealth, United Kingdom and abroad. Interest paid on fixed deposits.

**SAVINGS BANK DEPARTMENT**

**Branches** are open at 3 Moore Street, **Sydney;** 317 Collins Street, **Melbourne;** Queen Street, **Brisbane;** Royal Exchange, 96 King William Street, **Adelaide;** St. George's Terrace, **Perth;** Elizabeth Street, **Hobart;** and **Canberra** (Federal Capital); and **1900 Agencies** at **Post Offices** which issue Money Orders in the **Australian Commonwealth and Papua,** from 10 a.m. to 3 p.m. daily (Tasmania, 9 a.m. to 2 p.m.), and noon Saturday.

All Branch Offices are open for **deposits** and **withdrawals** on Friday 7 to 9 p.m.

**Withdrawals on demand** may be effected at any office within the Commonwealth.

**1/- Minimum Deposit.** **3% Rate of Interest on all Deposits up to £300**

JAMES KELL, Deputy Governor. June, 1913. DENISON MILLER, Governor.

## BALLARAT School of Mines

DEPARTMENTS:

CHEMISTRY and METALLURGY,
ENGINEERING and SURVEYING
ELECTRICAL ENGINEERING,
GEOLOGY and MINING
MATHEMATICS and PHYSICS.

**Prospectus on Application.**

**F. J. MARTELL, Director.**

# "INGREY"

## PATENT WEIGHING & RECORDING MACHINES

ARE

**Installed in H.M. Dockyards.**
**Certified by the Board of Trade.**
**Accurate and Reliable.**
**Automatic in action and**
**Pay for themselves in a year!**

## H. A. HARVEY & CO. LIMITED, LONDON.

**Australian Representative — LASCELLES PARRINGTON & BRACHE.**
**London House, 97 Elizabeth Street, Melbourne.**
**New Zealand Buildings, Pitt Street, Sydney.**

ESTABLISHED 1860.

## BONDHOLDERS' REGISTER

Publishes the Actual Numbers of all Drawn Bonds Throughout the World.

PUBLISHED FORTNIGHTLY.

**10s. PER ANNUM.**

73 FARRINGTON ST., LONDON, E.C.

Australian Offices,
376 FLINDERS LANE, MELBOURNE.

Sir Henniker Heaton, formerly member for Canterbury in the House of Commons, who is at present in Sydney, received a cablegram last Friday from London stating that the Wireless Committee of the House of Commons proposes a penny a word zone system of wireless messages to India, Canada, Africa and Australia. This would mean 4d. a word to Australia for wireless messages, as against Sir Henniker Heaton's proposal of twelve words for a shilling.

# 3 Kinds of Drills

***Good!***

***BETTER!***

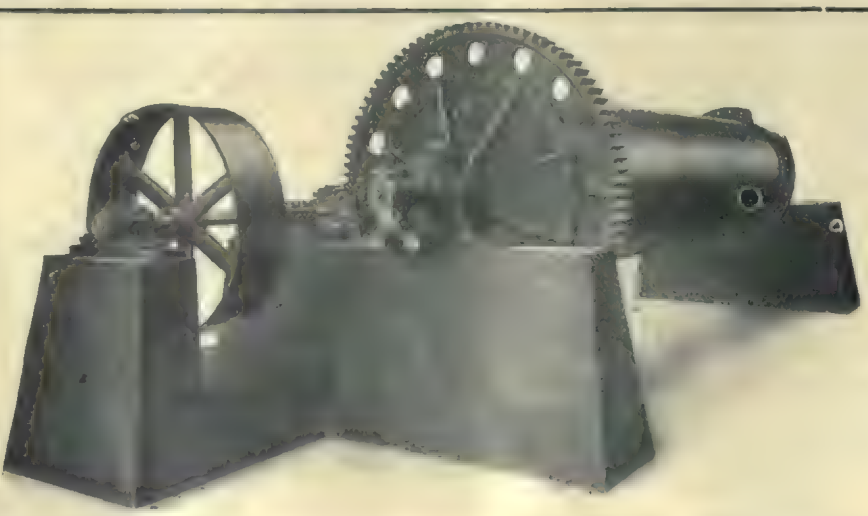
***"THARSIS!"***

**B. K. MORTON PTY. LTD.,**
**Steel Manufacturers,**
**Bridge St., Sheffield, England.**

**MELBOURNE**
Offices and Store,
**512 Little Collins St.**
Telephone, 1392.

**LARGE STOCKS.**
**"THARSIS" and all classes Tool Steel kept.**

**SYDNEY.**
Office and Store,
127 York St.
Telephone, 2515 City.



# Gates Tube Mills.

**The ALLIS CHALMERS COY.**
**Manufacture the GATES TUBE MILL**

in a variety of sizes, both for wet and dry pulverisation, and have a large assortment to select from. Linings may be of Silex, Iromite or Cast Iron. The feed end is equipped with either the SPIRAL FEEDER, cast iron elbow, or plain liner for squirt feed. The discharge may be either open or closed type.

**Frank R. Perrot, Sole Representative,**
**204 Clarence St., Sydney.** **883 Hay St., Perth.**

Sales Agents:—
**Melbourne, L. Bannister, 39 Queen St.** **Broken Hill, E. Barton Hack, Blende St.** **Brisbane, Evans Deakin & Co., 172 Edward St.**

## CONTENTS.

THURSDAY, AUGUST 14.

EDITORIAL—

Victoria in 1912 .. .. .. .. .. .. .. .. 123
Leaderettes .. .. .. .. .. .. .. .. .. 123-4
Our Big Mines .. .. .. .. .. .. .. .. .. 125
Metal Quotations .. .. .. .. .. .. .. .. 126
Personal .. .. .. .. .. .. .. .. .. .. 126
The Investor's Column—
Frenchman's Reef .. .. .. .. .. .. .. 126
Lode Hill .. .. .. .. .. .. .. .. .. 126
Mining in New South Wales .. .. .. .. 127
**Victorian Mining Activities** .. .. .. 127
Mining in New Zealand .. .. .. .. .. .. 129
Tasmanian Mining .. .. .. .. .. .. .. 130
The Coal Mining Industry .. .. .. .. .. 130
Reports of Companies, Etc. .. .. .. .. 131
Central R. W. and Bine (V.) .. .. .. .. 132
Mining in Western Australia .. .. .. .. 132
**Northern Territory Mining** .. .. .. .. 132
Electrolytic Refining Co.'s Wages Bd. 132
Melbourne Tramways .. .. .. .. .. .. 133
**Tapping Electric Meters** .. .. .. .. 133
**Electric Traction and Industries** .. .. 133
British and European Developments .. 134
Victorian Railways .. .. .. .. .. .. .. 134
**Railless Electric Traction** .. .. .. .. 135
Electric Supply in Melbourne .. .. .. 136
Miscellaneous .. .. .. .. .. .. .. .. 136
Northern Territory Railways .. .. .. .. 138
News and Notes .. .. .. .. .. .. .. .. 142
Dredging and Hydraulic Sluicing .. 142
**The Decline of Newnes (N.S.W.)** .. IX.
Wilful Miners .. .. .. .. .. .. .. .. IX.
**Spargo Creek Mine (V.)** .. .. .. .. IX.
Maryborough (V.) Goldfield .. .. .. .. IX.

---

HENLEY'S
Electric Wires and Cables
AND INSULATING TAPES
ARE THE BEST.
W. T. HENLEY'S Telegraph Works Co. Ltd.
546 COLLINS ST., MELBOURNE.
61 YORK ST., SYDNEY.

---

BELTING!
Largest stock of all kinds of Machine Belting in the Commonwealth.
Conveyor and Elevator Belting for all purposes.
HOPKINS BROS. & ODLUM PY. LTD.
LEICESTER ST., CARLTON, MELBOURNE.
Phone, Central 754 and 5202 Box 377 G P O.

---

COKE!
NORTH BULLI COLLIERY
Limited
Supplies best quality hard
SOUTHERN
SMELTING COKE.
(Weekly output 1250 tons.)
H. G. Hyde. Secretary
Royal Insurance Building, 16 Spring-street,
SYDNEY.

AUSTRALIAN MINING STANDARD.
PUBLISHED EVERY THURSDAY.
Forwarded Post Free to any Address.

| | Per Annum. |
|---|---|
| Australasia .. .. .. .. .. .. .. .. .. .. .. .. | 26/- |
| British Possessions .. .. .. .. .. .. .. .. .. | 32/6 |
| Foreign .. .. .. .. .. .. .. .. .. .. .. .. .. | 34/8 |

Payable half-yearly or yearly, in advance.

All amounts should be made payable to order of "CRITCHLEY PARKER, Bank of Australasia."

12 O'Connell-street,
Sydney.
Tel Central 2703.
P.O. Box 331.

376 Flinders-lane,
Mebourne.
Central 7931 & 1838.
P.O. Box 253.

**BACK NUMBERS OF THE "MINING STANDARD."**

The following is the rate for back copies more than a month old. Applications by post must be accompanied with cash and postage added. In no case can we guarantee to supply copies, as our storage accommodation is limited.

A postcard will be sent if the number required is out of print.

For copies three months old, ninepence; six month, one shilling; and beyond that period, one penny per month per copy.

As there is a regular demand for back copies of the "Mining Standard," newsagents are requested to send back all returns uncut and in good condition, otherwise they will not be accepted.

All Returns from Newsagents must reach us by the end of each month (the whole paper must be sent). No credit will be allowed beyond this term.

Postage — British, 1d.; Foreign, 1½d.; Australasia, ½d. per copy.

Stamps will be accepted as pre-payment.

Address communications: Publishing Department, "Mining Standard."

**CASUAL ADVERTISEMENTS.**

The rate for this class of advertisement is governed by the position it occupies.

If it appears on leader page or amongst or next to reading matter, the rate is 15s. per inch (nonpariel) per insertion.

Towards end of reading section—
Brevier, 16 ems width, 6s. per inch per insertion.
Nonpareil, 8s per inch per insertion.

For the convenience of advertisers, we might state that—Brevier has approximately 7 words to a line, and 8 lines to the inch—6s Nonpareil has approximately 8 words to the line, and 11 lines to the inch—8s

**ALTERATION TO ADVERTISEMENTS.**

As our publishing arrangements necessitate the "Mining Standard" being issued simultaneously in Sydney, Melbourne and Adelaide on the same day each week, advertisers wishing to change their advertising matter must supply same ten days in advance of publication.

**ADVERTISEMENT PROOFS.**

Proofs are submitted to advertisers in order to give them an opportunity of going over the advertisements before printing.

Advertising Copy must be typed and so arranged as to clearly indicate the display required for the more important features of the advertisement.

Any departure from the original copy will be charged for. Advertisers are specially requested to instruct their publicity departments to give us clear and definite instructions respecting changes of matter or new copy in order to avoid incurring unnecessary charges.

AUSTRALIAN MINING STANDARD.
PUBLISHED EVERY THURSDAY.
ESTABLISHED 1888.

It is requested that all business communications be Addressed to Critchley Parker.

THURSDAY, AUGUST 14, 1913.

## VICTORIA in 1912.

With one exception, Victoria is the smallest of all the Australian States; it is, also, on the whole, the most compact; it claims to be, in many ways, the most advanced; and its Mines Department should, on the score of age and experience, be the most efficient and the most rapid-working of all. In these circumstances, it is assuredly no credit to the State and to its Mines Department that that Department's annual report should be, year after year, the last of all the States' annual reports issued. We were able to deal, in these columns, with the Queensland figures for 1912 in the early part of April. In the case of New South Wales we waited for the publication of the complete report, which reached us the same month, and was dealt with on May 15. South Australia's mineral production was the subject of a leader on April 24, and Western Australia was dealt with recently. The complete figures for Tasmania, which is popularly supposed to be particularly "slow," have been in hand since the early part of the year; and here is Victoria, which prides itself on its dash, its enterprise, and its vigour, coming along a poor last with a report which reached us in the last week of July, and which we only received then owing to the courtesy of the Department in supplying us with an advance copy. We can see no excuse for this extreme dilatoriness, which contrasts very unfavourably with the expedition shown by the Departments of New South Wales and Queensland.

The figures given in the annual report are not such as to convey much pleasure to the mind of a patriotic Victorian. As compared with last year's figures, the total value of the mineral output has declined 9.4 per cent. to £2,331,294. In Victoria it is a case of gold first, and the rest nowhere, so that it may be taken for granted that, when there is a drop to this extent in the total mineral yield, there is a falling-off in the gold product. So it is, indeed, though in this case the falling-off amounts to only some 4.7 per cent. It is rather absurb that in order to see how long this decline has been in operation one has to turn to the Official Year Book of the Commonwealth, because the information is not given in the Department's report. That publication does give figures purporting to tell the annual gold yield for each year from the discovery in 1851, but the figures it gives are in crude ounces, and, therefore, valueless for any purposes of comparison; and the figures in fine ounces, given in another portion of the report, are for the past 5 years only. Turning to Mr. Knibbs' figures, we find that the gold yield has declined steadily since 1906, when it stood at a value of £3,280,478. From 1910 to 1911 the drop was one of 11.6 per cent., so that last year's decline is comparatively satisfactory. On the other hand, the total mineral decline has grown, the decrease, from 1910 to 1911, having amounted to only about 6.3 per cent.

Amongst other minerals, there are only two that count. By far the more important of these is coal; this industry has not had a good year, the total value of the output of coal of all sorts amounting to only £259,321, as compared with £301,142 the previous year, a decline of about 13.9 per cent. The bulk of this coal is bituminous; and in this class of coal the drop has been from 653,864 tons, of a value of £298,829, to 589,143 tons, of a value of £258,455, so that the fall amounts to 9.9 per cent. in tonnage and 13.5 per cent. in value, a decline that does not augur too well for the prospects of Victoria's not very large, and not too prosperous, coal industry. Antimony, from being a thing of insignificance, last year jumped into prominence, its output more than doubling and the value of its output very nearly doubling; its figures being, in fact, 2,430 tons, of a value of £16,126, as compared with 1,098 tons, of a value of £8,928. The whole of this output came last year, as did, also, the output of the year before, from the Costerfield Mining Company's property. The advance in this metal is, despite the smallness of the production, the most satisfactory feature of the year's figures.

---

That ineffable poseur, Mr. Lloyd George, describes himself, with the unctuous self-praise that is habitual with him, as doing, by means of his National Insurance Act, the work of the "Man of Nazareth." It is interesting, therefore, to note one effect of this marvellous piece of legislation by one who poses as the modern redeemer of mankind. A recent minute by the London County Council gives particulars of the absences through illness of motormen and conductors in the Council's employ during the months of February, March, and April of this year as compared with the absences from the same cause during the same months of last year. The average number of men employed has risen from 5319 to 5631, but the total number of men ill during the three months has increased from 1078 to 1958. Not only have more men been ill, but the period of their illness has been very much greater, as will be seen by consideration of the fact that the number of days lost in this way rose from 11,846 to 19,574. Are the motormen and conductors really having a very much worse time than they had last year? are they being treated for complaints which they used to neglect? are they seeking to get their money's worth out of the doctors? or is the Act proving to be an inducement to them to malinger?

* *

We have frequently pointed out in these columns that the demands of organised labour for increased wages generally carry with them demands for less work also; and that the object of militant unionism, in the latter respect, is fast reducing production per head of population, and tends to lessen our permanent prosperity. No one objects to higher wages provided they go hand in hand with increased efficiency, but when the very contrary is the result it is time to complain. Two instances of this tendency occurred in Sydney last week. One of them is the decision of the Sydney Wharf Labourers' Union to refuse in future to truck more than three bags at a time, including chaff. The pith of the proposal is contained in the last two words, and prompted the sarcastic remark that "they should have made it one bag instead of three." Three bags of grain at a time is the usual number, but, owing to the lightness of chaff, five bags of that commodity is considered a fair thing. The other case referred to is the demand by the same Union for an extra threepence per hour for handling oil and general cargo imported by the Vacuum Oil Company. In this case the coopers who work alongside the "wharfies," tightening up barrels, etc., and have had to serve years of apprenticeship to their trade, receive only 1s. 4½d. per hour, while the rate for the unskilled work of wharf-labouring is 1s. 6d. per hour, and they are now demanding an extra threepence per hour for handling the Vacuum Oil Company's cargo.

* * *

Like Mr. Justice Higgins, President of the Commonwealth Court of Conciliation and Arbitration, Mr. Justice Heydon, of the New South Wales Industrial Court, finds it essential, in determining the rates of wages in various industries, to ascertain first of all the cost of living—not necessarily the absolutely lowest cost upon which a man and his family can find subsistence, but such a cost as will permit them to feel that life is not a perpetual drudgery. It is easy to understand the difficulty of doing this in a manner which will give enduring satisfaction; for as one industry after another secures its award, and as an increase of wages is usually given, which in turn means increased working expenses to be passed on to the public as the universal consumer, their Honours find themselves pursuing a will-o'-the-wisp; they no sooner think themselves within reach of what they seek than it once more eludes them. There is one item of expenditure, however, which neither of them, nor any other judge, as far as we are aware, confesses to have taken into account, although it is really as unavoidable an expense as any incurred with butcher or baker. We refer to the ever-increasing demands made by trades unions in the form of special levies for the support of men who, maybe, in other industries and hundreds of miles away, with or without their own consent, are on strike. The fact is notorious, but last week's papers furnished a couple of concrete instances. In the one, the West Australian miners forwarded £1000 towards the support of the unionist miners who are on strike at Bendigo (V.), because they are not allowed to work with non-unionists. In the other, not only West Australian, but New South Wales, South Australian, and Tasmanian miners, even the badly-treated employes at the Victorian State coal mine, contributed, by the decisions of their officials, to the assistance of the strikers at the Waihi mine, New Zealand. Perhaps, in the majority of cases, the contributors were in full sympathy with the cause they were supporting; if not, they are the more to be sympathised with, for pay they must. The levy having been made, becomes a debt recoverable by action at law, and this article of expenditure, therefore, becomes an essential item when computing the cost of living.

* * *

The necessity for looking at a question in all its bearing was clearly shown recently at the first annual meeting of the Ohinemuri (N.Z.) Mines and Batteries Union. It appears that at the present time it rests with the executive to accept or reject applicants for membership, according as the committee may consider them desirable or undesirable. At a time when so many questions are dividing industrial bodies, when there is almost as much opposition between two extreme parties amongst employees as between one of them and the still unsubjugated employer, the position may at any moment prove awkward. If, for example, a unionist, having proved obdurate on some point, be deposed, a committee may nullify the action by admitting him to membership, or it may make his damnation more absolute by rejecting him. One who is a strike-breaker in the eyes of one party may be reinstated in full privileges by another. At the meeting in question, notice of motion was given "that the resolution now on the books giving the committee power to turn men away who they consider would not be desirable members of the union be rescinded, so that all bona-fide workers making application for membership be admitted on payment of the entrance fee." But it was objected by one of the moderates, who still favours arbitration for settlement of disputes and will have nothing to do with the "strike all the time" federationists, that to rescind that resolution would be industrial suicide; it would be the death blow to arbitration in the district, as it would open the door to the federationists who would flock thither from Karangahake and other places, if only for the purpose of capturing the Waihi district and adding it to the federation territory. After a brief discussion, it was decided to submit the question to a secret ballot, to be taken on the 28th inst., the mover of the motion, Mr. W. Benson, and his principal opponent, Mr. Potter, being appointed scrutineers.

* * *

Yesterday, on the Melbourne Stock Exchange, the price of "Herald" shares dropped from 40s. to 39s. The reason is probably to be found in the proposal to establish a new evening paper for the Victorian metropolis. This paper is to be called "The Australian Evening Mirror," and is to have a capital of £200,000 in 200,000 shares, of which 180,000 will be preferential "A" shares, carrying 6 per cent., and the remaining 20,000 "B" shares, which will be entitled to two-thirds of the profits after 6 per cent. has been paid on the preferential, the remaining one-third being divided proportionately between the two classes of shares. Of the preferential shares, 75,000 are to be issued at once, and, as it is said that these are being strongly applied for, it is expected that the issue will be completed without the putting forth of any prospectus. On these shares 12s. 6d. is to be called up forthwith. Another 75,000 shares are to be issued later on; 20,000 are to be held in reserve; and the remainder of the "B" shares are to go to the promoters. An option has been secured over first-class premises; a strong Board is promised; and a capable staff is said to have been secured. The machinery which is being negotiated for is estimated to cost £50,000. Whether this will leave enough capital for the company to work on is a question; but we incline to the opinion that the whole of the capital will be needed for the thorough establishment of the paper. Much will be certain to depend upon the character of the support accorded to the venture, and it will need to be strong (as it is said to be likely to be) to meet the powerful opposition of the existing paper.

* * *

A shameful incident of disregard of the convenience of the travelling public is shown by the New South Wales Railway Department in the delay of the quadrupling of the Illawarra line from Sydney to Sydenham, a distance of only three miles. A question asked in the Legislative Assembly last week elicited the reply from the Colonial Treasurer, Mr. Cann, that this work was estimated to have been completed in August, 1912, but another twelve months has since passed, and the work is still uncompleted. In the meantime, the traffic has been increasing, and exasperating delays are continually occurring in the running of trains; this and overcrowding having become chronic complaints. The excuse given for the delay in completing the work is the time taken by the Water and Sewerage Board in removing a pipe, which prevented the tunnel through the "bottle-neck" at the entrance to Sydney Station yard being driven. What would be thought, say, in America, of a constructing authority that would allow a paltry water-pipe to delay an important work for twelve months and seriously inconvenience tens of thousands of the travelling public? Mr. Cann further stated that the extra roads would be completed as far as the tunnel signal-box (which is probably barely half-way through the Sydney yard) by about October, but added that the train service would not be materially improved till the work has been carried right through the yard and additional platforms constructed. As one brick has not yet been laid upon another toward building the additional platforms, it looks as though the Illawarra residents will have to put up with another twelve months' scandalous inconvenience at the hands of a callous Department.

## RAILWAY DISORGANISATION.

It is difficult to imagine any railway organisation anywhere in the world making a greater hash of its traffic than the Victorian Railways made of the passenger traffic on the Caulfield line on Tuesday evening. At about the worst time of the day, a little before half-past five, an engine employed in connection with the regrading work now in progress went off the line. As a result, the whole of the trains from the city, carrying home business men and women who had finished their day's work, were tied up; and, as the full traffic was not resumed on the line for between two and three hours, the whole of the theatre traffic from the district between seven and eight o'clock was also held up. That some muddle should have resulted from the accident was doubtless unavoidable, but that it should have taken so long to remedy does not reflect much credit on the authorities. The most serious fault to be found with them, however, is their attempt to hide the actual state of affairs from the train passengers. In this way the inconvenience and annoyance were intensified, many people wasting a good couple of hours in the train, when, had they been told that a considerable time must elapse before the trains would be able to get through, they might have sought other means of reaching their destinations. As soon as the position was realised, all passengers should have been informed of the state of affairs, and have been given an opportunity to shift for themselves, instead of being misled by frequent assurances that their trains would be going through "almost directly."

# OUR BIG MINES.

## Examinations of their Yearly and Half-Yearly Reports.

(By a Mining Accountant.)

### The Great Boulder Proprietary G.M. Ltd.

The report for the year ended December 31st, 1912, differs but little from its predecessor so far as the financial results are concerned, while mine development during the period confirmed the undesirable trend of the last two or three years. No favourable discoveries of any importance were made in the deep portions of the mine; nevertheless there appear to be good chances of some handy pickings in the shallower levels. The dividend demand has been duly attended to, for the rate was not reduced despite the outlook. The wise policy, instituted three or four years ago, of writing off substantial amounts in order to build up a reserve was short lived, the amount written off having fallen from £45,000 in 1909 to £15,000 in 1912. Even so, this year the dividend was only £371 in excess of the net profit. Last year the excess was only £474, after £14,000 was written off. It would appear as if the writing down process is made subservient to a consideration of the dividend. It is, of course, a matter of opinion at best whether depreciation allowance should be respected when a mine gives evidence of exhaustion. But when the declared policy is to put up a stiff fight before going under an ample reserve fund is a necessity.

The prospecting work at the 2650ft and 2800ft. levels failed to discover pay-ore. Beyond this brief mention the 2800ft. level is left severely alone, so it is to be presumed that very little hope is entertained regarding this portion of the mine. The survey plans and sections illustrate how sharply the main lode dips westward below the 2350ft. level into the Golden Horseshoe until the 2800ft. level is right on the boundary. The main shaft is down to 2844ft., and the Edwards shaft to 2872ft.; bore holes from the bottom of these shafts have reached a depth of 3000ft below the surface on the western boundary without finding any ore, thus dispelling the hope held out at the previous general meeting. It is proposed to bore from the 2800ft. level of the Horseshoe in an easterly direction, to test the country underneath the main ore-shoot. And from the 500ft. level between the Edwards and Lane shafts more boring will be done. Here a lens of ore having a length of 90ft., an average width of 23ft., and an average assay value of 8½ dwt., was exposed by driving at 370ft. south of Edwards' shaft. This was the solitary discovery worth mentioning. And to ascertain its full extent will take considerable time. But even the easterly prospects do not appear to hold out much promise, except in the portions mentioned above, for 56 bore-holes averaging a horizontal length of over 300ft. each have been driven into the country east of the main lode and the lode at the Hamilton shaft. Many of these bores cover the distance between the lodes and the eastern boundary, and have been put in at varying depths below the surface from the 100ft. to the 2800ft. levels. From the Hamilton shaft a horizontal bore to the eastern boundary from the 1800ft. level passed through 6ft of ore assaying 8½ dwt. per ton. This was 115ft. from the eastern boundary; at 2ft. from the boundary it again passed through 7ft of ore assaying 1½ dwt. This latter is too low-grade to be classed as ore. In any case it will be expensive to prove what there may be of value in this remote portion of the mine. Drill holes to a depth of 2700ft. below the 1520ft. level, Hamilton shaft, failed to find any sign of ore. It must be admitted that the prospects look glum.

The Boulder gives good information concerning its mine, and the report contains complete plans and sections that are easily followed. It is indeed to be regretted that it has not a more cheerful tale to tell. The above narrative must heavily discount the almost over-done optimism of the chairman at the recent general meeting, when he was gratified to point to the fact that the development work this year opened up 147,705 tons of ore as against 125,995 tons last year. But the new ore discovered was 45,746 tons less than that extracted, though it is worth noting that the average grade credited to the reserves is now microscopically higher than before. Table A shows the depression of the last two periods, compared with the year 1910. All tons in this report are of 2240 lb.

Table A.—Underground History.

| | Year ended December. | | |
|---|---|---|---|
| | 1910 | 1911 | 1912 |
| Ore extracted ... tons | 195,407 | 187,510 | 193,451 |
| Average extraction grade | | | 13.84 |
| Ore in reserve ... tons | 760,177 | 698,662 | 652,916 |
| Average grade | 15.0181 | 14.5625 | 14.5973 |
| Footage of development work— | | | |
| Shaft sinking | 530 | 111 | 10 |
| Driving and cross cutting | [illegible] | 1,543 | 1,471 |
| Rising and winzing | [illegible] | [illegible] | [illegible] |
| Total | [illegible] | [illegible] | [illegible] |
| Diamond drilling | [illegible] | [illegible] | [illegible] |

The copious production of decimals in estimating the reserves borders on the absurd. To say the least, it suggests an accuracy that is not warranted by the nature of ore deposits as a whole, and of the Kalgoorlie deposits in particular. The figures look like a statement of tonnage rather than an estimated average of erratic assay values. The footage of development work has decreased considerably, which may partly explain the reduction in the reserves. But unfortunately that is not the only, or chief, explanation of the shrinkage. New ore has been much harder to discover. But this merely repeats what has already been shown.

The metallurgical work comes in for scant reference. A notable omission is the assay value of the ore treated: the only figures that are supplied give information as to the yield, and even these are not stated in terms of fine gold. The returns are given as so many ounces of bullion, from the treatment of ore in the sulphide mill by the two processes of amalgamation and cyanidation. A fair amount of old tailing is also being re-treated, the yield being stated in terms of bullion. The following table will illustrate the method:—

Table B.—Metallurgical Results for Year ended December, 1912.

| | Bullion, oz. | Valued at. |
|---|---|---|
| From 193,451 tons of ore treated in Sulphide Mill— | | |
| Recovery by amalgamation | 59,284 | £213,924 |
| Recovery by cyanidation... | 98,249 | 354,850 |
| Total recovery from ore ... | 157,533 | £568,774 |
| From 14,467 tons of old tailing ... ... ... ... ... | 1,203 | 4,385 |
| Grand total recovery ... ... | 158,737 | £573,159 |

In the directors' report it is stated that the average grade of ore treated was 13.95 dwt. per ton, "being under the average grade of the present reserves." The quotation loses the intended significance when enquiry reveals the probable fact that 13.95 dwt. represents the yield per ton of ore, and not the assay value. Though, of course, there is nothing to prove that the average grade of the reserves does not also represent the estimated recovery. But such a case would be unusual, nothing else. If the reserves are stated as assay value the 14.6 dwt. (see Table A) needs to be reduced to the recoverable amount before comparison is made with the extraction grade of the ore treated this year. Then it will be found that the results to be expected of the reserves will not compare so favourably with those of this year. It is difficult to understand why such an important feature as the assay value should be overlooked: its insertion would obviate a lot of difficulty and misconception as well. Returning to the directors' statement about the average grade of the ore treated there is only one roundabout way of discovering what was really meant. In Table B the bullion recovered from the ore treated is valued at £568,774. To calculate the number of ounces of fine gold this sum represents it is necessary to divide 568,774 by 4.248, as an ounce of fine gold is worth £4.248, or £4 4s. 11¼d. The result is 133,891 ounces of fine gold, equal to a yield of 13.84 dwt. per ton of ore. If the directors' figure of 13.95 dwt. represents the assay value, then the percentage of recovery would work out at 99.2 per cent., an altogether ridiculous figure.

So it is safe to ~~assert~~ that the directors' 13.95 dwt. was not the assay value, but the extraction grade per ton of ore. But even yet there is a discrepancy to be explained, as the calculated 13.84 is not equal to the stated 13.95 dwt. per ton. The explanation is that the directors have credited the ore with the gold obtained from the re-treatment of old tailing. If the £4385 (see Table B) recovered from this source be added to the indicated yield from the ore, and the same method of calculation be adopted, it will be found that the result is exactly 13.95 dwt. per ton of ore treated. Hence it may be considered as fairly well established that the directors' figure represents the extraction. And as another important omission of the report is that it does not state what was the percentage of recovery, the assay value can only be estimated. If the recovery be stretched to 95 per cent., a figure that certain Kalgoorlie companies do unblushingly claim to be a fact, the assay value works out at 14.68 dwt. per ton, after crediting the ore with the gold recovered by re-treating the old tailing.

It may be said that all this, after all, is but a storm in a tea-cup. Still a growl may be excused on the part of one compelled to travel by such a circuitous path in the search of knowledge. The net result arrived at is that the assay value of the ore treated was 14.57 dwt. per ton if a 95 per cent. recovery be allowed, and if the gold from the old tailing be kept in its proper place. A difference of 0.0273 dwt., probably less, per ton between the ore treated and the reserves is hardly a matter worth calling shareholders' attention to. Its place could well be filled by some other class of information that is essential and not misleading.

As a last word on the metallurgical achievements the average assay value of the residue of the ore treated during the year is stated to have been 1.60 dwt. per ton, and the average assay value of the residue of the old tailing dump 1.37 dwt. per ton. This information by itself can lead to no definite result, but to anyone anxious to further investigate the vexed question of percentage recovery, the revenue account—of all places—comes to the rescue with the statement that the current residue was 207,918 tons. But here the matter can rest. The aforementioned account, in its way, is an excellent production, being segregated with a praiseworthy regard for detail. The expenditure is set forth under various operating heads, both major and minor. The following list shows the main headings, and in it is included those shown in the profit and loss account, and in the directors' report.

Table C.—Total Costs during the Year 1912.

| | |
|---|---|
| Mine (opening up 147,705 tons) ... ... | £23,691 |
| Mine (stoping 193,451 tons) ... ... ... | 109,098 |
| Sulphide mill (193,451 tons treated) ... | 77,186 |
| Cyanide mill (193,451 tons treated) ... | 32,901 |
| Residues re-treatment— | |
| Current (207,918 tons) ... ... ... ... | 6,214 |
| Old (14,467 tons) ... ... ... ... ... ... | 2,266 |
| General charges ... ... ... ... ... ... | 8,925 |
| Sundries ... ... ... ... ... ... ... ... ... | 3,475 |
| Administration and head offices ... ... | 7,919 |
| Taxes ... ... ... ... ... ... ... ... ... ... | 29,873 |
| Depreciation ... ... ... ... ... ... ... ... | 15,000 |
| | £316,548 |

Under the operating heads are included supervision and proportion of salaries, labour, material and all catering charges such as power, light, assaying, etc. The "general charges" include management and proportion of salaries (£5046). "Sundries" mostly represent realisation of bullion. In this connection the cost of minting is not included as a cost, being shown as a deduction from the gross receipts on the credit side of the revenue account. The provision for taxes and depreciation allowance are shown in the balance-sheet and directors' report; the recommendations were adopted at the general meeting. With the information imparted by Table C a comparative table of the costs under the main operating heads may be introduced to indicate the trend of the last three years.

Table D.—Synopsis of Costs.

| | Year ended December. | | | | | |
|---|---|---|---|---|---|---|
| | 1910. | | 1911. | | 1912. | |
| | s. | d. | s. | d. | s. | d. |
| Mine (opening up) ... | 3 | 11 | 5 | 1 | 3 | 2 |
| Mine (stoping) ... ... ... | 8 | 9 | 10 | 1 | 11 | 3 |
| Sulphide mill ... ... ... | 8 | 9 | 8 | 2 | 8 | 0 |
| Cyanide mill ... ... ... | 3 | 7 | 3 | 10 | 3 | 5 |
| General charges ... ... | 0 | 10 | 0 | 11 | 0 | 11 |
| Sundries ... ... ... ... | 0 | 4 | 0 | 4 | 0 | 4 |

In the report the totals are given as 26s. 2d., 28s. 5d., and 27s. 1d. respectively. But the mine development charges are not based on the same unit as the others. The reduced total cost for 1912 is due to a double factor. Firstly because nearly £10,000 less was expended on mine development than during 1911, and secondly because a greater tonnage of reserves was opened up. If mine development were charged to capital it would be a perfectly reasonable proceeding to charge a development redemption of 3s. 2d. per ton when the 147,705 tons was being extracted. But as the mine development expenditure is charged to revenue the rate per ton of ore should be based on the tonnage of ore extracted and treated, or, in other words, on the ore from which the revenue for the period was derived. If this uniform basis be adopted the total costs in Table D would run as follows:—1910, 26s. 4d.; 1911, 26s. 9d.; 1912, 26s. 2d. The reason for the increase in 1910 is that more ore was developed than extracted that year: the decrease in the next two years is for the contrary reason. However, mine development is always a stumbling block to a comparison of costs, because of the varying amount of work done. If it be neglected, the comparison will be 5d. per ton in favour of 1911 as against 1912. It must be remembered that the total cost is not as represented in Table D. As shown in Table C, it works out at 32s. 8d. per ton of ore treated.

The revenue from ore treatment was increased by sundry receipts £4325, interest account £3259, and transfer department £196. A "finance and exploration account" is kept separate from the ordinary revenue accounts. The company is endeavouring to find a new mine: during the year an option was taken upon the Great Victoria, near Southern Cross, but was abandoned, as the ore proved to be too low in grade. Option expenses totalled £2425. Another £159 is also shown in the exploration account, which has a credit balance of £1953, after £5000 was transferred from profit and loss account. This £5000 is included in the amount written off, shown in Table E, which deal with the financial history for the last three years.

Table E. Financial History.

| | Year ended December, 1910. | 1911. | 1912. |
|---|---|---|---|
| Revenue* ... ... | £593,378 | £571,117 | £579,419 |
| Expenditure † ... | 302,395 | 297,143 | 301,548 |
| Written off for depreciation ... | 30,000 | 14,000 | 15,000 |
| Net profit ... | 260,983 | 262,974 | 262,871 |
| Dividend ... | 262,500 | 262,500 | 262,500 |
| Carry forward | 1,358 | 1,832 | 2,203 |
| Capital ‡ ... | 175,000 | 175,000 | 175,000 |
| Capital expenditure ... | 27,871 | 14,424 | 2,748 |
| Liquid assets § ... | 149,665 | 152,021 | 160,448 |
| Liabilities ... ... | 35,042 | 39,178 | 35,681 |
| Surplus of liquid assets ... | 114,623 | 112,543 | 124,765 |

* Cost of minting deducted.

† Exclusive of Finance and Exploration Account.

‡ Also premium capital, £174,646.

§ Includes stores, horses, furniture, but not broken ore. Allowance made for final dividend £65,625, but not provision for income taxes (ab at £20,000).

## METAL QUOTATIONS.

### By Cable.

(From Our Correspondent.)

### London, Tuesday.

There was much healthier feeling in the metal markets than in the previous week, copper, tin and lead all experiencing a satisfactory appreciation in value, though spelter failed even to maintain the low rates ruling of late. Copper closed the week at 42s. 6d. advance on the previous Friday's rate, for both spot and three months, while tin closed £4 better. The average price for lead during the week was 10s. higher than that of the previous Friday.

COPPER.—The rates for spot and deferred delivery were again the same throughout the week; the opening (Tuesday's) rate in each case was £67 10s. 3d., showing an advance of 8s. 9d. since Friday, and this was followed by £67 12s. 6d., £68 2s. 6d. and £69 10s.

Electrolytic brought £71 10s. on Thursday and £72 5s. on Friday. Yesterday the rate was again £72 5s.

TIN.—Wednesday's price for spot delivery was £188, which was 70s. above that of the previous Friday; then there was a decline to £186 15s., followed by a rise to £188 10s.

For three months terms the prices were £187 15s. (a rise of 65s.), £186 10s. and £188.

LEAD.—On Tuesday the quotation was £20 12s. 6d., showing a rise of 5s., then came £21 2s. 6d., £20 17s. 6d. and £20 15s.

SPELTER fell from the previous week's rate of £20 15s. to £20 10s.

SILVER.—The quotations were 27¼d. and 27 3-16d.

ANTIMONY.—"Star" brand still brought £30, and 50 per cent. ore was stationary at £7.

WOLFRAM (70 per cent. ore).—The rate was 32s. per unit, equal to £112 per ton, as against 33s., and £115 10s. per ton the previous week.

MOLYBDENITE fell back from 2s. 9d. to 2s. 8d. per lb., equal to £298 13s. 4d. per ton.

MANGANESE (50 per cent. ore).—There was a rise from 9½d. to 9¾d. per unit, that is, from 39s. 7d. to 40s. 7½d. per ton.

## PERSONAL.

Mr. C. Price Conigrave has accepted an appointment under the Federal Government for service in the Northern Territory, and left Melbourne for Darwin last Saturday.

Mr. A. P. Moline, late manager of the Y-Water Tin Mining Co., Emmaville (N.S.W.), has been appointed manager of the Cock's Pioneer Gold Mines, near Wangaratta (V.). Mr. H. Warlow Davies, of Broken Hill, has taken Mr. Moline's position at the Y-Water mine.

Mr. A. W. Ardlie, of Warrnambool (V.), has accepted an appointment as surveyor under the Government of the Federated Malay States, and left for Kuala Lumpur last Saturday.

Mr. Bertram Whitington, lecturer at the Ballarat (V.) School of Mines, has been selected, from ten applicants, for the position of director of the Queenstown (T.) School of Mines.

Mr. L. McClelland, one of the Railways Commissioners of Victoria, completed his 25th year of connection with the railways of that State last Friday.

Mr. H. G. Farrell, business manager for the Amalgamated Railway and Tramway Service Association, has resigned in order to accept a position elsewhere.

The Mortlake (V.) Shire engineer has been instructed to make inquiries as to the cost of a road-metal crushing plant and road-making machines.

## THE INVESTOR'S COLUMN.

### Some Companies Attracting Attention To-day.

(By Our Exchange Reporter.)

### Frenchman's Reef.

The general improvement in the tone of the business in Victorian gold mining stocks has been expressed mainly by a better enquiry for well established concerns, there having been so far but little disposition shown to embark upon new flotations. It is very sincerely to be hoped that this feature of the market will remain unaltered, for there could be nothing more detrimental both to stock exchange business and mining enterprise than an outbreak of company promoting. Such periods of unhealthy excitement are invariably followed by a long term of waiting and almost inevitable disappointment. Thus the funds which should be available for legitimate investment become exhausted and the result is market stagnation.

Among the mines which have lately come again into prominence is Frenchman's Reef, Daylesford, there having been a very considerable turnover in the shares and a substantial gain in price during the last few weeks. About two months ago they could have been obtained at 1s. 6d., but on Thursday or Friday they touched 5s.—a nice little profit for those who got in early. This reflection seems to have been shared by some of those fortunate persons, for the sharp rise was followed by some substantial realisations, so that the closing quotation was at about 4s. There is a good chance of another forward movement before long, as the prospects of the company have considerably improved of late. It will be remembered, especially by those who got in at high prices, that about three years ago this company had a brief era of prosperity, some good yields being obtained, from which dividends to the extent of £5400—equal to 3s. 6d. per share—were paid. The last of these was received by the shareholders in January, 1911. These yields were made the foundation for some very inflated opinions of the prospects of the stock, and the shares were freely dealt in at rising prices until 26s. was paid. Just for the purpose of comparison, it may be mentioned that when Frenchman's were thus in the heyday of their market prosperity that Central Red, White and Blues were beginning to come into notice with quotations fluctuating between sixteen and eighteen shillings. But what a difference in the performances of the two companies since then, the number of their shares, 32,000, being the same. "Central Blues" have paid in dividends £121,600, equal to £3 16s. per share, and there are buyers for them in the market at 45s., as against the record already stated of "Frenchman's." It is only fair, however, to the latter company to say that the success of the Bendigo stock has been very remarkable, affording another instance of the permanence and richness of that great goldfield. While it was being accomplished, "Frenchman's," having soon exhausted their limited ore reserves, rapidly declined in price until at last there was practically only a nominal quotation for the shares. Since then the shareholders have had a worrying period of dead work and call paying to endure, and those of them who maintained their faith in the stock well deserve the more prosperous times that seem to be at hand.

The quartz formations of the mine are similar to those on the Ajax lines of reef, occurring in vertical lodes and flat makes or wings of stone. The lodes have been poor in quality, at any rate as far as the prospecting work of recent years is concerned, and it has been from the flat makes of stone that the company has obtained its successful results. These bodies of stone have been worked pretty extensively down to the No. 5 level, and about three months ago a new flat make was discovered between the No. 5 and No. 6 levels, and it is owing to the manner in which it is opening up that the public interest in the shares has been revived. Stoping has been resumed, and over the south drive at the intermediate level there is 12ft. of payable quartz, and the drives which are being put in north and south of the No. 2 rise are in stone of similar size and quality. A crosscut which is being driven west from here is also in 5ft. of stone of payable quality.

There is some stone still being obtained from a flat make two or three feet thick at the No. 2 level, and prospects of gold are being obtained from leaders which are being met in the drive going north. At the No. 3 level a drive is being continued north from the rise, and promising prospects are being obtained from the stone, which is about 18in. thick, while in the intermediate drive stoping is being carried on, the stone being 8ft. wide and payable.

Most importance at the present moment must, however, be attached to what will be the result of the work which is being carried on with the object of proving the downward continuation of the flat make discovered between the Nos. 5 and 6 levels, a drive at the No. 6 level being now in about 250ft. for this purpose. It is expected that this make of stone will soon be intersected, and if this be the case then the position of the company as a payable concern may be regarded as established. From the above brief account of the past history of the company, and similar description of the present position of affairs at the mine, some guidance may be obtained as to the value of the shares as a speculation. It will be gathered that there is now a fair amount of payable quartz in sight with a reasonable prospect of the tonnage being materially increased before long. As the new make of stone appears to be worth about half an ounce to the ton, that is, judging from the last return, the shares appear to be a very reasonable mining investment at about 4s. to 4s. 6d. that is for a fair profit either from the mine or from the market.

So far the wings of quartz in the company's lease have not been either very extensive or particularly rich, but they seem to continue downward with satisfactory persistency, and taking into consideration the uncertainty of mining it is quite probable that larger and better formations may yet be found in the lower levels of the mine.

### Lode Hill.

Although this company has only recently been registered it cannot altogether be described as a new proposition, for the reason that when it was acquired by the present owners it was a going and payable concern. The vendors, although working under unfavourable conditions, owing to limited water power, were nevertheless able to win about 200 tons of tin from the property during the last three years, the average value of the material treated by them being about 2 lbs. of tin to the cubic yard.

The property, which comprises 87 acres of tin-bearing alluvial deposit, is situated near Cooktown (Q.), and a Melbourne syndicate having obtained an option over it sent up a practical mining man to examine and report. The result was so satisfactory that the option was exercised and the present company formed, the capital being £50,000 in 100,000 shares of 10s. each, these being issued as paid up to 2s. 9d., and all shares ranking alike. At the date of flotation there was a sum of £1900 to credit, and it was considered that this would be sufficient to provide for the increased water supply which will be necessary in order to work the property on a reasonably comprehensive scale, and this water supply, which is practically unlimited, will be obtained from the Roaring Meg River.

The sluice race will require to be brought in for a distance of 2½ miles, and this work and the construction of the tail races should be completed and the production of tin commenced early next year. With this increased water power the monthly returns should average from 25 to 30 tons. With regard to the value of the ground, it should be said that about 14 acres have been carefully tested by means of bores to a depth of about 50ft., and on what is believed to be a conservative estimate the whole area averages 1.26 lbs of tin per cubic yard. This ground is very easy to work, being composed of a soft material, easily sluiced, and containing no stones or boulders which are likely to give any trouble. The other portions of the lease are tin bearing, but have not been tested. It should also be mentioned that the extent of the alluvial deposit is probably great, as the hill in which it occurs rises to a height of nearly 350ft. Working costs are estimated at 3d. per cubic yard, and assuming the value of the ground to be equal to the results obtained by boring, the profit may be taken as about 1s. per cubic yard. As tin is now worth £186 per ton, it will be seen that substantial profits should be obtained when the plant is working up to a probable capacity of, say, forty-five to fifty thousand cubic yards per month—in fact, some anticipations of dividends at the rate of 5s. to 6s. per annum have been expressed. It will probably be safer not to expect so large a return, at any rate for some time, but whether such anticipations be realised or not, it is certain that a usually well-informed section of the market is very sanguine regarding the prospects of this property, and the rising prices of the shares is the best indication that the public is becoming of the same opinion. Sales have taken place during the week at up to 6s., this being a rise of 1s. per share on the price ruling ten days ago. There is a possibility of the money in hand not being quite sufficient to pay for the initial work before the company gets into the producing stage. If this be the case, then one call of 3d. per share should be more than sufficient to provide all the further capital required.

The opinions expressed by good judges upon the prospects of this company make the shares worthy of attention as a promising investment.

# MINING IN NEW SOUTH WALES.

## Broken Hill.

(From Our Correspondent.)

Broken Hill, August 8.

The most pleasing thing to report this week is about Block 10. The 615ft. south drive was extended 14ft. for the past period, showing 14.6 per cent. lead, 3.1 oz. silver, and 10.2 per cent. zinc. The body shows about 13ft. wide, and the average value of the ore shown so far is 12.0 per cent. lead, 3.4 oz. silver, and 7.5 per cent. zinc. This is believed, as stated last week, to be the ore body from the Central mine proved at the 500ft. The ore values might be better, and the lode wider, but the body is something seemingly to depend upon.

The Junction North mill is doing improved work in every way. The output increases steadily, and the recoveries also—and the confidence of shareholders, as expressed at the Melbourne meeting, may make the mine more solid in public feeling.

One hears casually that the litigation between Junction North and the Junction is likely to be settled, if not already so. In this case, both companies will benefit by a saving of expense. Why spend so much of shareholders' money to feed solicitors and barristers? It seems a farce.

Almost as bad as the Broken Hill Council paying nearly £150 to advertise its balance-sheet through the daily press.

## Bathurst District.

(From Our Correspondent.)

Bathurst, Aug. 8.

At the Mountain Run copper mine the lode is looking well, and increasing in size as depth is attained. A parcel of 12 tons has been despatched to the smelting works, and is estimated to yield over 10 per cent.

A small sensation was caused at Back Creek in connection with 40 acres of land owned by Mr. Cotteril. He was approached by a buyer who intimated that he wished to establish a large bee farm there, and asked for a price to be put on the block; this, however, the owner was disinclined to do, as he did not wish to sell his holding. A subsequent visit from the said buyer, who was extremely anxious to do business, led to the purchase, and, after it was concluded and a deposit paid, it transpired that it was no bee farming object that was contemplated, but the acquisition of a large deposit of steatite, which is said to be of great purity. Others then commenced to "smell a rat," with the result that a number of leases have been applied for by local residents on the same run. This soapstone is believed to contain a certain percentage of asbestos, and its fire resisting qualities are said to be excellent.

At Collins' mine, near Trunkey, a Huntington mill plant is at work on a large low-grade deposit. It is understood that the trial runs have been satisfactory, and that a cyanide plant will be added.

Hawkins' Hill Reward have crushed 15 tons for 28 oz., and have some 30 tons to follow. At the new reef they have two shafts down 135ft. deep. These are being connected, when a nice block of stone will be available for stoping. Good progress is being made in the equipment of the exhibition shaft, the machinery being in position and covered in. The finishing touches should be all done in a couple of weeks, when the milling plant can be kept continuously going, more especially on stone from the Frenchmen's Reef, of which there are tens of thousands of tons opened up ready for stoping. At Rowley's Reef Co., adjoining, they are following a decent-sized reef, but values are so far disappointing, but it is thought they are close to the indicator country, when a rich shoot of gold may be expected.

The Amalgamated are making good progress with their bottom level, and the same will be continued until it intersects the Star of Peace shaft, but they have a long way to go yet. They are now in the country in which very heavy gold was got in the early days, and having a good height of backs overhead, it will be surprising if some of these reefs do not carry big gold values.

Golden Gully sluicing plant is still hung up, and it would appear doubtful if it is likely to start again. It is a pity, too, and hard lines on the shareholders, as the ground has not been properly tested; but where the fault lies is hard to say. It can only be one of two things—that the prospecting was faulty and misleading, or that the right type of machinery was not installed.

The virtually-abandoned silver-lead field of Mount Werong gives evidence of coming to the front again. Quite a large area of land has been acquired by Mr. George and party, for, it is understood, Victorian capitalists, and a big working capital will be put up. The intention is to instal an up-to-date plant, which will be worked by electric power generated from the Kowmung River, whose waters never fail in the dryest seasons. The leases acquired are some of those formerly owned by Bathurst people, who did a little work of a desultory character, but no proper mining scheme was ever laid out, or sufficient capital put up to prove the ground. They failed, further, to locate any decent-sized ore-bodies, and ultimately became disheartened. The assays, however, were splendid—up to 200 ounces of silver and 50 per cent. of lead, besides valuable gold contents. About the best thing they abandoned was the "South Head" block, which shows a good solid body of ore of exceptionally high values. This has been pegged out by a Bathurst party, and it is thought no difficulty will be found in raising capital to work it, as, from all accounts, it is the richest thing in the district, if one may judge by the surface developments.

## Lithgow District.

(From Our Correspondent.)

Lithgow, Aug. 7.

It has been said in this district that things have not been looking too good with the Zinc Corporation's interests at Sunny Corner. After much toil, the bottom levels were unwatered and cleaned up, but there was no ore in sight, and, although a good deal of driving and rising have been done, nothing has been found, and work in that particular part has been abandoned. Operations are being continued in the higher levels, where there is a good deal of ore in sight, but whether the company will be satisfied with this is doubtful. Possibly the ore body has run out in another "flat," similar to those found in the old days. The lode generally lies at an angle of 45 degrees, but in one place it was quite horizontal, and covered an area of about four acres. The same thing may hve occurred again below the No. 4 level. At the Sulphide Company's option, the Nevada, the diamond-drill has completed two holes, and the third is down nearly 300ft. So far, however, nothing to brag about has been found.

The following cryptic announcement comes from the New Burragorang: "We are lifting ing ore of good quality in great quantities." This company has made a plucky effort to get at the lode worked, with more than respectable results, by the Yerranderie, and at 630 feet in the shaft dropped on to a body of ore. This was opened out at the 641ft. A sample gives silver, 107 oz. per ton; lead, 41.2 per cent.; and gold, 4½ dwt. A brand new winding plant is to be erected, capable of hoisting from a depth of 3000ft.; and the shaft is to be continued to a depth of 1000ft. at least. Even 1000ft. is a fair depth to follow a "ribbon." The ribbon must be more than passing rich to encourage the proprietors to continue their work in connection with the development of the mine.

The mills at the Burraga Lloyd Company's works, which have been closed down during the past ten days or so for repairs and to connect the recently-installed oil flotation plant, re-started on Tuesday evening last. Everything in connection with the new process is working satisfactorily. The fires will be re-lit in the furnaces in the course of the next few days. There is a great scarcity of labour at present.

The men employed at the Mabel gold mine, Wiseman's Creek, were knocked off a few days ago, owing to some part of the machinery not working properly. It is expected that it will require a fortnight to remedy the defect before the men will be able to return to work. This is rather unfortunate, both for the employes and those interested in the mine, as the machinery had only been running for a week when the men were put off.

Word from Mudgee, some 80 miles to the north-west of Lithgow, implies that that district is benefiting greatly as the result of the progressiveness of the Lithgow Iron and Steel Works. For the past eighteen months a train loaded with ore from the Tallewang iron deposits has been running every second day to Lithgow, and now Wall's Siding, at Havilah, is the scene of extensive operations. The siding is being extended another quarter of a mile, and the train will in future convey limestone every second day to Lithgow. This means that the mineral train will in future be running every day from Havilah to Lithgow — one day with limestone, the next with iron ore. Quite a large number of men are finding employment in these new development works.

## Orange District.

(From Our Correspondent.)

Orange, August 8.

A small syndicate, having tried several parcels of ore from a big reef at Gooley's Creek, near Forest Reefs, found its value to be 5 dwt. of gold per ton. Upon being further developed assays show 9½ dwt. gold, 11 oz. silver, and some copper. Should 1 oz. dirt be struck, a big face will be stoped out.

Mr. T. Ryan, in a deep gorge at Slattery's Creek, near Forest Reefs, has struck a large lode, which at present shows 4½ dwt. of gold and 8½ oz. of silver. Mr. Ryan proposes to further develop the formation.

At Four Mile Creek, near Cadia, Mr. Harris has sunk and driven over 600ft., as well as opening out to 50ft. on the lode. Parcels assayed showed 2½ oz. of gold per ton, and a large percentage of zinc, sulphur, and lead. A consignment of 50 tons is being bagged for treatment at Cockle Creek.

Some months ago a discovery of gold and silver bearing ore on a farm some 14 miles from Wagga led to a rush to the registrar with applications for leases. A 4 lb. sample of stone assayed 3 dwt. of gold, and 1 oz. 17 dwt. silver, which created expectations that other stone would be as rich, but, so far, this has not been realised, and enthusiasm has considerably abated. Two shafts have been sunk by the original syndicate to a depth of 40ft., and only two men are at present employed. As the necessary machinery is not forthcoming, it looks as though any developments of importance are unlikely.

The Big Nugget shaft of the Hargraves Consolidated G.M. Co. Ltd. is unwatered, the installation of the pump is almost completed, and crosscutting is proceeding both east and west of the shaft at the 200ft. level. A reef has been cut, which gives very encouraging results both by assaying and panning. The purchase of the Blue Spec plant from the North Mount Boppy Co. has been completed, and arrangements are being made to remove and re-erect the battery on the company's leases. The chairman of directors, Mr. H. E. Pratten, recently visited the property, and, in conjunction with the manager, Mr. John Cameron, arranged for an early start of developmental work on the reefs already opened. It is expected that the battery will be ready for crushing in about six to eight weeks, and that at an early date deep sinking will be started.

The result of 131 hours' run of No. 1 plant of the Turon River Gold Dredging Co. was 21 oz. gold. The Associated G.D. Co. obtained 36 oz. for a run of 117 hours.

W. Herriott and Bennet obtained 50 oz. of alluvial gold on the Turon after 12 weeks' ground sluicing. The gold is said to be a fine sample, some pieces weighing 15 dwt.

For 67 hours' run with 10 stamps, the Block 14 Torrington mine, near Deepwater, treated 167 tons crude ore for a yield of 2725 lb. of concentrates. Blue metallic bismuth has occurred for the first time in the northern terrace, and both this and the eastern terrace at Fielders' Hill average 0.65 per cent. wolfram. A late start was made owing to the breakdown of the suction gas engine, but this and the winding, crushing, and elevating plant are now in good working order.

# VICTORIAN MINING ACTIVITIES.

## Bendigo and District.

(From Our Correspondent.)

The gold production for the week, ending Aug. 9, 1913, amounted to 4808 oz. 6 dwt., including the returns from the mines of the Lansell Proprietary for the month of July, which totalled 1524 oz. 12 dwt. The principal producers were:—Lansell's Little No. 180, with 1197 oz. 10 dwt.; Central Red, White, and Blue, 350 oz. 12 dwt.; Golden Pyke, 269 oz. 2 dwt.; Lansell's North Red, White and Blue, 181 oz. 7 dwt.; Williams' United, 162 oz.; Carlisle, 151 oz. 7 dwt.; Ironbark, 146 oz. 3 dwt.; South New Moon, 145 oz. 16 dwt.; Lansell's Comet, 124 oz. 11 dwt.; Princess Dagmar, 124 oz. 7 dwt.; Clarence United, 115 oz. 5 dwt.; Great Northern, 111 oz. 10 dwt.; Victorian Pty., tribs., 104 oz. 16 dwt.; New Red, White and Blue, 96 oz. 7 dwt.; Bendigo Dredge, 95 oz. 13 dwt. Two dividends, totalling £3065 8s., were announced, viz.:—Princess Dagmar 1s., £1692 18s., total to date £94,983 7s. 6d.; Golden Pyke, 1s., £1372 10s., total to date £76,685 7s.

Golden Age met with important developments in the 853ft. south stopes, off the main shaft, on Wednesday, two of the three stopes operating north from the Princess Dagmar boundary revealing a substantial improvement in the quality of the stone allied to the east back, commonly referred to as the Golden Pyke reef. It had been anticipated that the first couple of stopes would have shown fair gold in starting, but expectations were not realised. The first or leading stope was advanced to 30ft. before meeting with an enrichment, while the second stope has so far failed to disclose much of value. It was to the starting of the third stope that most attention had turned, as this stope was about high enough on the reef to enter the richer shoot of quartz seen in the Princess Dagmar rise, at a few feet further south, providing it continued northward. The fact of prospects brightening considerably in the first breaking has created a more comfortable feeling regarding the future of the company's stock. This firing is also stated to have revealed a small fault in the hanging wall, the importance of which has not yet been generally recognised. This break is visible immediately below the three stoping going south from the main crosscut, where the best results had been obtained up to last week. Between these stopes and the third stopes off the south end of the lease, the reef is intact for nearly 150ft. in length, and the indications point to the more auriferous quartz being associated with this minor faulting throughout. This is probably the reason why the shoot of good stone did not conform to the north pitch of the beds and had to be risen for higher than originally anticipated. North of the 853ft. main crosscut the intermediate level has been temporarily stopped, in order to push on with the opening of the reef in the 655ft. crosscut at the north shaft. This formation is considered to be identical with that in the main shaft workings, and a continuation of the same reef as the Golden Pyke are operating on at 447ft., 543ft., and 643ft. Though the geological conditions are very similar in the north shaft to those in the Golden Pyke levels, there is a wide disparity in the caps of the reefs in these mines that is not easily reconcilable with their identity. Opposite the Golden Pyke shaft the cap is at a depth of 347ft., the cap of the old rich reef existing at the 280ft. level. This represents a difference of about 70ft. in the height of these formations. At the Golden Age north shaft the cap of the old "Pyke" reef is shown about the 370ft. level, close to where it should be located, if the pitch of the reef, observed further north, is maintained over the length of 500ft. in the section intervening. According to this, the cap of the present formation ought to be looked for at about 440ft., while the top of the east back of which the Golden Age are starting to extend the old levels is well under the 521ft. crosscut at their north shaft. There is a difference of over 80ft. to be accounted for before it can be stated with any degree of certainty that the 655ft. east back and the Golden Pyke are identical. This 80ft. has also to be made up in a length of not more than 250ft. if the official measurements given are correct, for the cap of the Golden Pyke reef is stated to be at a depth of 400ft., at 250ft. north of the Golden Age 655ft. crosscut. The position is an interesting one, and the working out of the problem will be followed very closely. The first firing in the 655ft. north level, which is in 38ft., was to have taken place before this appeared in print. An examination of the 728 ft. crosscut has shown that the downward continuation of the reef has not been tested. It was intersected in crosscutting, the back carrying about 2ft. of spurry quartz, of a highly mineralised character, but beyond driving 8ft. or 10ft., no prospecting work was attempted. As the trough of the reef is still nearly 100ft. deeper than the crosscut, there is a workable height of over 200ft. of the back opposite this shaft, if the quartz associated with it proves of any value. An encouraging feature is that the stone allied to the same back as it recurs over the main fold of the Garden Gully line in this property was of a payable character, on the east side of the synclinal trough. It here forms a saddle reef, at one time extensively worked by the defunct Johnson's Reef Extended Co., but, curiously enough, this portion of the back was also neglected from 90ft. above the trough.

Johnson's Reef development in the 781ft. east crosscut last week is less favourable than anticipated from the first official reports. An inspection of the crosscut proved that the quartz, though bedded, had its origin in the existence of a small dip fault exposed in the end. This break had apparently opened the bedding plane, permitting of the infiltration along a small bed of slate, dipping west and bearing some resemblance to an east back. Had it represented a back, there would have been a greater assurance of the quartz recurring with an east dip on the west side of the syncline. As it is, this stone does not appear to be continuous underfoot, but may, nevertheless, be found to recur again as the crosscut proceeds. The crosscut is in 55ft., and should reach centre at about 110ft. from the rise. Before meeting the regular anticlinal fold there should be some indication of the Princess Dagmar east back, if it extends so far south.

Princess Dagmar appear to have passed through the shoot of richer trough quartz in the 867ft. intermediate level, though payable gold is still seen in 18in. of crushing material underfoot. Since the bedded quartz rose overhead along the hanging wall, the level has opened up a quantity of spurry quartz, of high value. The existence of this less regular stone is due to a strong cross spur, connecting the hanging wall with a well defined bedding plane at about 12ft. further west in the footwall This spur has evidently affected the gold deposition, in conjunction with the break in the hanging wall further north. Last week's milling showed a further falling off in average. The crushing came from the level and two of the three overhead stopes, a small proportion being drawn from the side stopes going north from the bend in the hanging wall. The first stope was not worked, owing to timbering, but will be drawn upon this term. Stoping is also to be resumed off the rise near the north boundary shortly, where there is fair grade stone. A small break, similar to that accompanying the better grade quartz in the Golden Age stope, is said to be visible in these workings, where the best results were got in rising. If this should prove to be the case, it will improve the chance of meeting with profitable results as the the stopes extend south. The anticipated 1s. dividend was declared, and a fair sum carried forward. Nothing has transpired in driving north on the 1845ft. east back.

Golden Pyke had a reduced average, but the milling was still highly profitable, and the customary division of profits followed. The reef has been taken up along the 50ft. under the Constellation old level to bring the workings into line with the 543ft. level. This has revealed good stone. Overhead there is a stope taking 13in. to 15in. of high grade quartz at 40ft. from the north boundary. North of the No. 1 rise the reef is also of excellent quality in stoping, but south of the No. 2 rise, where gold was showing very freely last month, the stone has temporarily contracted, though still very payable. The rise from the 643ft. stope, at 150ft. south of the shaft, traversed profitable stone for a height of 69ft. before holing through to the 543ft. level, profitable prospects showing throughout in 1ft. to 2ft. 6in. of stone. This has materially enhanced the value of the formation, for it holds out greater hope of continuity in the rich shoot originally found in connecting these levels opposite the shaft. Previous to rising, the stopes had reached a height of over 40ft. without producing anything very remunerative, while the level had also been extended 150ft. further ahead, with similar results. It now looks as if this particular shoot is not pitching as rapidly southward from the main crosscut. At 447ft. the north level is in 385ft. The reef is smaller, and several spurs have made their appearance. The latter veins have a very promising appearance, and will be further tested to determine their value, little or no gold being visible as yet. In the first stope is 4in. to 9in. of quartz showing gold. The quality improves in the second stope, fair gold showing in 15in. of quartz. A little gold is also visible in 2ft. of crushing material in the south, near the cap. A crosscut will be started shortly at 743ft. to again intersect the same back, which carries stone under the 643ft. level. On the outer, or Chadwick's reef, a few colors of gold are beginning to show in stoping 6in. to 12in. of quartz.

Clarence United tributers recently obtained an average of close on 1 oz. per ton from the old 1580ft. west leg at the main shaft. The company are now unwatering the north shaft in order to extend one of the former crosscuts to the same back, which is expected to be found almost intact at this end. A crosscut of about 100ft. will be necessary to reach the leg. The eastern portion and cap of the reef were formerly extensively worked with good results. At 2280ft. the outlook is steadily improving in following a west leg north and south of the main shaft. From 1ft. to 3ft. 6in. of crushing material is available in driving and stoping, showing fair gold. The ground in the south end is rather limited, but in the opposite direction, where the best results are being obtained, the stone is untouched for a length of several hundred feet. This appears to be the most important development in the deep ground along the "Moon" group for some time. The 980ft. spurs are showing a fair sample of gold in rising to 15ft., and driving south along the east back. A good deal of interest is centred on the 835 ft. west crosscut off the north shaft, which is expected to disclose the continuation of the richer spurs worked for the past two years by the South New Moon above 980ft. On the Paddy's Gully line, operations have been suspended for the present.

Great Northern have reached a change in the north pitch of the good spurs allied to the McDuff east back, in driving to 857ft. north of the shaft, the veins rising again during the past few weeks. This has brought the level into cleaner country, with the spurs located overhead. As yet, there is no indication of any variation in quality of the quartz in the leading stope; but these workings are hardly far enough advanced to determine whether the altered geological conditions affected the gold deposition, a frequent contingency. Providing the spurs retain their gold-bearing character, the change in pitch will be a distinct advantage, as it permits of most of the payable stone being extracted from the present base, obviating the necessity of driving a very long main level below, or following the veins underhand from the end of the level. The second and third stopes take 8ft. of spurry quartz of very fair quality. At 180ft. from the end of the level, there is a stope going south on 10ft. of spurs with payable prospects. On the larger reef in centre the western level is in 801ft.; still showing a few colors of gold. This portion of the formation is now estimated to be payable. At 1278ft. the company have driven 419ft., with 18in. of mineralised stone showing overhead.

Ironbark.—Greater success of late is due primarily to the better quality of the 480ft. reef on the Sheepshead line, near the turnover, at 250ft. from the Victoria Consols boundary. The main south level off the winze is in 355ft., and about 70ft. from the end of the lease. There is a small vein of bedded quartz on the west wall, and several footwall spurs. A coarse color of gold was seen lately, but the stone is apparently of low value. In stoping across the cap, a good width of quartz is available, of payable quality. Several nice colors of gold show in the stopes on the eastern turnover. A few colors are also visible in the stopes north of the No. 1 winze. A winze has been started in this end, following the west leg downward toward the fault, which pitched under the main level some time ago. This break has been uncovered, but no improvement is yet disclosed in the stone. From the main crosscut off the old shaft the company are driving south in the cap of the reef, which is steadily rising toward the Victoria Consols. Up to the present, the stone has been of comparatively low value. The new shaft is down 586ft., and may be continued till deep enough to reach the Central Red, White and Blue reef.

Hercules and Energetic intersected a small east back with two inches of bedded quartz, at a depth of 678ft. in the eastern shaft on the Sheepshead line. No gold was seen. The back is assumed to be the continuation of the Ironbark 480ft. reef, and has probably been passed through at about 25ft. under the cap. As the profitable stone in the next mine is nearer the turnover on this side of centre very little importance was attached to the fact of the stone proving non-auriferous in the shaft. A plat will be formed at 780ft., prior to opening out on the reef. As the east back of a smaller formation was passed through just after leaving the 600ft. plat, a crosscut will also be extended west at this depth, and both reefs tested. At 500ft. the reef channel is close to the shaft, but, unlike most of the anticlinal folds here, it may have trended west in the intervening depth to 700ft. A feature of the Ironbark formation is a lengthy neck of auriferous quartz, which will be reached in the Hercules and Energetic workings by a centre winze later.

New Argus have commenced to de-water the bottom levels, with the object of finding the west back from which the Clarence United are getting payable results approaching the boundary at 2280ft. A survey will be undertaken to determine the strike of the reef. A couple of years ago the New Argus had a few colors of gold in a small reef at about the same depth, which subsequently proved of little value in driving north. At 1580ft. the reef at 70ft. west of the shaft has not shown any gold in the north level. From 1480ft. a rise is being extended in the eastern portion of the large formation, in the vicinity of where the McDuff east back should come through.

Victoria Consols closed the fortnight with a small credit balance. The 512ft. level is in 260ft. north, opening up a good width of crushing material overhead, but without revealing gold. The side stopes are taking 11ft. of stone at 50ft. from the face, very little gold showing. The south level has not shown any material alteration. In these stopes there is an occasional color of gold. The rise has been continued to the top of the reef, which is workable for a height of 40ft. A few small spurs of low value are being uncovered in driving north on the east back at 600ft.

New Red, White and Blue, after a period of adversity, happened upon a shoot of better stone near the north end of the lease which produced the bulk of the 96 oz. 7dwt. obtained from 123 tons. A couple of years ago the company worked the 1790ft. reef from this end, but it was generally of low grade. Last week's crushing was got from the leading stope of these former workings. There is a length of nearly 400ft. of this east leg intact to where the north level was suspended a few weeks ago. In the next mine, Lansell's North Red, White and Blue, the reef has been continuously worked for several years with good results.

## Maldon.

(From Our Correspondent.)

The report at the end of the week from the South German mine was that the intermediate drive north off bottom of winze below 1750ft. level had been advanced to 79ft. In the end of the drive stone half-way up from the bottom is from 20in. to 2ft. wide, and gold has been seen in the stone; stone from middle or drive up to back is 12in. wide. Very close attention has been paid to the doings of this mine, and every development of the workings has caused a corresponding fluctuation in the price of the shares. After reporting the lately-discovered gold stone to be first worth 15 dwt., then 10 dwt., then barren, Mr. C. L. Calder, the chairman of directors, issued an authentic personal statement: "Stone broken from face by myself, intermediate level, shows fair gold." Thousands of shares have been changing hands since the discovery.

Oswald's Gold Mines crushed 379 tons for 162 oz. 19 dwt.; cyanide treated 600 tons for 74 oz. 17 dwt. (three weeks); slimes, 400 tons, 93 oz. 18 dwt.; total for month, 331 oz. 14 dwt. The 466ft. level has been driven a total of 1020ft., showing a reef 6in. to 9in. wide, with traces of gold. A rise has been put up for 13ft. at 780ft. in, and a reef has been cut.

In the 400ft. intermediate stone is 3ft. wide, worth over half ounce. It is being stoped. At the 500ft. level driving has been done north and south. The north end stone went poor and broke up, but the south end made stronger, and a good wall came in. It is 4ft. wide, and worth as high as 1½ oz. per ton. This is reckoned to be a continuation of the shoot of gold worked below 400ft. level. The "Table-top" level has been worked out as far as the old make is concerned, but a new make above it now shows 2ft. of stone worked 10 dwt. The same value of stone is being broken from the stopes in the 600ft. level. The 1100ft. level has been extended to 519ft., but no stone is showing in end, and they are now bearing to the east to get stone showing on east wall. The east crosscut is showing a 14in. reef in the eastern wall.

The Oswald Gold Mines North reports a continued placing of parcels of shares, prominent investors being among the takers.

Derby United reports gold showing in the 680 ft. level in stone 7ft. wide, in the crosscut east from the main level; also whilst stoping north and south from the Cymru shaft. The 470ft. level east crosscut has been put out 10ft. in a channel formation. The battery has been running nearly a fortnight with three shifts.

### Castlemaine and District.

(From Our Correspondent.)

The improvements of late in the Spring Gully mine bid fair to be eclipsed during the immediate future. The patchiness of the reefs in the mine has always to be borne in mind. Truly, they know not what a week may bring forth, and it is not possible to forecast with any precision what will be the value of the stone for any considerable distance. As far as it has gone, the prospecting on the eastern spurs at 200ft. has broken out hopefully, and towards the end of last week a pocket was discovered which contained 117 oz. of stone, and it is estimated to go at least 60 oz. In the 240ft. level fair gold is being seen, and with the specimens thrown in, a good clean up seems assured at the end of the week. The company has a credit of £1050, and as a 1s. dividend absorbs £1200, shareholders are sanguine of the next crushing. From the 170ft. a connection has been made with the 25ft. stopes by breaking over east from the end. This will make the conditions pleasanter for the miners. The next move is to put out a crosscut to the east off the old 318ft. level on the Spring Gully fault, at 300ft. south of the shaft. At that point a crosscut will be well situated for the intersecting of the auriferous spurs which are said to exist along the southerly pitch.

South Wattle Gully has also unearthed something fresh. In the No. 2 rise from the 300ft. level, at a height of 34ft., a reef 3ft. thick, showing gold in the breaking, has come in during the past two days. The manager now expects to cut the saddle at any moment, and that the reef will prove payable between the two rises, which will be nearly 90ft. on the saddle and about 140ft. up to the 230ft. on the saddle.

A Melbourne Syndicate has made a start on a mine known as Rees' which was abandoned many years ago. The shaft has been located and a windlass erected. At a depth of 15ft. a crosscut going east was discovered. The water is now being pumped out.

The Burnt Creek Reefing Co., at Dunolly, reports that the treating of alluvial wash has had to be discontinued, owing to the Creek water coming in. Attention is being paid to developing the reef on the Dunolly road.

The sale of the Francis Ormond mine property duly took place. There was never a strong effort made to save the situation, and Lambert and Nixon, of Ballarat, auctioned it last week. The whole plant was first offered as a going concern, but the highest bid, £1275, was not up to the reserve. It was then put up in lots. The winding-engine brought £137 from Messrs. Millar, who also bought two boilers for £21, compressor for £105. Wilfley tables £10, air receiver £10. George and Hill bought a boiler for £137 10s.; battery engine, £28 10s.; sand pump and gear, £17 10s.; 15-head battery, £72; right to fossick, £8; the manager's residence brought £72; and the battery house £37; while the poppet legs, brace, etc., was bought by Mr. R. Grose, manager of the Spring Gully mine, for £26 10s. This is the end of a great mine, which has been run for many years, but, it may be said, it has never really proved anything as to what lies in the deeper levels of the Castlemaine field.

### Daylesford.

(From Our Correspondent.)

The gold returns for the past month's milling show an improvement, and in the aggregate total 2206 ozs. from 4041 tons crushed, giving an average of well over ½ oz. The Central Ajax again holds the premier position, with a fine average of over 1 oz. The North Nuggety Ajax has brightened up a good deal, for which the good stone that is being broken north from the rise off No. 6 level is largely responsible. The stopes at this level also producing very fair stone for crushing purposes. The Ajax return is about as before, while the plates helped with over 100 ozs. to swell the month's crushing. The crosscut going east at No. 7 level is being pushed ahead to meet the formation coming away south from the North Ajax, travelling through clean country at 173ft. end. This body of stone that is driven on by the North Ajax in their drive south at the 700ft. level is at present not keeping up its recent value. The Nuggety Ajax return is another disappointment, and is only a shade better than last month. They are driving on some most promising-looking stone going northwards. It seems not unlikely that some consideration will soon be given to the question of the advisability of running the shaft down a further lift. The Frenchman's Reef's result of the four weeks' milling is a gratifying one. The mine is showing up better than for some time past. Only one shift is being worked, so that the return will be a profitable one to the company. The Olive Branch keep crushing from the Abundance Reef, about ½ oz. material, the last eight days' milling of 54 tons producing 27 ozs. of gold. The state of the roads is preventing them from putting through a larger output, but the results of its operations for the past three months and the prospects of a continuance have induced the erection of a plant on the Abundance line, with the intention of putting down a shaft and thoroughly developing the payable surface formation at a depth. At the same time a heavier plant is to go up on the main Olive Branch shaft, which also is to be sunk deeper. The prospects, so far as they have been developed on the Abundance, are encouraging.

The Lord Roberts are meeting with promising indications as shaft-sinking proceeds, which is necessarily slow on account of the water coming up from the bottom very strongly. Another company (the North Lord Roberts) has been formed, and appears to have made a good start. On Friday, when costeaning on the surface, 4ft. reef of a payable character was cut. On Saturday it widened out to over 5ft., and of very good quality, some very fine specimens being taken out. These operations are about 2500ft. north of the Lord Roberts shaft. Like this company's lease, it has never been tested at a lower depth than 30ft. It was mostly worked in an open cut, and 40 years ago the returns obtained were of high average. Bell and party were the last to work here, with good results, until a slide came in and cut the reef off, and they were not successful in finding it again. The new company will at once start on a main shaft, and erect a double 10in. winch and Cornish boiler. They start with £1300 to credit. If the reef cut maintain its value, a good future lies ahead of the company.

The Ajax Consolidated have started to cut down a main shaft.

---

## MINING IN NEW ZEALAND.

A working party has been formed at the No. 1 level of the Just-in-Time mine, Greymouth, for the purpose of prospecting for the continuation of what is known as the Victory Reef on the Paparoas, on the opposite side of the Grey River at Stillwater. A very rich vein of quartz was discovered there, and worked by Messrs. Curtis Bros. some 15 years ago. The old Julian Gold Mining Co. did a considerable amount of prospecting in the vicinity, but with the exception of locating several leaders nothing of a permanent nature was discovered by the company. It is now intended to prospect at a deeper level for the rich lode, which is believed to exist, and of which the Victory Reef is thought to be an offshoot.

During the four weeks ended with July 12 (24 days' work), the Waihi Grand Junction G.M. Co. crushed and treated 9096 tons of ore for a return of bullion valued at £17,130. No comparison can be made for the same period last year, owing to the strike. The total value of the bullion won from the mine to date is £702,124, from 378,299 tons of stone. The two biggest years were 1910, when 83,313 tons gave £133,523, and 1911, when, from 105,956 tons, bullion worth £150,729 was won.

With the payment of its 81st dividend (1s. per share) on September 1st, the total sum divided amongst members by the Waihi G.M. Co. in dividends and bonuses will amount to £4,557,411. Speaking at the last annual meeting of the company in London, Mr. Hockley, a shareholder of 20 years' standing, said: "I have seen the Waihi Co. grow. I have seen it at its height; I have seen it in its misfortunes, and I hope again to see it come to the front. The worst of the Waihi mine is that it is very patchy, and while at the moment it may be entering into good widths at a portion of the ore-bodies, in the next few feet we may come into a barren zone again, and the chairman naturally and very rightly points out that until we have done a year, or perhaps two years', driving and quantities of crosscutting to prove these different lenses (and that is all that they are), you will not be in a position to say whether the ore reserves of this mine are really going to be very much strengthened. Therefore, it comes to this, that the future of this mine, as of all other mines, is at the end of the miner's pick."

Under date July 26, the consulting engineer of the Watchman G.M. Co., Thames, wrote:—"The final instalment of bullion from the Waiotahi mill, valued at £588 19s., has been banked to-day. This amount, together with the cash previously received, gives a total extraction of £2693 16s. 5d. from the experimental treatment of 1120 tons of ore, of an assay value of £3 3s. per ton. Concentrate valued at £240 gross still awaits treatment. The values of the concentrate is not included in the figures of total extraction, as stated above." The directors state that this experimental crushing was carried out under difficulties at the Waiotahi battery, but it had been the means whereby the Watchman company had obtained valuable data as a basis upon which alterations and additions were being carried out at their own mill, the effect of which would be to reduce treatment losses, especially in the sands and slimes. With this object in view, a special modern plant was being installed.

Promising results have followed recent developmental work in the main south drive at No. 14 level of the Talisman mine, Karangahake. Some 50ft. to 60ft. back from the present face the pay values cut out, and the reef became smaller, but the last round of holes fired shows more quartz, with a nice-looking band of sulphide ore from 10in. to 12in. wide on the hanging-wall portion. It thus seems probable that the pay values are coming in again, but further development will be necessary before anything definite can be said on this point. The Woodstock shaft has been unwatered, and is now being deepened. When the chamber has been excavated and the pump workings installed driving both north and south will be commenced. Going north, the Maria reef should be cut in about 80ft. of driving, and the intention is to drive on the course of the lode. Coming south the drive will also follow the course of the reef provided anything of value is met with.

The New Sylvia mine has just crushed 850 tons of stone, which yielded bullion valued at £880, and concentrates valued at £305, making a total return of £1185.

The Minister for Mines has authorised a subsidy of £2 for £1 to the Hauraki Prospecting Association. The five local bodies within the Auckland goldfields are subscribing £100 each, or a total of £500, and the Government will find £1000, making a grand total of £1500, which will enable three or four parties of prospectors to be sent out to explore the back blocks.

### Westland Jubilee.

New Zealand is proposing to celebrate the jubilee of the Westland goldfield by a series of functions, to be held at Hokitika, commencing on January 7, and extending over a fortnight. The jubilee has a special interest to Otago people, as many of the pioneers were from the Otago goldfields, and a good many of them found their way back to Otago again. Ex-residents of the Coast are invited to send in their names for inclusion in the pioneers' roll, which will be published at jubilee time. The joint secretaries are Mr. A. A. Andrewes (town clerk) and Mr. D. J. Evans (county clerk), both of Hokitika. The chairman of the committee is Mr. J. Grimmond, who, it will be remembered, visited Otago to take part in the Otago goldfields jubilee celebrations. It is proposed to mark the jubilee with a memorial to the pioneers. This, it is suggested, should take the form of a statue at the junction of Fitzherbert and Stafford streets, in Hokitika, intersecting the north, south, and inland main roads. The statue will represent the figure of a miner in prospecting kit, typical of the pioneer days, and is estimated to cost £400. This movement, however, is apart from the jubilee celebrations.

---

## TASMANIAN MINING.

### Mount Lyell District.

(From Our Correspondent.)

Queenstown, Aug. 8.

Matters generally in connection with the Mt. Lyell Company's operations are proceeding smoothly and satisfactorily, and there are no fresh developments of importance to note.

At the North Lyell mine they are breaking ore in four different stopes at the 1100ft. level, and this level, along with the 1000ft. and 850ft. levels, is chiefly responsible for the regular output of approximately 2000 tons a week. A small tonnage of ore continues to be won from the 400ft. and 700ft. levels. Good progress is being made with the new mullock pass, which is being put through solid country between the 300ft. and 850ft. levels. This work has been completed between the 300ft. and 500ft. levels, and the balance is being actively pushed ahead by sinking and rising in sections between the 500ft. and the 850ft. levels.

The output of pyrites from the Mount Lyell mine continues at between 600 and 700 tons a day, and with the climatic conditions existing, this is about the limit. The weather during the last ten days, which, when last writing, was very fair, has been unspeakably bad again, and day after day pretty well all surface work in the open cut has had to be suspended. This means, of course, that the contribution of pyrites from the surface workings is very small, and it also interferes with underground production, as with no overburden for filling being broken in the open cut, the work of keeping the stopes properly mullocked is held up and that of ore extraction has, perforce, to be curtailed accordingly. And somehow it seems that with an inefficient or inadequate labour supply and rough weather hampering surface work, the management will be pretty hard put to it to get out anything over 700 tons a day until the South Lyell mine workings are thoroughly opened up.

At the Comstock mine the output to the smelters is less than usual, owing to the fact that a much larger tonnage of North Lyell ore is now coming forward, and provided that the present supply of ore can be maintained, the management is not likely to bother much about the Comstock material for the present, anyhow. As a matter of fact, a number of the men working at the Comstock have, during the last fortnight, been transferred to the North Lyell mine, presumably with the object of increasing the output of 6 per cent. ore to the greatest possible extent.

At the reduction works only two furnaces have been in operation during the four-weekly period which closed on Wednesday last, August 6th. They have, however, had a good run on North Lyell ore—the total furnaced for the month should be between 6000 and 7000 tons—and assuming that the reduction was the average 6 per cent., the copper production for the period should be by a long way the best since the disaster in October last.

Regarding the reported purchase by the Mount Lyell Company of the Tasman and Crown mine, nothing further has transpired officially. At time of writing, however, the general manager (Mr B. Strett), and the engineer-in-charge of mines (Mr. R. M. Murray), are in Melbourne, having left here on Saturday last, and a strong impression prevails that the visit of these two head officials has something to do with the negotiations which are understood to be proceeding for the acquisition of the Tasman and Crown property.

The recent improvement in the price of Lyell Blocks shares has caused a good deal of interest locally, as a fairly large number of shares in small lots is held here. As an outcome of inquiries which have been made by those interested, the report is being circulated that the Mount Lyell Company has had the Blocks placed under offer to it for 2s. a share, equal to £30,000, and that the Mount Lyell Company is favourably considering the offer. So far as the first part of the report is concerned, the writer would not be at all surprised to find that it is correct, but as to the second part, it may be regarded as being very distantly related to the truth. And this scribe still holds to his previously expressed belief that the Mount Lyell Company will, in due time get the Blocks mine at its own price, and that the said price will be considerably less than £30,000.

In concluding these notes a few remarks may be made about the weather. It has been raining almost incessantly for the last 11 days, and at time of writing it is coming down in torrents. Likewise, out of the last 40 days 32 have been wet.

## THE COAL MINING INDUSTRY.

### New South Wales.

### Northern District.

(From Our Newcastle Correspondent.)

The Miners' Wages Board for the Northern District of New South Wales continued its sittings last week, at Newcastle. On Tuesday, evidence on behalf of the Miners' Federation, in support of their claim for payment for small coal, was entered upon. During the course of the sitting, His Honour Judge Edmunds, chairman of the Board, said he had himself fixed the payment for round coal at some of the collieries, and in doing so had taken the quantity of small coal into consideration.—Mr. A. Lewis, who is conducting the case for the miners, said their contention was that payment for small coal was never taken into consideration when the old agreement was formed, because the small coal was then a useless product. He would like to know if His Honour took into consideration whether or not the small coal was sold?—His Honour said: "No; irrespective of that, the question is, what is a fair daily wage to be allowed under existing conditions to a competent miner? I am supposed to be fixing a hewing rate, and in fixing that the first element to be considered is, What is a fair rate to pay to a competent miner? Then the next question is, What is the quantity of coal per day which a competent miner should be expected to produce? That is a somewhat difficult question, no doubt; still, it has to be fixed. Those are the two elements out of which the hewing rate has to be arrived at."—Mr. Lewis: "Would Your Honour take into consideration also the amount of profits made by the companies?"—His Honour: "Well, that is a matter that I am not dealing with at the present time, unless, of course, a sliding scale may come in for consideration."—Evidence was then given to show that the miners contend that they should be paid a hewing rate for the small coal, and that it should be on a sliding scale, following the market price of the coal, as is the case in connection with the hewing of round coal.

Trouble arose during the week at Pelaw Main colliery, in the Maitland district. The first grievance was between the men and the management over payment for deficient places. The men contend that there are certain places in the mine where a man cannot make more than 5s. a day, or about £1 per week, and they contend that the conditions of the work are such that the management should make the men's wages up to 12s. 4d. per day. There was a further grievance that certain miners had left their cavils, and had gone to work in the tops, and the lodge urged that these men should be told to return to their cavils, but the manager refused to do so. As to the wages made, the management states that the average for the whole mine is about 16s. per day, and that some of the men are making up to 30s. or more per shift of about six hours. In the circumstances, they do not see why they should give the men a further large sum every pay, running into possibly thousands of pounds in the year. The matter was considered at a special meeting of the delegate board of the Colliery Employees' Federation on Wednesday, and after discussion it was decided to approach the Minister for Labour and Industry, with a request that something should be done to get over this difficulty, and at the same time not to interfere with the work of the Wages Board; and also that something should be done in order to secure a resumption of work at the Stockton-Borehole and Lambton B. pits.

The Pelaw Main colliery was idle on Wednesday afternoon, owing to the wheelers objecting to work because, as they allege, of the great quantity of dust. They state that it is so bad at times that it causes a choking sensation. They saw the manager, but no agreement was come to over the matter, and so the wheelers did not go to work on Wednesday afternoon. A meeting was held at night to consider what should be done, and another on Thursday morning, but the mine remained idle on both Thursday and Friday. The management says the reason why the wheelers stopped is that one of their number was discharged for having made use of offensive language to the manager. However, whatever the cause of the stoppage, the President of the Industrial Court will be asked to deal with those who have thrown the mine idle, and so caused heavy loss to all concerned.

At the conclusion of the inquest, last Friday, into the cause of the death of a miner named John Callaghan, who was killed at the Central Greta colliery, on the 10th of July, Mr. A. A. Atkinson, Chief Inspector of Collieries for New South Wales, stated that if the workings had been correctly surveyed and charted, and rule 13 of the Coal Mines Regulation Act strictly complied with, he was of opinion that the accident would not have happened. The jury returned a verdict that deceased had met his death by an inrush of water from the old workings, and added: "If the mine had been properly surveyed and charted on the plan, and general rule 13 of the Coal Mines Regulation Act carried out, the accident, in our opinion, would not have happened; and, further, we are of opinion that the management conscientiously believed that the plan showed the true position of the workings; and we also consider that rule 13 should be enforced as regards advance bords, cut-throughs, etc."

### Southern District.

(From Our Wollongong Correspondent.)

The promoters of the Balgownie Colliery Co. proposition recently placed on the financial market appear to have not got the capital they were asking for; at all events, since the advertised date of closing the list, nothing has transpired.

The party which is holding the lands in the Dapto district, which were included in the prospectus of the late Smelting Co. of Australia, as the "Ocean View Collieries," is making an endeavour to induce the Government to resume the six miles of railway construction undertaken by the late Land and Harbour Corporation to connect these leaseholds with the main line. This party has done the most development work on the coal seams of any prospecting party in this part of the district.

At the Excelsior mine, Thirroul, extension work has been brought to a standstill by an influx of gas, which is supposed to have come into the new workings by holing into the old North Illawarra mine. The latter mine was acquired by Messrs. Vickery and Sons nearly 20 years ago, and closed down. It is feared that it will take several weeks to restore a workable condition of the Excelsior tunnel; this part of the property was a later acquisition by the company, and its opening out meant a considerable increase of output.

Bulli Colliery development is proceeding fairly; the rebuilt jetty is expected to be ready for shipping in three weeks: the fender piles are now being put down.

The wheelers have, since resumption after the late strike, kept fairly good. At South Clifton colliery, however, on Wednesday last, they got over the traces. One who had done wheeling, it seems, was employed at clipping-on, for which the wages are 6s. 6d. per day. He demanded a wheeler's wage of 8s. 4d., and when it was refused, the wheeler lads laid the mine idle. The trouble was settled in time for resumption next day.

### Victoria.

### Powlett River District.

(From Our Correspondent.)

At the State mine work under the conditions of the new agreement is now proceeding smoothly. As was anticipated some time ago, before the new rates were fixed, the coming into force of an agreement for a lengthy period has resulted in the output being substantially increased. The reason for this is that the miners now have no inducement to keep back the output with a view to getting higher prices. Before the agreement was signed the output had gone down to between 1600 and 1700 tons per day, and it now amounts to about 2000 tons. The last fortnight's pay, which was the first full one under the new rates, totalled over £6000, an advance of nearly £1000 on recent pays. The average earnings of the miners working on contract rates worked out at over 14s. per shift, which, it must be admitted, proves that the new rates are anything but sweating prices. A further increase in these averages will no doubt be shown in the next pay, as the wheelers, on Thursday last, started on contract rates. The wheelers under their agreement are guaranteed a minimum rate of 9s. 2d. per shift. The contract rates are an inducement to the wheelers to put forth an extra effort, and already the results are bearing out expectations. The miners in the past have complained about not being able to get enough skips to keep them going. With the new arrangement there will be no further complaints on this score. The management will also benefit by the increased output which will result, and no further expense will be entailed in handling it. Fair progress is being made with the driving of the McBride tunnel, but, owing to its size, it will take a good many months to reach the coal.

At the Powlett-North Woolamai Company's lease the sixth bore has been started, and the coal should be reached in another week. The five bores already put down, in only about half the lease, have proved the existence of a million tons of coal, and the company has undoubtedly a valuable property.

# REPORTS OF COMPANIES AND CORPORATIONS.

## Etheridge Gold Mines (Q.).

### Ex-Manager in Reply.

The second ordinary general meeting of shareholders in the Etheridge Gold Mines Ltd. was held at 39 Queen-street, Melbourne, on the 6th inst., Mr. H. F. C Keats presiding.

The chairman, in moving the adoption of the reports and balance-sheet, said that the directors were of opinion that the high cost of the mining, which had caused the failure of the company, had been due particularly to the smallness of the lodes, the hardness of the walls, and the fact that the mine had not been sufficiently opened up. The Queenslander mine, which it had been proposed should be worked by the new company, had the biggest lode and the softest walls and gave most hope of profitable working. The plant that had been erected was too powerful for the ore that would be treated, and there was an opportunity of selling it at about cost price. A smaller one suitable to their needs could then be installed, and the ore would then be treated at less cost than formerly.

Mr. Keats then referred to the circular which had been issued to shareholders respecting the previous management of the mines (summarised in our issue of July 31), and Mr. A. J. Macgeorge, ex-manager, complained that the results of development work had not been given. There had been a lot done since last report, and the outcome of most important development work in the Havelock mine had not been given to shareholders. To which Col. F. G. Hughes, one of the directors, replied that previous reports had been so misleading that the directors could not publish any more.

Mr. Macgeorge then made the following explanation of the position from the managerial standpoint:—

While he was quite prepared to take his share of whatever blame there was the board of the Chillagoe Company, and the board of the Etheridge Company were equally responsible for all that had been done. A separate company was formed, and an attempt to raise £50,000 as working capital was made in London. That having failed, the programme was curtailed, and £35,000 was eventually secured. The mill was estimated to cost £25,000, which left only £10,000 for all other work, so it was decided by the board that the parent company should help the Etheridge Company to the extent of making a branch line of railway to the Havelock, and the water services for which charges should be made. It was expected that a Government line would connect the Queenslander with the railway system. Had the ore been made available in that way the mill would have been working that day. But the Government did not build the line, so the Queenslander ore was not available. The mill was erected at the Havelock, because it was the most central mine of the four, and its suitability, from a railway engineer's point of view was approved by the engineer of the Chillagoe Company. Above all, the board themselves visited the field before the erection had much more than started, and they confirmed the selection of the site. It was always admitted that the mill was not complete, and, had funds been available, another crusher would have been added. The board had full reports on that a year ago. Hand-sorting had been tried, and found not to pay. Mr. de Lautour said the cyanide section was not required, but he (Mr. Macgeorge) said it was required. It must be remembered that the mill was erected to act as a customs works, as well as for treating the company's ore, and if that idea were ever carried out, the cyanide plant would be the most valuable section of the mill. The mill was estimated to cost £25,000, and it cost [illegible], and its erection was delayed by three strikes. The power plant was a most efficient unit, but was designed to supply more power than was used, hence the cost was high. It was a central station for the mill and various mines of the company, and it was intended to supply power for the working of the sampling mill erected by the Chillagoe Company. The engines were not working to more than half their load, hence the costs were high. The mill started working last May twelve months, and gradually the difficulties were overcome. Had it been possible to continue the milling, costs would have been brought to quite a satisfactory level. The mill gave excellent metallurgical results on ore that had up to that time baffled all attempts to successfully treat it. Its success was a great achievement. In the mines the same success had not been achieved. In the Havelock mine the reef split up in the most ruinous manner. For every ton of ore on the average four tons of mullock had to be handled. The splitting up of the reef was the principal cause of the high mining costs, but it was also to some extent due to the scarce and inefficient labour. When the stoping of the Nil Desperandum ore was begun, former results were not confirmed. The progress sampling had been left in the hands of junior officers, and was undoubtedly over-valued in the first instance, but when estimating the ore reserves, all the high assays were considerably cut down, and such glaring instances did not exist in the revised estimate, by which the whole of the ores were valued, as those quoted by Mr. de Lautour in his report. Some of his reasons for resigning were that when he was in the middle of all the difficulties, with the starting of the mill and the splitting of the reef in the Havelock, and other matters, the board, instead of helping, hampered him in every way. Discharged officers were asked to furnish secret reports, and a junior officer was appointed to send confidential and secret reports. Those actions were fatal to all discipline. He had taken the opportunity of defending himself against the unjust and very unfair and cowardly charges made against him. The report of the board did not in any way set out the true position, but was written to shield the directors from blame for the miserable failure the company then was.

The chairman stated that the directors had believed and trusted in Mr. Macgeorge thoroughly, and they were entirely to blame through that trust.

The report having been adopted, an extraordinary meeting was held, at which a resolution to reconstruct the company was carried, and Mr. C. L. Hewitt, the secretary, was appointed liquidator. Another extraordinary meeting, to confirm this resolution, will be held on the 21st inst.

## Junction North Broken Hill (N.S.W.).

### Stormy Special Meeting.

At the request of shareholders a special meeting of the Junction North Broken Hill Mining Co. was held at 360 Collins-st., Melbourne, on the 6th inst. to consider the following motion:—"That Messrs. John Hunter Stephenson and J. S. Palmer, two of the directors of the company, be, and each of them is, hereby removed from the office of director of the company, and that Messrs. C. Gordon Lyon and Alexander Campbell be appointed as directors of the company in their stead." Mr. Allan Nott, of Sydney, occupied the chair.

The motion having been proposed by Mr. Arthur Robinson, M.L.C., and seconded (pro forma) by Mr. H. Bickford, the chairman said that no doubt all present had received a circular containing certain statements made in Sydney. They all knew the amount of money spent to make the Junction North a payable proposition. When the directors bought the slimes there was no direct metallurgical treatment to submit them to. The directors had made provision for such treatment, and they knew the results. The circular also set forth the financial position of the company when the Sydney meeting was called. Nothing remained to be said except that another circular had gone out, he supposed with Mr. Gordon Lyon's approval (Mr. Lyon signified assent), which stated that at the Sydney meeting a vote of no-confidence in the directors had been passed. Mr. Lyon was at the meeting when Mr. Crawford moved the amendment that the reports and balance-sheet for the last half-year be not adopted, which was seconded. When put to the meeting not a hand was put up to vote for it. Was that a no-confidence motion? He liked fair play, but that was "hitting below the belt." Mr. Lyon said, "If you went back to March, 1906, you would find that the present board started with liquid assets of some £24,000. Now, in making a statement like that it was a wonder he did not verify it first. The present board was not connected with the business of the Junction North until September, 1907. Instead of handing over that £24 000 liquid assets, the company was then handed over an overdraft of £17,900, and against this there were fixed deposit receipts for £10,000. Therefore, when handed over to the present board the overdraft was practically £8000. The previous board, it would seem, according to the figures and dates, must have got rid of this £24,000 liquid assets, and the amount of the overdraft, £8000, as well, in the 18 months before they took over management. As Mr. Campbell was one of that board, it seemed to him to be a case of "defend me from my friends." They could imagine his feelings when one morning in Queensland he read a statement to the effect that they were making a laughing stock of the Junction North. It had been said that they were making a big blunder in erecting a tube mill, but now there was not a mine on the field which had not one, and which did not treat its slimes.

Mr. Arthur Robinson said: "The object of the Sydney meeting was to get possession of the slimes and take over the company to Sydney. I say the statements of Mr. J. Hunter Stephenson made at that meeting were a deliberate untruth, and you can't challenge me. The Palmer influence has been a dead weight on this company. People turn up their noses when you mention the company, and their silence is more eloquent than volumes could express. You have promised us dividends and let us in. The Palmer influence and clerks and 13,000 shares were used in Sydney to rig up a meeting there. The Palmer clerks no doubt cheered to the echo all this nonsense. What has the board done? It says it was getting 30s. per ton for slimes, and yet the profit on 30,000 tons treated last year was only £3500. Companies on the same line of lode, with slimes worth 15s. per ton, put through 43,000 tons last year, and at this price, which was giving it away, they got £30,000 in profit for the half year. Add the profits for the rest of the year, and the amount became £50,000, as against the £3500 of the Junction North."

A heated interchange took place here between Mr. Robinson and the chairman, after which the former continued: "I believe Mr. Lyon's figures, and I am satisfied by the last balance sheet that the board is making dividends hopeless. Every company on the field is paying dividends, and we are making calls—seven during the last half-year. The mine has been regarded as a derelict on the field, and the Palmer influence is largely responsible for it. Wipe out that influence, and see if we shall not then get dividends. There is an even money chance of getting a dividend now, but there is also an equal chance that other money is to be called up. At the last meeting of the shareholders the majority pronounced against the board, but the shareholders did not want to take drastic action. The hints given were such that a rhinoceros would have taken them, yet they were not taken by those for whom they were meant. These people have made libellous and untrue statements under privilege which they would not make outside."

Much further recrimination and personalities were indulged in at this juncture, Mr Palmer and Mr. Robinson, Mr. Lyon and Mr. Stephenson, Mr. Palmer and Mr. Lyon, Mr. Palmer and Mr. Robinson vieing with each other in mutual denunciation. When this storm had somewhat cleared the air

Mr. Palmer said the shareholders had not been asked for one penny until the plant and process had proved successful. Lead fell last year £6 or £7 per ton. Their output was enormous, but the metal shipped at high prices sold at very low ones during half the year, and the board thought it advisable to pay off the whole of the consequent depreciation. It had been shown that, taking £18 10s. per ton for the half year, the actual profit was £26 000. But the state of affairs mentioned had brought the profits down to £3500. If the price of lead fell again as it did last year they must expect a call of 4s. per share. Last year, he said, the Broken Hill South profits had decreased by £40,000.

The chairman announced that of the proxies received 326, representing 52,700 shares, were for the motion, whilst 422, representing 100,793 shares, were against. He therefore declared the motion lost, and the meeting terminated.

## Amalgamated Zinc (De Bavay's), N.S.W.

The output, working expenses and estimated profits of the Amalgamated Zinc (De Bavay's) Ltd., for the last two four-weekly periods, were as follows:—

| | Four weeks ended | |
|---|---|---|
| | June 28, 1913. | July 26, 1913 |
| Tailings treated ... ... ... tons | 45.417 | 43.780 |
| Zinc concentrates ... ... ... tons | 12,889 | 12,192 |
| Assaying— | | |
| Zinc ... ... ... ... per cent. | 48.9 | 49 4 |
| Silver ... ... ... ... ... oz. | 8.7 | 8.6 |
| Lead ... ... ... ... per cent. | 6.3 | 5.9 |
| Lead concentrates ... ... tons | 137 | 133 |
| Assaying— | | |
| Lead ... ... ... ... per cent. | 52.9 | 51.8 |
| Silver ... ... ... ... ... oz. | 34 3 | 34.3 |
| Zinc ... ... ... ... per cent. | 18.0 | 18.1 |
| Estimated income (spelter at £22 per ton) ... ... ... ... | £36,609 | £35,474 |
| Total working expenditure (including cost tailings treated) | £17,505 | £17,234 |
| Estimated profit on working account (spelter at £22) after deducting amount due to Broken Hill South Co., under partnership agreement ... ... ... ... ... ... ... | £13,097 | £12,498 |

## Hampden-Cloncurry Copper Mines.

The smelting returns of the Hampden-Cloncurry Copper Mines Ltd. for May and July (the works having been closed throughout June on account of a strike) were as follows:—

| | May. | July.† |
|---|---|---|
| Ore treated ... ... ... ... tons | 6600 | 1418 |
| Metals recovered— | | |
| Copper, blister ... ... ... tons | 710 | 171 |
| Copper, fine ... ... ... ... tons | 701 | 169 |
| Gold ... ... ... ... ... ... oz. | 194 | 49 |
| Silver ... ... ... ... ... ... oz. | 6567 | 543 |

†Reduced tonnage due to cessation of operations owing labour troubles.

## Great Fitzroy Mines (Q.).

The following was the output, revenue and working expenses of the Great Fitzroy Mines Ltd. for the past two months:—

| | June. | July. |
|---|---|---|
| Furnace, hours | 720 | 741 |
| Ore treated, tons | 2,848 | 2,997 |
| Copper, per cent. | 3.22 | 2.80 |
| Gold, dwt. | 4.83 | 4.25 |
| Sintered concentrates, tons | 1,094 | 1,290 |
| Copper, per cent. | 10.87 | 11.30 |
| Gold, dwt. | 7.81 | 9.72 |
| Copper, in blister, tons | 195.99 | 203.18 |
| Gold, in blister, oz. | 1,092 | 1,171 |
| Silver, in blister, oz. | 2,359 | 2,516 |
| Mill, hours | 417 | 403 |
| Ore treated, tons | 6,224 | 6,411 |
| Copper, per cent. | 2.38 | 2.59 |
| Gold, dwt. | 1.93 | 2.61 |
| Concentrates, tons | 1,164 | 1,250 |
| Copper, per cent. | 10.80 | 11.54 |
| Gold, dwt. | 7.22 | 10.09 |
| Revenue | £16,223 | £17,061 |
| Working expenditure | £14,409 | £15,504 |
| Price electrolytic copper | £66/13/4 | £67/0/6 |

## CENTRAL RED, WHITE AND BLUE (V.).

(From Our Bendigo Correspondent.)

The block of ground in the vicinity of the No. 5 winze below 318ft. is bidding fair to realise the most optimistic expectations, created by the excellent prospects disclosed in sinking the winze to a depth of 30ft. last year. This winze was started at about 500ft. north of the 318ft. plat, on the eastern hanging-wall, traversing a full width of well-mineralised quartz to a depth of 40ft., where it connected with the intermediate level off the stopes above 400ft. For 30ft. of sinking the stone was of good quality, splendid prospects showing in the first 85ft. Beyond increasing the height of the intermediate level at this point, the reef had not since been drawn upon above the intermediate till last week. There has been a stope coming toward the No. 5 winze from the No. 4 winze, and the last couple of breakings prior to reaching the latter disclosed rich stone, gold showing very freely. The shoot is extending downward a little further than anticipated. There is evidently a fair reserve of high-grade stone north and south of the No. 5 winze to a depth of 30ft., for profitable prospects were found in a couple of winzes to nearly 100ft. further north. Added to this is the existence of payable stone below the intermediate level, also beyond the No. 5 winze, proved by the rise from 400ft. that has just connected the intermediate level. It is proposed to hold this portion of the reef in reserve as much as possible, in order to regulate the gold production. In these circumstances, it is unlikely that more than a few tons from the No. 5 winze will be included in the weekly millings. If the quality of the reef dislodged in the last firing is maintained, this will be quite sufficient to assure returns. Nearer the shaft, and above the intermediate, the quartz is also of good value between the Nos. 3 and 4 winzes, and close to the 318ft. main level, but was not drawn upon last week. More encouraging prospects have been revealed in continuing the 318ft. north intermediate level, the spurry quartz increasing to a width of 6ft., and showing fair gold. A somewhat unexpected development has occurred in the 720ft. north workings, on the second saddle reef seen in shaft sinking. Where passed through in the shaft, the cap and west leg carries the most stone, only a few inches of quartz adhering to the east back. A few colours of gold were seen. The company have since driven 70ft. north on the west leg, opening up 2ft. of quartz, associated with the lava. The steep pitch of the reef channel here was considered to have carried the backs underfoot, and a crosscut was put out east through the cap. In the end there is 5ft. of crushing material extending overhead along the west wall, of payable quality, and levels have now been started on this more productive quartz, and stoping will be commenced immediately. The development is looked upon as of some importance, as the best results have been forthcoming from north of the shaft in the upper levels. The shaft has been deepened to the position of the next plat, the objective being the third saddle reef northward. This cap is at the 720 ft. plat, pitching rapidly underfoot. In following this formation about 100ft. south, it contracted, and was of no value, though fair gold had been seen in the shaft. It is hoped that in driving north that history will repeat itself and more stone of a remunerative character be found in the northern portion of the holding. The 318ft. south level is still in a full width of stone, of little or no value. The important work of connecting this south level with 218ft., at 300ft. from the shaft, will be entered upon at an early date, by sinking a centre winze. These operations will reveal the value of the spurry quartz across the folding of the beds, the position of the good stone found several months ago in extending the width of the 318ft. side stopes to centre, at 245ft. north of the shaft. A suggestion has been put forward for the development of the southern end of the lease by the formation of another company. The projected company would ultimately absorb the Manning's Blue property, the latter company's lease being limited to a depth of 600ft. Good returns are now confidently expected for some time, and a steady succession of substantial dividends is likely to be shown.

## MINING IN WESTERN AUSTRALIA

(From Our Correspondent.)

Kalgoorlie, Aug. 5.

A good deal of attention is being directed to the recently-discovered copper find situated 120 miles north of Peak Hill, on the Murchison goldfields. The lode was located by a squatter named Towers, and the first lease pegged is named after him. On this lease there is an outcrop, samples from which have given assay results of 50 per cent. copper and 3 oz. of gold per ton. So far only two trenches, one 7½ft. and the other 6ft. deep, have been cut across the lode, which is 30in. wide. A six months' option on the block has been secured by Mr. C. H. Nicolson, manager of the Great Fingall, and Mr. L. B. Williams, manager of the Queen of the Hills, at Meekathara, on behalf of Messrs. Bewick, Moreing and Co. They also tried to secure options on the adjoining north and south blocks, but, as all the owners were not present, no deal eventuated. The district has been officially inspected, on behalf of the Government, by Mr. Talbot, the geologist. According to Mr. Talbot, the belt of country can be traced for 23 miles in a north-westerly direction, and the district appears to have very good prospects. A large number of leases have been pegged and already some prospectors are breaking rich ore from the outcrop for despatch to the smelters. Bewick, Moreing and Co. have already got four men at work on the Towers, and Mr. Henry Fey and his party are breaking out a test crushing. Mr. Fey had his thigh dislocated ten weeks ago, when driving to the field, by his buggy wheel hitting a stump and upsetting, and lay helpless on the track for several hours before he was discovered and brought back to the Peak Hill mine. His thigh was not replaced till five days after the accident, and he has made such a remarkable recovery that he intends returning to the field this week. A squatter named McGrath told Mr. Fey that he knew another outcrop showing green and blue carbonates some 30 miles further north. Already representatives of Melbourne, Adelaide, and Perth investors are being attracted to the district, a Mr. Bruce representing Melbourne. The lode is likely to be well tested in the near future.

Judging from official reports the Oroya Links Co. has a good future ahead of it in its holding of the Eclipse and Croesus leases, consisting of 25 acres. These are the only blocks on which any estimate of ore reserves were made on Dec. 31, 1912. Mr. P. Fitzgerald, the manager, estimated the reserves above No. 7 level at 126,473 tons, assaying 25s. 4d.; and Messrs. Bewick, Moreing and Co. at 114,537, assaying 25s. 6d. per ton. Since these estimates were made the actual tonnage treated has been 66,420 tons for £69,200, or only 20s. 10d. per ton. Costs have been £62,966, or 19s. per ton; and profit £6234, or 1s. 10d. per ton. This shows that the ore was overvalued by 22½ per cent., or that the extraction is only 77½ per cent. This is not the worst feature, for, in 1909, before the Oroya Links amalgamation took place, Mr. Frank Powell, in a series of articles on the Kalgoorlie Golden Mile, which appeared in the "Financial Times," and was subsequently issued in pamphlet form by Messrs. Lionel Robinson, Clarke and Co., pointed out that the shaft on the Eclipse lease was then down 600ft., and that the western underlay gave 145ft. of backs for every 100ft. vertical. In other words, the lode is 100ft. further west for every 100ft. sunk. As the whole width of the lease is not 600ft., the lode if Mr. Powell be correct, must have been outside the boundary, and in the Hannan's Pty. Co.'s Queen of the West lease at that time. This may account for the sinking of the shaft having been suspended ever since. The company does not publish plans with its annual report, so that the true position of affairs cannot be gauged. The company has started equipping the old Croesus Prop. shaft with 80ft. poppet legs from the Links' No. 3 shaft, and is also removing the large first motion winding engine from the Oroya South block, and is laying a 2ft. tram line from the Croesus shaft to the Eclipse shaft—a distance of 1250ft. The Croesus shaft is already down 750ft., and a winze 810ft., and it is the intention to sink the shaft to 2000ft., in lifts of 150ft. each. How this is to be done when the adjoining ground, known as the Levant, is held by a local syndicate is a conundrum, unless the company buys the Queen of the West and Levant leases from the present owners.

The crosscut at the 2720ft. of the Ivanhoe has now passed through the east lode, which has a total width of 58ft. The first 50ft. penetrated assayed from traces to 16s. per ton, and the last 8ft. 44s. 6d. per ton. At the 2570ft. the lode where penetrated assayed 14s. per ton over a width of 34ft. At 2420ft. it averaged 36s. per ton for 7ft., and, at 2270ft., 26s. per ton for 9ft. The lode at these levels proved very poor when opened up, the impoverishment being due to an intrusion of graphite, which Dr. Malcolm MacLaren predicts will gradually cut out, and the ore-shoot improve again. Acting on his advice, the directors are to strengthen the head gear and instal a new winding engine capable of hauling from 5000ft., the capacity of the present engine being limited to 3000ft.

Mr. Wm. Martin, manager of the Victorious, has gone east for a holiday, and Mr. G. M. Roberts, the consulting engineer, has taken charge of the mine. The east drive, at No. 5 level, from 32 to 47ft., passed through ore assaying 60s. per ton for a width of 72in., but the west drive is still in low values. Mr. Roberts is very sanguine of the ultimate success of the property, and continues to push on developments.

## NORTHERN TERRITORY MINING.

The following results of borings on the Sagabiehl reef, Pine Creek, have been supplied to the administrator of the Northern Territory by Mr. H. J. Jenson, Director of Mines:—

"In the No. 5 borehole started on the north side of the Sagabiehl hill during August, 1912, and completed in January, 1913, two reefs were met with, viz.: (1) Between 649ft. 6in. and 658ft. 10in., carrying only traces of gold. (2) Between 702ft. and 761ft. 6in., a large reef carrying on the average under 2 dwts. per ton. A mullocky reef was also encountered between 682ft. and 688ft., carrying 16 grains gold per ton. In No. 6 bore hole, on the south side of the same hill, the principal reef was encountered at 559ft. 6in., and carried rich gold on the hanging wall side to the value of 4 oz. 11 dwts. 11 grs. gold per ton. The boring was at right angles, or nearly so, to the dip of the reef, the thickness passed through being 13ft. 3in., this being the approximate width of the lode. The boring operations at Pine Creek have successfully proved:—(1) That auriferous formations exist at a depth; (2) that they carry gold to a depth of 500 and more feet; (3) that the richest portions are the walls, and in the case of the Sagabiehl, the hanging wall, which impinges the soft slickensided slates, is richer than the foot wall."

## ELECTROLYTIC REFINING CO.'S WAGES BOARD.

In the Industrial Court, in Sydney, last week, judgment was delivered in the matter of the application of the Electrolytic Refining and Smelting Co., Port Kembla (N.S.W.), for the inclusion of crafts in the Metalliferous Mining (General) Group, No. 5 Board. His Honour (Mr. Justice Heydon), amended the constitution of the board by omitting therefrom all exceptions, and said that he did so on general grounds, and not because he thought it desirable that men should work seven days in the week. On the contrary, he hoped that every effort would be made to find some method by which the six-day week could be secured for all who wished it, and, if possible, for the other workers as well as the engine-drivers.

His Honour also said that the business was an isolated one, and the only one of its kind in Australia, providing a local market for many low grade ores, which would otherwise have to go out of the country. The process was a continuous one, and work had to be carried on all the seven days of the week. Under the new Act, the craftsmen employed at the works were put under separate boards, with the result that an engine-drivers' award had been made introducing a 48 hour week, its own overtime and rates of overtime, and this had created conflict, discontent and trouble.

Regarding an incidental dispute as to the proper classification of many of the men, his Honour pointed out that electric power was used throughout the establishment, and all sorts of work was done by pressing buttons and pulling levers. Materials were taken from place to place by men who loaded them into trucks, and then stepped up, moved a lever, and were taken wherever they wanted to go. Those men were claimed as motor-drivers, and as such entitled to overtime, if they had to work on the seventh day; and that, it was said, would create discontent, as they were really doing only labouring work of a simple character, and were working side by side with other men who were under a different award adapted to a continuous process. The only course appeared to be to leave that class of worker to the electrolytic board, which board should bear in mind the general principle that the craftsman got the craft wage.

# ENGINEERING AND ELECTRICAL SECTION

THE FAMOUS
"Brimsdown"
"Wirum"
BRITISH MADE Lamps.
The most popular, reliable and economic lamp on the market.
Sole Agents—
THE
LAWRENCE & HANSON
Electrical Co. Ltd.
495 LONSDALE ST., MELBOURNE.
53 YORK ST., SYDNEY.
and at WELLINGTON, N.Z.

## MELBOURNE TRAMWAYS.

The Victorian Premier, Mr. Watt, was reminded last week of the draft Bill prepared over twelve months ago by a conference of metropolitan municipal councils providing for the creation of a Greater Melbourne Tramway Trust to take over control of the whole of the city and suburban tramways. On the 5th inst. another conference was held in the Melbourne town-hall, when the following resolutions were passed:—

(1) "That, in view of the working of the present tramway system, owned by the municipalities, lapsing into their hands at an early date, and in view of the many urgent suburban tramway propositions demanding attention, this committee of the Melbourne and metropolitan municipalities resolves that there is imperative need for immediate action, and calls the attention of the Premier to the Bill for the constitution of a municipal tramways trust, which Bill was placed in his hands on July 24, 1912, and submits that such Bill should be at once introduced with such modifications as the Government may think proper to make. (2) That a letter be forwarded to the Premier conveying this resolution, and asking that he will make an appointment to receive the members of this committee in reference to the matter."

The Lord Mayor, Cr. D. V. Hennessy, having brought the matter under the Premier's attention, it was arranged that the latter would receive a deputation on the 13th, the Premier remarking that on the same day he would be receiving the representatives of the Melbourne Tramway and Omnibus Company with respect to the company's protest against the construction of two proposed new tramways which, it was alleged, would injuriously affect the company's lines during the currency of its lease.

As the outcome of a series of conferences extending over some weeks, the municipal councils of St. Kilda and Brighton waited upon the Minister of Railways, Mr. A. A. Billson, on the 6th inst., and asked him to consider a proposal that the Government should hand over to them, as representing the municipalities most concerned, or to the Prahran-Malvern Tramway Trust, the electric tramway running between St. Kilda and Brighton, now controlled by the Railways Commissioners. It was contended that in this way the public interest would be better served, while the line in question could be linked up with others now controlled by the Trust, also that as the tramway was laid along municipal roads the two should be under one control, and it was pointed out that in the duplication of the line at the St. Kilda end the department had not laid the rails with sufficient regard to the interests of other street traffic. Mr. Billson replied that the proposal was one that involved policy, and must therefore be remitted to the Cabinet for consideration. The Railway Commissioners said that in the event of the Greater Melbourne Council being created for the purpose, amongst other things, of controlling the tramways, the Brighton electric street railway would be transferred to that body; but, pending the establishment of that council, the Commissioners were averse from the tramway being removed from their control, and could not see that any advantage would accrue from the transfer. The length of the electric railway was five miles 13 chains, and the capital cost was £88,113. He would report the representations of the deputation to the Premier, with a view to having the proposal submitted to the Cabinet for consideration. In the meantime it would be well if the councils obtained reports, and submitted some concrete proposal.

---

## TAPPING ELECTRIC METERS.

At the Oakleigh (V.) Police Court last Thursday, John Cameron, manager of the Oakleigh and District Electric Works Company, was sued (1) for having injured the fuse-box of the Melbourne Electric Supply Company Limited, and (2) for having fitted up certain fittings whereby electrical energy was obtained from the Supply Company's main without its consent. Mr. W. H. Walker (of Messrs. Blake and Riggall) appeared for the informant. The evidence showed that the defendant supplied and fitted up the inside connecting wires in connection with the installation of the electric light in a house at Oakleigh. While he and his men were doing this the Supply Company's men placed the meter-board in the house. This meter-board, when complete, would hold the fuse-box, the property of the Supply Company, and should not have been interfered with by anyone outside the company. The board was placed in the house with the fuse-box on it, the porcelain plug was left outside the fuse-box, which was sealed up, and the wires therefrom to the meter were left clear and unconnected, in preparation for the placing and proper adjustment of the meter when the fittings were ready. Instead of waiting for the Supply Company to fix its meter and complete its work, the seal of the fuse-box was broken, the porcelain plug inserted into it, the ends of the wire joined together, the current thus turned on, and a full supply of electricity rendered available to the house, unregistered by any meter. The bench held that defendant had acted illegally, and that the Electric Supply Company had vindicated its claim that its meters and other apparatus must not be interfered with by other parties. Defendant was fined £1 for each offence, with £4 costs. A similar case against a junior employee of the local company was then withdrawn.

---

## ELECTRIC TRACTION AND INDUSTRIES.

### A Premier's Observations.

It was natural that Mr. Watt, Premier of Victoria, in which so much interest is at present being taken in railway and tramway electrification, should, during his recent visit to England and Europe, have paid special attention to electrical matters. Mr. Watt has now reduced the result of his inquiries to writing, and last week he handed the following interesting memorandum to the press for publication:—

"During my visit to England I was able to pay a short but most interesting visit to Newcastle, the pivot of the North-East Coast Electric Power Works. Knowing the desire of the people of Victoria to obtain the latest and most authentic information regarding such works, I took full advantage of the facilities generously afforded me of visiting nearly all of them, and of collecting some interesting facts and figures relating to the effective application of electric power to traction and industrial purposes.

"The district known as the North-East Coast extends from Morpeth and Blyth in the North, where the collieries begin, to Guisborough and Skinningrove, in the South, where the Cleveland mines end. It extends westward as far as Consett and Bankfoot. The population of this district is approximately two and a quarter millions, or about 5 per cent. of the population of the United Kingdom. It produces 20 per cent. of the coal mined in the United Kingdom, 36.4 per cent. of the coke, 40.4 per cent. of the ironstone, 37.5 per cent. of the pig iron, and 36.5 per cent. of the ships built in the United Kingdom are constructed at the Tyne Works in Newcastle. This district has shown the most original and extensive development on a large commercial scale of the application of electricity to industrial purposes. There are some larger installations in America, mainly for electric lighting and traction purposes, and various places have longer transmissions, but nowhere has there been such a wide application of electric power to so many different industries.

"The industries and processes to which electricity is now applied in this district are collieries, alkali making, shipyard, salt mines, iron mines, blast furnaces, flour milling, paper making, as well as, of course, lighting and traction. Many of the works in this district use more electric power than is required for lighting towns of a considerable size. The net result of the application of electric power to these industries has been a great reduction in the coal consumption, and in the smoke of the district, and great economy to the numerous manufacturing industries and processes.

"The question on the North-East Coast district to-day is, not the desirability of applying electric power, but the source of the supply, and it has been found economically more sound to deal with the large central producer rather than instal separate systems. The results show that the costs of production have steadily fallen in proportion as the size of the stations has grown. It is now commercially practicable to supply several hundreds of square miles from the one central system, and even from a central station.

"The economy of using electric power arises, not only from the concentration of power production and the abolition of small and inefficient plants, but also from the utilisation of heat and gases and steam which previously were practically wasted, but which now provide power formerly produced by coal. The area supplied by the concentrated power system is 1400 square miles, the length of mains is 760 miles; there are 15,200 consumers, and the generating stations have a combined horse power of 146,280, and the horse power connected as at January, 1911, totalled 166,600. The power is produced by two classes of generating stations:—(1) Coal fired; (2) waste heat. There are six coal-fired stations, i.e., stations which use coal to generate the electric power. These are situated at Dunston, Carville, Neptune Bank, Philadelphia, Kebburn and Grange town. The two largest are Carville (52,000 h.p.) and Dunston, which at present has a horse power of 30,000, but this station is laid out to accommodate eventually six generating units, each of 10,000 horse power continuous capacity and 13,000 maximum capacity, or a total capacity of about 70,000 h.p. There are eleven waste heat stations, the largest being Bankfoot (coke oven waste heat, and gas), 8200 h.p.; Weardale (coke oven waste heat, and gas), 7330 h.p.; and Newport (exhaust steam and blast furnace gas), 7330 h.p. The whole of these stations form one system of electric power supply, and are all connected up, and the power generated is practically pooled or stored.

"The electric power companies now derive an important and increasing proportion of their supply from the waste-heat generating stations. The generating power is derived from utilising chiefly the waste heat from coke ovens and blast furnaces. It would be difficult for an individual works to utilise to advantage its waste heat. There would be times when the heat available for generating power would exceed the requirements of the works and district, and times when it would be insufficient. But by consolidating the power in one system the whole is under the control of the main stations, and supply is adjusted (supplemented or withdrawn) to meet the actual requirements for electric power. The two main stations, Dunston and Carville, control the supply to the numerous sub-stations, and increase or decrease the transmission pressure to meet the requirements of the consumers.

"To a Victorian the Dunston power station is interesting, as the station to be erected at Yarraville will be of a similar model. Dunston is the most modern, and will ultimately be the largest of the power stations in the North East of England. It was erected by the company to the designs of Messrs. Merz and McLellan. It embodied in its design the experience gained from the numerous other stations designed for the Newcastle and other electric power companies by these engineers. It has proved to be the most economical both in first and annual costs.

"The companies which use the electric power from the consolidated supply for traction purposes in the Newcastle district include:—The North-Eastern Railway Company, which uses electric power on 40 miles of its lines; the Tyneside Tramways Company; the Gateshead Tramways Company; the Tynemouth and District Electric Traction Company; the Sunderland District Electric Tramways Limited; the Jarrow and District Electric Traction Company Limited. The purpose which led the North-Eastern Railway Company to adopt electricity on their suburban lines around Newcastle was to improve the method of dealing with the suburban traffic, and as far as possible supply the district with a good inter-urban service. The system adopted is the third-rail continuous current. The current is transmitted to five sub-stations, where it is converted by stationary transformers and rotary converters to a continuous current of 600 volts fed to the third rail. The return circuit is made through the running rails. The service given before electrification was approximately an hourly one. The service is now practically quarter hourly, and during the rush of traffic in the evening 16 trains leave the central station in one hour for the coast, five of them at one-minute intervals.

"My general conclusions are that the conversion of our metropolitan railways from steam to electric traction is a wise step, and that for efficiency, economy, and cleanliness we shall stand unrivalled. I am confident that the effect on our industrial expansion and in the domestic world will be wide spread, and most advantageous to the people of the State."

---

## BRITISH AND EUROPEAN DEVELOPMENTS.

(From Our Correspondent.)

London, July 11.

In business circles, especially in London, feelings of dissatisfaction with the telephone service have been gradually rising of late, and this week they were given formal expression to by a deputation sent to the Postmaster-General by the London Chamber of Commerce. Almost immediately after the taking over of the system from the National Company by the Post Office early last year, pent-up irritation began to burst out in letters to the press and questions in Parliament, but after explanations by the Postmaster-General there was a disposition to stop further complainings for a time in order to see whether the seemingly greater inefficiency was a consequence of the transfer and whether it would cease when things settled down. But there appears to be no possible settling down in such a matter as telephone service in a big business area where exchange improvements are ever making and in progress, and where there are always a large number of people waiting for connection. Settling down also becomes still more remote because the public got into the way of expecting everything to be much better for them after the State had got possession, and Government instead of company officials had taken hold of the wires. Charges were to be revised, or they hoped so, and of course revision meant reduction. Perhaps the present irritation is in some measure due to the disappointed hopes as much as to poor service. However, whatever the cause, complaint is fairly general—everybody's doing it. What then has Postmaster-General Herbert Samuel to say? In reply to the criticism that the official records of effective calls are not correct, and that users are therefore overcharged, he says that a very difficult position must arise if the official records are not to be accepted as the basis of account. The Department would welcome the invention of a meter which would efficiently record effective calls. The deputation had said that the "engaged" call was due to the lack of sufficient junction lines connecting the exchanges, and the Postmaster replied that their number is being increased, but the ineffective calls from insufficiency of lines has been less than one-half per cent. in the latter half of the past complete year. Modernising of London telephone exchanges is proceeding, about £3,000,000 having been expended in new construction and development during the year. Before very long Mr. Samuel is going to Parliament to ask for authority to borrow another £10,000,000 for development during the next few years. Large extensions to the trunk line service are being made; £300,000 is being spent on a new underground cable from London to Birmingham, which will provide three times the present number of wires, and will help to serve Manchester, Liverpool, the north of England generally, and the west of England. Mr. Samuel reminded his deputation that they had been passing through the transition stage, and between January last year and May this year, the number of women operators had been increased by 1336 and the male night operators by 201, while better pay and easier hours than under the old conditions had also been given. For every eight operators there is one supervisor. Mr. Samuel sticks to what he has said all along regarding changing the charges—he does not propose to alter the existing system of rates until the whole question has been studied exhaustively. He also favours the setting up of advisory committees in London and all large towns to work in accord with the Post Office respecting necessary reforms in the service. The Chamber of Commerce deputation spoke approvingly of this suggestion.

Mr. Herbert Samuel has also been prominently before the public mind in connection with the new contract with the Marconi Company. He made a very full statement on the matter in the House of Commons on the 4th inst., from which it appeared that the company says that the additional cost which would result consequent upon the loss of time caused by the contract being in suspense, would be about £6000 per station. For keeping its staff of engineers waiting for twelve months it wanted £4000. The Postmaster concurs in the price alteration due to increase in cost of materials, but the company has given way in regard to the £4000 item. The company also asks for better conditions respecting the time of payment for the work, and for the contract to be settled by August 31st, 1913. If the House of Commons approves, payment will be made as to 30 per cent. of the purchase money from the date of the contract, 30 per cent. nine months later, 30 per cent. on completion, and 10 per cent. after the system has been tried and the time is ripe for final settlement. Turning from the financial to the technical aspect of the new contract, the company will guarantee land working under all conditions, but it will not guarantee automatic working at high speed during temporary periods in which the atmosphere is affected by serious electrical disturbances, in the present stage of wireless science. It is provided that if the Postmaster-General desires to instal some other system of wireless telegraphy he shall not give preference to any other contractor if the Marconi Company can show to his satisfaction that they are able to provide that alternative system with equal efficiency and economy. During both erection and trial periods the stations will be available for Government experiments, but not so as to impair their normal working. In the previous agreement the company guaranteed a speed of transmission of 50 words per minute by automatic apparatus, except during periods of exceptional electrical disturbance of the atmosphere, and a speed of 20 words a minute by hand signalling apparatus at all times. They now guarantee automatic 75 words a minute. Other points touched on in Mr. Samuel's very exhaustive statement included the reasons why the Post Office and the Admiralty were not prepared or free to do the work of erection. The Post Office has not a suitable staff available, and the Board of Admiralty is unwilling and unable—without serious interference with its own affairs—to undertake the erection or working, as its staff is fully employed and could not be diverted without serious detriment to their own work. In regard to a suggested alternative that the Government should create a new staff and employ an engineer of distinction to supervise the erection of the stations, the Postmaster-General says that no one in England outside the Admiralty and the Marconi Company has had any actual experience either of the erection or working of long range stations. If an engineer without that experience were chosen he would have to collect a staff as best he could, and to prepare fresh designs, and he and his staff would have to gain experience in a most difficult understanding as they went along. The Postmaster says that the company has the designs ready, the engineers available, and it can start the work immediately.

Before the contract is definitely approved, an opportunity is to be given to the House of Commons to consider it. Just now an effort is being made, both in Parliament and in the newspapers, to secure due recognition of the merits of the Goldschmidt wireless system, as shown by up-to-date performances. The Postmaster-General stated on Wednesday, in answer to a question, that he had received a communication from the British representatives of the system giving information regarding recent trans-Atlantic communication achievements with it, and suggesting a contract with them for an Imperial station. He had asked them to arrange with the Post Office and Admiralty for their representatives to be present at a demonstration at an early date, but so far no reply had been received.

The question of wireless telegraph patents has been raised once more in the Courts, the occasion this time being a summons by Mr. Marconi and the Marconi Company against the Helsby Wireless Telegraph Co., to restrain them from infringing patents granted to Mr. Marconi in 1900. The summons asked for leave to administer interrogatories regarding the state of the defendant's plant (an installation in Liverpool) since it was inspected by plaintiffs in May last. The interrogatory has been allowed, and has to be answered within a fortnight.

An application is to be heard shortly in which the National Telewriter Co. seek an extension of their telautograph patent.

---

## VICTORIAN RAILWAYS.

### A Year's Construction Work.

The annual report of the Victorian Chief Engineer for Railway Construction, Mr. M. E. Kernot, shows that the total length of new lines opened during the year ended on June 30 was 342.39 miles, while 242.25 miles had yet to be completed, making the total undertakings for the year 584.64 miles. The cost of the former (12 lines) was £979,070, while the latter (7 lines) will cost £1,075,708, making a total of £2,054,778. In addition, eight other railways, having a total length of 224 miles, estimated to cost £991,042, have been authorised, but not commenced, whilst Border railway connections with a length of 37 miles, to cost £83,900, have also been authorised, but not yet put in hand. The following figures show the railway mileage of Victoria per 10,000 inhabitant, compared with that for the other States of the Commonwealth, and also with that for the Dominion of New Zealand and the United States of America, according to the latest official records:—New South Wales, 22.06; Victoria, 26,74; Queensland, 67.30; South Australia, 46.09; Western Australia, 85.94; Tasmania, 26.09; Commonwealth of Australia, 36.39; New Zealand, 25.44; United States of America, 26.24.

The principal item in the present high cost of construction is the increased wages paid for labour, which was raised on February 1 from 8s. 6d. to 9s. a day. The rate in 1895 was 5s. a day. This increase of 80 per cent. in the cost of labour, together with greater cost of timber and other materials obtained in the State, and increasing difficulty in obtaining experienced railway workmen, due to the numerous large public works in hand in this and other Australian States, has made construction work more costly than for many years past.

Mr. Kernot repeats his complaint that 93 per cent. of his staff hold only temporary appointments, a fact which militates against efficient working. Resignations of officers have again been frequent, on account of tempting offers from other States and the Commonwealth. The places left vacant were filled as quickly as likely applicants could be found, but suitable engineers and surveyors have been scarce, and the process of training new men is being repeated, with loss of time and increased cost of supervision.

---

The Victorian Railways Commissioners have issued a statement showing the enormous increase in traffic on the Melbourne suburban lines during the past thirty years, up to the end of the financial year 1911-12; had the figures for the year ended on June 30 last been available the increase would have proved even more surprising. In the year 1882-3 the number of passenger journeys on the lines then open was 13,269,563, out of a total of 26,485,304 for the whole State. In the year 1911-12 the number was 53,323,563, out of a total of 105,909,650. In the year 1902-3 the total journeys numbered 28,503,525, so that in nine years there was an increase of 24,820,038 passenger journeys on the suburban lines alone, or over 87 per cent.

There are now about 23,000 employees in the service of the Commissioners, as compared with 11,300 in 1904. In the Newport workshops alone about 4000 men are employed, as against 1250 in 1904. Besides this, large additions have had to be made to the staff at the signal, and interlocking shop, also at Newport, where the safe-working appliances of the department are made and repaired, over 400 men being now employed, whereas in 1904 there were only 40.

Efforts are being made by the Commissioners, though, it must be confessed, somewhat tardily, to bring their railway workshops at Newport up-to-date in their equipment, and during the past few months several improvements have been made. The new installations include a 1¼in. four-spindle nut tapping-machine, a 25 cwt. steam hammer, two ½ cwt. steam hammers, with special anvil blocks; two 5ft. radial drills, with reversing clutch and balance spindles; two 5-ton travelling cranes; two 36in. swing surfacing and boring lathe, with screw-cutting gear; one 36in. duplex boring and turning mill, with swivel head and loose jaws; two Storey's patent high speed sensitive turret radial drilling-machines; one automatic surface grinding-machine; four Tabor hand draft-power squeezing split pattern moulding-machine; one power or foot level spree-cutter, one punching and shearing machine, three polishing lathes, and one oxy-acetylene welding cutting plant.

The weight of the heaviest locomotives now in use on the Victorian railways (class A2) is 128 tons.

The revenue of the railways for July amounted to £382,257, as compared with £368,628 for the same month last year, the increase being £13,629. There was an increase of £14,802 in respect of goods traffic, but the increase in the receipts from passenger traffic was only £322. The live stock return showed a decrease of £1593.

# RAILLESS ELECTRIC TRACTION.

## The Trolley 'Bus in Great Britain.

As the question of tramway extension through Australia is receiving the attention of not only the local governing bodies, but also of the ratepayers, it seems a fitting opportunity for us to give the following particulars of the "trolley bus" system, which has met with such success in Great Britain.

Chiefly on account of its low cost of installation, it appeals strongly to such bodies as are requiring better means of transport and linking up of districts. Secondly, the rapidity of construction, not in any way inconveniencing the ordinary transport along the roads, appeals to many corporations who are dependent on a few main roads for ingress and egress to the city. It also meets the ever growing demand for an economical and flexible means of passenger and goods transport. Its value as feeders to the main tramway lines and railways has been amply demonstrated in Great Britain, and the various systems installed at Leeds, Bradford, Dundee, Rotherham and elsewhere have greatly exceeded the expectations of the municipalities who ventured to instal this class of transport. One of the largest factors in favour of the railless system is that the overhead contruction and poles, as installed by the R.E.T. Construction Company Ltd. of London, remain even when the service has been converted to a rail system. Railless traction is, therefore, a half-way step towards the permanent rail system, when that is the eventual outcome of the desires of local bodies.

R.E.T. Car at Leeds, passing traffic under low bridge.

"R.E.T." Car Turning Loop at Leeds.

The cars are not confined to a fixed path, but can be steered in and out amongst heavy traffic with the greatest of ease, and can pass obstructions and under low bridges with the same facility as any other road vehicle. The system, therefore, is free from such handicaps as hamper tramways, particularly in narrow streets, where the service becomes disorganised by dense traffic. Railless cars can be drawn up to the kerb to take up or set down passengers, which must be recognised as a great advantage and obviates the risk attached to the inconvenience of boarding tram cars in the middle of the road. Should accident overtake the railless car, it can be removed to the side of the street for repairs, and does not obstruct or delay the rest of the service or other traffic.

It has been thought that a service of motor 'buses or a battery system of cars would be more effective in some districts, but it has been proved by careful examination that the life and maintenance of the "trolley bus" excells these other means of transport, which also do not give to a district the permanency of operation that railless cars give. It may be considered that where corporations are prepared to expend money to equip the railless service with the standard overhead wires and poles, they eventually contemplate the laying down of a track. This gives the residents along the route some definite undertaking that the service will be continued, but where the motor 'bus or other mechanically operated vehicle is concerned no security is given to the landholders of its continuance. It has been demonstrated along the routes in Great Britain, such as at Leeds and Bradford, that the districts tapped by the railless system have improved enormously, and the municipalities interested in the control of the service have reaped the benefit in improved values.

In order to indicate the growth of the railless system within Great Britain we give the following list, embracing various bills in Parliament for the installation of such services, and also powers already obtained by municipalities and companies who have the system operating successfully.

Bills in Parliament:—The London County Council; Metropolitan Electric Tramways; Folkestone, Sandgate and Hythe; Bradford Corporation (for a further 11½ miles); Leeds Corporation (for seven additional routes); Chesterfield Corporation (about 18 miles); Derby Corporation; Nottingham Corporation; Morley Corporation; Huddersfield Corporation; West Bromwich Corporation; Mexborough and Swinton; Southport Corporation; Western Valleys (Monmouthshire) 20¾ miles); Rhondda Valley; Brighton Corporation (further routes).

Powers already obtained:—Rotherham Corporation; Dundee Corporation; Ramsbottom Council; Middlesbrough Company; Leeds Corporation; Bradford Corporation; Brighton Corporation; Hove Corporation; Northampton Corporation; Halifax Corporation.

In order to indicate the working costs of the system we reproduce figures supplied, showing the working costs per car mile for one month on a route about 5 miles long in the United Kingdom.

Management, .222d.; inspectors, .212d.; motormen, .825d.; conductors, .657d.; car repairs, .503d.; car cleaning, .119d.; car lubrication, .825d.; depot, .095d.; tyres, 1.500d.; road maintenance, .375d.; current, 1.359d.; total, 5.892d.

R.E.T. Car at Leeds, inter-running with Tram Cars, and using tramway overhead wires.

The tyres in the above returns cost 1¼d. per mile, whereas now they cost only 1d. per mile. Deducting .500d. for tyres and eliminating the item for road maintenance this reduces the actual cost to about 5d. per mile. Management expenses and various sub-headings are all taken at the figutes used for tramways, although the tramways have an average speed of about 7 miles per hour, whereas the railless cars have an average speed of about 12 miles per hour. The current costs 1⅝d. per unit and 1 unit per car mile has been taken. The current consumption at the car is actually only about ¾ of a unit, and the total current consumption, including line losses, varies from .87 to .89 of a unit. The larger figure of 1 unit given in these costs is on account of the great distance which the current is fed over the trolley wires, the end of the line being 7 miles from the switchboard, and there are no feeders on the railless line, which is about 5 miles long and is a continuation of a tramway. In these circumstances 4½d. to 4½d. is more nearly the true figure for operating expenses at this place, exclusive of interest on capital or redemption charges.

R.E.T. Car passing traffic at Bradford, showing great clearance of the trollies.

Under colonial conditions no doubt some increase over these costs will require to be made. The item of tyres, which is one of the largest considerations to-day, will be proportionately higher here in Australia; also the increased wages in Australia as compared with Great Britain will slightly advance the figures given above; but it would seem that the cost of these cars in Australia per car mile should not exceed 6d. to 6½d., and this in comparison with the maintenance of motor buses or other mechanically-operated vehicles is certainly much less.

## ELECTRIC SUPPLY IN MELBOURNE.

### City Council and Municipalities.

In the course of discussion by the Melbourne City Council last Saturday on a recommendation of the Electric Supply Committee respecting the terms and conditions of supplying electric current to the Williamstown town council (which discussion was eventually postponed), Councillor Bell proposed an amendment in the following terms:—

"That consideration of the order of the day be postponed till next meeting of the council, and that in the meantime the members of the council be furnished with the following statements:—1. Statement showing quantities of current sold to Footscray City Council, the amounts paid therefor under terms of agreement, and the monthly average price per unit from December, 1911, to 31st May, 1913. 2. Statement showing analysis of the City Council's total costs, per unit, of current sold per month, from December, 1911, to 31st May, 1913, extracted from electrical engineers' monthly record sheet. 3. Statement showing in monthly comparison the average prices per unit paid by the citizens of Melbourne and the City Council of Footscray for current supplied for all purposes, from December, 1911, to 31st May, 1913 (inclusive). 4. Statement showing in comparison the average prices per unit paid by citizens of Melbourne for power, heat, and light, light only, power and heat, lighting municipal buildings, lighting street; Footscray council for all purposes."

This having been agreed to, Cr. Cabena proposed a further amendment to include the cost of supplying Footscray with current and all other necessary information, which also was agreed to.

## MISCELLANEOUS.

The Victorian Railways have received from Messrs. Meggitt Ltd., of Sydney, a first consignment of 2250 drums containing 11,250 gallons of raw and boiled linseed oil supplied under a new contract. The drums testify on their outsides to the fact that the produce is "made in Australia."

* * *

Mr. Justice Burnside delivered the award of the West Australian Arbitration Court on the 6th inst. in the dispute between the Kalgoorlie Electric Tramways Ltd. and its employees. The award fixes the minimum wage of motormen drivers 11s. a day, 48 hours to constitute a week's work, but the company may employ motormen and conductors 54 hours per week, exclusive of Sunday, at ordinary rates. After nine hours in one day, or 54 hours in a week, overtime is to be paid at the rate of time and a quarter. Sunday work is to be paid at time and a half, but if the company is compelled, by agreement with the municipal councils, to maintain a Sunday service, the ordinary rate is to prevail. Motormen and conductors are to be granted seven days holiday annually on full pay.

* * *

Mr. Evans, the Queensland Commissioner of Railways, considers that the time for electrifying the railways of that State has not yet arrived. His chief care is to increase the number of passenger trains to meet urgent requirements.

* * *

In the South Australian Legislative Assembly last Thursday the Premier, Mr. A. H. Peake, promised to appoint a Royal Commission to consider the municipalisation or nationalisation of the electric light and gas services.

* * *

**Mr. G. G. Jobbins**, manager of the Electric Lighting and Traction Supply Co., has been asked by the Geelong, Newtown and Chilwell and Geelong West (V.) municipal councils for extensions of the electric tramway system to Belmont, Chilwell, North Geelong, and East Geelong. Mr. Jobbins promised to lay the matter before his directors.

* * *

Electric light was formally switched on at Hopetoun (V.) on the 2nd inst.

* * *

The Melbourne Electric Supply Co. Ltd. transfer books will be closed from August 18 to August 30 inclusive, in connection with the payment of the dividend on the 7 per cent. first preference shares.

* * *

A powerful wireless station has just been completed at Apia, Samoa, its range being about and above a 2000 miles radius. The station is about five miles inland.

* * *

A press cablegram was received from London last week to the effect that the Postmaster-General (Mr. Herbert Samuel), in a letter to the Empire League, dealing with Imperial communications, stated that arrangements are being made to secure the Government control of cable rates through the landing licences granted to the cable companies. He added that the Government will fix rates consonant with the earnings of the companies.

* * *

The Queensland railway regulations, which prohibited railway employees taking part in political affairs, has been rescinded by the Governor-in Council. The clause (No. 18) of the regulations ran as follows:—"Employees of all ranks are to refrain from taking part in any political affairs otherwise than by the exercise of the franchise." In view of the abolition of the regulation letters have been written to the heads of departments, asking them to suggest to the men that they should refrain from discussing politics on railway premises during working hours.

* * *

In the West Australian Legislative Assembly on the 6th inst., interesting information in connection with the Powellising process was elicited. The cost of the royalty on timber for waggon and car construction was 3s 2d. per 100 super feet. The quantity of timber treated to June 30 last was 2,830,332 super feet. The royalty paid on timber treated to June 30 for the Port Hedland railway was £1062. The cost, exclusive of royalty, of Powellising sleepers used for the Port Hedland railway was 8d. per sleeper. The number treated was 220,395.

* * *

After a silence of a month Dr. Mawson sent a wireless message from Adelie Land, dated August 4, explaining the cause of the delay. The message, which was received by Mr. Conrad Eitel, the secretary of the expedition, on the 6th inst., read as follows:—"The two top lengths of the wireless mast were blown down by continuous hurricanes on June 8. We have, so far, experienced even less calm weather than last year, so that the work of reconstruction has been very slow. We have now a two-mast system, consisting of a main mast 90ft. high, held in position with 18 stays, and a 45ft. southern mast. We experienced to-day the first calm weather since July 28, when we had a four-hours' spell. All members of the party are well and in good spirits.—(Signed) Mawson." The ketch "Rachel Cohen," left Hobart for Macquarie Island on June 9, carrying stores for those members of Dr. Mawson's party who were left there, and should have reached there well before the end of June. Up to the middle of last week, however, she had not been heard of; then came news from New Zealand that she had arrived at Half Moon Bay, Stewart Island. Terrific weather had blown her past Macquarie Island, and she had been hove to under bare poles for nine days, and at another time drifted aimlessly for 300 miles. Owing to the urgency of the position of the men at Macquarie Island, Mr. Eitel sought to make other arrangements for the despatch of the necessary food supplies to the island, and the Prime Minister of New Zealand (Mr. Massey) generously and promptly placed the cable steamer "Tutanekai" at the disposal for that purpose.

* * *

The N.S.W. Government has been served with a writ, claiming £90,000 compensation, by Smith, Timms and Co., the firm of contractors from whom the Minister for Works took over a contract in connection with the North Coast Railway. A sum of £8550, the amount of the guarantee deposit, was returned to the firm in question.

* * *

Oil Fuel Economiser Ltd. has been registered in Sydney with a capital of £10,000, in £1 shares, to carry on business as agents, brokers, engineers and merchants. The registered office is in Sydney, the first directors being John A. Paterson, Andrew J. Paterson, Archibald D. Powell, and Herbert E. Powell.

* * *

The expenditure on Sydney tramway extensions since 1907 is stated by the Minister for Works to have been:—1907-8, £210,505; 1908-9, £293,850; 1909-10, £192,755; 1910-11, £198,291; 1911-12, £182,714; 1912-13 (subject to adjustment with Treasury), £161,364.

* * *

The water supply of Melbourne is a paying proposition for the Metropolitan Board of Works. Last year the gross profit was £120,341, but there was a debit of £66,973, and interest on the renewals fund was £5529, making a total of £72,502 to be deducted, leaving a net balance of £47,839, which sum has been transferred to the credit of the renewals fund. That fund on July 1 amounted to £191,602.

* * *

Good progress is reported by the Thompson and Co. (Castlemaine) Proprietary Ltd. with its big contract for machinery for the Brisbane Water Supply Department, and some hundreds of tons of parts of the plant are ready for forwarding. Some idea of the immense machinery can be formed from the fact that the crank shaft will weight 15 tons, and each of the three engines will have two fly-wheels, each weighing 15 tons. The plant, when complete, will deliver 30,000,000 gallons of water per day from the

Brisbane River to the top of Mount Crosby into a reservoir from which 30-inch pipes will convey it to Brisbane, 26 miles distant. The contract price is £120,000.

• • •

The amount expended by the Metropolitan (Melbourne) Board of Works on behalf of ratepayers in connection with sewering and draining of houses, totals £1,075,545, the number of premises dealt with being 42,223. Of this sum £215,420 will be paid in full on completion of the work of 7968 houses, £859,688 will be paid by instalments on account of 34,240 houses, and £437 represents the work on fifteen houses for which one month's allowance of time expired is being granted.

* * *

At a recent meeting of the Motor Conference in London it was stated that the day of the tramway was over. Tram rails were no longer laid in the large and busy towns, said the speaker.

* * *

The twenty-third annual report of Walkers Ltd., engineers, of Maryborough (Q.)—namely, that for the year ended on June 30 last, shows that after appropriations to the reserve funds there remained a balance to credit of profit and loss account of £14,518 on the year's work. The directors propose to pay a dividend of 7 per cent. and a bonus of 3 per cent., which, together, will amount to £8210, while dividend tax will require £410 10s.; £3000 will be put to depreciation account, and the balance, £2897, will be carried forward. The paid-up capital amounts to £82,804. The company has an insurance reserve fund of £5000, a dividend equalisation account of £7000, a general reserve fund of £25,000, while the depreciation account stood at £12,000. The assets include land, plant, buildings, wharves, etc., £51,351, stock in trade [illegible], bills and current accounts £5037, cash and bank balances £10,876, besides £12,895 in deposits on contracts with the Queensland, Victorian and South Australian Governments, [illegible] in investments (at cost price) whilst the value of work done on contracts still in hand, over and above progress payments received, is set down at £21,922. The annual meeting will be held on the 25th inst.

• • •

The Imperial Government was not allowed, without a fight, to make a new contract with the Marconi company for an empire chain of wireless stations. In the House of Commons last Thursday Lord Robert Cecil gave notice of the following amendment:—"That in the absence of an independent report on the desirableness of the Marconi contract, the House is not prepared to approve of the agreement." The motion for the acceptance of the contract was, however, carried by 221 votes to 140.

• • •

How little will serve ground of complaint when a member of Parliament desires to show his vigilance in the public interest was seen last week when a member of the Labour Party asked the Victorian Minister of Railways whether the DD engines recently manufactured for his department by Walkers Ltd., of Maryborough, Q., had not been found defective. Mr. Billson replied that it had been found that in two locomotives running on trial, as well as in the parts of four locomotives in course of erection, the bolts connecting the cylinders to the frames were not sufficiently tight in the holes. This defect, however, had been remedied. The axle boxes of one of the locomotives became heated during the running test, probably because the white metal lining was of insufficient depth. No difficulty would be experienced in remedying this. The dome joint in two of the engines was found to be leaking, but the defect had been remedied by the insertion of a copper ring.

• • •

The New Zealand Government railway workshops are working at high pressure on rolling-stock of various descriptions. Big 90-ton locomotives are being constructed at Addington shops, which, when finished, will be sent up to the Taihape-Taumarunui section of the Main Trunk line. Eight 45-ton tank engines have been constructed for the North, and since April 1 they have been going away at the rate of one a month. Trucks are also being made in large quantities, the sizes being 8 and 12 ton four-wheeled waggons and 30-ton bogie trucks.

• • •

The Good Roads Association of N.S.W. recently interviewed the Minister for Works on the subject of the Roads Bill, which, it was stated, had the support of the Trolleymen and Draymen's Union, the Commercial Travellers' Association and the mercantile community in general. Mr. Griffiths, in replying, while unable to promise that the re-introduction of the Bill should take place this session, assured the deputation that he was securing practically the same effect by administrative action in the general distribution of subsidies. He estimated that for the future an amount of £1,300,000 would be necessary for the making and keeping in repair of those roads coming under the main road classification. Allowing that half of this cost should come from the owners of the land, it would mean that the main road grants must be increased from £250,000 to £600,000 for the future, and to make that up there would have to be found some new source of revenue. Under these circumstances the Minister hoped next session to make a proposal to the Cabinet for the establishment of a petrol monopoly to enable the Government to raise a big sum annually, or else to effect the same object by the establishment of a tax on motor cars and waggons and certain machinery. The president of the Automobile Club, Dr. R. E. Weigall, at the conclusion of a lecture on the history of the petroleum industry given at the club on Friday night, spoke in strong terms against Mr. Griffiths' proposal, and said that motorists must combine to resist the efforts of such "iniquitous suggestions."

* * *

The Deputy Potmaster-General, N.S.W., states that considerable difficulty has been experienced in getting a tender for the erection of the Bathurst-Mudgee telephone line. On the last occasion when he had been at length successful in getting a contract entered into, it had to be cancelled on account of the contractor failing to supply the poles. Amended particulars are now being prepared with a view to calling for fresh tenders.

* * *

The Turon (N.S.W.) Shire Council has adopted a recommendation of the works committee that a suspension bridge be erected over the Macquarie River at White's Crossing, the probable cost being £500.

* * *

The Government Railways (Appeal Board) Bill, N.S.W., has been adopted with certain amendments and read a second time. Provision has been made that the chairman of the board shall be a specially appointed stipendiary or police magistrate.

* * *

The Minister for Works, N.S.W., has placed a sum of £3250 on this year's estimates for the construction of a high level bridge over Glennie's Creek at Noble's Crossing.

* * *

At the annual meeting of the Electrical Trades Union, held on Thursday last at the Trades Hall, Sydney, it was stated that with the exception of a slight depression at the end of last year and the beginning of this, trade had been good. The work of the Tramway Department had kept up, private firms had a fair number of important contracts in hand and prospects for the immediate future were most encouraging.

* * *

The Albury (N.S.W.) municipal council has accepted the offer of the Commonwealth Bank to advance £10,500 for an electric lighting and power scheme. The loan has been made at 4½ per cent., repayable by annual instalments of £644 12s. 3d.

* * *

H.M.S. Pyramus, recently returned to Sydney from New Zealand, is in the hands of the dockyard authorities to undergo a thorough overhaul and the installation of new evaporators. Some defects have developed in her engine room, and her port tail shaft also requires attention.

* * *

A fatality is reported from Auckland, N.Z., caused through a boy named Horace Parker leaning out of a tramcar and striking his head against the centre pole. The public are agitating for the abolition of these poles as a public danger.

* * *

Morts Dock and Engineering Co. Ltd. held their 29th half-yearly meeting in Sydney last week. The net profits amounted to £12,849, and the amount brought forward was £13,206, which together made a sum of £26,056 available. Out of this sum a 6 per cent. dividend, amounting to £8814, was paid, a sum of £2000 carried to reserve fund, £2000 to the plant and renewal fund, and the balance of £13,241 was carried forward. The chairman stated that the new foundry had been commenced and would be equipped with most modern appliances, and referred to several other extensions that were in hand and contemplated, and to provide capital for which calls had been made on the new shares, which were now paid up to 17s. 6d., the remaining 2s. 6d. being due for payment in October.

* * *

The N.S.W. Minister for Works has promised a large deputation, which waited upon him to urge the speedy construction of the new railway line between Henty and Billabong, that the work shall be gone on with immediately the money is available.

* * *

The State Treasurer of N.S.W., in replying to a deputation urging the establishment of locomotive and repair works at Newcastle, stated that the railway authorities considered it a mistake to duplicate the extensive machinery and supervision required by establishing two depots. Mr. Cann expressed himself further as ready to shoulder the blame for cutting down the expenditure of additions to railway workshops, as that was the only item where retrenchment was in any way possible. Five million bushels of wheat were waiting to be brought to the coast, the wool season had begun, and before the last of it were dealt with the next harvest would be on us; and so as locomotives could not be manufactured quickly enough, they had to be imported. The carriage shops at Eveleigh were to be removed to provide space for doubling the size of the locomotive works, but it must be understood that there was no immediate proposition for their extension.

* * *

The Minister for Customs, Mr. Groom, is considering the suggestion made by Councillor Gallagher at Lithgow (N.S.W.) that assistance should be given to the Commonwealth Oil Corporation in the form of a Federal bonus, and he is receiving a deputation on the subject. It has been pointed out that the corporation has spent a million and a half of money, and every trade in Australia had reaped a certain amount of benefit therefrom, while the Government had received £75,000 directly in revenue, yet the works were now lying idle and 1700 men thrown out of employment.

* * *

The return from the Customs of the motor importations for the first six months of the year shows a decrease of 11 per cent. for the whole of the Commonwealth, as against the corresponding period of last year. New South Wales shows a decrease of 9 per cent., Victoria of 11 per cent., South Australia of 15 per cent., and Queensland of 30 per cent. West Australia, however, increased her imports to the extent of 7 per cent., and Tasmania shows the surprising increase of 77 per cent. The total sum expended for the Commonwealth was £831,209.

* * *

Mr. Reginald Allman, an officer of the Public Works Department of New South Wales, in appearing before the Industrial Laws Commission, handed in a statement at the instance of the Minister for Works showing many curious discrepancies in the rates of pay fixed by different wages boards for similar classes of work. Among these were the following:—Under the Railway and Tramway Construction Award, general smiths receive 1s. 8d. per hour and fitters 1s. 4½d. Under the Iron Trades (State Board) the former receive 1s. 6d. and the latter 1s. 5½d. Guards in charge of ballast trains, and who are responsible for them, receive 63s. weekly: their firemen receive 70s. A bridge carpenter receives 14s. per day; his ganger might only get 12s. There are many other equally curious anomalies.

* * *

The half-yearly report of J. C. Ludowici and Son Ltd., leather and belting manufacturers of Sydney, has just been issued. During the period under review a net profit of £3566 was made. Adding to this £513 brought forward, makes £4079 available for distribution. A dividend of 10 per cent. per annum, equal to £2832, was declared, and £1247 carried forward. The capital now stands at £56,644, and the reserve fund at £6548, while the machinery, plant, and assets are said to be in good condition. The last two dividends declared were at the same rate as for the current half-year.

* * *

A sudden surprise was sprung upon the employees of Fitzroy Dock, which has recently been acquired from the N.S.W. State Government by the Federal Naval authorities at a cost of £867,716, when the works were ordered to be closed down on account of the boiler plant being defective and a menace to the safety of the workmen. This threw all the employees out of work, but the Defence Department paid their wages for most of the time they were idle, which fortunately was only for a few days, as, after a hurried inspection it was decided to continue work by running a night shift, and thus diminishing the strain on the boilers during the daytime. It transpires that when the dockyard was taken over by the Defence Department, the officers of that department were made aware that the power generating plant was in a condition far from satisfactory. Senator Millen, the Minister for Defence, stated that the question of providing new power plant is under consideration, and that he intends urging the Cabinet to ask for Parliamentary authority to obtain all the necessary plant for warship building, and which will involve a very considerable expenditure. Incidentally it is rumoured that the superintendent of the dockyard, Mr. Cutler, is likely to be succeeded by Mr. Hillman, undermanager of John Brown's shipbuilding works on the Clyde, where the Commonwealth cruiser "Australia" was built. It is further rumoured that Mr. Cutler will be appointed engineer-in-chief of the State coastal works.

* * *

The N.S.W. Public Service Board are inviting applications for the position of Superintendent of Technical Education, Department of Public Instruction. The salary is £750 per annum, and full particulars are advertised alsewhere in this issue.

**P & O.** COMPANY'S ROYAL MAIL STEAMERS
FOR MARSEILLES, PLYMOUTH, AND LONDON.

Leave Sydney on the subjoined dates, calling at usual ports.

FIRST AND SECOND SALOON ONLY.

| Steamer. | Tons. | Commander. | Noon. | Melb., 3 p.m. |
|---|---|---|---|---|
| MACEDONIA | 10,500 | Bennett | Aug. 23 | Aug. 26 |
| MALWA | 11,000 | Thompson | Sept. 6 | Sept. 9 |
| MOOLTAN | 10,000 | Haddock | Sept. 20 | Sept. 23 |

PASSAGE MONEY TO LONDON—
Single, £41 16s to £82 10s.
Return, £69 6s. and £123 4s.

Return Tickets between Inter-State Ports are available for return by Orient, Messageries Maritimes, and N.D.L. steamers having room.

SPECIAL HOLIDAY RETURN TICKETS to COLOMBO are now issued, available for two months. Fares from Sydney, £45 2s. first saloon, and £31 18s. second saloon.

A. GORDON WESCHE, Superintendent IN AUSTRALIA, 63 Pitt-street, Sydney.

**The COLONIAL MUTUAL FIRE Insurance Company Limited.**

Principal Office: 60 MARKET-ST., MELBOURNE

Branches in all the States.
Transacts Fire, Guarantee, Employers' Liability, Marine Burglary, and Plate Glass, Accident, Workers' Compensation and Live Stock Insurances.

Send for Prospectus.
W. TUCKER, General Manager

**Harringtons Ltd**

**ANALYTICAL & METALLURGICAL DEPT.**

Lowest fees for all kinds of Assay, Analytical, and Metallurgical work.

Expert Advice on Ore Treatment, Bullion Refining, Smelting, etc., etc. Directed by a qualified Analyst from Messrs. Johnson and Sons, London; Assayers to Bank of England; H.M. Mint, The Council of India, etc.

**HARRINGTONS LTD.**
**386 George Street, Sydney.**

## NORTHERN TERRITORY RAIL-. WAYS.

Under the guidance of Albert Giles, a resident for over 40 years in the Territory, the Northern Territory Railways Commission left Darwin on June 29 in the Government steamer "Stuart" for the Roper River, the purpose being to inspect the country between there and Pine Creek to ascertain its suitability for opening up by means of a railway. The party returned to Darwin on the 5th inst., having travelled overland from Pine Creek. They describe the country traversed as somewhat patchy, but, generally speaking, good; whilst the few cattle seen were in good condition. The weather throughout the journey was fine, the thermometer at night ranging from 33 deg. to 44 deg. The Commission, in travelling the valley of the Roper, noted the feasibility of locking the upper reaches in connection with the establishment of settlements along its banks, and of the inland capital. At Bitter Springs, which is the head of the Roper, they camped for a night on the site proposed by Dr. Gilruth for the future capital of the Northern Territory. Inquiries en route showed a strong feeling in favour of a new route for the Trans-continental railway—viz., in a straight line south from Brook's Creek, on the present railway, to Alice Springs. The advantages claimed for this route are that it would be about 100 miles shorter than that via the Katherine River: that it would save considerable expenditure in costly bridges and cuttings; that it would pass through a belt of forest country; that it would open up a vast area of grazing and mineral country that can only thus be opened up, including Tanami, and that the route presents absolutely no engineering difficulties.

The party expected to leave Darwin again, after a couple of day's spell, in the "Stuart," for Borroloola, whence they will examine the proposed deep-sea harbour in Pellew Islands, recommended by Captain Barclay. Thence the country between the Macarthur River and Top Springs will be examined. From Top Springs the party will proceed to Daly Waters telegraph station, thence along the line to the Katherine and westward to Victoria River. They will traverse stations in that district, and will then travel across country to Newcastle Waters, continuing eastward, through Barkley Tableland, and various station properties to Camooweal, on the Queensland border, where they expect to arrive in April next year.

# Tenders Invited and Accepted

**It is particularly requested that the information regarding contracts open, and the successful tenderers, be forwarded to The Editor not later than Monday of each week.**

**The following contractions are used throughout:—S—supply; D—delivery; M—manufacture; C—construction; E—erection; P—purchase; I—installation; R—removal. Where no contractions appear, supply and delivery is understood. The date at the beginning of each paragraph refers to the closing of tenders.**

## INVITED.

### Commonwealth.

**Specifications, tender-forms, etc., for tenders invited for the Postmaster-General's Department of the various States under this heading may be had as follows:—Victoria—Various State G.P.O.'s. New South Wales—Departmental Stores, Sydney, and various G.P.O.'s in other States. South Australia—Adelaide, Melbourne, Sydney and Brisbane G.P.O.'s. Western Australia—Departmental Stores, Perth, and various G.P.O.'s in other States. Queensland—Various State G.P.O.'s. All States—Various G.P.O.'s. If the Specifications, etc., may be had elsewhere in addition the places will be given in parentheses.**

POSTMASTER-GENERAL'S DEPARTMENT, Melbourne.—19th August.—105 miles of paper-insulated, lead-covered cable, as per schedule No. 906.

19th August.—S. and D. of stamps and type, for a period of two years, from the 1st July, 1913, to the 30th June, 1915, as per schedule No. 911.

26th August. — 460 coin-collecting devices, electrically controlled, as per schedule No. 916.

26th August.—S. and D. of general stores, for a period of two years, from the 1st July, 1913, to the 30th June, 1915, as per schedule No. 912.

26th August.—45,000 swan neck spindles, as per schedule No. 967.

26th August.—500 letter-box fronts, as per schedule No. 972.

2nd September.—1000 protectors, as per schedule No. 964.

9th September.—Steel conduit and fittings, as per schedule No. 973. (See advertising columns.)

16th September.—S., D., E., and I., at the Telephone Exchange, Collingwood, Victoria, of a common battery switchboard, as per schedule No. 860, or an automatic, or semi-automatic, switchboard, as per schedule No. 859.

16th September.—Galvanised-iron piping and fittings, as per schedule No. 951.

23rd September.—Sulphate of copper, as per schedule No. 956, in the undermentioned quantities:—New South Wales, 140 tons; Victoria, 25 tons; Queensland, 55 tons South Australia, 20 tons; Western Australia, 60 tons.

23rd September.—500 letter-box fronts, small size, as per schedule No. 957.

23rd September.—General stores, for a period of two years, from the 1st July, 1913, to the 30th June, 1915, as per schedule No. 913.

30th September.—S. and D. of 1,017,000 pattern "A." and 1,768,800 pattern "B" insulators, at Sydney, Melbourne, Brisbane, Adelaide, Perth, and Hobart, during the years 1913-14, 1914-15, and 1915-16, as per schedule No. 974.

7th October.—S. and I. of electrically-driven machinery for operating pneumatic tube services, Central Telegraph Office, Melbourne, as per schedule No. 900.

14th October.—S. and E., at the Telephone Exchange, Melbourne, of a common battery multiple switchboard, as per schedule No. 868.

14th October.—Cable boxes, as per schedule No. 877.

4th November.—D. and E. of eight automatic telephone switchboards at the Ascot, Canterbury, Malvern, Cheltenham, Footscray, Oakleigh, Sandringham, and Williamstown Telephone Exchanges, as per schedule No. 953.

POSTMASTER-GENERAL'S DEPARTMENT, Sydney. — 20th August.—575 detectors, O. and I., as per stores schedule N.S.W. No. 322.

20th August.—S. and D., at the departmental stores, Sydney, of 9200 dry cells, as per stores schedule N.S.W. No. 323.

20th August.—220 telephone cabinets, to stores schedule Nos. 329 and 330.

20th August.—Oil engine, switchboard, and accumulators, as per stores schedule N.S.W. No. 331.

27th August.—(1) Telephones to stores schedule N.S.W. No. 301; (2) switchboards to stores schedule N.S.W. No. 302; (3) lamps, electric, incandescent, to stores schedule N.S.W., No. 304.

3rd September.—M. only, and D. at the Departmental Stores, Sydney, of 900 waterproof capes, as per stores schedule N.S.W. No. 332.

15th October.—450 fire sheets (asbestos), as per stores schedule N.S.W. No. 326.

15th October. — Measuring instruments, to stores schedule N.S.W. No. 303; telephone parts, to stores schedule N.S.W. No. 314; switchboard parts, to stores schedule N.S.W. No. 315.

POSTMASTER-GENERAL'S DEPARTMENT, Perth.—20th August (extended from 6th August). — Cable, lead-covered, paper-insulated telephone.

20th August.—2 tons of salammoniac, to W.A. schedule No. 301.

3rd September.—100 miles wire, twisted pair, outside distributing, to W.A. schedule No. 305.

8th October.—Expansion bolts and shields to schedule No. 297.

POSTMASTER-GENERAL'S DEPARTMENT, Brisbane.—27th August.—S., D., and E., at the Telephone Exchange, Brisbane, of 5 sections of switchboard, common battery, multiple, and other equipment to schedule No. 243, specification No. 458.

10th September.—Telephone Exchange, Brisbane, nine sections of a trunk line switchboard, to schedule No. 244, specification No. 461, and the general conditions, drawings, etc., attached thereto.

24th September. — Ironwork, as per stores schedule No. 264; pipes, cast iron, as per stores schedule No. 265; poles, iron, etc., as per stores schedule No. 266; wire, G.I., as per stores schedule No. 269.

POSTMASTER-GENERAL'S DEPARTMENT, Adelaide.—3rd September.—6500 spindles, "J," steel galvanised, as per schedule No. 304.

12th November.—One lamp signalling trunk line switchboard, of five sections, one cable turning section, and one cable storing section, one two-position recording desk, and one chief operator's desk, as specified in specification No. 431, etc., delivered at the Telephone Exchange, Adelaide, as per schedule No. 296.

POSTMASTER-GENERAL'S DEPARTMENT, Hobart.—15th September.—S. and D. of telephone material as per schedules Nos. T.72 and T.73.

22nd September.—S. and D. of 3 motor cycles, as per schedule No. T.77.

DEPARTMENT OF HOME AFFAIRS.—Federal Capital. — 18th August.—S. and D. f.o.r. Queanbevan, N.S.W., of materials for power transmission lines.

15th September.—S. of sect. 1, main powerhouse switchgear; sect. 2, switchgear for Diesel engine plant.

DEPARTMENT OF HOME AFFAIRS.—Kalgoorlie-Port Augusta Railway.—2nd Septemberber. — M., S., and D. of 80 lb. steel rails and fishplates; M., S., and D. of iron dog spikes and steel fishbolts and nuts for 80 lb. rails.

16th September.—M., S., and D. of fifty 40-ton bogie waggons.

DEPARTMENT OF EXTERNAL AFFAIRS. —Pine Creek to Katharine River Railway.—19th August.—S. 80 lb. steel rails and fishplates; sleepers, (a) steel (b) timber (Powellised): iron dog spikes and steel fishbolts and nuts for 80 lb. rails.

DEPARTMENT OF TRADE AND CUSTOMS. —26th August.—S. and D. of eight (8) automatic flashing lights.

DEPARTMENT OF DEFENCE. — Royal Australian Navy.—25th August.—S. and E. of an oil storage tank at Garden Island, Sydney.

1st September.—S. and E. of a 500-ton oil storage tank at Flinders Naval Base, Victoria.

8th September.—S. of machinery and accessories for standard 25ft. motor launches, as may be required, for a period of two years from date of contract.

### Victoria.

VICTORIAN RAILWAYS.—14th August Electric disc stoves.

14th August.—Iron chain

15th August.—Hand bolt cutter and nut tapper, galvanised iron tanks, woven fencing wire, sheet copper, iron bolts.

15th August.—M., S., and D. of one railway and electric tramway crossing (complete), for Glen Huntly-road, Elsternwick.

18th August.—Telephone cable.

20th August.—M., S., and D. of metal carriage fittings.

20th August.—S. and fixing two fire resisting doors at railway offices, Spencer-street.

20th August.—Liquid fuel for oil furnaces

20th August.—Copper ingot.

20th August.—10 tons copper scrap.

20th August.—M., S., and D. of wrought iron forgings for trucks.

20th August.—M. (within the Commonwealth), S., and D. of 500 15-ton steel trucks, "I" class, in contracts of not less than 50 trucks. (See advertising columns.)

20th August.—C. and riveting of mild steel girders, etc., for first section, renewal of Moorabool Viaduct, Geelong to Ballarat line.

20th August. — C. and riveting of mild steel girders, etc., for second section, renewal of Moorabool Viaduct, Geelong to Ballarat line.

20th August. — C. and riveting of mild steel girders, etc., for third section, renewal of Moorabool Viaduct, Geelong to Ballarat line.

20th August.—Mild steel obtuse angles.

20th August.—10 tons block tin.

20th August.—1000 wrought iron "W" guard forgings.

20th August.—8in. wood stave pipes.

27th August.—20 sets of speed recorder driving gear.

27th August.—30 sets crane anchors.

27th August.—12 water cranes.

27th August.—M., S., and D. of 364 tons of 1in. steel fishbolts, with steel nuts, for 80 lb. and 100 lb. rails.

27th August.—Hollow chisels and bits.

27th August.—S. and D. of balls and ball races for 70ft turntables. (Time extended.)

27th August.—C. and E. of steel verandahs at Toorak station.

3rd September.—S. of three petrol engines and pumps for use at Newport Workshops. (Fresh tenders.)

3rd September.—Steel faced machine knives.

3rd September (extended from 20th August). —M., S., and D. of (a) lathe, (b) sawing machine, (c) chisel mortiser, (d) cut-off machine, (e) moulding machine.

3rd September.—M., S., and D. of one truck traverser, complete, with motor, chills and patterns (fresh tenders).

3rd September.—M., S., and D. of one emergency pumping plant

1st October (extended from 10th September). Neutral track relays.

5th November —Copper rod.

5th November.—Locomotive seamless copper tubes.

5th November - Best Yorkshire iron angle and tees

5th November. Best steel boiler plates.

5th November. Copper plates.

5th November —100 tons of good machinery cast-iron scrap.

12th November —Steel channel bars.

12th November.—20 tons steel ingots.

12th November —Steel blooms, for crank pins.

12th November Locomotive boiler tubes.

12th November —High-speed tool steel.

12th November — M., S., and D. of one 15-ton electric crane for Ballarat.

12th November —Flame arc lamps.

VICTORIAN RAILWAYS COMMISSIONERS - State Coal Mines. — 18th August.—Round head metal screws (fresh tenders)

27th August (extended from 13th August).—S. of electrical equipment.

12th November (extended from 1st October). —S. of rope road haulage engine and electrical equipment for McBride tunnel. (See advertising columns.)

PUBLIC WORKS DEPARTMENT. — 14th August. — S. of refrigerating plant for cool stores, Ringwood.

## New South Wales.

PUBLIC WORKS DEPARTMENT. — 18th August I. of mechanical ventilating apparatus, post office, Newcastle.

3rd September —Efficient steam tugs for use at Bellinger River and Cape Hawke, from 1st November, 1913.

8th September —S. and E. of pumping machinery, Experimental Farm Water Supply, Grafton. (See advertising columns.)

27th October.—M. of steel bridge for Wilson River, Wauchope to Kempsey section, North Coast railway. (See advertising columns.)

RAILWAY DEPARTMENT.—20th August. —S. of a pneumatic ash handling plant for White Bay power-house

15th October.—S. of 13 direct-current motors.

METROPOLITAN BOARD OF WATER SUPPLY AND SEWERAGE, 341 Pitt-street, Sydney. — 18th August. — Centrifugal pumps and electric motors to No. 1 pumping station, Ultimo, for Manly low level pumping stations.

SYDNEY HARBOUR TRUST, Circular Quay, Sydney. — 18th August.—S. and E. of hand-power travelling bridge cranes, in car sheds, No. 1 Berth, Dawe's Point. (See advertising columns.)

## Western Australia.

GOVERNMENT TENDER BOARD. — 28th August.—Copper firebox tube plates for Railway Department.

28th August.—Steel angles, tees, plates, etc., for Railway Department.

## Queensland.

RAILWAYS DEPARTMENT.—26th August (extended from 19th August).—General supplies for 1914 and 1915, for Northern Division schedule No. 1 (fixed quantities), to be for year 1914 only; schedules Nos. 2 to 30, inclusive, are for two years.

26th August.—General supplies for the years 1914 and 1915, for the Southern and Central Divisions.

TREASURY DEPARTMENT.—29th September.—S. about 1687 tons of cast-iron spigot and faucet water pipes, special castings, and valves, for Maryborough waterworks.

29th October.—C. and E. of central sugar mill at Babinda Creek, North Queensland.

## New Zealand.

RAILWAYS DEPARTMENT.—31st October. —S. and D. of stores for the period from April 1, 1914, to March 31, 1917.

## General.

CITY OF MELBOURNE.—15th August.—P. of certain second-hand electrical plant and machinery, in accordance with specification obtainable at this office.

9th September.—S. and D. of electricity recording meters and maximum demand indicators.

16th September.—S. and D. of (a) insulated copper cables, (b) three-phase transformers.

MUNICIPAL COUNCIL OF SYDNEY.—18th August (extended from 7th August).—S. and D. of coal to council's power-house, Pyrmont, for periods (a) one, (b) two, (c) three years. (See advertising columns).

18th August (extended from 7th August). — S. of curve drawing ammeters and voltmeters. (See advertising columns.)

18th August (extended from 7th August). — Prepayment meters. (See advertising columns.)

18th August (extended from 7th August). — Motor generator and motor converter. (See advertising columns.)

18th August (extended from 7th August). — Arc lamp contact and suspension gear. (See advertising columns.)

CITY OF FITZROY (V.) (A. Batson, Town Clerk). - 18th August.—S. of one sand spreading machine.

CORPORATION OF KADINA (S.A.) (F. W. Harris, Town Clerk).—1st September.—One 60 kw. generator, driven from a 100-110h.p. engine, complete with suction gas producer, erected on foundations.

One 500 ampere-hour battery, erected and charged.

1 motor-driven booster (erected).

METROPOLITAN GAS COMPANY (V.) (A. E. Bradshaw, Subst. Secretary, Melbourne).—11th September.—P. of a total fixed quantity of 1800 tons of sulphate of ammonia, to be produced by this company during the twelve months ending 31st August, 1914.

MELBOURNE HARBOUR TRUST COMMISSIONERS (V.) (R. Rudd, Secretary). — 19th August.—S. and D. of one direct coupled electric light set.

MUNICIPAL TRAMWAYS TRUST, Adelaide (W. G. T. Goodman, Chief Engineer and General Manager).—19th August.—M., S., and D. of steel poles.

Specifications relating to the S. and D. of copper cable and wire may be obtained on application to W. G. T. Goodman, Engineer and Manager. Tenders will be invited at 48 hours' notice, at a later date, and specifications are now issued to facilitate prospective tenderers obtaining quotations.

SOUTH AUSTRALIAN SILICATE BRICK CO. LTD. (in liquidation) (S.A.) (E. M. Twiss, Liquidator, 12 and 13 Alma Chambers, Adelaide).—14th August.—P., as a going concern, of the whole of the machinery, plant, buildings, land (freehold, 30 acres), and stock (comprising

**NORD DEUTSCHER LLOYD**
REGULAR SERVICE TO EUROPE.
REDUCED FARES TO LONDON.
TO MANILA, CHINA AND JAPAN.
Via New Guinea and Yap.
Fares to Hong Kong, £40; II., £26.
Full particulars will be sent on application to—
LOHMANN AND CO., General Agents,
7-9 Bridge-street, Sydney.
Ostermeyer, Van Rompaey and Co., Melbourne; H. Muecke and Co., Adelaide; L. Ratazzi and Co., Fremantle; Thos. Brown and Sons Ltd., Brisbane.

**A.U.S.N. Co. LTD.**
*Fast, Regular, and Comfortable Passenger Steamers*
(also carrying cargo) from and to
MELBOURNE, SYDNEY, ADELAIDE, FREMANTLE, BRISBANE, and all QUEENSLAND PORTS.
Passage Tickets interchangeable, with other Inter-State Companies, on certain conditions.
Full Particulars at
**COMPANY'S OFFICES**
**at all principal Australian Ports.**

**The Mount Lyell Mining & Railway**
**CO. LIMITED.**
Purchasers of **Ores containing Copper, Gold and Silver.** Rates obtainable on application to the Secretary
Manufacturers of **Coke for Smelting and Foundry Purposes, Acids, Etc.**
**HEAD OFFICE—**
**39 QUEEN-STREET, MELBOURNE.**
**D. G. LUMSDEN,**
Secretary.

The Human Life depends on the Reliability of the Mine Engine . . .
and when life is at stake you cannot afford to run any risks.
Be certain; select the Engine of known efficiency and reliability, that has been adopted by Mine Managers everywhere—
THE "ATLAS" DIESEL CRUDE OIL ENGINE.
No fear of the "Atlas" failing at a critical moment.
Every "Atlas" Engine is built of the highest-grade materials by expert workmen.
It runs on the very cheapest fuel—petroleum residue, etc. This, combined with its high efficiency, makes the running cost extremely low.
"Atlas" Engines are made from 15h.p. upwards in horizontal type.
Many other superior features to interest you.
Call and see the Engine running, or write.
STAWN LIMITED,
*Specialists in Mine Machinery and Tools.*
**343 KENT STREET, SYDNEY.**

HIGH EXPLOSIVES.
OBTAINABLE FROM ALL BOOKSELLERS.
224 pages. Price, £1/-.

Dunlop Mining Goods
Dunlop Rubber Belting
Is more efficient than Leather belting for Outdoor & Wet Work.
Sample & Price on application

"FIBRO-CEMENT" Fireproofing
Everyone about to build should obtain full particulars of this cool, acid-proof, ant-proof and fire-resisting material. The slates for roofs and the sheets for walls and ceilings are specially suited for the Australian climate. Used by the Federal and State Governments and by all the leading Architects and Builders.
**ECONOMICAL AND EVERLASTING.**
Full particulars, etc., from Sole Agents and Importers—
**JAMES HARDIE & CO. Melbourne & Sydney**

THE : : :
DIAMOND
OUTPUT :

Choice Diamonds set in platinum as ring, £14/14/-.

Diamond Cluster ring set in platinum, £10/10/-.

5 Fine Diamonds set in platinum, £12/12/-.

of our House has broken all records this year again.
WHY?

Well, we took on a Sole Agency calling for an enormous output, and to live up to it we decided two years ago to offer Diamonds (set or unset) at merely a broker's commission on the landed cost. We calculated that the commissions would be numerous enough to pay us, especially as the pleased buyers would remain customers. The experiment proved partly successful. We, therefore, are continuing it for another year. Our prices for Diamonds are less than London. There is no duty on unset gems.

FAIRFAX AND ROBERTS LIMITED,
The Oldest Jewellery House in Sydney. 23 and 25 Hunter Street.

about 714,000 bricks), of the above-named company, situate at Osborne, on the Outer Harbour line.

TE AWAMUTU WATER SUPPLY (N.Z.).—21st August.—S. of cast-iron pipes and fittings; spiral steel pipes and fittings; drawn steel tubes and fittings.

MORWELL WATER WORKS TRUST (V.) (A. K. T. Sambell, C.E., Trust Engineer, 421 Collins-street, Melbourne).—20th August.—Contract No. 7—S. of 12½ tons 5in. C.I pipes; S. of 2½ tons of 4in. C.I. pipes; S. of 22 tons 3in. C.I. pipes. Contract No. 8—S. of 3432 lineal feet, 2in. G.W.I. tubing; S. of 9834 lineal feet, 1½in. G.W.I. tubing; S. of 10,428 lineal feet, 1in. G.W.I. tubing; bends, tees, fittings, etc., for same. Contract No. 9—Section (a): Excavating and refilling 488 chains of pipe trench; section (b): Laying and jointing 129 chains cast-iron and 359 chains of galvanised wrought iron pipes.

ESTATE OF E. L. LLOYD (Executors, c/o Northmore and Hale, Solicitors, Howard-street, Perth, W.A.). — 31st August.—P. of mining leases, plant, etc. (See advertising columns.)

GLEN INNES (N.S.W.) SCHOOL OF ARTS (R. Soutar, Secretary).—Complete installation of an electric lighting plant.

CORONATION DEEP LEAD LTD. (in liquidation) (R. V. Saddington, 109 Pitt-street, Sydney).—15th August.—P. of leases, machinery, plant, tools, and stores.

## ACCEPTED.

### Commonwealth.

DEPARTMENT OF HOME AFFAIRS. — I. of refrigerating plant at the Royal Naval College, Jervis Bay, £634—R. Werner and Co. Pty. Ltd., Richmond (V.).

S. of main steam pipes and valves for power-house, Canberra, Federal Territory, £374 9s.—Stewarts and Lloyds (Australia) Ltd., Sydney.

DEPARTMENT OF DEFENCE.—Oil fuel, 445.2 tons, and demurrage charges in connection therewith, for H.M.A. ships, £2286 8s. 4d. —The British Imperial Oil Co. Ltd.

### Victoria.

VICTORIAN RAILWAYS. — Lux railway cylinder lamps—10 No., at £11 15s. each (not publicly advertised)—Lux Lighting Co.

Coke (gas)—100 tons, at £1 2s. per ton (not publicly advertised)—Williamstown Gas Co.

Coke (gas)—150 tons, at £1 2s. 6d. per ton (not publicly advertised)—Metropolitan Gas Co.

Morse registers—59, at £5 each (not publicly advertised)—Deputy Postmaster-General.

M., S., and D., on the site of the work of the steel girders, etc., for the bridge, Hopkins-street, Footscray, siding, and power-house—Item No. 1, mild steel, in 2 No. parapet girders, complete, with necessary holes (painted one coat), at £29 10s. per ton; item No. 2, mild steel, in 410 No. straps, 9in. x 4in. x 3-8in., with necessary holes, at £29 10s. per ton; item No. 3, mild steel, in 820 clips, 4in. x 2½in. x 5-16in., with necessary holes, at £29 10s. per ton; item No. 4, mild steel, in angle, 55ft. x 2½in. x 2½in. x 3-8in., in about 3ft. lengths, with ¾in. holes about 8in. apart, at £29 10s. per ton—Forman and Co.

PUBLIC WORKS DEPARTMENT.—Copper cooking vessels, Hospital for Insane, Ararat, £243—Robison Bros. and Co. Pty. Ltd.

Pumping plant for ship-building yard, Williamstown, £1114—Thompson and Co. (Castlemaine) Pty. Ltd.

Two sets of propelling machinery, ship-building yard, Williamstown, £4756—Thompson and Co. (Castlemaine) Pty. Ltd.

Electric lighting, etc., cool store, West Melbourne, £382 17s. 6d.—India Rubber, Gutta Percha, and Telegraph Works Co.

### New South Wales.

PUBLIC WORKS DEPARTMENT.—S., D., and fixing of steel ceiling material for Robinson's shops, George-street North, Sydney, £235 —Australian Embosteel Ceiling Co., Sydney.

S., D., and fixing of steel ceiling material for seven shops, George-street North, Sydney, £539 5s.—Wunderlich Ltd., Sydney.

C. of water heating installation for the new offices of the Public Instruction Department, £2374 7s. 7d.—George Vincent, Sydney.

M., S,, and D. of reinforced concrete plates for Carrington Wharf, Newcastle, £5084 — Couston and Cowling, Sydney.

### General.

CAIRNS HARBOUR BOARD (Q.). — S. of mild steel round bars, £6 17s. 6d. per ton — Samuel Allen and Sons Ltd., Cairns.

NEWCASTLE COAL MINING CO. LTD. — S. of Lancashire boiler, 30ft. long x 8ft. 3in. diameter, steam pressure 150 lb. per sq. in.—John Thompson, Wolverhampton, per Ferrier and Dickinson, Sydney, agents.

PRAHRAN AND MALVERN TRAMWAYS TRUST (V.) (W. O. Strangward, Secretary, 413 Collions-street, Melbourne).—M., D., and E. of 10 car bodies, contract No. 36a, £815 each —Duncan and Fraser, Adelaide.

MELBOURNE CITY COUNCIL.—Lubricating oils for 12 months, at schedule rates named in tender:—Items 1, 2, 3, and 4—Wm. Adams and Co. Ltd.; item 5—Vacuum Oil Co. Pty Ltd.; items 6, 7, 8, and 9—Ramsay and Treganowan.

Spare armature for 500kw. motor generator, £200—British General Electric Co. Ltd.

One 3-ton pulley block, £15 16s. 8d.—Thos. McPherson and Son.

Insulated copper cables, £1361 5s.—British Insulated and Helsby Cables Ltd.

Two Tangye's suction gas engines, including water cooling apparatus, £1270—Dalgety and Co. Ltd.

150 enamelled street name plates, at 4d. per letter—Horrocks, Roxburgh Pty. Ltd.

Purchase of a second-hand motor, with fittings, £100—Noyes Bros. (Melbourne) Pty. Ltd.

Purchase of the following:—39 tons (approximate) of lead accumulator plates, at £10 5s. per ton—The Moreland Smelting Works Pty. Ltd.

2 tons (approximate) of lead silt in acid, at £2 7s. 6d. per ton—J. E. Stone.

5 tons (approximate) of sheet and solid lead, at £17 3s. per ton—Lewis Holmes.

RICHMOND CITY COUNCIL (V.)—S. of pipes for drain along Swan and Charles streets, £173 5s.—Reinforced Concrete and Monier Pipe Co.

S. of right-hand driving wheel, of Australian manufacture, for steam roller, £50—Wm. Anderson and Sons.

## DIVIDENDS.

The following dividends and bonuses of mining companies in Australia have been declared, and are payable on the dates noted:—

August.

14th.—Princess Dagmar G.M. Co., Bendigo (V.), 1s., £1700.

15th.—Caledonia Collieries (N.S.W.), interim on ordinary and cumulative pref. shares, at rate of 8 per cent. per annum.

15th.—Tongkah Compound, Siam, 1s. and bonus 2s., £7500.

15th.—Black Range Mining Co. (W.A.), 1s., £4000.

19th.—Guildford Bucket Dredging Co., Guildford (V.), 1s. 6d., £525.

19th.—Harrietville Star B. Dredging Co., Harrietville (V.), 1s., £250.

19th.—Excelsior Bucket Dredging Co., Freeburgh (V.), 1s., £300.

20th.—Broken Hill Proprietary (N.S.W.), 1s., £48,000.

21st.—Cathcart Central G.M. Co., Ararat (V.), 2s., £5000.

21st.—Porepunkah G.D. Co., Bright (V.), 1s., £250.

25th.—Oswald Gold Mines, Maldon (V.), 1s., £1250.

26th.—Bourke's Hill Tin Sluicing Co., Emmaville (N.S.W.), 6d., £1125.

27th.—Lake View and Star, Kalgoorlie (W.A.) interim, 5 per cent. less English income tax.

28th.—Briseis Tin and General Mining Co. (T.), 6d., £15,000.

28th.—Ajax Central G.M. Co., Daylesford (V.), 1s. 6d., £2250.

September.

1st.—Silverton Tramway Co., Broken Hill (N.S.W.), 1s. and bonus 1s., £25,000.

6th.—Hampden-Cloncurry Copper Mines (Q.), 2s., £35,000.

26th.—Sons of Gwalia Ltd., Coolgardie (W.A.), 1s., £17,500.

## BANK CLEARINGS.

The report of the Melbourne Clearing House for the week ended August 11 was:—

| | | |
|---|---|---|
| Total Clearance ... ... ... ... ... ... ... | | £4,747,035 |
| Balances— | | |
| Settled by certificates... | £400,000 | |
| Settled in coin ... ... ... | 97,525 | |
| | | £497,525 |
| Total clearance for the corresponding week, 1912 ... ... ... ... ... ... ... | | £4,868,350 |

For the week ended August 4 the clearings through the Sydney Banks amounted to £6,118,353, the amount for the corresponding period of last year being £5,021,096.

## Government Notices (N.S.W.).

Sydney Harbour Trust Office,
Circular Quay, 8th August, 1913.

TENDERS FOR HAND-POWER TRAVELLING BRIDGE CRANES FOR CARGO SHEDS, No. 1 BERTH, DAWES' POINT.

TENDERS will be received at this Office up to 2 p.m. on MONDAY, the 18th INSTANT, for the SUPPLY and ERECTION of HAND-POWER TRAVELLING BRIDGE CRANES in Cargo Sheds No. 1 Berth, Dawes' Point.

Forms of tender and full particulars may be obtained on application to the Engineer-in-Chief of the Trust.

HAROLD F. NORRIE,
7a10. Secretary.

---

Department of Public Works,
Sydney, 9th August, 1913.

TENDERS FOR MACHINERY, ETC.

TENDERS, specified below, will be received at this Department until 2 o'clock p.m., on the date mentioned:—

MONDAY, 8th SEPTEMBER, 1913.

SUPPLY and ERECTION of PUMPING MACHINERY, Experimental Farm Water Supply, Grafton.

MONDAY, 27th OCTOBER, 1913.

MANUFACTURE, etc., of STEEL BRIDGE for Wilson River, Wauchope to Kempsey Section, North Coast Railway.

Further particulars may be obtained from N.S.W. "Government Gazette."

(6a7) ARTHUR GRIFFITH.

---

Public Service Board.
4 O'Connell-street, Sydney,
August 8, 1913.

APPLICATIONS are invited for the position of SUPERINTENDENT of TECHNICAL EDUCATION, Department of Public Instruction, N.S.W. (Educational Division); Salary, £750 per annum. Applicants should state the qualifications they possess in any branch of Technical work, and indicate their previous training or experience in an educational, administrative, or organising capacity. Copies only of testimonials or credentials to be sent. The officer appointed will be responsible to the Minister, through the Director of Education, for the proper working and control of the Technical Education Branch — including the Sydney Technical College, Country Colleges, and Museums.

Applications should reach the undersigned not later than 1st September, 1913.

By order of the Board,

R. A. GILFILLAN,
Secretary.

---

NOTICE is hereby given that the Patentee of Australian Letters Patent, No. 19,656, of 23rd October, 1909, for "Improvements in and Relating to Reversible Seats for Railway Carriages, Tramway Cars and other purposes," is prepared to satisfy any demands and all requirements of the public respecting the said invention. Further information from P. M. NEWTON, Patent Attorney, Fink's Buildings, Elizabeth-street, Melbourne.

## Commonwealth of Australia.

Postmaster-General's Department
Melbourne, 8th August, 1913.

**TENDERS** will be received at the Office of the Deputy Postmaster-General, Melbourne, until 3 p.m. on the 9th SEPTEMBER, 1913, for the SUPPLY and DELIVERY of STEEL CONDUIT and FITTINGS (Sch. 973). See "Commonwealth Gazette," 9th August.

AGAR WYNNE,
(1241) Postmaster-General.

---

## MUNICIPAL COUNCIL OF SYDNEY.

### IMPORTANT TO CONTRACTORS.

### EXTENSION OF TIME FOR RECEIPT OF TENDERS.

NOTICE is hereby given that the time originally advertised for the receipt of Tenders for **the following has been EXTENDED from Thursday, the 7th August, 1913, until 3 o'clock** p.m. on MONDAY, the 18th AUGUST INSTANT:—

(a) ARC LAMP CONTACT and SUSPENSION GEAR
(b) MOTOR GENERATOR or MOTOR CONVERTOR.
(c) PREPAYMENT METERS.
(d) CURVE DRAWING AMMETERS and VOLT METERS.

Any tenders received on the original date will remain sealed until the amended date, namely, Monday, the 18th August, 1913.

THOMAS H. NESBITT,
Town Clerk.

Town Hall, Sydney,
8th August, 1913.

---

## MUNICIPAL COUNCIL OF SYDNEY.

### TO CONTRACTORS.

SEALED and ENDORSED TENDERS will be received by the undersigned until 3 o'clock **on MONDAY, the 18th AUGUST INSTANT, for the SUPPLY and DELIVERY of COAL to the** Council's Power-house, Pyrmont, for a period of one, two, or three years.

Specifications, etc., may be seen or obtained upon application at the Office of the City Electrical Engineer, Town Hall, Sydney, upon payment of the sum of 10s. 6d.

The lowest or any tender not necessarily accepted.

TENDERERS please note that they must pay their CASH DEPOSITS direct into the **City Treasury, and NOT enclose same with their** Tenders, otherwise their tenders will be rejected as INFORMAL.

THOMAS H. NESBITT,
Town Clerk.

Town Hall, Sydney,
6th August, 1913.

---

## MORWELL WATERWORKS TRUST.

TENDERS are invited and will be received until 8 p.m. on WEDNESDAY, 20th AUGUST, for the following:—Contract No. 7—Supply of 12½ tons 5in. C.I. Pipes; Supply of 2½ tons 4in. C.I. Pipes; Supply of 22 tons 3in. C.I. Pipes. Contract No. 8—Supply of 3432 lin. ft. 2in. G.W.I. Tubing; Supply of 9834 lin. ft. 1¼in. G.W.I. Tubing; Supply of 10,428 lin. ft. 1in. G.W.I. Tubing; Bends, Tees, Fittings, etc., for same. Contract No. 9—Section (a), Excavating and Refilling 488 chains of Pipe Trench; Section (b), Laying and Jointing 129 chains Cast Iron and 359 chains of Galvanised Wrought Iron Pipes. Tenders will be considered either separately or collectively for sections (a) and (b) of Contract No. 9. Specifications may be seen at my office. Tenders to be addressed to the Chairman of the Trust. A. K. T. SAMBELL, C.E., Trust Engineer, 421 Collins-street, Melbourne.

---

## WANDILIGONG GOLD DREDGING CO. No Liability.

A DIVIDEND (the 56th) of One Shilling per share has been DECLARED, payable at the Registered Office of the Company, Gavan-street, Bright, on FRIDAY, 22nd AUGUST, 1913.

Transfer Books Close Friday, 15th August, 1913. **P. J. BREEN, Manager.**

---

## NORTH NUGGETY AJAX CO. N.L.

A DIVIDEND (17th) of 1s. per share has been made. Payable on Tuesday, 26th August, 1913.

Books for transfer close from Tuesday, 19th August, 1913.

D. MURRAY, Manager.
430 Little Collins-st., Melbourne.

---

## Government Notices (V.).

### VICTORIAN RAILWAYS COMMISSIONERS.

### STATE COAL MINES.

### HAULAGE ENGINE AND ELECTRICAL EQUIPMENT.

TENDERS (endorsed "Tender for Haulage Engine and Electrical Equipment"), to be addressed to the General Manager, State Coal Mines, Wonthaggi, and delivered at his Office at Wonthaggi, not later than 12 noon on WEDNESDAY, 12th NOVEMBER, 1913, are invited for the SUPPLY of ROPE ROAD HAULAGE ENGINE and ELECTRICAL EQUIPMENT for McBride Tunnel. P.D., £15. Particulars at the Melbourne Office of the State Coal Mines, Robb's Buildings, Collins-street, and at the Office of the General Manager, Wonthaggi.

No tender will be necessarily accepted.

G. H. BROOME,
General Manager.

---

### VICTORIAN RAILWAYS.

### MANUFACTURE OF STEEL TRUCKS.

TENDERS are invited for the MANUFACTURE (within the Commonwealth), SUPPLY, and DELIVERY of 500 15-ton STEEL TRUCKS, "I" Class, in contracts of not less than 50 trucks. Particulars also at Ballarat, Bendigo, Geelong, and Castlemaine Stations. P.D., ½ per cent. (nearest £1) of amount of tender. Tenders, endorsed "Tender for Steel Trucks," must be lodged, with the preliminary deposit, in the Tender-Box, Railway Offices, Melbourne, at or before eleven a.m. on WEDNESDAY, 20th AUGUST.

No tender will necessarily be accepted.

E. B. JONES,
Acting Secretary.

---

## THE HAMPDEN-CLONCURRY COPPER MINES LIMITED.

NOTICE is hereby given that a DIVIDEND (the 2nd) of Two Shillings per Share, on all the issued shares in the capital of the Company has been DECLARED, and will be payable at the Registered Office of the Company, No. 360-6 Collins-street, Melbourne, on SATURDAY, the 6th day of SEPTEMBER, 1913. Dividend warrants will be posted direct to shareholders. Transfer Books and Share Register will be closed from Wednesday, the 27th day of August, until Friday, the 5th day of September, 1913 (both days inclusive). By order of the Board.

H. L. SHACKELL, Assistant Secretary.
Melbourne, 11th August, 1913.

---

## NORTH BROKEN HILL LIMITED.

The FIRST HALF-YEARLY MEETING of Shareholders in the above Company will be held at the Board Room, Collins House, 360 Collins-street, Melbourne, on THURSDAY, the 28th AUGUST, 1913, at 12 o'clock noon. Business: 1. To Receive Accounts and Balance-sheet and the Ordinary Reports of the Directors and Auditors, to 30th June, 1913. By order of the Board.

HENRY M. FIEDLER, Secretary.
360 Collins-street, Melbourne, 23rd July, 1913.

---

FOR SALE.—1 Horizontal Compound Steam Engine, Cylinders 12in. and 20in. x 13 stroke, in good working condition; also 1 Fly Wheel, 11ft. in diam., in halves, weighing about 8 tons. Apply, Mr. KERR, Dunlop Rubber Mills, Montague.

---

## MINERS WANTED.

250.

FOR STEADY WORK ON INCREASED OUTPUT OF CONCENTRATING ORE.

Contract Miners averaged last year 17/4 per shift.

| | |
|---|---|
| Wages Miners (under agreement about to be executed) | 11/- per shift |
| House Rent | 8/- to 12/- per week |
| Meat | 5d. to 6½d. per lb. |
| Bread | 4d. per loaf |
| Milk | 4d. per quart |

**Living Conditions excellent.**

**Government School, High School, Technical College. Good Contract Miners apply on Job at earliest.**

MOUNT MORGAN GOLD MINING COMPANY LIMITED,

**MOUNT MORGAN, QUEENSLAND.**

---

## CITY OF MELBOURNE.

TENDERS will be received until 12 o'clock noon on TUESDAY, 7th OCTOBER, for the SUPPLY and DELIVERY of:—

(a) INCANDESCENT ELECTRIC LAMPS
(b) SINGLE-PHASE TRANSFORMERS.

Specification may be seen at the Office of the City Electrical Engineer, Town Hall.

JOHN CLAYTON,
Town Clerk.

Town Clerk's Office,
Town Hall, Melbourne,
13th August, 1913.

---

## CITY OF MELBOURNE.

TENDERS will be received until 12 o'clock noon on WEDNESDAY, 1st OCTOBER, for the SUPPLY and DELIVERY of:—

INSULATED COPPER CABLES.

Specification may be seen at the Office of the City Electrical Engineer, Town Hall.

JOHN CLAYTON,
Town Clerk.

Town Clerk's Office,
Town Hall, Melbourne,
13th August, 1913.

---

## CITY OF MELBOURNE.

OFFERS are invited for the PURCHASE of certain SECOND-HAND ELECTRICAL PLANT and MACHINERY, in accordance with specification, obtainable at this Office.

Offers will be received until noon on 15th August for all or any portion of the plant.

Plant may be inspected upon application at the Office of the City Electrical Engineer, Town Hall.

JOHN CLAYTON,
Town Clerk.

Town Clerk's Office,
Town Hall, Melbourne,
19th July, 1913.

---

## CONCENTRATING.

### EXPERT FOREMAN WANTED.

**Must have Good Past Record and be able to Successfully Manage Men.**

**Only First Class Man will be considered.**

**Reply, giving fullest personal information and Salary expected to—**

"NECNOC,"

OFFICE OF THIS PAPER,

SYDNEY or MELBOURNE

---

## IODIDE (MINERAL HILL) LTD.

Registered Office,
Castlereagh House, Sydney, July 30, 1913.

NOTICE is hereby given that the First Annual General Meeting of Shareholders of the above Company will be held at the Board Room, Vickery's Chambers, Pitt-street, Sydney, on THURSDAY, August 28, at noon.

BUSINESS: To receive Directors' Report and Balance-sheet for period ending June 30, 1913; to elect Directors in the room of G. H. Blakemore, Esq., and G. O. Hyde, Esq., who retire at this meeting, but are eligible for and will seek re-election; to appoint Auditors in the room of Messrs. Johnson, Johnson and Edwards, Public Accountants, who retire at this meeting, but may be re-appointed thereat; and to transact any other business which may be brought forward in accordance with the Memorandum and Articles of Association.

By order. R. D. HARTWELL, Secretary.

---

## THE MELBOURNE ELECTRIC SUPPLY CO. LTD.

NOTICE is hereby given that the TRANSFER BOOKS, Local Share Register, of the above-named Company will be CLOSED in connection with the payment of the Dividend on the 7 per cent. first preference shares, from Monday, the 18th August, 1913, to Saturday, the 30th August, 1913, both days inclusive. By order. GEO. A. GARDNER, Acting Secretary. 19 Queen-street, Melbourne, 7th August, 1913.

---

WANTED by an established wholesale firm, Responsible Salesman and Expert to take charge of Electric Fittings and Appliances' Department, starting about October next. Apply in first instance to "Electric," C/o "Mining Standard," Melbourne.

## NEWS AND NOTES.

Mr. J. E. Cocker, secretary of the Mt. Oxide Options, states that he received cable information on Tuesday to the effect that an English company has agreed to take up the Mt. Oxide option, giving the present company share for share in a new company and placing £80,000 cash in addition to credit of the new company. He also states that one of the Mt. Oxide directors is in Brisbane interviewing the Queensland Premier in regard to a railway to the field, and guaranteeing a debenture issue, but with what result is not yet known.

A conference between Victorian Ministers and representatives of the Labour party in the Legislative Assembly has been arranged to deal with the problem of miner's phthisis. Messrs. Outtrim, Chatham, Hampson, Hogan, Smith and Tunnecliffe have been appointed to represent the Labour party, but the Ministerial representatives have not yet been appointed. The Minister for Mines (Mr. A. A. Billson) will preside over the conference, and the Premier (Mr. Watt) and the Minister for Lands (Mr. H. McKenzie) will attend, if necessary.

The proposal to turn many of the temporary employees of the N.S.W. State Government into permanent hands is at present receiving consideration, and a bill to give power to the Public Service Board to give effect to such appointments will shortly be introduced. It is understood that the proposal is gazed at somewhat askance by a large section of the permanent staff.

The Chaffers Gold Mining Co. Ltd. registered in London at the end of last week, with a capital of £150,000, is a reconstruction of the old company of that name, forced upon the board at a time when shareholders had been led to anticipate dividends rather than calls. In the new company Messrs. Lionel Robinson, Clark and Co. have underwritten 500,000 shares for a commission of £3500 and a three years' option over the unissued shares at par.

During July the Bullfinch Proprietary Co. (W.A.) crushed 4806 tons of stone for a return of bullion worth £14,413, the expenses being £4503. Expenditure on development work was £1069, after deducting which there remained a profit of £9914.

The International Geological Congress commenced its sittings at Toronto, Canada, last Friday, the opening ceremony having been performed by the Deputy-Governor, Chief Justice Sir Charles Fitzpatrick, the Governor-General, H.R.H. the Duke of Connaught, being absent in England. During the congress the delegates will traverse the Dominion "from sea to sea," and will also visit the Yukon.

While a man was removing boulders from a creek at Walhalla (V.) last week for road-metal, he unearthed a heavy water-worn block, which, on being broken, proved to be rich in copper, assaying 33 per cent.

It is stated that several instances have occurred on the Ardlethan tin fields (N.S.W.) of the pronouncements of water diviners as to the location of water on indicated spots resulting in the discovery of tin lodes, the latest being a find, assaying in some specimens 64 per cent., on the Carpathia. This was found 18in. below the peg which had been placed in the ground by the water diviner, who appears now to have discovered an even more payable profession than that he formerly followed.

Mr. Justice Heydon, in alluding in the Industrial Court to the waste of time on wages boards, occasioned by repeated inquiries into the cost of living, stated that the information received was neither complete nor satisfactory. He therefore invited the parties interested to come before him specially and assist the Court. Mr. Buchanan, the president of the Employers' Federation, promised to communicate with the various bodies associated with the Federation, with a view to holding an inquiry and obtaining the necessary evidence, and Mr. E. J. Kavanagh, secretary of the Trades and Labour Council, engaged to put the matter before the union secretaries with a similar object.

At the Daylesford (V.) Police Court, on the 6th inst., George Digney, Samuel Downing, Richard Downing and Peter McMahon, miners who had been in the employ of the North Nuggety Ajax G.M. Co., were committed for trial on charges of having gold and gold-bearing quartz in their possession when searched on coming off shift on July 29. Mr. G. A. Maxwell, of Melbourne, prosecuted, and Mr. R. W. Shellard, of Daylesford, defended the accused. Mr. Barlow, P.M., and Messrs. G. W. Parker, Mayor, and Densm, J.P.'s, were on the bench. Warrants had been secured for their arrest, which was effected on their reaching the surface. They will be tried at the Ballarat Supreme Court on or about the 19th inst. The accused were admitted to bail.

Towards the end of last month a deputation from the Victorian Gold Miners' Wages Board waited upon the Minister of Mines (Mr. A. A. Billson) and the Minister of Labour (Sir Alex. Peacock) and asked for assistance to determine the definition of "wet places" for which higher wages are to be paid. Their suggestion was that a special tribunal, consisting of the local inspector of mines and representatives of employers and employees, should decide such questions. After giving the matter mature consideration, the Ministers have decided that Mr. A. H. Merrin, Chief Inspector of Mines, shall decide the point in each instance.

During July the Mt. Bischoff T.M. Co. (T.) shipped 100 tons of tin oxide, and 21,066 tons of crude ore were treated in the milling and concentrating plant for the same period.

The receipts of the Emu Bay (T.) Railway Co. for July amounted to £5307, as compared with £5578 for July, 1912, making the total receipts for the seven months of 1913 £39,767, as against £38,002 for the same period last year.

The Goldfields Diamond Drilling Co. have accepted a contract to bore the western ground of the Lord Nelson mine, St. Arnaud (V.) from the 1310ft. level.

The gold received at the Melbourne branch of the Royal Mint during the week ended on August 9 amounted to 12,491.97 oz.

The Lloyd Copper Company has substituted a traction engine for horse teams in hauling copper to the railway, and the engine, with two trucks of coal, is now on its way to Burraga, N.S.W.

Some apprehension is being caused by the strike of wharf labourers in Sydney at the works of the Vacuum Oil Co. Ltd. Conferences between representatives of the Wharf Labourers' Union and the company have as yet been ineffective, and it is feared that the trouble may spread to the Storemen and Packers' Union, which might extend the strike over a large area.

The suggestion was made recently to the Queensland Minister of Mines, Mr. Appel, that the Government should advance £60,000 for the purpose of putting down a large shaft on the Charters Towers goldfield to test the ground to a depth of 4000ft. The Minister replied that the Government did not consider the scheme feasible, at any rate, for the present. Mr. Appel, however, stated that the Brilliant Block Company had made an application for a loan of £2500 to carry out the exploratory work mentioned as desirable before the shaft was sunk. The Government had previously advanced £3000 for this work, to be undertaken by the Brilliant Block and Brilliant Deeps in concert, and the amount had been so extremely useful that it was desired to continue the arrangement, the sum of £2500 being required for its completion.

The Public Works Committee of New South Wales has submitted a report to Parliament on the subject of the construction of a floating dock at Newcastle. The committee recommends the building of such a dock; and it is proposed that it should be constructed at the Government dockyard, Sydney, from plans prepared by Messrs. Clarke and Stanfield, at an estimated cost of £110,000. Of this sum, £65,000 is to be allocated for the construction and delivery of the dock itself, and the balance of £45,000 will be expended in dredging the site in Newcastle Harbour, and the construction of wharfage and sheds to be used in connection with the work of the dock. Of the latter sum, £16,000 will be expended in dredging the site to a depth of 45ft. below low water spring tides. The dock will require 17ft. below the keel of any vessel docked, and the excavation will admit of a vessel drawing 26ft. entering the dock at low water, while at high water an additional 5ft. will be available. To meet the working expenses of the dock, which have been estimated at £9000 per annum, it will be necessary to dock annually 25 per cent. of the foreign tonnage entering the port of Newcastle, and this is estimated approximately at 1,528,000 tons. This year, however, it appears likely that the amount of tonnage will exceed this figure considerably.

Messrs. Smith, Timms and Co. have issued a writ against the N.S.W. Minister for Works to recover £90,000 damages in connection with the taking over by the Government of the North Coast railway, for which they were the contractors. Mr. Griffiths appears by his statement on the subject to be somewhat bewildered, as he had been informed by members of the Opposition that he had overpaid the contractors in the bargain made for taking the contract from them.

---

## DREDGING AND HYDRAULIC SLUICING (V.).

The annual report on Dredge Mining and Hydraulic Sluicing in Victoria for 1912, has been published. In it Mr. D. B. Sellars, the engineer in charge, shows that the number of leases in force during the year was 138, the total area comprising 14,797 acres. The quantity of material treated under dredge mining and hydraulic sluicing by gravitation was 19,722,227 cubic yards, as against 20,144,347 cubic yards in 1911, and the amount of gold won was 73,781 oz., as against 81,593.6 oz. in 1911. The yield of gold per cubic yard of material treated was 1.8 grain, as against 1.94 for the previous year. The total area treated was 675.7 acres, the ground varying from 8 to 59 feet in depth, and the number of men employed was 1293. This area may be classified thus:—Agricultural, 20 acres; pastoral, 159 acres; river and creek beds and old worked ground, 497 acres. Under this heading the dividents paid were £32,320, the wages and other expenses amounted to £222,539, and the initial cost of the plants was £389,544. The quantity of tin won during the year was 20 tons 12 cwt., valued at £2624.

The following table shows the respective mining districts, the number of plants, yields of gold, and dividends paid during 1912, which refer to dredge mining only:—

| District. | Plants. | Gold Won.<br>Oz. | Dividends.<br>£ |
|---|---|---|---|
| Ararat and Stawell | 1 | 800.6 | — |
| Ballarat ... ... ... ... | 9 | 3,384.5 | 194 |
| Beechworth .. ... | 53 | 53,066.5 | 26,073 |
| Bendigo ... ... ... ... | 4 | 1,998.8 | 700 |
| Castlemaine ... ... | 15 | 7,053.9 | 662 |
| Gippsland ... ... ... | 5 | 5,547.2 | 4,525 |
| Maryborough ... ... | 6 | 1,362.5 | 166 |
| | 93 | 73,214.0 | 32,320 |

Resoiling and levelling were carried out in the following areas:—Collegian dredge, near Bonnie Doon, 16 acres; Harrington dredge, 12 acres; Hinnomunjie No. 1 dredge, 32 acres; Briseis No. 1, 16 acres; Briseis No. 3, 18 acres; Porepunkah, 12 acres, in patches; Myrtle Queen, 7 acres; Confidence, 20 acres.

No. 1 dredging district (Mr. Bremner inspector) comprises Ararat and portions of Ballarat, Castlemaine, Gippsland and Maryborough mining districts. Very little improvement was shown in dredge mining during 1912, and most of the plants working show returns about on a par with other years.

No. 2 district (Mr. A. R. Campbell inspector) includes the Beechworth and portion of the Gippsland (Omeo) mining district. "Plants working in areas where the earthy overburden is of sufficient depth to allow it to be advance stripped continue to do this and replace it on the tailings. For the most part the earth has been deposited in ridges, and has not yet been graded. Experiments are being carried out with the view of ascertaining the least expensive method of grading, as the levelling by hand-work has proved to be very costly. In one instance a company, whose plant had arrived at a part of the leased area, where the overburden was deep, being compelled to restore the soil, and, not having had the plant constructed for the purpose, has had the earth ploughed and carted from the land in front of the dredge, and placed on the tailings at the rear. This restored land has this season grown crops of grass and oats of good yield and quality. Good results have been attained where black wattle seeds have been planted on tailings which are sand and gravel; parts of the ground were old diggings before being dredged. Some have been planted each year since the year 1909, and in every place the wattles are making good growth. At only one place has any serious consideration been given to the planting of fruit and walnut trees on the tailings, but at this place the results are good. The walnut trees, especially, have made good progress, and are equal to any of the same age grown on sound ground. They are now from four to five years old, and are thriving well."

No. 3 district (Mr. J. E. Douglas inspector) embraces Bendigo and portions of Ballarat, Castlemaine, and Maryborough mining districts. As a rule, in this district, the sludge provisions of the Mines Act, 1907, No. 2127, have been complied with. The extensive settling basins scattered about the district, in which are stored large quantities of consolidated slum, appear to have caught the eye of potteryware manufacturers. Many of these abandoned areas have been secured under license, with a view to the utilisation of the contents thereof in the manufacture of various articles of potteryware, draining pipes, roofing tiles, etc. For such purposes the material is said to be specially suitable.

"In this State," explains Mr. Sellars, "the term 'dredge mining' is applied to processes whereby alluviums are in large quantities broken down, conveyed, elevated, passed with water through sluice boxes for winning gold, tin, etc., and re-deposited in the ground. It includes bucket dredging, hydraulic sluicing by centrifugal pump, and by the jet elevator. The term 'hydraulic sluicing' is applied to gravitation plants. . . . No outside power, except water, is necessary, and by its application, underhead pressure, it is forced through a nozzle against the alluviums, the dirt broken down, and then conveyed through gold-saving boxes, the heaviest wash being cast out and the balance disposed of by a tail race."

## THE DECLINE OF NEWNES (N.S.W.).

Our Lithgow correspondent, who has just paid a visit to Newnes, the scene of the Commonwealth Oil Corporation's extensive works, writes of that centre as follows:—"A little while ago a train left the junction of the branch line with the Great Western railway, some 34 miles away from the township, once a day, but now there is only one train a week, and this is but poorly patronised, taking as it does goods to supply the few remaining inhabitants of the Valley, and drawing up to the main line some of the remaining shale and oil which were in stock when the company closed down. Along the railway track there is now very little evidence of life or progress; there are deserted homes which were erected by the pioneers who helped to build the railway, and afterwards looked after it. It is in the valley that the gloominess of the picture is most intense. Here the great works, that had thousands of pounds spent on them, and still remain unfinished, are silent, the coal mine and the shale mine are deserted, and a few men mount watch and keep in order the works that were so full of promise but a few years ago. With those who still live in the valley, nourishing their hope, oil is the one theme of conversation."

## WILFUL MINERS.

### Judge's Caustic Remarks.

(From Our Correspondent.)

Newcastle, August 9.

Application was made to His Honour Mr. Justice Heydon, President of the Industrial Court of New South Wales on Wednesday, for the dissolution of a writ of injunction directed against three officials of the Pelaw Main Miners' Lodge. The application was made by the Colliery Employees' Federation of the Northern District.

In dismissing the application, His Honour said he could quite understand the position of the officials and could sympathise with them. He added: "They would not be in the difficult position they were in to-day if they were not officials in the hands of unreasonable men. I say unreasonable men, speaking of northern miners generally. They have made themselves perfectly notorious throughout New South Wales and Australia by their unreasonableness. Some time ago they actually gave their pledges that they would not go on strike without referring the matter to the federation, or giving it an opportunity for consideration. Before the sound of the promise had ceased to vibrate in the air, four of the miners were out on strike. The official who thinks he has an interest in observing the interests of his employers — the lodge—finds himself up against the law, and the law may send him to gaol. It is because of that fact that this application is made. But for these circumstances they would not feel the injunction as a hardship. While Mr. Thompson is a mouthpiece of the lodge in a position of trouble and dispute I cannot remove this injunction. When everything is peaceful, and the air is calm once more, and nothing of this kind is threatening, when the clouds have dispersed and the sun is shining, let him come here, and I don't suppose there will be any difficulty."

Personally, he did not think Mr. Thompson was a firebrand. It was not a personal matter, and Mr. Thompson might be a law-abiding, decent man, but the trouble was that the men Mr. Thompson acted for did not always behave as they ought to do.

Mr. W. Brennan, secretary of the federation, who was present to support the application, said: "Do I understand that in view of your Honour's decision, the manager at Pelaw Main can do anything he thinks fit in the working of that colliery, and that any man who conveys, or in any way acts on behalf of the lodge—no matter what the dispute may be—holds himself open to the position that these men find themselves in?"

His Honour: "The manager of a mine can no more do what he likes than he can turn any part of the mine into a dungeon, and send a miner there in chains. The manager must obey the law."

Mr. Brennan: "Then he will have a big try to do what he can."

His Honour: "I think you should not make attacks upon a person who is not present."

Mr. Brennan: "I feel very strongly."

His Honour intimated that he considered Mr. Brennan's attitude most reprehensible, and not creditable to the Court.

Mr. Brennan: "I have not said anything that I would not say if the manager were present."

## SPARGO CREEK MINE (V.).

### Departmental Report.

The Victorian Minister of Mines, Mr. A. A. Billson, last week received from Mr. H. S. Whitelaw, an officer of the Geological Survey, the following report on the Spargo Creek mine, in the Daylesford district:—

"The Spargo Creek mine lies about midway between the Spargo Creek post office and the Lady Staughton mine, at an altitude of about 2020ft. above sea-level. The Werribee River runs close by the mouth of a tunnel, which has been driven easterly to intersect two reefs that have been worked with in places payable results along the surface over a length of about 600ft. These reefs, known as the eastern and western, in the tunnel are about 260ft. apart. Midway between them is a decomposed dyke, which has broken through the country about where the rocks appear to have been folded as an anticline.

"Along the surface the eastern and western reefs vary in width from 2in. to 2ft. 6in., and appear, Mr. Whitelaw states, to be bedded with the country. In the tunnel neither reef is of an encouraging appearance. The western is about 2in. wide, and thins out to a thread in the face of a north drive 60ft. in length; the eastern is a mere track, and it is doubtful whether it is the matching leg of the western reef, wich is probably a fault as distinct from a back. In three places along the eastern reef a payable shoot was worked to a depth of about 30ft., and on the western reef payable crushings were broken from above and below the tunnel over a length of about 120ft., the most profitable results being obtained from a flat make of spur on the hanging-wall side.

"A shaft is being sunk 130ft. west of the western reef. It is 40ft. deep, and sinking will, the manager states, be continued to a depth of 200ft., in the hope that a second flat make will be found. From the structure of the country it seems probable that flat makes will be found below the one already worked with such good results, and it is likely that where they intersect the beds in which the top make was rich, they will prove as profitable. It is difficult to understand what influenced those who selected the site for the shaft in their determination to sink at the extreme north end of the surface gold—opposite where the reef at the surface contained only 2½ dwt. of gold to the ton. The outcrop of the rich flat make was 100ft. to the south end, and, moreover, the flat make pitches to the south—i.e., away from the shaft. A better site would be about 100ft. to the southward. From here the downward continuation of the flat make previously worked could be reached with so much less driving, and there is a better chance of intersecting in favourable beds, any other makes that may exist at lower levels."

## MARYBOROUGH (V.) GOLDFIELD.

### Geological Survey.

Mr. Hyman Herman, Director of Geological Survey for Victoria, has supplied to the Minister of Mines, Mr. A. A. Billson, the following report on the Maryborough goldfield.

In the Maryborough district, says Mr. Herman, as in most other Victorian mining districts, the gold is almost entirely confined to the quartz reefs, or to alluvial deposits, which have derived their auriferous contents from the disintegration of these reefs. The period at which the gold was deposited in the reefs can be determined only within very wide limits; auriferous reefs must have been in existence when the Older Pliocene streams ran across this district, for all the deposits formed by their action are auriferous, and it is also certain that the quartz reefs were formed after the lower Ordovician strata had been folded. Some of the reefs and quartz spurs were formed after the intrusion of the lamprophyre dykes. The free gold in the reefs is either solidly embedded in the quartz, or distributed around mineral aggregations, or occurs as loose particles within the hollows formed by the leaching out of these minerals. As a rule, the particles are irregular in shape, but crystal gold is reported to have been found in the Chow Chow reef, and in the workings of the Old Leviathan reef, both of which are directly associated with lamprophyre dykes. Free gold is also found under three other conditions, as well as in the alluvial:—(1) As fine specks and flour gold in green and purple slates in the main indicator belt; (2) on the oxidised faces of cubes of pyrites in slates, as, for instance, at Soldier's Hill; (3) in some of the lamprophyre dykes various specimens were proved auriferous by assay, and in one specimen examined, "paint" gold was visible on the joint faces of the dyke at Splitter's Reef. The dyke here was decomposed, and stained deep-red with iron oxide. Although a number of quartz reefs have been worked with profitable results from the fifties till the present day, only a few of them have been prospected or developed below water-level. Besides these there are several worked at a depth of over 200ft., such as the Frederick, Native Youth, Amy Castles, North German, Old Leviathan, Rob Roy, and Ellery, and Passmore's reefs.

It is not generally known, even amongst those directly interested, that there exists such a body as the Wireless Institute of Victoria, and that a similar association exists in New South Wales. The hon. secretary of the Victorian institute is Mr. W. King Witt, of St. Kilda.

The Public Works Committee of the New South Wales Legislative Assembly has recommended the construction of a floating dock at Newcastle at an estimated cost of £110,000, also the expenditure of £22,000 on a water supply scheme for the town of Tamworth. It has decided against a proposal to improve the entrance to Bellinger River, but recommends that the entrance be kept open by dredging.

250 H.P. Turbine.
Showing Wheel and Guide Vanes.

G. Weymouth Pty. Ltd.

Electrical Engineers,

Neptune-street, RICHMOND, VIC.

Telephones:—
Office, 2651 Windsor.
Works: 2507 Central.

Manufacturers of all Classes of Electrical Machinery, Turbines, Pumps for Irrigation and Mining, Underground and Surface Mining Locos., Winches, Haulage and Winding Plants, Motors, Generators, etc.

Estimates submitted.

Correspondence invited.

BALLARAT
School of Mines

DEPARTMENTS:
CHEMISTRY and METALLURGY,
ENGINEERING and SURVEYING
ELECTRICAL ENGINEERING,
GEOLOGY and MINING
MATHEMATICS and PHYSICS.

Prospectus on Application.
F. J. MARTELL, Director.

Within a short time the railway officials of New Zealand should have received the first lot of passenger petrol locomotives. These locomotives, which with their carriages are all self-contained, are intended for use upon branch lines where the traffic hardly warrants the incurring of the expense of running an ordinary train.

DUPLEX
STEAM PUMPS.

The GARDNER PUMPS are the best designed and most accurately constructed. This means low fuel consumption, easy maintenance and satisfactory service.

STOCKS IN SYDNEY AND PERTH.

**FRANK R. PERROT, Sole Representative,**
204 Clarence Street, SYDNEY. 883 Hay Street, PERTH.
Sales Agents:—L. BANNISTER, 39 Queen Street, Melbourne.
E. BARTON HACK, William Street N., Broken Hill.

QUEENSLAND MINES DEPARTMENT

GEOLOGICAL SURVEY PUBLICATIONS. REVISED LISTS FORWARDED ON REQUEST

**Charters Towers School of Mines.**

SUBJECTS AND INSTRUCTORS:

Geology, Mining Geology, and Mineralogy.—The Director, H. I. McGillivray, M.A. (Melb.).
Chemistry, Assaying, and Metallurgy.—J. A. Hughes, F.C.S.; W. H. Bowater, F.C.S.; P. Harvey, A.C.T.S.M.
Mechanics, Materials and Structures, and Physics.—A. R. Wright, F.S.A.S.M.
Mining, Ore Dressing, Surveying, and Mechanical Drawing.—E. C. B. Heden, B.A., B.E., B.Sc. (Syd.).
Mathematics.—G. F. Clinton, A.C.T.S.M.
Secretary.—J. F. Horrigan.

Candidates prepared for Associateship in Mining and Metallurgy, Diploma as Chemist and Assayer, the Mine Managers' Examination, and in all branches of Metallurgical Work, such as Cyaniding, Chlorination, etc.

Scale of Fees.—15s. per class per term (three terms of three months each per year), or £2 per class per year. A full course of six or more classes for £10 10s. per annum. Full particulars on application to the Director.

Managers of Mines, Mills, and Smelters requiring trained Assistants are invited to communicate with the Director.

**Queensl'd Government Mining Journal**

A Monthly Publication Issued under the Authority of the MINES DEPARTMENT.

Containing Official Reports, Statistical Tables, and othe
Authentic Information relating to
MINING IN QUEENSLAND.

SUBSCRIPTION—Per Annum, 6s.; Posted within the Commonwealth, 6s. 6d. To any place beyond, 8s.

PUBLISHERS—GORDON & GOTCH, Brisbane, and at 15 St Bride-street, Ludgate Circus, London, E.C.

DALGETY & COMPANY Ltd.

BUYERS AND EXPORTERS OF

HIGHEST VALUES GIVEN.

ORES

BEST ATTENTION ASSURED.

LEAD, COPPER, SILVER, GOLD, Etc., Etc.

Ore Sampling.

**Offices and Laboratory; 15-17 Bent St., SYDNEY.**

Purchases of ORES are made by the Company.

SYDNEY Weights and Assays final.

Check Assays by Sellers and Buyers.

Liberal allowance made on ORES destined for sale on consignment in Europe, when owners prefer this mode of realisation.

Check Weights determined by weighings made on two independent weighbridges.

## CONTENTS.

### THURSDAY, AUGUST 21.

EDITORIAL—

Victorian Mining Enterprise .. .. 143
Postal Electricians' Award .. .. .. 143
Leaderettes .. .. .. .. .. .. .. .. .. 144
News and Notes .. .. .. .. .. .. .. 145
Personal .. .. .. .. .. .. .. .. .. 145
Metal Quotations .. .. .. .. .. .. 146
Investor's Column—
Llanberris No. 1 .. .. .. .. .. .. 146
South German (V.) .. .. .. .. .. 146
Duke Extended (V.) .. .. .. .. 146
Our Big Mines .. .. .. .. .. .. .. 147
Mineral Returns .. .. .. .. .. .. .. 148
Birthday Tunnel Prospects .. .. .. 148
Reports of Companies, etc. .. .. .. .. 148
Northern Territory Notes .. .. .. .. 149
Queensland Mining .. .. .. .. .. .. 149
Tasmanian Mining .. .. .. .. .. .. 149
Western Australian Mining .. .. .. 150
Victorian Mining Activities .. .. .. 150
The Coal Mining Industry .. .. .. .. 151
Tramways and the Greater Melb. Council .. .. .. .. .. .. .. .. 152
Postal Electricians' Award .. .. .. 152
The Fitzroy Dock Imbroglio .. .. .. 153
Trans-Australian Railway .. .. .. .. 153
Melbourne Tramway Company .. .. 154
British and European Development .. 154
Port Pirie Electric Light .. .. .. .. 155
Miscellaneous .. .. .. .. .. .. .. .. 156
Tenders Invited and Accepted .. .. 157
Commonwealth Oil Corporation .. .. 159
Industrial .. .. .. .. .. .. .. .. .. 160
Royal Mint Returns .. .. .. .. .. .. 160
Mixed Menu .. .. .. .. .. .. .. .. 160

WELSBACH
WIRE LAMPS,
BRITISH MANUFACTURE.
SEND FOR CATALOGUE.
Welsbach Light Co. of Aust. Ltd.
302 Pitt Street, SYDNEY.
280 Lonsdale Street, MELBOURNE.
Creek Street, BRISBANE.
102 Victoria Street, WELLINGTON, N.Z.

FIRE. . BRICK
Our Products have proved their superiority.
FIRE CLAY GOODS For Every Purpose.
Darley Fire Bricks will withstand the most intense heat, and will not shrink. Our bricks are made near Bacchus Marsh, Victoria, and we supply all the States.
Specialities
High-Grade Firebricks & Retorts.
Prompt Delivery. For Prices, etc., write to—
DARLEY F. B. Co.,
Oliver's Lane, Flinders St. Melbourne

COKE!
NORTH BULLI COLLIERY
Limited
Supplies best quality hard
SOUTHERN
SMELTING COKE.
(Weekly output 1250 tons.)
H. G. Hyde, Secretary
Royal Insurance Building, 16 Spring-street,
SYDNEY.

AUSTRALIAN MINING STANDARD.
PUBLISHED EVERY THURSDAY.
Forwarded Post Free to any Address.

| | Per Annum. |
|---|---|
| Australasia .. .. .. .. .. .. .. .. .. .. .. .. .. | 26/- |
| British Possessions .. .. .. .. .. .. .. .. .. | 32/6 |
| Foreign .. .. .. .. .. .. .. .. .. .. .. .. .. .. | 34/8 |

Payable half-yearly or yearly, in advance.

All amounts should be made payable to order of "CRITCHLEY PARKER, Bank of Australasia."

12 O'Connell-street,
Sydney.
Tel. Central 2703.
P.O. Box 331.

376 Flinders-lane,
Mebourne.
Central 7931 & 1838.
P.O. Box 253.

### BACK NUMBERS OF THE "MINING STANDARD."

The following is the rate for back copies more than a month old. Applications by post must be accompanied with cash and postage added. In no case can we guarantee to supply copies, as our storage accommodation is limited.

A postcard will be sent if the number required is out of print.

For copies three months old, ninepence; six month, one shilling; and beyond that period, one penny per month per copy.

As there is a regular demand for back copies of the "Mining Standard," newsagents are requested to send back all returns uncut and in good condition, otherwise they will not be accepted.

All Returns from Newsagents must reach us by the end of each month (the whole paper must be sent). No credit will be allowed beyond this term.

Postage — British, 1d.; Foreign, 1½d.; Australasia, ½d. per copy.

Stamps will be accepted as pre-payment.

Address communications: Publishing Department, "Mining Standard."

### CASUAL ADVERTISEMENTS.

The rate for this class of advertisement is governed by the position it occupies.

If it appears on leader page or amongst or next to reading matter, the rate is 15s. per inch (nonpariel) per insertion.

Towards end of reading section—
Brevier, 16 ems width, 6s. per inch per insertion.
Nonpareil, 8s per inch per insertion.

For the convenience of advertisers, we might state that—Brevier has approximately 7 words to a line, and 8 lines to the inch—6s. Nonpareil has approximately 8 words to the line, and 11 lines to the inch—8s.

### ALTERATION TO ADVERTISEMENTS.

As our publishing arrangements necessitate the "Mining Standard" being issued simultaneously in Sydney, Melbourne and Adelaide on the same day each week, advertisers wishing to change their advertising matter must supply same ten days in advance of publication.

### ADVERTISEMENT PROOFS.

Proofs are submitted to advertisers in order to give them an opportunity of going over the advertisements before printing.

Advertising Copy must be typed and so arranged as to clearly indicate the display required for the more important features of the advertisement.

Any departure from the original copy will be charged for. Advertisers are specially requested to instruct their publicity departments to give us clear and definite instructions respecting changes of matter or new copy in order to avoid incurring unnecessary charges.

AUSTRALIAN MINING STANDARD.
PUBLISHED EVERY THURSDAY.
ESTABLISHED 1888.

It is requested that all business communications be Addressed to Critchley Parker.

THURSDAY, AUGUST 21, 1913.

## VICTORIAN MINING ENTERPRISE.

An interesting brochure by Mr. C. E. Walker of Ballarat (V.), entitled "Mining Reform and Millions," directs once again the attention that has so often been directed by the "Mining Standard" to the utter lack of enterprise shown in connection with mining in the State which has been by far the greatest in gold production of all the States of the Commonwealth. Mr. Walker wants Victorians concerned in the industry to deal in millions. He must first get them to think in millions, a fact which the whole tenor of his illuminating articles shows that he thoroughly appreciates. It is a distressing fact that there is not, in the whole of Victoria, a single mine of first-class importance—not one whose report and balance-sheet we would for a moment think of handing over to the mining accountant who deals in these columns with the fortunes of our more important mining properties as disclosed in their published statements. When the Victorian mining man looks at the great work done in New South Wales, in Western Australia, in Queensland, in Tasmania, he feels he has very little reason to be proud of the enterprise displayed by his own State. To some extent the backwardness seems to be due to the fact that the mineral wealth of the State is almost entirely in the form of gold, for so far as its gold mines are concerned, New South Wales shows no less—in many respects even greater—backwardness. But it is not necessary to go outside Australia to find that even gold mines are capable of being worked on a very big scale to very great profit. We hear very much of the enterprise shown in Bendigo in deep-sinking; but in point of fact had enterprising people held the Bendigo mines they would have passed their present point of production years and years ago. Kalgoorlie has been in existence only about a third the time that the Bendigo field has been worked, and it is already carrying on mining operations at approximately two-thirds of the depth attained on the great Victorian field. Of course that may mean that Kalgoorlie will be worked out very much sooner than Bendigo, and it is always an argument put forward by the Bendigo men that by going along slowly and keeping up a fairly steady supply of the precious metal, the town which has grown up on the field will retain its importance for very many more years than would be the case were it worked on a large scale. There is much reason in this argument, but let not those who use it talk of mining enterprise. They may claim for their policy caution, common-sense, far-sightedness, if they will; but let them not claim for it enterprise. Indeed, what enterprise can there be where the mines are worked on the call-paying principle? That is to-day, as it has always been, the curse of Victorian mining; and a better state of affairs is not to be expected until this ruinous system of financing the companies that work the mines has been superseded by something better.

## POSTAL ELECTRICIANS' AWARD.

It is not to be wondered at that in a memorandum the Federal Public Service Commissioner should have protested strongly against the recent award of Mr. Justice Higgins in the case of the Postal Electricians' Union, for the case against it is remarkably strong. Mr. M'Lachlan puts the result of the finding in terms that are perfectly clear. Here is what he says:—"There are approximately 1300 employees who will be directly and immediately affected by the present award. These employees will now give each 2½ hours less service per week than hitherto. The average actual service of permanent officers is 46 weeks in each year. Thus, during the year 115 hours less time will be worked. Multiplying this by the number of employees gives a result of 149,500 hours, approximately equal to the time of 68 employees, or, expressed in monetary terms, an estimated amount of £10,000 per annum."

An award that makes such differences is not necessarily uncalled-for, for the men may have been over-worked and under-paid; but, as Mr. M'Lachlan goes on to show, and as the public is well aware, Government employees are worked a great deal more lightly than are those of private firms. The fact is that, if such an award had been made in any private undertaking, it would have meant the closing down of the business. The officers concerned in the award are, says Mr. M'Lachlan, mainly employed in connection with the telephone service; and it may be further remarked that (as Mr. M'Lachlan does not say) that service is, of all the unsatisfactory services of the Postal Department, the most deplorable. The cost of salaries and wages of persons employed in the telephone branch of the Department has amounted to 85 per cent. of the total revenue, and we are informed by the Public Service Commissioner that the increases in salaries under the award of Mr. Justice Higgins. will amount to "at least" 14 per cent. Even at this minimum figure the payment in salaries and wages will absorb no less than 99 per cent. of the revenue; and probably not even Mr. Justice Higgins, confident as he is of the justice and righteousness of all his decisions, will expect the remaining 1 per cent. of revenue (if it amount to so much) to be sufficient to pay for his new provisions concerning overtime, Sunday pay, travelling expenses, and other allowances, to say nothing of interest on capital, cost of material, tools, appliances, switchboards, buildings, rentals, depreciation and what not. Unless the President of the Arbitration Court can believe that, he must admit that, if Mr. M'Lachlan's figures be correct, he has erred on the side of generosity to the employee. But probably Mr. Justice Higgins would advocate the raising of telephone rates, in order that, as usual, the cost of the award may fall on the general public.

There is another point about the award to which some attention may be drawn. In private firms and in Government institutions where political influence is not feared, promotion is ordinarily by merit. In Australian Government Departments, where there has been too great an experience of the evils resulting from political influence, merit is ignored, and length of service is the determining factor. The result is, of course, the promotion of utter incapables whose only claim to consideration lies in the fact that they have been longer in the Government service than other men infinitely their superiors in mental qualifications. But even this promotion by length of service is something very much better and fairer than the scheme which Mr. Justice Higgins has hit upon of having junior mechanics paid upon an age basis. Under this system it will not be the ablest man who receives the most remuneration, nor even the man of the greatest experience; but the man who is furthest advanced on the road to second childhood. It is plain that in Government offices the value of the service rendered is never of any account whatever.

---

Very naturally the West Australian Minister for Works, Mr. Johnson, as a member of a Labour Ministry, feels sore that the present Commonwealth Government should contemplate the substituting of the contract system of work for the day labour principle which the Fisher Ministry espoused. As we pointed out in these columns a few weeks ago, there are good reasons why the Labour Party, as a body, prefers day labour to contract or piecework—we say "as a body," for there are honourable exceptions, and not a few of them, if they were allowed to think and act for themselves, would give a fair day's work for a fair day's pay under either system, and would on that account, if on no other, prefer the contract system as more remunerative to a capable and industrious workman. These sane men in their private conversations admit and deplore the fact that the rank and file of the so-called "workers" in any trade are little better than wasters, and having their minimum wage secured give as little as they are allowed in exchange for it. The man who ventures to work a little faster than the dawdler thinks he should is denounced as "a bosses' man," "a speeder-up," and so forth. It has been proved to demonstration on the Government contracts at Jervis Bay and at Canberra that in the interests of the taxpayer, who, after all, is the actual employer, the contract system is by far the more economical, while general experience of the effect of a change from day labour to piecework, at such times as the unions see fit to demand it, is that actual and willing workers can easily earn higher wages. But, as we have before pointed out, such demand is only made after the day-labour rate has been fixed to tally with previous earnings on the other system. Incidentally it may not be out of place to remind Mr. Johnson that, when on one occasion during the last regime a State Minister criticised some action of the Federal Government, he was promptly told to mind his own business.

* * *

The report, drawn up by Mr. G. A. Julius at the instance of the Naval Board, on the Fitzroy Dock plant at Cockatoo Island, reads more like the enumeration of the items of a scrap heap than the description of a plant which is supposed to be constructing warships. Amongst other things, he states that not one of the eight steam electric sets is suitable for incorporation in any power scheme adequate to meet the requirements of the island, that the whole of the six boilers are practically worn out, and that the transmitting cables are in a bad condition, and run without system in such a way as to break every regulation for the safe running of electric cables. He adds that it is quite impossible to keep things going even at the present poor rate without continuous and excessive maintenance expenses, which should be absolutely unnecessary. In view of the foregoing, Senator Millen's remark that the Commonwealth has been landed in an extremely doubtful bargain, does not err on the side of rashness. However, in reply, Senator Pearce says that the fact that the plant was old and obsolete is neither a disclosure nor a revelation; but that, as Admiral William Henderson had told him personally that the Commonwealth would be wise in taking over the Dock, the Fisher Ministry, impressed with the advisability of constructing warships in Australia, first endeavoured to arrange with the New South Wales Government for the commencement of the construction of the fleet, and then, in consequence of difficulties in carrying out the agreement, became convinced that it should take the Dock over. To outsiders it may appear that no matter how impressed a Government might be with the desirability of building a fleet, it would need to be first satisfied that it possessed or could obtain adequate works for the purpose; and that it would be brought no nearer to the attainment of its ambition by the acquisition of an obsolete plant.

* * *

In many respects the monthly report of the Bendigo (V.) School of Mines, and the speeches based upon it at last Monday's meeting, reflect a sign of the times which is greatly to be deplored, particularly in a country still in its youth, and with its way to make in the world against keen opposition. The complaint has been made before that, owing to a falling off in the demand for trained mining managers and metallurgists, the number of students in the Bendigo school in the mining and metallurgical classes has fallen off considerably; but surely this is the result of a very restricted view of the possibilities for advancement offered by the mining world. Youths and parents who measure chances by the standard of merely local demand are so obviously blind to the true state of affairs that it ought to be unnecessary to draw attention to their error, and the Bendigo School of Mines, in common with others on this side of the line, can boast of former students who have secured high positions in the older countries of the world. The vice-president, Mr. R. A. Rankin, at the council meeting, attributed the change to a tendency, apparently inherent in human nature (and, if so, certainly to be combated and overcome) to hold black coats in tender regard, and to object to work which requires that a coat of any kind be temporarily discarded. This, he considers, is partly responsible for the decline in those two classes, as well as in others which present the same drawback. The registrar says that apparently the young people are leaving the School of Mines for the secondary schools under the Education Department. The consequence, if this should continue, will be, as one put it, a superfluity of school teachers and a scarcity of young people educated for other branches of employment; a plethora of typewriters and a dearth of mechanics. Mr. Rankin, however, gladly recognised that there are still very many people at Bendigo who take a broader view of the demands which the future will make upon their sons and daughters, and a healthier view of the dignity of work. Such people are the salt of the industrial world, and in the years to come their sons and daughters will bless them for having taken a sane and wholesome view of life.

* * *

Some interesting observations have been made by authorities in several branches of the State service in Victoria to check the allegations of "sparking" brought against the coal from the State colliery at Wonthaggi. Special arrangements were made by the Railways and the Mines Department, and the management of the coal mine for a number of trips by a special train, run under test conditions, during which elaborate notes were collected of the number of sparks blown off by the funnel, the number which reached the ground still burning, etc., and in the tests loadings of various New South Wales coals were brought into comparison with that supplied from the various shafts of the Wonthaggi mine. The outcome of the experiment was to show that the fear of setting the country in a blaze during dry weather has no more foundation with respect to the fuel from the Railways Commissioners' own mine than in respect to the other coals—with one curious exception, in which the output from one of the Wonthaggi shafts proves to be in this respect different from that of the others. The obvious solution of the difficulty is to withhold the product of that shaft from consumption in country trains during the dry season and when crops are ripening. Many months ago, it will be remembered by readers of the "Mining Standard," laboratory tests were made by the Mines Department to ascertain the calorific value of Wonthaggi coal, and the results were highly satisfactory; but more recently practical tests were made in special train journeys, run under ordinary working conditions, and these have amply confirmed the verdict of the laboratory that the best coal from the State mine is very little indeed below the standard of New South Wales varieties for steaming purposes. Taking these results in conjunction with the much lower cost of the local product, there would appear to be very strong reasons why the Government should make the most of its opportunity to supply its own requirements. Do not the facts also emphasise the mistaken policy of the Government in refusing, after having reserved to itself an immense and unbroken area, to permit private companies now in existence, or others which would be formed, to open up fresh ground, so that the State's coal wants might be more fully supplied from its own mines? This would at least be in harmony with the accepted principle of supporting local industry—a principle recognised and acted upon by other States.

* * *

Though the news of the resignation of the Lord Chief Justiceship by Lord Alverstone proves to be premature, it is not out of place to refer to the rumour so generally current, and obviously so well warranted, that it is the intention of the British Government to appoint to the position the present Attorney-General, Sir Rufus Isaacs. It is to be feared that the chances are very heavily in favour of this happening, for it was long an open secret that the Government would look no further for a successor to Lord Alverstone; and, though the Marconi revelations which have since been made would, in ordinary circumstances, have been held to altogether disqualify Sir Rufus Isaacs from the holding of such an office, it has to be borne in mind that the Government cannot now pass him by without admitting that it holds him to have acted as he should not have acted, and without administering a slap in the face to the servile House of Commons majority which whitewashed him. We thus believe that if the Asquith Government have the awarding of this very high honour, it is upon Sir Rufus Isaacs that it will fall; but it is not too much to say that, in view of all the circumstances, such an appointment will create a very bad impression in every portion of the Empire which is not swayed by party prejudice, and will serve to confirm people in the rapidly-growing belief that the high standard of political morality hitherto ruling in the United Kingdom is becoming a thing of the past. To say that Sir Rufus merely acted without due consideration is not correct. If it were, it might show that he lacked the discretion which should be a *sine qua non* for anyone aspiring to the Lord Chief Justiceship; but the argument against his fitness for the position is in reality much stronger than that, for it is based mainly on his failure to communicate to the House of Commons the whole truth regarding his actions. But for a series of fortunate accidents, his speculations would not have been known; and it is with an eye to that fact that we say that conduct such as that which has been proved against him should effectually debar anyone guilty of it from becoming Lord Chief Justice of England.

## NEWS AND NOTES.

The Victorian Railway Department has issued a report on the extraordinary muddle on the Caulfield suburban line, to which we drew attention in our last issue. In the course of this report, it is stated that the passengers in all trains which arrived at Richmond and South Yarra after the occurrence became known, were notified of the accident, and advised to make use of the Brighton line, wherever suitable. We can only say that, if the report contain the whole truth, the passengers by the trains referred to must have contained a quite remarkable proportion of liars. Similarly, the report says that at Flinders-street as soon as word was received of the accident, the passengers in each compartment were notified while the trains were waiting at the platforms "that a block had occurred on the line, that it was uncertain as to how long the block would obtain, and that it was preferable for them to adopt other means to reach their homes." On this statement, also, precisely the same comment may be made.

The announcement was made last week that Messrs. Earle, Hermann and Co., of Sydney, who held an option over the Mount Balfour Copper Mines Ltd. (T.), had succeeded in floating a company in Paris to work the property. The capital will be £1,100,000, consisting of £600,000 share capital and £500,000 in 5 per cent. 30-year debentures. The railway concession granted to the Mount Balfour mines, as well as the other land and mining concessions held by that company, are included in the sale. The necessary finances are to be supplied at the rate of £10,000 per month. Connected with the purchase is a novel immigration scheme, whereby the Tasmanian Government will grant approved immigrants 40 acres of land each, and the company will assist them.

According to the official statement of the secretary of the Broken Hill Proprietary Co. (N.S.W.), the profit for the half-year ended on May 31st amounted to only £124,192, as compared with £164,903 for the previous term, and with £186,883 for the half-year to May 31st, 1912. For last half-year the company has paid two dividends totalling £120,000.

It is reported from Karangahake (says the "Auckland Weekly News") that operations will shortly be commenced at the Ascot cinnabar claim. A new system of treatment is to be introduced, and those interested are of the opinion that with the change the property will prove payable.

For the four-weekly period ended July 26th, the Waihi-Paeroa Gold Extraction Co., Ltd. (N.Z.), treated 12,500 tons of tailings for a return of £4470. The company has now treated 175,500 tons of tailings for a total extraction of £57,911, and has paid £6250 in dividends.

It was reported at Charleville (Q.) last week that a payable gold reef had been discovered at Windorah, about 200 miles north-west of Charleville and on the west side of Cooper's Creek. The discovery is attributed to three brothers named Henness, one of whom is a mining engineer. It was stated, also, that specimens of the stone have been sent into Charleville.

During June last Burbanks Main Lode (1904) Ltd., Coolgardie (W.A.), milled 2005 short tons of ore for a yield of 963 oz. of bullion worth £3320, and cyanided 1298 tons of tailings for 276 oz., worth £566, making a total revenue of £3886. The working expenses were £4021. At the beginning of July the average width of the reef in the main North drive at No. 7 level was 18in., and the average value of assays 10 dwt., while in the No. 2 winze below that level the reef had widened to 20in., the average value being 12 dwt., and at the intermediate level the reef was 14in. and the average value 11 dwt. In the North drive off No. 27 shaft, near the South boundary, the width of reef was 10in., the assays averaging 8 dwt. per ton.

The Mining Act Amendment Bill was considered in committee in the N.S.W. Legislative Assembly on the 12th inst. It is intended to facilitate miners' entry on to private lands for prospecting, to abolish the system of exemption from labour conditions in regard to mining leases, and to give the Government the right to resume lands for mining purposes.

The secretary of the Radium Hill Company, of Olary (S. Aus.), has received the following report from Mr. Radcliff, works manager and chemist of the company:—"Smelted 7 tons 2 cwt. concentrates since last report. Despatched 543 lb. uranium oxide, assaying 79 per cent. urano-uranic oxide. Radium—Slimes plant running well. Bromide containing 30 milligrammes recovered for last week, in addition to the 100 milligrammes recovered for month of July." The managing director, in a letter received last week, states that he has received an offer from a firm of good standing on the Continent to purchase 100 milligrammes of radium bromide per month at a satisfactory figure.

The value of the July output of the Tasmania gold mine, Beaconsfield (T.), was £8290, or £2790 more than in June. The quantity of gold obtained was 1955 oz., being 1050 oz. from 4922 tons of stone crushed at the battery, and 905 oz. from other sources. The return for June was 649 oz. from 3357 tons crushed, and 648 oz. from other sources.

The Victorian Mines Act Amendment Bill was passed by the Legislative Assembly last week, the final stages having been got through on Thursday night. The committee divided on clause 86, abolishing the mining boards, whose work is now done by officers of the Mines department, and though the ancient arguments for their retention with increased powers were duly revived, they failed to elicit sympathy from the majority of the members, and an amendment to that end was negatived by 27 votes to 8, four members of the Labour party voting with the Government.

The directors of the British Broken Hill Proprietary Company Limited entertained Mr. W. H. Woodhead, the general manager, at dinner on the evening of the 1st July in the Cafe Royale, Regent-street, London. The chairman (Mr. J. S. Smith-Winby) presided, and in expressing the regret of the board at losing Mr. Woodhead's services, he took the opportunity of carrying out the expressed desire of the shareholders at the recent general meeting by presenting him with a substantial recognition of his services on behalf of the company. A handsome piece of plate was at the same time presented to him by his colleagues in London and Adelaide.

## PERSONAL.

The Rev. J. Crookston has been elected President of the Administrative Council of the Bendigo (V.) School of Mines, while Mr. R. A. Rankin becomes Vice-President, and Dr. O. Penfold treasurer.

Mr. Peter Finlayson, who was for about twelve years chairman of the Long Tunnel Extended mine, Walhalla (V.), died at his residence, Clifton Hill, Melbourne, on the 4th inst. Mr. Finlayson was also, up to the middle of last year, a member of the Council of the Chamber of Mines of Victoria.

Mr. W. Williams, underground manager of the Sea mine, Garden Gully, has been appointed to succeed Mr. S. Prowse (resigned) as the manager of the New Argus mine, Eaglehawk (V.).

Mr. A. Capper Moore has been elected president of the Chamber of Mines of Victoria for the ensuing year, in succession to Colonel F. G. Hughes. Mr. Moore was born at Bendigo, in 1865. He is a Fellow of the Australian Corporation of Public Accountants and of the Federal Institute of Accountants, and carries on his business as a public accountant at Collins House, Melbourne. For many years he was in partnership with his father, Mr. Thompson Moore, and his brother, Mr. E. Thompson Moore, the latter being now a member of the Melbourne Stock Exchange. The new president was for three years a vice-president of the Chamber of Mines, and he is also vice-chairman of the Legal Managers' Association.

Mr. A. E. Clarke, the veteran stock and sharebroker, of Melbourne, died at his residence, at Glen Huntly, last Tuesday, at the age of 70. Deceased was born in Melbourne, in a house which then occupied the site of the Port Phillip Club Hotel. In 1858 he entered has father's gold-buying office, situated on what was, until a few years ago, if not still, known as Clarke's Corner, Elizabeth-st. In later years he built up the prosperous business of Clarke and Co., having Mr. Robert Wallen as his partner. Mr. Clarke was one of the founders of the Melbourne Stock Exchange, and remained a member of it until a few years ago.

Mr. A. E. A. Philps, foreman of the Umberumberka water works scheme now being carried out by the New South Wales Government at Broken Hill, died in the Broken Hill Hospital last week from acute bronchitis and asthma. Deceased had been connected with the Public Works Department of that State for many years.

Mr. E. Visich has been appointed manager of the Poseidon Alluvial mine, Tarnagulla (V.).

Mr. Stanislaus Napier Bell, only son of the late Mr. Charles Napier Bell, M. Inst. C.E., died in London on June 30. Mr. Stanislaus Napier Bell was a fellow of the Geological Society and an associate of the Institute of Mining and Metallurgy, and was connected with several Australian institutions; in 1911, he was appointed by the West African Syndicate Company Ltd., to prospect for them in Northern Nigeria. While there he was attacked by some insidious disease, which developed into chronic kidney trouble, which led to his death.

The appointments of Mr. J. D. Audley Smith as consulting engineer to the Mammoth Copper Mines Ltd., of Mungana, Chillagoe (Q.), and of Mr. C. G. Rutledge as general manager, have been confirmed by the Glasgow board of directors, and instructions have been given for prompt resumption of smelting.

# THE INVESTOR'S COLUMN.

## Some Companies Attracting Attention To-day.

(By Our Exchange Reporter.)

### Llanberris No. 1.

It is probably as far back as twenty years ago since it could have been said with truth that the two great goldfields of Victoria, Ballarat and Bendigo, were rivals as far as gold production was concerned. Both were even then showing signs of exhaustion of the rich deposits which had made them and Australia famous; but in Ballarat the prospects of the mining industry certainly looked much the less promising of the two; and the signs of the time have been unfortunately only too well realised. Ballarat has ceased to be a great mining field, and is now what is perhaps much better—that is, the centre of an important agricultural district. There is still a Stock Exchange in Ballarat, and the daily reports show that the shares in a number of mining companies are quoted and a fair amount of business transacted daily. An examination, however, of the official list discloses the fact that by far the greater number and most important of the stocks do not belong to Ballarat. It is the outlying mining districts, such as Ararat, Beaufort, Daylesford, Berringa and Scarsdale, Creswick and Maryborough, which keep the Ballarat Stock Exchange alive—not the enterprises of the one-time golden city itself. In Bendigo it is quite different, for the stocks quoted and dealt in daily there, and which continue their career as gold producers and dividend payers, are still working the lines of reef which practically traverse the city itself, and some of these enterprises are forty or fifty years old, while others are of quite recent date. Over thirty of these stocks are quoted daily, and they also provide a considerable amount of business on the Stock Exchange of Melbourne. Both in number and importance the mining companies of Ballarat compare badly with those of Bendigo, there being probably not more than eight or ten left to awaken public interest or increase the gold return. Such a decline must awaken a feeling of regret among those investors who remember the great mining enterprises of a quarter of a century ago such as the Band and Albion and the Star of the East, the latter of which at one time was paying its shareholders dividends at the rate of 6s. per month, and this feeling of regret will be accentuated by a recognition of the fact that there does not seem to be much reason for hoping that the field will ever again be prominent as a gold producer. It is true the lodes on the main lines of reef are both large and persistent, but unfortunately their value is too low under the present cost of working, to pay for mining and milling. A good illustration of the character of the quartz deposits of the district and how little profit the shareholders receive as a reward for risking their capital, is afforded by the results of the operations for the last half-year of the Llanberris No. 1—this being one of the most successful companies of the district during the period under review. 10,161 tons of stone were mined and milled for a yield of 2636 oz. of gold; 157¾ tons of pyrites were also treated, the revenue from these two sources amounting to £11,963 10s. There was also a balance of £784 brought forward from the previous half-year, and capital called up £317. The expenses included:—Contracts, £1735; wages, £5583; percentage, £308; material, £987; fuel, £1084; round timber, £317, and water, £73, these and some smaller items bringing the expenditure up to £10,310, so that the amount available for dividends for the shareholders, after placing £800 on fixed deposit, came to only £1200. It is rather interesting to note that this disbursement to the shareholders, amounting to one-tenth of the revenue, is just about the average maintained by the company during its history, as will be seen from the following figures. The capital called up is £29,000, gold won £355,881, pyrites £17,608. These amounts, together with some smaller items, bring the total receipts up to just under £404,000, out of which the shareholders have received in dividends £39,000—that is, rather less than one-tenth. The principal items of expense have been:—wages, £172,668; contracts, £75,264; material, £31,019; plant, £14,509; fuel, £32,144; round timber, £7731; water, £3108; sawn timber, £2881, and percentage, £8605. The general charges and directors' fees, including visiting expenses, during the life of the company, amount altogether to only £3340, so it is evident that the expenses of management have been kept down as much as possible. When it is taken into consideration the amount of employment in different occupations, which has been provided by the operations of the company, it is plain that the shareholders thoroughly deserve a better return for their enterprise than they have up to now received, and it is to be hoped that they will receive a greater measure of success in the future. It does not seem improbable that this will be the case, for during the last two or three months some large bodies of stone of a payable grade have been opened up at the mine. These veins of quartz are located at a depth of from 1030 to 1230ft., and it is mainly from the 1030 and 1130ft. levels that the battery is being supplied—the width of the crushing material running up to 25ft. Under these circumstances it is to be assumed that operations will be carried on vigorously and a substantial tonnage of stone mined and milled during the present half-year. For a while there were regular quotations in Melbourne for the stock, the shares gradually rising in price from about 1s. to about 7s., but latterly there have been very few attempts at business, and the market for them now is practically confined to Ballarat. As there are only 24,000 shares in the company, and the reserves of stone substantial, it may safely be assumed that dividends will be forthcoming for some time to come. These disbursements will probably not be on a large scale, for the mine is a low-grade proposition, nevertheless at about present prices the shares seem to be a reasonably sound mining investment. Some of those persons who were sufficiently well informed to anticipate the improved position of the company's affairs and get in at the low prices, have not so far shown any anxiety to take a market profit, and it is probable that they look forward to taking a fair number of dividends out of the mine before doing so.

### South German (V.).

The course of the quotations for the shares in this company shows that the market is still in a sensitive state regarding its prospects. There has, however, been a considerable falling off in the number of transactions, and on the whole it may be said that Stock Exchange opinion is not so favourable as it was a fortnight ago. The reason for the lessened confidence is a growing doubt as to whether the payable returns recently obtained by the tributers have been derived mainly from below the floor or crosscourse, which formerly closed the prosperous career of the company, or whether a substantial proportion of the gold has not been won from stoping what may be described as the heel of the old reef in the higher workings. There is also some question of whether the drive at the 2000ft. level is not far enough in to have met the downward continuation of the payable stone, if it had maintained its normal pitch northward.

Under the influence of the anxiety caused by the uncertainty upon these important matters, the market has lost some of its strength, and it cannot be expected that there will be much improvement unless a favourable development takes place.

### Duke Extended (V.).

During the last two or three weeks there has been a well-sustained rise in the price of the shares in this company, the support being so consistent that there have been very few of the usual market fluctuations. The improvement first set in when the quotations were in the vicinity of 4s. 9d. (one operator taking all the shares that were then offered), and the support continued until 10s. 3d. was touched; a pause then ensued, but it was of small duration, and was followed by keener enquiry than ever, with the result that there are now buyers at 11s. 6d. This rise in price does not appear to have been owing, certainly to any great extent, to what are generally described as "market operations," such operations being the continuous conflict between "Bulls" and "Bears," but almost entirely to the favourable official reports which have been coming to hand. These announcements have been to the effect that wash-dirt of a good payable quality has been proved, and that, generally speaking, the mine is opening up well. Small quantities of the dirt are now being treated, but operations on a large scale will probably not take place for a few months, for although the wash is draining satisfactorily, the directors wish to avoid the very common error in connection with alluvial mining of starting the panelling before the gutter is sufficiently dry to enable it to be worked in the most economical and effective manner. The yields so far have been 41 fathoms for about 38 oz. and 80 fathoms for 100 oz. of gold, which is well over an ounce to the fathom. Wash-dirt of such an average value should pay well, as the operations of the adjoining companies show that with careful management about 10 to 12 dwt. per fathom should be sufficient for the working expenses. The mine is situated between those of two successful companies—namely, the Duke and Main Lead Consols and the Duke United—the former of which has returned its shareholders £65,000 in dividends, and is still a gold producer, with the shares worth about 7s., while the latter, which was an English enterprise, paid about £50,000 before stopping operations. It should be mentioned that the wash in the Duke United lease improved considerably while nearing the boundary of the ground now held by the Duke Extended—so much so that the management started and nearly completed the shaft which is now being used by the latter company. Under these circumstances it will be strange if the Duke Extended does not prove also to be a payable concern. So far, 600ft. of the gutter in length, with a width of 250ft., has been proved by driving; but it is probable that it will be wider, as there is still good wash in the face of the drive which is going across the lead. Altogether, there will be a length of about a mile of gutter to work. The above brief description will show that the proposition is one of considerable merit, several important questions regarding it having been satisfactorily answered by the result of the work which has been done. The market indications are that the shares will go higher, but it must be remembered that a very substantial rise has already taken place, and it is only reasonable to expect that a reaction will take place before long. Some of those who bought in early will be tempted to secure their profit as soon as the market shows signs of wavering.

The past record of the lead shows it to have been somewhat patchy, but the holding of the present company appears to have been enriched by the junction with it of an important tributary; there is justification for a belief that the values will be higher and better maintained than in the case of its nearest neighbours—both of which paid well.

---

# METAL QUOTATIONS.

## By Cable.

(From Our Correspondent.)

### London, Tuesday.

The tone of the market for industrial metals during last week was less satisfactory than in the previous week, copper and lead having both fallen off somewhat heavily, though the former more than recovered the previous week's level before Friday. Tin, on the other hand, opened with a substantial rise, but closed the week below the level of the previous Friday. Spelter had a rise of 5s., which restored the rate of a fortnight ago. Antimony, both "Star" brand and 50 per cent. ore, brought lower prices than for a long time past, but wolfram improved.

COPPER.—Monday's quotation for spot cash was £68 17s. 6d., or 12s. 6d. below the Friday price, but later rates were £69 2s. 6d., £69 16s. 3d., £70, and £69 16s. 3d.

Three months' parcels also brought £68 17s. 6d. on Monday and £69 2s. 6d. on Tuesday, but the price then rose to £69 17s. 6d., followed by £70 and £69 16s. 3d.

Electrolytic had the satisfactory rise of £1 per ton—namely, from £72 5s. to £73 5s.

TIN.—The rates for spot delivery were:—£189 15s. (a rise of 25s.), £188 10s., £189 5s., and £188.

For three months' orders the quotes were £189 5s., £188 15s., £187 10s., £188 5s., and £187.

LEAD.—The quotations were £20 12s. 6d., £20 7s. 6d., £20 5s., and £20.

SPELTER.—There was a return from last week's reduced rate to £20 15s., the rate of the previous week.

SILVER.—The daily rates were 27$\frac{5}{16}$d., 27¼d., 27$\frac{3}{16}$d., and 27$\frac{5}{16}$d.

ANTIMONY.—"Star" brand fell from £30 to £29, and 50 per cent. ore from £7 to £6 10s. per ton.

WOLFRAM (70 per cent. ore).—There was a gratifying rise from the previous week's reduced rate of 32s. per unit to 33s. 6d., or from £112 per ton to £117 5s.

MOLYBDENITE.—The previous reduced rate of 2s. 8d. per lb. was maintained.

MANGANESE (50 per cent. ore).—The prevailing price was still 9¾d. per unit, or 40s. 7½d. per ton.

---

The following statement regarding the Broken Hill mineral output is taken verbatim from the Melbourne "Argus," and makes quite interesting reading:—"The output for June was valued at close at hand. The diamond drill on No. 7 level of Thompson's shaft was carried north-west to 179ft. There was 4ft. good ore in the core, and a little low-grade stuff, but core was mostly quartzite and sandstone. Good development work was continued £474,437. The tonnages for July were greatly below those for June. Direct oversea imports for mine last week the main east crosscut on No. 11 level was extended to 73½ft., through quartzite ore and sandstone; the expected lode should be July were valued at £5719, and the revenue collected was £2545." We looked in vain through the next issue of the paper to see what reward was offered for the solution of the puzzle thus presented to its readers.

One of the few bright reports at present of gold mining in the farther south coast, writes our Wollongong correspondent, is from Wyndham district; a lode 4ft. by 3ft. is estimated to be worth £40 a ton in gold, bismuth, and silver, supposing 40 tons of it at grass to be of average quality. There is rich bismuth are showing in the pipe, about one foot of which is estimated to assay 25 per cent.

# OUR BIG MINES.

## Examinations of their Yearly and Half-Yearly Reports.

(By a Mining Accountant.)

### The Great Fitzroy Mines Limited.

This company was incorporated in Victoria last year, being a reconstruction of the old company, of similar name, that during a life of six years had such a depressing career. The old company was largely over-capitalised, and was burdened with a heavy debenture debt as well. Possessing a large but low-grade ore deposit, it quite failed to make both ends meet, and in the end was compelled to resort to a reconstruction that looked—and still looks—remarkably like a benefit to the debenture-holders. The new company has a nominal capital of £225,000 in place of the former £600,000. Of this latter sum, however, only £450,000 was actually subscribed, in shares of £1 each; in the terms of the reconstruction these shares were to be exchanged for 900,000 shares of 5s. each, on the following plan. Every member of the old company was entitled to receive one share paid up to 2s. in the new company for each share held by him, and also had the right to call for an allotment, at par, of an equal number of shares in the new company to that applied for by him in the reconstruction. This option right expired last May, but has been renewed until May, 1914. The reason for this will be obvious from what follows. In return for agreeing to the reconstruction, which imposed a liability of 3s. on each of the original shares, and for underwriting the issue of the first 450,000 shares, the debenture-holders were to take up 6 per cent. first mortgage debentures in the new company, repayable in three years from date of incorporation, at a premium of 5 per cent. Furthermore, they were to receive £45,000 return of principal within fourteen months, the balance of the debenture debt being redeemable by the company setting aside one-half of its net profits and one-half of the cash from the proceeds of any reserve shares called by the option-holders. The appearance of the accounts suggests that few, if any, of the shareholders have been rash enough to call for an allotment of the reserve shares. Had all the shareholders decided to fully exercise their rights—or penalties, depending on the point of view—the position at the end of last May, by which time (or shortly after) 2s. 6d. out of the 3s. liability had been called, would have been as follows:—

| | | |
|---|---|---|
| First 450,000 shares at 2s. 6d. | £56,250 | |
| Less debenture repayment | 45,000 | |
| | | £11,250 |
| Second 450,000 shares at 5s. .. | £112,500 | |
| Less debenture repayment | 56,250 | |
| | | 56,250 |
| Working capital .. .. .. | | £67,500 |

Add the remaining liability of £11,250 on the first 450,000 shares, and the total working capital to be made available would have been £78,750. This probably would be the most favourable happening for the company as a whole. It certainly would be for the debenture-holders, for they would have been repaid £101,250, leaving a paltry £3750 yet to be redeemed, taking into consideration the 5 per cent. premium on the £100,000 debenture debt. The debenture-holders had little to lose and much to gain.

But such as the above has not happened. Nevertheless, the debenture-holders have been well catered for. At the end of May, the date of the balance-sheet, £33,100 debenture debt had been redeemed, leaving a balance of £46,900. This is in connection with the "A" debentures, which originally had a face value of £80,000. They are dissociated, in the directors' report, from the £20,000 debentures held by the Australian Metal Co. Ltd., as collateral security for the unredeemed portion of a £20,000 loan. This unredeemed portion at May 31 was £9463: it is being reduced with each monthly shipment of blister copper. The distribution of the debentures is not quite clear when comparison is made with the last report of the old company. At June, 1911, the debenture debt amounted to £100,000, including £25,000 held by the Australian Metal Co. Ltd.; at May, 1913, the debentures of £100,000 are still shown, the Australian Metal Co. holding £20,000 instead of £25,000. Whether this £20,000 is also entitled to a 5 per cent. premium is doubtful. The premium may thus be either £4000 or £5000, which has to be added to the debt shown in the balance-sheet, where the unredeemed debentures are stated at £56,363. Since the date of the balance-sheet this liability, according to the directors' report, has been reduced to £36,200. Thus, of the original £80,000 of the "A" debentures, £43,637 has been repaid out of the share capital subscribed during the year. In future, if anyone cares to exercise his option on a reserve share of five shillings, he will be making a donation of half a crown to the debenture-holders. At present it would be much cheaper to buy in the open market rather than seek for an allotment. Shares may possibly, with some great streak of luck, attain a premium, but until such does happen the option rights may as well be extended a few more years.

The report deals with the operations during the thirteen months ended May 31, 1913. The mine development carried out was limited to immediate requirements. The work that is enumerated in the report was done with a view to facilitating filling operations in the various stoping sections. This cost was included in the expenditure on mining, that is, it was charged to revenue, and not to capital, under the heading of development account. At June, 1911, this account stood at £27,013: now it has disappeared, along with the major portion of the other fixed capital items. The reconstruction has made a desirable clearance. The actual stoping operations were hampered by torrential rains that flooded the open cuts used for filling purposes, and affected several of the stoping sections in the Nos. 1 and 2 levels, resulting in a settlement of the ground. The underground history may be summed up as follows:—

| | |
|---|---|
| Ore extracted .. .. .. .. | 107,098 tons. |
| Ore reserves .. .. .. .. .. | 507,046 „ |
| Footage of development work— | |
| Shaft-sinking .. .. .. .. .. | 82 ft. |
| Driving and crosscutting .. .. | 771½ „ |
| Rising and winzing .. .. .. | 778 „ |
| Total .. .. .. .. .. .. | 1631½ ft. |

The report states that pending a satisfactory solution of the treatment difficulties experienced in the earlier portion of the period the development work was restricted, and no attempt was made to prove the extension of the ore body outside the known boundaries. The details of the reserves are as follows:—

| Level. | Tonnage. | Copper, per cent. | Gold, dwt. |
|---|---|---|---|
| 1 | 36,373 | 2.66 | 2.69 |
| 1-2 | 128,163 | 2.95 | 2.67 |
| 2-3 | 267,918 | 2.59 | 2.16 |
| 3-4 | 74,592 | 3.0 | 2.2 |
| | 507,046 | 2.75 | 2.33 |

Of this total the pyritic ore is only 31,611 tons, averaging 2.16 per cent. copper and 1.96 dwt. gold, while the siliceous ore is 475,435 tons, averaging 2.78 per cent. copper and 2.36 dwt. gold. The scarcity of pyritic ore is indeed a serious matter for the company. An option has been taken over the Laloki mine, Papua. This is only 17 miles from Port Moresby, and the Federal Government may build a light tramway to Sapphire Creek, within two miles of the mine. The shaft was deepened to 140ft., and a crosscut put out for 74ft., at which point the lode was intersected. At June 24th, it had been driven on 44ft. east and 44ft. west on the footwall side. The ore from the Laloki is stated to be very basic in character, and to contain 3 to 4 per cent. copper, and 2 dwt. gold per ton. Though it will be a long time before this mine can be of much use to the company, the Laloki certainly appears to be a promising prospect. The terms of the option are conspicuously absent from the report. The development expenditure incurred to date of balance-sheet was £2960, charged to capital.

At the time of the reconstruction the following estimate was made. On the basis of treating 6000 tons of siliceous ore per month by the mill, and smelting 3000 tons of mixed pyritic and high-grade siliceous ore, the yield would be 210 tons of copper and 820 oz. of fine gold. With electrolytic copper at £57 per ton, the estimated profit per month was £2000. This output was not quite obtained, as will be seen thus:—

Metallurgical Results for Thirteen Months.

| | Tonnage. | Copper, per cent. | Gold, dwt. |
|---|---|---|---|
| At the mill— | | | |
| Ore milled .. .. | 71,847 | 2.62 | 2.12 |
| Concentrate produced .. .. | 14,445 | 10.96 | 8.29 |
| Percentage of recovery .. .. | — | 84 | 78 |
| At the smelter— | | | |
| Ore smelted .. | 34,887 | 2.88 | 2.83 |
| Concentrate smelted .. .. | 14,230 | 10.96 | 8.25 |
| Percentage of recovery .. .. | — | 84 | 95 |

Metallic contents of the blister produced for shipment were:—

| | |
|---|---|
| Copper .. .. .. .. .. | 2,235 tons. |
| Gold .. .. .. .. .. .. | 11,356 oz. |
| Silver .. .. .. .. .. | 33,088 oz. |

The extractions in the mill were 84 per cent. copper and 78 per cent. gold; at the smelters the two corresponding figures were 84 and 95 per cent. The way the monthly extractions wobble about is a matter of wonder to those who take the trouble to analyse the returns. But that is neither here nor there. If the above figures may be implicitly believed, it is evident that the mill work has vastly improved, so far as the technical side is concerned. At the smelter 21,265 tons of limestone and 6007 tons of ironstone were used as fluxes, and the quantity of coke used was 12,484 tons.

The costs, as is usual with companies managed by B.M. and Co., are set forth very completely and explicitly. The following working costs are of technical interest:—

| | Per ton of Ore treated. | | | |
|---|---|---|---|---|
| | s. | d. | s. | d. |
| Ore extraction— | | | | |
| Development .. .. .. .. | | 8.37 | | |
| Breaking .. .. .. .. .. | 8 | 8.25 | | |
| Filling .. .. .. .. .. | | 10.43 | | |
| Trucking and raising .. | 1 | 9.60 | | |
| | | | 12 | 0.65 |
| Ore treatment— | | | | |
| Concentration— | | | | |
| Rock-breaking .. .. .. | | 11.75 | | |
| Transport to mill .. .. | | 3.21 | | |
| Crushing .. .. .. .. | 1 | 5.48 | | |
| Jigging .. .. .. .. .. | | 5.88 | | |
| Fine-grinding .. .. .. | 1 | 5.02 | | |
| Flotation .. .. .. .. | 1 | 11.37 | | |
| Transport of concentrates .. .. .. .. | | 2.97 | | |
| Disposal of residues .. | | 4.53 | | |
| | | | 7 | 2.21 |
| Sintering .. .. .. .. .. | | | 1 | 10.62 |
| Briquetting .. .. .. .. | | | | 1.56 |
| Smelting— | | | | |
| Rock-breaking .. .. .. | | 2.60 | | |
| Transport to smelter .. | | 2.72 | | |
| Smelting .. .. .. .. .. | 9 | 7.02 | | |
| Disposal of slag .. .. .. | | 3.55 | | |
| | | | 10 | 3.89 |
| Converting .. .. .. .. | | | 1 | 7.52 |
| General expenses, including salaries, rates, taxes, etc. | | | 1 | 5.09 |
| Grand total .. .. .. .. .. | | | 34 | 7.54 |

There are, of course, other expenses to be added on to those enumerated above. The working account shows £2771 on the charge on blister copper, and £468 as Government royalty on gold won. The profit and loss account shows cost of strengthening and renewing plant (£1536), exchange, interest (£5031), preliminary expenses and share indemnity commission (£3619), head office and administration expenses (£1843). The grand total of all these is £200,369, equal to 37s. 4d. per ton of ore treated. But about £4000 of these expenses will probably not be recurrent. Say the total normal expenditure was £196,000. From an examination of the metal output, it is evident that a loss would have resulted had not copper been unusually high. The working account is credited with £201,468 by sale of products and sundry revenue. But no prices are mentioned in the report. Taking copper at £60 per ton, gold at £4.24 per oz. fine, and silver at 2s. 6d. per oz. fine, the metal output would be worth:—

| | |
|---|---|
| Copper, 2235 tons at £60 .. .. .. | £134,100 |
| Gold, 11,356 oz. at £4.24 .. .. .. | 48,149 |
| Silver, 33,088 oz. at .. .. .. .. | 4,136 |
| | £185,385 |

Thus there would be a loss of over £11,000, even allowing for the non-recurrent £4000 expenditure. The metal prices, taken as a basis, are not low by any means. For it must be remembered that the costs do not include the realisation charges. If these latter amounted to, say, £7 10s. per ton of copper, the price of electrolytic copper in the above calculation would be £67 10s. If the £57 10s. had been taken for electrolytic copper, as estimated, the loss would have increased by another £22,350. Thus it is plain that the Great Fitzroy is in for a bad time unless copper remains at a high figure, or the cost of production is considerably reduced. The total working cost of producing blister copper amounted to £84 10s. per ton of copper contained in the blister. The grand total cost, including everything, was a shade over £97 per ton of copper, if the realisation charge be taken at £7 10s. In these calculations, of course, no allowance has been made for the gold and silver contents of the copper. These amounted to about £23 10s. per ton, explaining how the company managed to make a profit at all, even with the high price that must have been obtained for its copper.

As it was, the company made a net profit of £1099, after making no allowance for depreciation. In view of the heavy writing-down, when the new company was formed, of machinery, plant, buildings, live stock, and freehold property, it was not deemed necessary to make further provision for depreciation. In terms of the reconstruction deed, half the net profit was set aside as provision for redemption of debentures, leaving £549 at the credit of profit and loss account. The amount is not formidable. The balance-sheet shows the severe pruning of the fixed capital accounts, when compared with a year ago. Thus the mining leases and freehold property are valued at £52,729, as against the former £322,306. The machinery, plant, and buildings are valued at £75,716, as against £129,254; during the year £5433 was expended and charged to this account. Development account, £27,013, has disappeared, being replaced by Laloki option account, £2960. The following table will show the leading financial features of the period to May 31, 1913:—

| | |
|---|---|
| Revenue* | £201,468 |
| Expenditure | 200,369 |
| Written off | — |
| Net profit | 1,099 |
| Carry forward | 549 |
| Subscribed Capital† | 99,531 |
| Capital expenditure | 8,393 |
| Liquid assets, including stores | 28,595 |
| Liabilities, including debentures‡ | 59,481 |
| Debt | 30,886 |

*Net, after deduction of realisation charges.

†Paid in cash, £54,531.

‡Repayable, at premium of 5 per cent., in April, 1915.

## MINERAL RETURNS.

The return furnished by the New South Wales Under-Secretary for Mines shows that the gold yield recorded for that State for July was 15,421 oz. crude, equal to 12,255 oz. fine, valued at £52,058, as compared with £20,992 oz. crude, equal to 16,510 oz. fine, valued at £70,128 for the same month in 1912. The yield for the first seven months of this year amounts to 102,707 oz. crude, equal to 82,446 oz. fine, valued at £350,209, as compared with 115,029 oz. crude, equal to 94,818 oz. fine, valued at £402,760, for the same period in 1912, showing a decrease of 12,372 oz. fine, and £52,551 in value.

The Victorian yield of gold for July was 36,960 oz. gross, or 34,639 oz. fine, valued at £147,137. Compared with the yield for July of last year, there has been an increase of 759 oz. fine. The yield for the last seven months was 266,941 oz. gross, or 247,775 oz. fine, valued at £1,051,576. This shows a decrease of 14,240 oz. fine compared with the quantity won during the corresponding period of last year.

Queensland's output of gold for July was 25,213 oz., valued at £107,098, compared with 31,090 oz., valued at £132,062, for the same month last year. This gives a decrease of 5877 oz., and £24,964 in value. For the seven months of the year the yield was 156,431 oz., valued at £664,476, a decrease of 45,013 oz., valued at £191,203, in the seven months. The dividends aggregated £127,329, a decrease of £9180.

The West Australian gold yield for July amounted to 108,796 fine oz., valued at £462,137, or 4689 oz. less than for June, and 3156 oz. more than for July last year. The total production to the end of July amounts to 26,478,292 oz., valued at £112,472,630.

The gold exported from New Zealand during July amounted to 40,103 oz. gross, or 36,329¾ oz. fine, valued at £154,319, as compared with 38,567 oz. gross, or 35,152½ oz fine, valued at £149,318, for the same month last year. The quantity exported for the past seven months was 210,385 oz. gross, or 194,601½ oz. fine, valued at £826,614, as compared with 237,848 oz. gross, or 219,879 oz. fine, valued at £933,986 for the corresponding period last year. The exports of silver for July reached 107,909 oz., valued at £11,984, as against 65,889 oz., valued at £7311 for July, 1912; while for the seven months the exports amounted to 605,939 oz., valued at £63,788, as against 598,300 oz., valued at £61,841 for the same portion of 1912.

A return, issued by the Under-Secretary of Mines for New South Wales, shows that the value of silver, silver-lead, zinc concentrates, copper, tin, and coal exported from that State during the first half of the year was £4,845,362, or a net increase of £17,339. Silver-lead products show a comparative increase of £186,557 in value, due to the large output of silver-lead concentrates, etc. The value of zinc concentrates shows an increase of £71,957. The export of copper, obtained largely from matte, etc., imported from other States, exhibits a decrease of £181,356 in value. The quantity of the tin (ingots, ore, and concentrates) exported discloses an increase of £54,496 in value. Coal exports during the half-year were on an augmented scale, the value of coal shipped being £1,472,867, or an increase of £29,599 in value over that recorded for a similar period last year.

The Board of Trade returns show the following imports and exports of metals to and from Great Britain during June, the corresponding figures for June, 1912, being added in parentheses;—Copper—imports 10,746 (13,165) tons, exports 5362 (4175) tons; tin—imports 4140 (2693) tons, exports 4029 (2323) tons; lead—imports 13,362 (16,244) tons, exports 4159 (3598) tons; spelter—imports 11,813 (12,856) tons; pig iron—imports 20,583 (16,710) tons, exports 92,401 (103,930) tons; iron and steel—imports 79,271 (85,191) tons, exports 216,565 (161,292) tons; galvanised iron—exports 58,588 (50,978) tons; tin plates—exports 41,483 (30,471) tons. The totals for the first six months of the two years were:—Copper — imports 80,789 (74,970) tons; exports 37,012 (29,134) tons; tin — imports 23,417 (21,571) tons, exports 22,051 (25,644) tons; lead—imports 104,779 (107,445) tons, exports 26,263 (22,148) tons; spelter—imports 64,129 (61,352) tons; pig iron—imports 111,359 (84,671) tons, exports 548,309 (645,633) tons; iron and steel—imports 510,359 (468,154) tons, exports 1,281,768 (1,066,530) tons; galvanised iron—exports 378,628 (289,574) tons; tin plates—exports 225,019 (216,089) tons.

## BIRTHDAY TUNNEL PROSPECTS.

(By Our Ballarat Correspondent).

No fault can be found with the vigor displayed by the Birthday Tunnel management in the matter of prospecting, and it will not be deserving of blame if nothing of value is discovered ere long. The mine was for several years a prolific gold producer, paying £1000 monthly in dividends. As showing how sensitive the stock is on the market an unofficial and much-exaggerated report got into circulation two or three weeks ago concerning the stone at the No. 4 level, and before the news could be confirmed (which it was not) eager buyers "chased" the stock until 4/6 was paid for a parcel. Then an official report showed that nothing better than 3dwt. per ton ore was being opened up, though the stone certainly looked promising.

A great amount of dead work has been carried out since the beginning of the year, mostly at the Nos. 4 and 5 levels, and there is to be no slackening in this regard until the old mine has been given a fair opportunity to re-establish itself. The No. 5 south drive is to be pushed on, and a rise started in, say, another 100ft. to connect with the crosscut going out westerly from the bottom of the No. 2 shaft. A big area of unexploited quartz may thus be opened up, and while work will be conducted from the No. 1 shaft, the country about the No. 2 shaft will be prospected. The west crosscut at the bottom of the No. 2 shaft was stopped at the time of the fire a few years ago, since which calamity the company has been struggling for its life. Between the Nos. 4 and 5 levels a reef was crossed in sinking, and this is being given attention. The cutting of the plat at the No. 5 level revealed a total width of 40ft. of formation. A drive was put across the big formation south from the shaft in the footwall side, and 60ft. of stone was proved up to the break, on which latter they drove about 40ft. It is described as a well-defined reef, with a good footwall, and the formation, when last seen, was extending away easterly. Its prospects averaged 3dwt. per ton. Drives have been opened north and south from the break. The stone is now considered as of payable quality, and it is said by the manager (Mr. L. Hansen) to be as good looking as any yet seen in the mine. Mr. Hansen hopes to keep these and another drive, the No. 3 west, going. The latter crosscut is expected to soon cut a big reef that outcrops on the surface for a goodly distance. The rise for the Express reef is to be kept going, and in another 80ft. should connect with the bottom of an old shaft about 100ft. deep.

The Express lode was followed some years ago for about 1000ft. along the surface, and the open cut varied from 30 to 100ft. in depth, and the extent to which the reef was worked suggests that some decent stone existed in parts. It had to be broken and carted away to be crushed. So when the rise is through a south drive will be started and prospecting will be carried on to a depth of 200ft.

The most important work at present being carried on is the developing of the lode at the No. 4 level, where in the drive and the rise above the east crosscut the lode averages 3 or 4ft. in width, and is worth about 3 dwt. There has been no work done on this line above the No. 4 level.

The company is about paying its way, owing the bank only some £200.

---

At the Williamstown (V.) shipbuilding yards the construction of a combined hopper barge and grab-bucket dredge, weighing 350 tons, which is to cost about £60,000, has been begun. Its length will be 125ft., its width 25ft., and its moulded depth 9ft. It will be fitted with three grab-cranes, the machinery being manufactured by Thompson and Co. Ltd., of Castlemaine.

## REPORTS OF COMPANIES AND CORPORATIONS.

### Mount Lyell M. and R. Co.

The smelting returns of the Mt. Lyell Mining and Railway Co. (T.) for the last two four-weekly periods were:

| | | Four Weeks ended | |
|---|---|---|---|
| | | *July 9. | Aug. 6. |
| Mt. Lyell ore treated | tons | 18,351 | 12,567 |
| N. Mt. Lyell ore treated | tons | 4,800 | 7,036 |
| Lyell Comstock ore | | 2,617 | 225 |
| Total ore treated | tons | 25,768 | 19,828 |
| Fluxes and purchased ores | | 1,339 | 98 |
| Blister Copper produced | tons | 330 | 383 |
| Contents— | | | |
| Copper | tons | 325 | 378 |
| Silver | oz. | 28,459 | 27,886 |
| Gold | oz. | 684 | 683 |

*The smaller proportionate output of copper was due to the lower grade of North Mount Lyell ore treated.

### Great Fitzroy Mines Ltd. (Q.).

The reports and statement of accounts to be presented at the first ordinary general meeting of the Great Fitzroy Mines Ltd., to be held at 360 Collins-street, Melbourne, on the 22nd inst., cover the thirteen months since the incorporation of the new company, during which period £5433 has been spent on additions to machinery, plant, buildings, etc.

The report of the general managers, Messrs. Bewick, Moreing and Co., shows that the ore extracted from the mine was 107,098 tons, of which 34,887 tons, averaging in value 2.88 per cent. copper and 2.83 dwt. gold per ton, were sent direct to the smelters, and 71.847 tons of ore, of an average value of 2.62 per cent. copper and 2.12 dwt. gold per ton, were treated in the concentrating mill. The mill produced 14,445.26 tons of concentrate, assaying 10.96 per cent. copper and 8.29 dwt. gold. of which 14,230.06 tons were sent to the smelter. assaying 10.96 per cent. copper and 8.25 dwt. gold. The metallic contents of the blister produced for shipment were 2235 tons copper, 11,356 oz. gold, and 33,088 oz. silver. The extractions in the mill were 84 per cent. copper and 78. per cent. gold. Working costs amounted to £184,802, averaging 34s. 7.54d. per ton of ore treated. Ore reserves include 31,611 tons pyritic ore, averaging 2.16 per cent. copper and 1.96 dwt. gold, and 475,435 tons silicious ore, averaging 2.78 per cent. copper and 2.36 dwt. gold per ton, making a total of 507,046 tons, averaging 2.75 per cent. copper and 2.33 dwt. gold, the average value (taking copper at £60 and gold at £4.24), being about 42s. 11d. per ton. "Pending a satisfactory solution of the treatment difficulties experienced in the earlier portion of the period, development work was restricted, and no attempt was made to prove the extension of the ore body outside the known boundaries. The general managers, speaking of the mill ing section, state that the metallurgical difficulties connected therewith have been overcome. Some difficulty has been experienced in the sintering of concentrates preparatory to smelting; the plant is now, however, said to be producing material satisfactory for smelting, though at a somewhat high cost, and with a view to reducing this they are experimenting on the lines of briquetting the concentrates.

The working account shows that sales of products and sundry revenue yielded £201,467, and after deducting expenditure on working account a balance of £13,379 was carried to profit and loss account, and after deducting charges on that account—interest. underwriting commission, Melbourne and London expenses, etc.—there remains a net profit of £1099.

### Broken Hill Proprietary (N.S.W.).

The report of the Broken Hill Proprietary Company for the four weeks ended 30th July states that 24,722 tons of crude ore were raised. At the 650ft. level, Delprat shaft, bores have been started to intersect the mineralised zone to the north and to the south of the existing bore, but have not yet reached this zone. At the ore-dressing mills 22,901 tons of crude ore were treated, and 17,027 tons of dump tailings reground, together producing 5179 tons of lead concentrates and 5200 tons of slimes. From the zinc flotation plant 7000 tons of zinc concentrates were produced, assaying 46.09 per cent. zinc, 7.48 per cent. lead, and 12.89 oz. silver per ton. Sulphuric Acid Plant.—476 tons of sulphuric acid (strong) were produced. By the aerial ropeway 8817 tons of tailings were delivered to the various chutes for underground filling, including 2129 tons sold to the Block 10 Company.

Port Pirie.—Three lead smelters worked continuously throughout the period, though during the first two weeks, whilst repairs were being made to the boilers, they were run at a somewhat slower speed. With the slower running of the smelters the supply of roasted material was met by the Ropp roasting furnaces, and work on the Dwight-Lloyd plant was suspended for several days. Advantage was taken of this suspension to introduce some minor improvements. The Ropp roasters and converters were in constant operation throughout. At the zinc plant eight distillation furnaces worked without interruption in conjunction with the Hegeler roaster, and with satisfactory results.

Iron Knob Tramway.—Productive and traffic operations proceeded without incident of note, and 3771 tons of ironstone were forwarded to the smelters for the use as a flux. Such preparatory work as is necessary to enable the expansion of the output to supply the steel works, when completed, is well in hand. A new quarry is being opened, and the ordering of such additional rolling-stock and other material as will be required is receiving attention.

Steel Works, Newcastle.—Steady all-round progress in the construction of the steel works has been made.

## Mt. Bischoff T.M. Co.

During the last half-year the net earnings of the Mt. Bischoff Tin Mining Co., Waratah (T.), amounted to £41,631, which, with a balance of £104,953 brought forward, makes a total of £147,395 to be dealt with. From this £36,000 was paid in dividends and £2571 in income tax, while £5906 was written off plant and property, leaving £102,918 to credit. A sum of £8427 was expended on plant and buildings, in addition to the ordinary expenditure. Additional prospecting was carried out on the northern slope, where a tunnel is being put in to intersect the lode which gave such good prospects on the surface. During the period 580 tons of concentrates were obtained from 106,063 tons of material crushed. Working costs were 4s. 11.787d., compared with 4s. 8.390d. per ton for the previous term, the increase being partly due to stoppage caused by dry weather. The total quantity of ore smelted was 1644¼ tons, which produced 1117 tons of tin, of which 1056 tons, producing 744 tons, were treated on public account.

## Broken Hill South (N.S.W.).

The mill returns of the Broken Hill South Silver Mining Co. for the last two four weekly periods were:—

| | | Four Weeks ended June 28. | Four Weeks ended Aug. 9. |
|---|---|---|---|
| Ore milled | tons | 27,660 | 41,960 |
| Assay— | | | |
| Lead | per cent. | 15.0 | 14.9 |
| Silver | oz. | 6.9 | 7.3 |
| Zinc | per cent. | 14.2 | 15.0 |
| Concentrates | tons | 4,554 | 7.017 |
| Assay— | | | |
| Lead | per cent. | 70.2 | 68.8 |
| Silver | . . .. oz. | 24.4 | 24.6 |
| Zinc | per cent. | 6.8 | 6.7 |

## Zinc Corporation (N.S.W.).

The following table shows the production, working costs, and estimated profit of the Zinc Corporation for the last two months:

| | | June. | July. |
|---|---|---|---|
| Ore milled | tons | 13,822 | 15,915 |
| Tailings treated | tons | 27,080 | 29,150 |
| Zinc middlings treated | tons | 3,000 | 3,430 |
| Zinc concentrates | tons | 7,508 | 7,683 |
| Lead concentrates | tons | 3,899 | 4,415 |
| Estimated income from all sources (spelter at £23, lead at £15) | | £46,962 | £49,951 |
| Total working expenditure | | £25,921 | £26,953 |
| Other estimated expenditure | | £400 | £400 |
| Cost per ton on ore mined and milled | | 16/6 | 14/7 |
| Cost per ton tailings and middlings treated | | 9/8 | 9/5 |
| Cost of redemption of tailings | | £6,224 | £7,188 |
| Estimated profit over working, excluding cost of tailings | | £14,417 | £15,410 |
| Expenditure on mine development | | £2,303 | £2,952 |
| Expenditure on new construction work | | £6,140 | £1,826 |

# NORTHERN TERRITORY NOTES.

(From Our Correspondent.)

Brock's Creek, July 23.

It is pleasing to note that the authorities are making some genuine effort to assist the development of deserving mining properties here. It has been decided to assist the Great Katherine copper mine (formerly the Maud Creek) which is a property of considerable promise. Also the Coronet Hill company is to have a subsidy of £ for £, which, with the £5000 recently obtained for further development purposes, will enable the company to fairly test the mine's value. This property is considered by expert opinion to be a very big proposition, possessing tremendous prospective value.

The Fleet gold mines are still working away doing development work out of Government grant. I am informed that payable gold was met with in driving the tunnel along the big reef, and that work is now being carried on with a view to increase the ore reserves before endeavouring to obtain capital for the erection of machinery for dealing with the ore.

Arrangements have been made to unwater the Iron Blow mine. With this object, boilers, engines, pumps, and other mining plant have been purchased by those interested. It is intended to sink a winze at the 200ft. level, and do other development work, and erect a furnace for treatment of the ore (of which there is about 60,000 tons ready for stoping) in conjunction with other ores, and thus demonstrate that it can be profitably smelted. This work is dependent on the mining estimates for the Northern Territory being passed by the Federal Parliament. I am told (not officially) that the Director of Mines has applied for £30,000 for the Mines Department. This is certainly a very modest amount: £50,000 could be very profitably allotted to this department, and Parliament would do well to increase the amount asked for. If the Federal Government deal liberally with the mining industry, the country will benefit.

Excellent work is being done by our geologist and inspector of mines; and, whatever may be said regarding some of the appointments made for the Northern Territory, the two appointments of geologist and inspector of mines secured to the Territory two highly qualified officers devoted to their work. A topographical survey of the Pine Creek goldfield has recently been made by our mines inspector, and some useful information should be forthcoming as a result of the work being carried out. It is a very great pity our Director of Mines cannot be supplied with, say, another two men to carry out geological surveys. It would be money well spent.

A new tin discovery was made a few weeks ago some distance out from Katherine, but owing to its distance from the rail (nearly 100 miles), the expense of carting will be so great that there is very little hope of much good being done with it until the rail is completed, at least to the Katherine.

The Venture syndicate are obtaining very good tin from their claim, the Scotchman. The ore is being treated at the Horseshoe Creek battery.

Mt. Wells is now working on a splendid tin lode, recently broken into on the hanging wall of the old tunnel. The lode is about 4ft. wide, and the ore is being put through the mill.

The Wolfram Camp battery has been kept going on tin ore of fairly good quality, but not much wolfram has been raised for some time past, though the owner informs me there is plenty of excellent quality in the mine.

# QUEENSLAND MINING.

## Anakie Field.

(From Our Correspondent.)

Sapphiretown, August 9.

During the fine weather prevailing here for some weeks there has been increased activity in sapphire mining operations. All the washing machines have been taxed to their utmost capacity to cope with the increased output. On the country west of the township over a dozen new surface claims have been pegged out during the past month. The wash is not particularly rich, but is easily obtained. The locality is known as the "New Chum's Rush." The stone is of good size.

The number of miners at and around Sapphiretown has nearly doubled during the past half-year.

# TASMANIAN MINING.

## Mount Lyell District.

(From Our Correspondent.)

Queenstown, August 15.

According to the report which will be submitted to the shareholders at the sixth half-yearly meeting of the Lyell Blocks company on August 25, the directors are evidently determined to adhere to their previously expressed intention of sinking to 1300ft. in the endeavour to locate the North Lyell—or some other—ore bodies. And, while there is a lot of uncertainty as to whether the objective sought for will be reached, there is none at all about the cost of the work being carried on. The shaft on June 30 last (the end of the last half-year) had been sunk a total depth from the surface of 1141ft. The actual work of sinking was started at a point about 1400ft. in from the entrance of the main tunnel at a depth from the surface of 530ft. The actual depth, therefore, which has been sunk since operations commenced over three years ago is 611ft. During the period six calls of 3d. each have been made, and according to official reports have all been well responded to. The company is in 300,000 shares, so that a threepenny call brings in £3750, and as up to the 30th of June last six calls had been made, the total amount received would be £22,500. According to the report, the whole of this has been expended either directly or indirectly in the sinking of the shaft an actual depth of 611ft., so the work has cost practically £37 per foot. Of course, the work of sinking by itself has not cost this much, but as all the contingent work carried out has been actually necessary in connection with sinking operations, it amounts to the same thing in the end. And while the company deserves to be rewarded for its enterprise, the question may be asked if it is good business to spend £37 a foot in sinking a shaft like that of the Lyell Blocks on the off chance of striking ore which, even if found, is never likely to be payably productive. And assuming in this connection that ore worth, say, 6 per cent. (which is the average limit value of the North Lyell ore), is met with in the Blocks at a depth of between 1100 and 1300ft., what will it be worth to the Blocks company after paying mining and treatment costs? However, having already spent £22,500 in sinking to 1140ft., the directors are probably of opinion that they may as well "go the whole rupee" and spend a few thousands more in searching for ore down to 1300ft. If the search is unsuccessful, the shareholders will have the satisfaction of knowing that they had a fair run for their money, which is more than the shareholders in some mining companies get.

Mr. R. P. Roberts, the newly-appointed chief metallurgist to the Mount Lyell Company, arrived on Saturday last, and has taken up his duties. Mr. Roberts hails from the mining state of Montana, U.S.A., and, judging by appearance, is in the prime of life, and carries about with him the hustling characteristics of the typical American. Some people are predicting that the advent of the new man will be productive of considerable changes in connection with the company's reduction works department.

Reports are still current that further administrative changes will shortly be made in connection with the mining department of the company. It is understood that Mr. E. James, assistant engineer at the mines, has resigned his position, and will shortly leave for the mainland; and, if rumor be correct, the board has under consideration a scheme of reorganisation which will bring about important alterations in administration as far as direct supervision of the company's mines is concerned. However, while the writer does not place a great deal of credence in all the reports which are in circulation, it is just possible that the near future will show that some of them, anyway, are not far wide of the mark.

---

During the last three months 3175 tons of ore were delivered to the Metals Extraction works, with net return to the Tasmanian Copper Company, after payment of treatment charges, of £3880. The Metals Extraction Company have advised that furnace troubles are now only of mechanical nature, and can be overcome. The acting manager confirmed his opinion that the Merton furnace will give the required roast; his roasting returns substantiate this. The contract with the Tasmanian Copper Company will be carried out in its entirety.

A syndicate of Melbourne and Tasmanian investors have provided £3200 for the purpose of developing the copper-nickel deposits in the Zeehan district, over which the Broken Hill Proprietary Block 10 company held an option, which it abandoned. The work done by that company is considered to have proved ore bodies of sufficient value to be worth working, although not large enough for the company's requirements.

A deputation representing residents of Zeehan recently suggested to the Premier that something should be done by the Government to further prove the Zeehan Flat and open it up at shallow levels, so as to permit tributers to operate, and had a sympathetic reception. The deputationists had no detailed scheme to submit, but they made clear to the Premier what they wanted, and he promised to lay the matter before the Minister of Mines, and to earnestly confer with Mr. Mulcahy and the expert officers of the department to see what could be done in the matter.

The Sydney syndicate who have taken an option over the South Renison Bell and adjoining section, North Dundas, are expected to start work next month. During the option period of twelve months the syndicate have to maintain a minimum expenditure of £50 a month on the South Renison Bell section, and £30 a month on the other. The syndicate's capital is £3000, and if the option is exercised the vendors will receive £800 cash and 11,000 shares out of 60,000 shares of £1.

The Round Hill silver-lead mine, West Devonport, has produced about 900 tons of galena, containing 500 tons of lead and 30,000 oz. of silver, since the present company commenced work, but it has only been worked spasmodically, and no regular output was forthcoming until lately. The tributers have lately put on more men, and expect to considerably increase their output.

## WESTERN AUSTRALIAN MINING.

(From Our Correspondent.)

Kalgoorlie, August 11.

On March 31, 1913, the ore reserves of the Great Boulder Perseverance were estimated as 498,260 tons, assaying 24s. 9d., equivalent to a recoverable value of 22s. 3d. per ton. Since then 82,541 tons have been treated for a yield of £81,232, or 19s. 8d. per ton, and a loss was incurred of £928. The Perseverance is the only mine whose ore reserves are estimated every three months, and the difficulty of arriving at a reliable estimate can be gauged from the results. Estimates are oftener over than under the mark, Mr. Hamilton of the Great Boulder being the most conservative. During the last six years the gold per ton actually recovered on the Great Boulder has averaged 93.7 per cent. of Mr. Hamilton's estimate.

The second intrusion of granite in the Greenfinch at Westons at 60ft., only 16ft. below the first intrusion, appears to foretell the early doom of the adjoining Edna May and other leases on the same line of country. The fear of the granite sooner or later cutting off the lodes at Westons has all along made speculators who had visited the district very chary in investing in the shares of the mines there. For instance, the reef in the Edna May was driven on at 70ft. from the boundary of the Myrtle on the east for a distance of 250ft. west towards the Greenfinch's Recovery lease, in which the granite intrusion has cut off the lode. The whole of the ore taken from this drive was milled at the Greenfinch mill for a return of £10,250 from 1307 tons, or £7 16s. 10d. a ton. In addition, 114 tons, broken in sinking a winze 40ft. deeper, returned £1170, or £10 5s. 3d. per ton. These returns are exclusive of gold in residues, variously estimated at 30s. to 40s. per ton. A crosscut on the east boundary proved the lode at that point to be 44ft. wide, of an assay value of 55s. per ton, while the crosscut, 150ft. west from the shaft, which collapsed, passed through 23ft. of ore assaying 56s. per ton before junctioning with the drive at the 70ft. level. With such developments the price of the 41,250 issued shares would have reached a far higher figure than 45s. apiece had the bugbear of granite not made investors chary of investing in the proposition. The Edna May lease comprises 22 acres, and the adjoining Septum 24 acres. The company also holds an option on the Myrtle East, situated 8 chains east, the price asked being £3000 in cash, and one-tenth share interest.

The Associated Northern Co.'s Victorious venture at Ora Banda is not proving the success anticipated. July's return of £7758 from 8573 tons, or 18s. 1d. per ton, with a profit of £320 only, coming on top of the June return of £8148 from 8487 tons, or 19s. 2d. per ton, with a profit of £1266, hardly justifies the dividend of 1s. per share, or £17,500, payable this month. The July return includes high-grade ore broken from the intermediate drive at 50ft. from No. 3 east winze and the stope immediately above it. This winze, down to 69ft., averaged 186s. 8d. per ton, and the first 30ft. of the intermediate drive 240s. per ton, so that the rest of the ore treated must have been very low-grade, when, with the addition of some of this high-grade material, an average of only 18s. 1d. per ton was reached. The ore-shoot is reported to be richer underfoot at No. 5 level, but, until further development is done, no improvement in grade or profits need be looked for.

The South Kalgurli Consols, since the amalgamation with the Hainault, has not been doing well. Just prior to the amalgamation in March the South Kalgurli treated 50,000 tons for an average extraction of 23s. 2d. per ton, but, since then, the grade has fallen, and, during July, was only 21s. 3d. per ton, and the result was a loss of £360. The poor result during July may be the result of Mr. John Morgan's illness, as he has been quite incapacitated from superintending operations. However, taken in conjunction with the recent poor returns from its neighbour, the Boulder Perseverance, it looks as if the mines on the eastern side of the belt do not maintain their values at depth.

During July the Oroya Links Co., in addition to showing a profit of £1783, accumulated a gold reserve of 279 oz., or £1180, the best return since the previous gold reserve disappeared a year ago. The mine is now almost entirely dependent for its output from the Eclipse-Croesus Proprietary leases, which are unreliable, though a lot of money is being spent to enable developments to be prosecuted below the 750ft. level of the Croesus Proprietary lease.

The water supply in the main shaft of the Siberia Consols is gradually increasing, and should the improvement continue, a milling plant will be installed in order to thoroughly test the values of the mine at various points. An enormous tonnage of ore can quickly be developed once cheap crushing is procurable. Specimens of the rich ore obtained at the 184ft. were exhibited at Adelaide prior to the flotation of the company, but no attempt was made to open out, as the Government battery only runs at long intervals, when 1000 tons of prospectors' ore is available, and, even then, costs are prohibitive, owing to the four miles' cartage involved, and to the fact that the water supply is only sufficient for one shift, and watchmen have to be paid for doing nothing the other two shifts out of every day's work.

## VICTORIAN MINING ACTIVITIES.

### Bendigo and District.

(From Our Correspondent.)

The gold production for the week ending August 16th, 1913, amounted to 3486 oz. 6 dwt. The principal producers were Golden Pyke, 371 oz. 6 dwt.; Central Red, White and Blue, 307 oz.; Spring Gully, 243 oz. 10 dwt.; South New Moon, 230 oz. 10 dwt.; Carlisle, 177 oz. 15 dwt.; Ironbark, 169 oz. 17 dwt.; Princess Dagmar, 136 oz.; Great Northern, 119 oz. 6 dwt.; Williams United, 112 oz. 2 dwt.; Suffolk United, 98 oz. 18 dwt. Two dividends totalling £4400 were announced, viz.:—Central Red, White and Blue, 2s., £3200, total to date, £128,000; Spring Gully, 1s., £1200, total to date, £74,400.

Johnson's Reef have uncovered 2ft. of spurry quartz, and an east back carrying 9in. to 12in. of more regular stone, in the 781ft. west intermediate crosscut; a few colours of gold showing. The east back is apparently the same associated with the trough stone in the Princess Dagmar 867ft. workings, at about 240ft. from the boundary and 260ft. further north. The auriferous character of the quartz suggests greater permanency in the payable quality of the stone in the next mine, with the chance of the shoot extending well into the Johnson's No. 2 lease. The original intention was to continue the crosscut to the east back of the Golden Age old reef, some 30ft. or 40ft. further west, but it is more likely that the programme will be varied and the gold-bearing stone opened up southward immediately by driving off the crosscut. As previously indicated, the quartz is allied to the synclinal fold, which has here a very steep north pitch. These unusual geological conditions will make it difficult to keep in touch with the stone. To work the reef systematically, it may be necessary to drive south from the Princess Dagmar 681ft. crosscut, a distance of about 170ft. Meanwhile the resources of the trough stone and east back will be fairly well ascertained by prospecting above the intermediate crosscut.

Princess Dagmar prospects have been greatly enhanced by the finding of gold-bearing quartz in what appears to be the same trough channel in the adjoining property, at 20ft. from the boundary. The bedded quartz and spurs have the same character as in the 867ft. south intermediate level, and there is about 240ft. of solid ground to open up between these points. During the week the prospects in driving were less encouraging for a couple of breakings, but toward the close the outlook improved again, and there is now a strong probability of this stone and the trough of the Golden Age reef being irregularly connected. Two stopes are following the level above the timber on payable stone, one stope being in commission north of where the rise will be started during the next few days, to connect with the 781ft. north crosscut. Instead of resuming operations in the three stopes near the north boundary, which extend to 53ft. overhead, it is proposed to continue the latter stope through to these workings, and make the stoping overhead more general, to increase the tonnage. In these upper stopes the same minor fault seen in the Golden Age mine is visible where the richer shoot of quartz existed. The return exceeded general expectations.

Golden Age met with an encouraging development with the second firing in the 655ft. north level from the north shaft, several colours of gold showing in the bedded quartz along the footwall. This portion of the reef is 4in. to 6in., the crushing material being increased by the spurs extending to the hanging walls, but these veins are yet of low grade. Up to the present the hanging wall has carried very little stone. The end of the level is estimated to be about 160ft. from the Golden Pyke boundary.

Golden Pyke are extending the stopes above 643ft. from the rise connecting the 543ft. south level, at 150ft. from the shaft. The stope north of the rise will be followed with interest, as it will reveal how far the rich shoot of stone, seen in rising opposite the shaft, extends. As this stope approaches the No. 1 rise, the bottom of the shoot is likely to be disclosed. Though not as rich, the stone for 60ft. of rise at 150ft. south of the shaft proved of profitable quality. Good stone is being drawn from the 543ft. north stopes, while the outer reef is also furnishing its quota of payable quartz from above 447ft. In advancing the 447ft. north level on the main reef, the workings appear to have got out of position in consequence of the back being faulted by a slide. Recognising the error, the formation has again been picked up by breaking across east, and presents a very favourable appearance. Though no gold was seen in the first breaking, the stone is considered payable. An improvement in this end would enhance Constellation prospects. Preparations are being made to extend a crosscut to the same back at 743ft. The crosscut will need to be continued another 80ft., and as the stone is extending under the 643ft. level, there are possibilities at the greater depth.

New Shenandoah not only proved the main west back over 500ft. to be gold bearing above the faulting encountered several weeks ago, but have ascertained that this west leg continues intact above the old 432ft. workings, where it is 8in. thick. A rise is to be started from the latter crosscut to determine the position of the cap. Another strong fault will probably be met before reaching the turnover, and the location of the cap will depend on the amount of displacement by the break.

### Daylesford.

(From Our Correspondent.)

The North Ajax have early met with encouragement in opening up at the 600ft. level, a foot of payable formation being intersected about 10ft. from the shaft. The stone is considered to be the same make as that followed north and south at the lower level. The shaft is to be cut down another 100ft.

The North Nuggety Ajax is looking brighter than of late. Some particularly nice quartz is being broken in the north end at No. 6, and west of the main stopes operations will soon be resumed on rich leader country. The brown make at No. 2 level continues to produce its share of serviceable milling ore. The main shaft is to be sunk a further lift. The company, as a result of its last yield, is once more on the dividend list, and on present appearances the output for the current month's milling will prove a profitable one also. There is a rumor afloat that one or more of the Nuggety Ajax group of mines may be placed under offer to an English syndicate. Of course, the Dame may prove a lying jade.

The Central Ajax have started to cut out ready for driving at the No. 8 level, where it is fully anticipated the downward continuation of the western vertical will be intersected. The quantity of ore milled this month will be much larger than hitherto, the while 20 heads being kept going.

The Frenchman's Reef are at present operating upon a quality of stone that will bear comparison with the best this company has ever had. For a width of a dozen feet south from the rise it is of really good value, and a crosscut driven in west on the formation discloses a face of similar value for the full distance. The matter of deepening the shaft is likely to have favourable consideration.

The lode met with by the new North Lord Roberts on the surface has been laid bare for over 20ft., and maintains its width of fully 5ft. of payable value. The stone is being grassed for milling while preparations are making for the erection of the winding plant.

### Castlemaine and District.

(From Our Correspondent.)

Spring Gully came right up to expectations during the past fortnight. Including the specimens mentioned last week, a crushing of 218 tons yielded a net result of 243 oz. 10 dwt. This enabled the directors to forthwith declare a 1s. dividend, and still allowed a credit balance of £500 to stand. Something will also be added to the reserve fund. The mine is looking very well at present, payable gold being in sight in each of the leading faces. The north level at 170ft. has uncovered the slide, and it is showing

6in. of payable stone. In the 240ft. north level gold-bearing spurs are showing in the face, while at 200ft., where the crushing came from, nice stone is showing in both the intermediate levels.

At South Wattle Gully the outlook all round is improving, and there are many movements in shares as a consequence. At the 300ft. level the drive on the west leg is now out 36ft. from the east back, and the reef is 18in. thick. As the drive is extended more gold is showing. The No. 2 rise has been put up 23ft., total 45ft. A reef at the back of the rise is 3½ft. thick, and stone has been risen on which is guaranteed by the manager to be 15ft. in thickness, while he also thinks it is payable. Gold has been seen frequently whilst breaking down.

The movements at Campbell's Creek are becoming a little more lifelike. Some months ago it was reported that all the shares of the Little Nuggety mine had been placed. There has been considerable delay in collecting the first lot of money, but it has now been so far advanced as to begin fixing a day for beginning to work. As a consequence, the country right along that line of reef for miles has been pegged out. A party of Melbourne men have pegged out several leases on the chance of something good coming from the Little Nuggety.

The syndicate operating in Rees' old shaft at Chewton has cleaned out the shaft and eastern crosscut. There is a big body of stone in the latter, and it will be driven upon to the north.

Campbell's Creek bucket dredge has now got over the 100 oz. mark per week. The returns are highly payable. For the past two weeks returns have averaged 103 oz. per week from the double plant.

## Malmsbury and Metcalfe.

(From Our Correspondent.)

The latest report from the Malmsbury Alluvial mine is that the main reef drive is in 539ft., which is 98ft. past the No. 2 bore. The country is wet. A lode formation 8ft. wide has been gone through, and it consists of slate and quartz. The third bore will be put up, and a rise will be started east of the No. 2 bore.

The Hanover mine, at Drummond North, has got the main drive south out 200ft. Reef is 6in. wide, and well-defined and heavily mineralised. A little gold is showing, with a good flow of water from both faces.

New Galatea Energetic mine has commenced baling. The machinery is working well, and it is expected that sinking will be resumed within a week.

Hubber and Sons continue working their claim in a small way with satisfactory results to themselves. Their last clean-up was 25 oz. 2 dwt. from 11 tons.

At Metcalfe the revival is still causing interest to be shown in the possibilities of the field. Over 40 men are at work, and the various crushings, although somewhat infrequent, continue to average highly. Reed and Keath are getting fine prospects in their mine, and a fortnight ago they put what they called second-class ore through the mill. The net result was 115 oz. retorted gold. They have a battery of their own, and are now busy crushing their own stone. The new shaft is down 150ft., and they expect to cut the old reef at about 300ft. Poppet legs and engine house have been erected, and the engine winch and winding plant are in full swing. A dozen miners are employed.

Seamon and party are down 30ft. in the old shaft, and are also sinking another one. There the reef has been cut, and is showing gold. A crushing lately of 7 tons returned 26 oz., and another lot is being paddocked.

Rennie and party have a good-looking prospect in Gamble Bros.' paddock. It is thought to be on the same line as that worked by Mr. Sorenson further along in the same paddock. The reef has been traced for a good distance along the hill. The shaft is down 15ft., and a crushing is being taken out. Mr. Sorenson's show gave 21 oz. from 7 tons last week.

Gamble Bros. are down 30ft. in their shaft. A big lode is showing, about 6ft. wide, and gold-laden. Driving is being done, and stone being stacked for the battery.

Swainson Bros. are also sinking and breaking out stone from the same place as a five-ton parcel came, which returned 14 oz. gold.

Some individual miners are making wages on the hills.

At Taradale J. Beer has taken up a lease on the old Plutus reef. He has got to work quickly. The crosscut has been finished, and a good body of stone is showing in the face, carrying much mineral and a little gold. The main shoot of gold should be cut within 20ft. The reef is said to have fissure veins intersecting for two sides, and to be one of the longest gold shoots in Victoria. The footwall is composed of diorite and carbonaceous slate. A crushing is being taken out.

## Maldon.

(From Our Correspondent.)

There has been nothing fresh during the week at South German mine. On Wednesday last "visiting day" was utilised by many shareholders to view the scene of the recent discoveries. Among them were Mr. "Grif." Williams and Mr. Phillips. The intermediate drive north off bottom of winze below 1750ft. level is now in about 85ft. The stone in the face is about 3ft. wide in the lower part, and in the back of the drive it tapers out to a few inches. While the stone is of nice appearance and well mineralised, recent values are not maintained.

The first dividend distribution to the shareholders in the recently-floated Oswald Gold Mines has taken place. The payment is 1s. per share, absorbing £1250.

New Day Dawn has had all hands busy excavating site, and installing air compressor and rock-drilling plant. The drills should be in operation in a fortnight, when the opening up of the payable gold-bearing reef found on the surface and both underground lodes will be gone on with.

---

# THE COAL MINING INDUSTRY.

## New South Wales.

### Northern District.

(From Our Newcastle Correspondent.)

The Miners' Wages Board, under the chairmanship of his Honour Judge Edmunds, has continued to take evidence respecting the claim of the Colliery Employees' Federation that all small coal won with the picks should be paid for at the rate of 1s. 6d. per ton. The case for the miners has been closed, and that for the proprietors has been entered upon. The witnesses for the miners were men who have worked in the mines for many years, and who were able to say that the present sliding scale for the payment of large coal was agreed upon at a time when small coal had no marketable value. Therefore they contended that, seeing they forewent payment for small coal at that time, they should now receive something, when small coal is selling up to 7s. 3d. per ton. In support of their contentions, it was pointed out that Mr. Jesse Gregson, formerly superintendent of the Australian Agricultural Co., had agreed to the payment of a certain rate for the winning of small coal in the New Winning colliery, (Sea Pit), and the miners there are still paid on the basis of that agreement. At the Glebe (Newcastle company's) pit, the men also receive something for small coal. They held that their case was further strengthened by the fact that the colliery proprietors, at the time that payment for all coal won was made compulsory, tacitly admitted that they were not paying anything for small coal, as they bargained with the men to accept one-eighth of a penny per ton for it at that time, so as to comply with the law. Had the proprietors been paying for the small coal in the rate they paid for the large, they would have said so at that time (the men contend), and would thus have answered the Government of the day when it insisted upon payment for all coal won. The case for the proprietors has only just been entered upon; but the evidence and the arguments adduced are directed to showing that the men's contentions are wrong, and that it has always been recognised that the men were paid for the small coal in the price fixed for the round. As already mentioned, the matter is creating much interest in mining circles, for if the men obtain only a small sum for small coal, it will mean increased expenditure to some of the pits, and a corresponding advantage to the miners. When this matter is disposed of, the Board will enter upon consideration of the claim put forward on behalf of the miners of the Maitland field that the afternoon shift should be abolished. This also is an important matter, closely affecting the interests of both masters and men.

Pelaw Main colliery, in the Maitland district, has been idle for some days, owing to the wheelers objecting to go in until certain roads had been watered. They alleged that the dust in them was very bad; the management, on the other hand, stated that there was nothing to complain about, and that the men's check inspector had been down the mine since the new fan had been installed, and had reported that all was right. At the time of writing, the matter was still in that condition, although the officers of the Colliery Employees' Federation were endeavouring to get the men to return to work, and have the dispute settled by lawful means.

At the last delegate board meeting of the Colliery Employees' Federation, it was decided to send a deputation to interview the Minister for Labour and Industry in Sydney, relative to the disputes at the Lambton B and Stockton-Borehole collieries. On meeting the Minister it was pointed out by the deputation that the disputes at these mines had been running for some time, and that as the Wages Board was engaged on the small coal and afternoon shift questions, it would not be wise to refer the disputes to that tribunal, and so delay decisions in respect of those two important matters. As a way out of the difficulty, the deputation urged that a conciliation committee should be formed to settle the disputes at the two pits named. The Minister decided to take a certain course in the matter, and asked the colliery proprietors to meet him. They replied that the time was too short, and also pointed out that the Wages Board had been delayed through the men not being ready to continue their case in the small coal claim. If the disputes had to be decided, they said, they should come before the Wages Board. Reference has been made to the Board in the Pelaw Main dispute, and probably the other disputes will also come before it.

The output of coal from the Newcastle and Maitland mines continues large, and the Railway Commissioner has promised to provide additional facilities for the loading of coal at the port of Newcastle. In addition thereto, it is stated on good authority that a private company, which now has a considerable frontage to deep water, will within the next two or three years erect an enormous coal-bin, from which vessels may be loaded by means of shoots in a very short time, on the American principle.

### Southern District.

(From Our Wollongong Correspondent.)

Except that a rough sea, the effects of a gale away to the south, stopped shipping, the week has been one of good work for the coal mines. There were fears that the late strike would have caused a loss of trade, but that has not ensued; the trade has been taken up at the point where it left off, and has continued as before. The Mt. Kembla mine has, for this pay, a full fortnight—the fourth in succession; usually, the average is a day less. There is no doubt that if the Railway Commissioner could supply more trucks, and the sea would not get rough, the output of coal from this district would just now be very great.

Something in the nature of a creep has recently occurred in a part of the Mt. Kembla mine, and a quantity of pillar coal has been lost; extension, however, continues, and next quarter there will be places for about 20 more miners. The demand for coke also keeps the ovens all going. For the new plant, which is to get the Coalcliff colliery small coal, the plans are understood to be about ready; it was expected that a beginning would have been made on the site ere now. The design for the ovens is stated to be a German one. Mr. G. Hyde, the promoter of the company, was also the founder of the present industry at North Bulli, and will thus be interested in two important coking plants in the district.

The collieries award, which expired, says the chairman of the Wages Board, at midnight on the 9th inst., has been, on the initiative of the Minister for Labour and Industry, extended for three months, or till such time as a new one has been gazetted. Mr. Bowling, the secretary of the Colliery Employees' Association, represented to the Board that the members thereof would brook no delay in the formulation of the new award and its gazetting, as they anticipated that in present conditions any change made would be in an upward direction. To this it was retorted that it was remarkable, supposing the members of his association to be so keen for a new award, that they had been so long in putting forward their claims, which had not yet been received, and upon which the next proceeding waits. The facts are that with a president of the union and a secretary busy trying to wipe one another out as leaders of labour, the business of the award has not been receiving quite the amount of attention which would satisfy impatience. Some lodges (three, I believe) have, in view of the feud between the president and secretary, sent in motions to the effect that a special meeting of the delegate board be convened to arrange for a ballot of the district to be taken on the question of Bowling or Willis. The executive are manifestly in no hurry to comply with these requests.

### Western District.

(From Our Correspondent.)

Lithgow, August 14.

The Lithgow collieries and district are complaining bitterly of their treatment by the Railway Department regarding the supply of trucks. Though there is plenty of work for the men they are continually losing time because the mineral cannot be got away. This morning it was expected that nearly, if not all the mines, would have to close down for the day.

# ENGINEERING AND ELECTRICAL SECTION

Australian
General Electric Co.
217 Clarence Street, Sydney.
Tel.—Central, 3495, 4397; City, 2381.
"Penfold House," Cr. Queen and Little Collins Sts., Melbourne.
Tel.—Central, 2647.
Representing—
GENERAL ELECTRIC CO., U.S.A.
The
BRITISH THOMSON-HOUSTON CO. LTD., of Rugby, England.
The GUARANTEE of EXCELLENCE on GOODS ELECTRICAL

## TRAMWAYS AND THE GREATER MELBOURNE COUNCIL.

### The Premier's Views.

Nothing much came of the conference which the Victorian Premier, Mr. Watt, held last Thursday with representatives of the Melbourne, South Melbourne, Richmond, Hawthorn, Camberwell, Coburg, and Brunswick councils, respecting the protest of the Melbourne Tramway and Omnibus Co. against two lines of tramway which it is proposed to lay, on the ground that they threaten to compete with the company's lines during the currency of its lease. The Premier sought to obtain from the deputants an expression of opinion on behalf of their respective councils as to the interpretation to be put upon the Tramways Act, and he assured them that if any such competition threatened to result in financial loss to the company they would find Parliament very reluctant to go behind the spirit of a contract. The provisions of the Act might be construed as meaning that new tramways could not be built in that area during that particular time if the Melbourne Tramway Co. objected. There was also the view that there were certain rights reserved to Parliament which might enable it to grant construction privileges to other bodies. It was conceivable that the Melbourne Tramway Co. might suffer an assessable loss. This suggested a clause in the new measure to provide for compensation. Apparently the members of the deputation had not been apprised of the precise point which it was intended to raise, and they had come with no definite proposal. Councillor Dureau, of Hawthorn, who claimed also to speak for Richmond and Camberwell on this point, said that they would be prepared, if there was any infringement of the company's rights, to have compensation fixed by some arbitration body agreed upon. On the other hand, Councillor Strangward, of South Melbourne, strongly objected to such a proposal, as he considered that the company had neither moral nor legal claims to compensation. Parliament had four times already amended the legislation on which the company relied—in the cases of Prahran, St. Kilda, Kew, and Hawthorn. He said that the new tram lines would not materially compete with the existing cable trams, and that the Railway Commissioners' objections on the score of competition had been overridden by the Railways Standing Committee. The Premier asked the deputation to consider the matter again, and he would invite them to see him later.

More interest attaches to a second deputation, representing the municipal conference on the tramways, which over a year ago forwarded to the Premier a draft Bill embodying the scheme of municipal control upon which the conference had agreed after long and frequent discussion. Mr. R. Beckett, M.L.C., introduced the deputation and expressed its views. The Melbourne tramways control, he said, was the biggest municipal proposition that had come before them since 1890, when the Metropolitan Board of Works was constituted. Councils had combined their forces, and Melbourne, as a whole, was prepared to speak with one voice. The principle underlying the entire question was that there should be a complete pooling of the whole of the tramway system as against a number of small trusts. At present there were at least fifteen tramway propositions before the different municipalities, and at least one-half represented sound business proposals. They objected to a number of small trusts. The Bill presented to the Government provided that the whole of the propositions for Melbourne and suburbs should be remitted to a responsible body, which could be brought into existence without delay. He would not presume to say that the Bill was perfect or that it was the "last word" on the subject. But they thought it contained the groundwork of a practicable scheme, and they desired that it should be brought into effect at once. If the principle adopted by the conference and approved by the councils were accepted, the "pool" burden would be borne by the whole of the suburbs.

In reply, Mr. Watt said he had read the Bill prepared, though not microscopically, and there were many things in it which would need alteration, and he enumerated three. He did not think a Government with any degree of sense could ask Parliament to entrust any authority with the complete control of all tramway construction and routes. Parliament would reserve to itself the right to pass Bills which would finally decide the routes of any extension. They had an enormous property, on which they were going to spend a large amount of money in electrifying. The task of Parliament was to knit up the travelling facilities now in the hands of the Government with those outside, for the service of the people. Then there was the question of tolls and fares, and he did not think Parliament would give away its own powers in relation to these. The borrowing power was a very important matter; Parliament would never give to any authority the right to borrow in unlimited sums. No matter what debenture holders might say, it was not conceivable that any State body should get into financial difficulties by loans raised under Parliamentary authority. A limit was placed to the borrowing powers of all kindred bodies which Parliament had created. He agreed that there was a danger with regard to odd tramway extensions. When in England he had discussed with eminent authorities the system of laying out tramways, and he thought Melbourne, with its unexampled situation, could, if given a chance, provide the most excellent tramway system on the face of the earth. They would have to see if it was possible to get in Australia or from abroad some expert to provide them with some future tramway "lay-out." One mistake might prove disastrous to the whole system. The Government contemplated trying to get Parliament to agree to a Greater Melbourne Council, and one of the most important powers they hoped to confer on that body was that of tramways. If the Greater Melbourne Council proved unacceptable to Parliament, he thought the Government was bound to push on with some such proposal as the deputation suggested. The Government realised the responsibility of the situation, and was not unmindful of the work the councils had done in the matter. It was a subject which could not be treated hurriedly, but they proposed to get the Greater Melbourne Council Bill passed this session. It would be his duty to let the deputation know the determination of the Government.

---

From every direction proposals for new tramway extensions crop up weekly. The latest, which emanated from the Footscray council, is for a line to connect that suburb and Williamstown with Braybrook, which is at present connected only by an unsatisfactory railway service. The other two councils concerned have been invited to send representatives to a conference on the proposition.

Two definite applications were made last week for municipal sanction to motor 'bus stands to supplement existing suburban tramway services while affording means of travel to areas lying between existing routes. The town clerk of Melbourne informed the Prahran City Council that an application had been received from Withers and Sons' Motor Char-a-banc Company Limited for motor-'bus stands to be fixed at the intersections of Commercial-road and Green-street with Chapel-street to connect respectively with South Melbourne and the Richmond railway station. The Prahran council expressed satisfaction with the proposition submitted, and, of course, consented. The Richmond council, however, when approached as to the one line, adopted without discussion the recommendation of its works committee, that the railway station site is unsuitable, but that a motor omnibus service along Church-street, from Victoria-street, North Richmond, to Windsor, would be well-patronised, and that the council would be favourable to a motor omnibus stand being fixed near the corner of Victoria and Church streets.

---

## POSTAL ELECTRICIANS' AWARD.

### Telephone Service Chiefly Benefited.

### 99 Per Cent. of Revenue Swallowed.

When the Prime Minister, Mr. Cook, a week or two ago quoted a report attributed by him to the Federal Public Service Commissioner, Mr. D. C. McLachlan, that the effect of the Postal Electricians' Award would be to eat up 99 per cent. of the revenue, he needed to have been more precise, and his statement would then have been justified. Accompanying the award when it was laid on the table of the House of Representatives on Wednesday of last week, was a memorandum from Mr. McLachlan dealing with the matter in extenso, and the conclusion come to is that as "the officers concerned in the award are mainly employed in connection with the telephone service," and as "salaries and wages alone of persons employed in positions directly connected with the telephone service amount at the present time to 85 per cent. of the total revenue obtained from that source," and as "the additional salary expenditure which will follow on the present award will increase the total expenditure on salaries of this particular section of officers concerned by at least 14 per cent.," "the result will be that practically the whole of the telephone revenue of the Commonwealth will be swallowed up in salaries and wages alone."

The following are passages extracted from the P.S.C.'s memorandum.—

"Generally, the award grants substantial increases upon the rates prescribed in the public service regulations, and in its provision for payment to junior mechanics upon an age basis and not upon experience makes a radical departure from the practice which has hitherto been followed in the public service, and introduced an entirely new principle. In the grades of officers above the 'junior mechanics' material increases in salary have been awarded, which will have an important effect upon departmental expenditure. There are at present 980 permanent employees directly concerned in the award, and the nature of the increased expenditure which will accrue from its adoption will be gathered from the fact that for the first year of its operation, as applied to the number of employees mentioned, the additional cost will be £19,575.

"As the estimates for the current year provide for a total staff of 1304 permanent employees of the classes affected, and appointments to that number are being made as rapidly as possible, and as it is inevitable that a large advance upon this number will be requested in the forthcoming estimates, it can be confidently stated that the adoption of the award will entail an increased cost of at least £30,000 per annum in its application to salaries alone. The greater portion of this increased cost will be absorbed by the following classes of officers, whose salaries will be raised as shown hereunder:—Mechanics: Minimum salary, from £144 to £168; maximum salary, from £168 to £186. Senior mechanics: Minimum salary, from £174 to £198; maximum salary, from £186 to £216. Foremen mechanics: Minimum salary, from £198 to £228; maximum salary, from £276 to £306."

At some length Mr. McLachlan shows that whereas persons employed in private establishments work 48 per week and on 313 days in the year, the Commonwealth employee will, under the award, be required to work only 44 hours per week. He receives three weeks' annual leave, public holidays amounting to two weeks, and the average absence on sick leave is one week. He, therefore, actually only works 46 weeks, of 44 hours, in each year, and for an equivalent remuneration the outside employee gives 23 per cent. more service.

"There are approximately 1300 employees who will be directly and immediately affected by the present award. These employees will now give each two and a half hours less service per week than hitherto. The average actual service of permanent officers is 46 weeks in each year. Thus, during the year, 115 hours less time will be worked. Multiplying this by the number of employees gives a result of 149,500 hours, or approximately equal to the time of 68 employees, or, expressed in monetary terms, an estimated amount of

£10,000 per annum. If the same rule be applied to the remainder of the service, it will be seen that no inconsiderable sum is involved.

"It is prescribed that the wages therein awarded shall be paid to the employees specified if they are members of the claimant organisation. It is not clear that the other sections of the award are equally restricted in their application, but it may be assumed that, even if not so definitely expressed, that is the intention. In such circumstances, it will be necessary, if the award be adopted, to take such action, either by regulation or otherwise, as will ensure that the conditions of the award may apply to any officer employed under the designations in the award, who are not members of the claimant organisation: otherwise, so far as they are concerned, the existing rates of pay and other conditions would continue to operate. This would practically mean punishment for refusal to become members of the organisation."

## THE FITZROY DOCK IMBROGLIO.

### Boilers 30 Years Old.

### History of the Transaction.

Considering that the cost to the Commonwealth of the Fitzroy Dock, Cockatoo Island, Sydney Harbour, was £867,000, that in spite of this it was found necessary to temporarily close it down, and that the Government now proposes to ask Parliament for an appropriation of £175,000 in order to bring the concern to a state of efficiency, the following outline of the transaction, for which Senator Millen, Minister of Defence, is responsible, will be read with interest.

"According to the papers in the Department, negotiations were opened between the Commonwealth Government and the Government of New South Wales for the building of cruisers at Fitzroy Dock early in 1911. In March of that year the New South Wales Government agreed to do the work, stating that the whole of it would be completed in 26 months from the receipt of plant and the order of material. The terms of the New South Wales Government were accepted by the Commonwealth a month later, but it was not until August of that year that an agreement was prepared. In this agreement the date of the contract was fixed as 1st August. The keels of the Brisbane and the two destroyers were laid on 25th January last, and the keel of the third destroyer has not yet been laid. Concurrently with the negotiations for letting this contract correspondence took place as to the transfer of the island and dockyards to the Commonwealth. This project was strongly reported against by Captain Clarkson, the member of the Naval Board, who urged that a shipbuilding establishment should be erected on some other site. A little later Captain Clarkson further reported:—

"'In my opinion Cockatoo Island dockyard has neither the staff, organisation, nor facilities for building vessels for the Royal Australian Navy with either efficiency, economy or despatch. I consider that if the proposal to build vessels there is carried out the result will be disastrous.'

"Matters at the dock apparently did not proceed either to the satisfaction of the Naval Board or the State Government. The latter appointed a committee to administer the yard, while the Naval Board was anything but satisfied with the reports reaching it as to the conduct and progress of the work. I will give some idea as to the condition of affairs if I give the following extract from a report of the engineering overseer, who represented the Naval Board at Fitzroy dock:—

"'The material (that is, the material arriving for the construction of the Brisbane) is now lying on the island exposed to the weather, and if something is not done to put it in a proper rack, many pieces will be ruined and others will be rendered much harder to work into the ship. I consulted the engineer superintendent in the matter, but he said that he would have nothing to do with the material until the contract was signed and he received definite instructions.'

"The multiplicity of matters of this kind evidently induced the board on 9th July, 1912, to represent to the Minister that the position at Fitzroy was very unsatisfactory, and that there was grave risk of failure by the State Government to complete the building of the war vessels. The board pointed out that action by the Commonwealth seemed urgent, and that the only solution seemed to be the taking over of Cockatoo Island by the Commonwealth Government. Negotiations to this end were followed, and were completed towards the end of 1912, and the transfer was effected as from 1st February of this year. Soon after taking over the island, the electrical engineer of the city of Sydney wrote pointing out that there would soon be required increased power at the dock. This communication was referred to the board, which replied that the position at Fitzroy Dock was a very serious one, as the power plant was running with a heavy overload, and might at any time break down. The board recommended calling in an independent engineer, and Mr. G. A. Julius, of Sydney, was deputed to inspect and report. That was on 18th March last. His report was received on 30th July, and here are some extracts from the document:—

"'The whole of the boilers, of which there are six, are practically worn out. All of them were, I believe, secondhand boilers when installed, and at the present time considerable repairs have to be effected every week end to keep them running for another week. Many of the motors are excellent machines, whilst others are obsolete, and practically worn out. The cables transmitting power from the power station to various parts of the island are in a bad condition, being run without system, and in such a way as to break every regulation for the safe running of electric cables. The electrical equipment, as a whole, is in a very faulty and inefficient condition, and it is quite impossible for the electrical engineer on the island to meet the requirements of the dockyard with the present plant. It is impossible to keep things going, even at the present poor rate, without continuous and excessive maintenance expenses, which should be absolutely unnecessary. The present power plant consists of a miscellaneous group of steam electric sets, some supplying current at 110 volts, and others at 240 volts. Of these machines, of which there are eight, there is not one suitable for incorporation in any power scheme adequate to meet the requirements of the island.'

"It must be remembered," continued Senator Millen, "that Mr. Julius was particularly deputed to report on the power plant, and he says, 'The whole of the boilers are practically worn out.' Upon the receipt of that report it was at once considered by the Naval Board, and the following minute came on to me:—'I am of opinion that the board, having received this report, can pursue no other course than to immediately order the fires of these boilers to be drawn and the boilers disused until a survey can be made by a board of engineer officers. This will entail the suspension of a number of men for at least a week, in the case of a favourable report being received. On the other hand, if the boilers are condemned as the result of this survey, the work of construction must be stopped until other plant can be provided or other arrangements made.' That was the minute of Captain Clarkson, concurred in by the two other members of the board. In these circumstances, and in view of the grave position disclosed, there was, I submit, no other course for me to follow than to approve of the minute. This I did. As has already been announced, the power plant has been closed down and the examination proceeded with.

"Of fourteen boilers examined five have been condemned. The ages of these are respectively 22 years, 28 years, 29 years, 29 years, and 30 years. They were originally used for locomotive work, and those taken from the Countess of Hopetoun and the Protector. Other boilers have been passed as fit for service under limited pressure. The report induced the Naval Board to address a letter to the acting manager of the dockyard, stating that the board was of opinion that obvious and necessary precautions, which common experience had shown to be absolutely necessary for the safe working of steam boilers, would appear to have been neglected. The board of survey had found thick deposits of slime and scale on tubes, stays and plates, and in the case of the locomotive type boilers the lower tubes were buried in sludge. The examination of the thickness of plates and the condition of the tubes of five boilers pointed to the fact that these boilers had been working for years in an extremely dangerous condition, and the Naval Board was of opinion that if the condemned boilers had been working much longer under these conditions an explosion would have been inevitable. The letter stated that the board recognised that the power resources of the dockyard were partially crippled, and indicated that the pressure gauges on some of the boilers were not working accurately. Directions were therefore given to have these examined and tested, and the working pressure clearly marked on their dials.

"Owing to the condemnation of the boilers, instructions were given a few days ago to the acting manager to see what additional boilers he could obtain. I believe two are already under offer, and I anticipate that in the course of the next few days considerable advance will be made towards supplementing the power required. I should like to repeat here a statement that I have previously made that, in my judgment, the Commonwealth is landed in an extremely doubtful bargain. However, I hope to make a statement before long dealing with this aspect of the case. It is somewhat difficult to identify plant as set out in the schedule of value, but as far as the officers of the department can advise me, something like £40,000 worth of plant and appliances is practically worn out, and will need to be replaced as speedily as possible. A large additional expenditure will also be required to put the yard into a fit condition to do the work expected of it. Quite apart from the question of cost, the delay in the completion of the vessels now building is very serious. These boats should have been ready under the original plan to have joined with the Australia on her arrival, and thus complete the unit. It is quite clear now that they cannot be completed in under two years, and probably in the case of the larger boat a little longer."

## TRANS-AUSTRALIAN RAILWAY.

### Engineer-in-Chief's Report.

A report, prepared by Mr. Henry Deane, Engineer-in-Chief of Commonwealth Railways, and relating to the construction of the trans-Australian line between Port Augusta and Kalgoorlie, was laid on the table of the House of Representatives on the 12th inst. by the Assistant Minister for Home Affairs, Mr. H. W. Kelly.

On the much-disputed question, whether karri or jarrah is the more suitable for sleepers, Mr. Deane states that it is confidently anticipated that while jarrah sleepers are known to have an average life of only about fourteen years, karri powellised will last double the time. Jarrah timber had the unfortunate peculiarity of shrinking away from the spikes, so that with time the spikes became loose. Karri, on the other hand, had the property of closing round the spikes and holding them tight.

The hope is expressed that before there is any urgent necessity to obtain further locomotives, the internal combustion principle will have sufficiently developed to permit of engines of sufficient size being built. Offers to manufacture had been received, and two propositions were now under consideration. The chief advantage due to their use would be in the saving of water and the avoidance of repairs to boilers, which in a dry country, with highly mineralised water, would be exceedingly large. Moreover, an internal combustion locomotive would do a much greater annual mileage than a steam locomotive, and there would, therefore, be a saving in the number required. Two American track laying plants were now being put together, and as soon as the required number of the 40-ton bogie waggons had been delivered the plant would be attached, and would be ready for work. There were now 113 miles of rails and 58 miles of sleepers at the Kalgoorlie end of the line, and 88 miles of rails and 66 miles of sleepers at the Port Augusta end, besides those already laid in the roads, and these supplies and those in prospect would be adequate to maintain a steady progress.

The progress of permanent way and works, Mr. Deane says, has been considerably delayed through the Commonwealth having to design and build by contract every vehicle required upon the railway, as the gauges of the existing State railways at both ends of the line are of a different gauge to that of the trans-continental line itself.

Reference is made by Mr. Deane to the announced intention of the South Australian Government to construct a 5ft. 3in. line from Adelaide to Port Augusta, with a separate station and wharfage facilities for purely State purposes at Port Augusta. "I have no hesitation," he states, "in submitting that in my opinion the adoption of a 5ft. 3in. gauge, thus causing a break in continuity at Port Augusta, would be a great mistake from a national point of view. The necessity for uniformity of gauge should, in my opinion, be kept in view, and uniformity in this case would afford an unbroken line from Adelaide to Perth, and would at the same time obviate the necessity for dual station accommodation at Port Augusta, and the heavy cost of building a new wharf. These items, of course, so far as they relate purely to expenditure, are State matters, but the gauge matter, I submit, is a national one, and as such I am including it as a subject on which, as it appears to me, the Commonwealth Government would be justified in taking action."

Exclusive of supplies obtained locally by the supervising engineers, and of the cost of freight from West Australian ports to Kalgoorlie, the material already contracted for and in part received will cost £1,405,769, and the freight will add considerably to that amount. It is estimated that rolling stock yet to be ordered for construction and traffic purposes, will involve the expenditure of an additional £210,200. This includes six 8500 gallon water-tank waggons, estimated at £850 each; 12 guards' vans at £1000; 10 internal-combustion locomotives at about £8000 each; 4 ballast ploughs at £250 each; 4 passenger cars at £2500 each; and 10 louvre vans at £400 each.

In reply to a question in the House of Representatives on the 12th inst., the Prime Minister, Mr. Cooke, stated that Mr. Henry Chinn, who had been appointed by the late Ministry as supervising engineer at the Kalgoorlie end of the railway, had been dismissed, though he declined at that time and subsequently to assign the Government's reasons for that step. It is stated, however, that in replying to a Press representative who sought information, Mr. Cook said: "I want to let the matter drop and be forgotten." On

Mr. Chinn's removal, Mr. Hobler, deputy engineer-in-chief, took charge of the Kalgoorlie office.

In the Senate on the 13th inst. Senator de Largie gave notice that he would move for a select committee to inquire whether Mr. Chinn had been fairly dealt with by the Government. Meantime, Mr. Johnson, Minister of Works in Western Australia, has come to the relief of all parties in his dispute on the instructions to "ease off" in the supply of sleepers, by stating that Mr. Chinn had undertaken the responsibility of holding up this national work, because of the industrial trouble on the works. Mr. Cook may thank Mr. Johnson; Mr. Chinn hardly will.

The Assistant Minister for Home Affairs, Mr. Kelly, has made the following statement respecting the slow progress with the line, which has been the cause of much criticism.

"With reference to comments which have been passed on the rate of progress of the Kalgoorlie to Port Augusta railway, it may be pointed out that Mr. Deane was appointed engineer-in-chief for the construction of the line on December 1, 1912, when, of course, a staff had to be organised. In Mr. Deane's report (as consulting engineer) of September 20, 1911, presented to Parliament at the time of the passing of the bill to authorise the construction of the line, it was recommended that the proper way to proceed was to spend the first year collecting plant and materials, and, at the same time, doing what work was necessary in the way of formation of depots at each end of the route. After the first 12 months had elapsed, and plant and material had been collected, would be the time to push forward with the real work of construction. Owing to the press of work in railway construction throughout Australia, it was found impracticable to buy suitable rolling stock, new or even secondhand, and, consequently, a staff of draughtsmen had to be established to work out designs of the requisite rolling stock, and early in 1912 steps were taken to this end." This, Mr. Kelly explained, was not completed until May 6, 1912, and he considers that Mr. Deane's "twelve months" should rightly date from then. He adds:—"Drawings and specifications were then prepared, and tenders were publicly invited for the construction of 100 40-ton bogie-waggons. On November 14, 1912, a tender was accepted. The contract for this first and most important set of waggons was given to the Clyde Engineering Company Ltd., who undertook to supply 10 waggons on June 21 last, 18 waggons on July 21, and similar quantities on the 21st of the following months, until the whole order was completed. Had the Clyde Engineering Company Limited carried out their contract 28 waggons would now be available, whereas only two were ready for shipment from Sydney on August 8. With the supply of the waggons, in accordance with the terms of the contract, facilities would have been secured to push on the work of track-laying."

## MELBOURNE TRAMWAY COMPANY.

### Motor 'Bus Proposal.

The report of the Melbourne Tramway and Omnibus Co., presented at the annual meeting on the 12th inst., showed that the profit for the year, after paying three shillings per share in dividends and bonuses for the year, and including £95,991 brought forward from the previous year, was £202,754. From that the directors proposed to pay a final bonus of 1s. per share (£48,000), to carry to the reserve for return of capital, making it £480,000, £105,741; leaving a balance to carry forward of £49,013. The traffic receipts had improved by £34,181, and 4,284,810 more passengers had been carried than during the previous year. The balance-sheet showed assets to the amount of £1,762,872, consisting chiefly of stock and plant at valuation £172,325; loans on fixed deposit at face value, £391,276; municipal and other debentures at cost, £843,665; freehold properties, £221,346; cash in hand, £4907; and loan on mortgage, £89,300. The liabilities consisted of capital paid up, £480,000; reserve accounts, for dividends, £50,000; to safeguard investments, £20,000; for depreciation of properties and plant, £255,000; for return of capital with interest accumulations, £374,258; for renewal of tramway and other purposes, £258,679; sundry creditors, £58,055; and Bank of Victoria, £63,887.

Mr. F. B. Clapp, who presided, in moving the adoption of the report and balance-sheet, said that the past year had been a particularly good one for the company, and the position was especially satisfactory when they considered that such a large sum of money had been granted as increases by the wages boards. It only showed the elasticity of the business that they could do that and still pay in dividends 4s. per share, instead of 3s. as in the previous year. The great prosperity of the country and the promise of an excellent season warranted him in saying that they would have a considerable increase of revenue in the coming year.

The report having been adopted, a shareholder raised the question of the company's motor 'buses; when would they be started? To this, Mr. Clapp replied: "We are just waiting to see the result of the trials, and so on. We are keeping in touch and getting information wherever they are running. At present we are not putting them on, but when it becomes necessary we shall have all the information and shall be prepared to act."

Another shareholder, who had evidently bought in when shares were at a pretty high value, remarked that during the company's career shares had risen as high at £9 and fallen as low as 6/8, and expressed anxiety as to what would be ultimate repayment on the shares. Mr. W. G. Sprigg, one of the directors, replied that the shareholders must judge from the figures presented to them as to what would come out of it. Shareholders should remember that if they took large dividends they should consider some of the money as representing the final payments to them. Some shareholders had sold at £9 per share, and reaped the benefit. The directors had no more knowledge than the shareholders of what the next three years would bring forth. When the time approached it would be necessary to arbitrate as to the value of the properties taken over. The shrinkage assets, such as the cars, etc., had been largely written down, so that they might fairly stand in the balance-sheet as shown. The profits in the future might be greater or less than in the past.

The retiring directors and the auditors were re-appointed.

## BRITISH AND EUROPEAN DEVELOPMENTS.

(From Our Correspondent.)

London, July 11.

An application is to be heard shortly in which the National Telewriter Co. seek an extension of their telautograph patent.

The Perth Electric Tramways Limited held an extraordinary general meeting in London on 4th inst., at which the resolution for voluntary liquidation was passed. Mr. O. Wethered presided, and said that the step followed upon the disposal of the undertaking to the West Australian Government, and as soon as the resolution had been passed and duly confirmed, they could at once make a distribution, which would probably be £1 per share. The balance of the assets would be distributed as soon as the necessary details of the liquidation were carried out. Mr. A. P. Stoneham, in seconding the motion, paid a tribute to the Government for their pluck and foresight in purchasing the undertaking, and for the businesslike way in which they had handled the transaction. The Government raised money at 4 per cent. to pay for the undertaking, and would doubtless be able to make 10 per cent.; it had made a very good bargain.

Mr. Hugo. Hirst had nothing but prosperity to report to shareholders of the General Electric Co. Ltd., who met in London yesterday. The annual statement was mentioned in these notes a week ago. In referring to the increase in dividend on the ordinary shares from 7½ per cent. to 10 per cent., he said that the ordinary shareholders had pursued a most unselfish policy in the past, and had been content with 5 per cent. for a considerable period, preferring to make the company's position sound rather than to take big dividends. Now that loose plant, tools, patterns and sundry utensils were written down to £1, fixtures and installations to £1, goodwill and patents to £1, and freehold land and buildings £193,755, and fixed plant and machinery to £76,500, and by a recent valuation the last two figures had been shown to be over £100,000 less than actual value, they felt that they were justified in returning to the dividend which they used to enjoy before they started their big manufacturing enterprises. The company has about £160,000 invested in its different trading companies abroad. Some of them had started contributing towards their dividend, while others had very considerable establishment charges to their debit, and would only contribute towards revenue when these establishment charges had been wiped off out of profits. The difficulties of the past year were touched upon only very briefly. They included the National Insurance Act (cost to the company between £3000 and £4000), and the effects of the coal and railway strikes, which, coming when the world was passing through a period of unprecedented enterprise, caused great stagnation in the supply of raw material, and all prices were considerably above the average. Copper, iron, coal, lead, everything during the year seemed to have inflated value. There was labour unrest and a great difficulty in securing efficient men in skilled trades. That symptom of labour unrest was still very much to the front, and were it not for this uncertain state of affairs the outlook in the electrical industry continued hopeful. "There is an ever-increasing demand for electrical power for use in small and big industries. Every day brings forward some new, useful apparatus which brings electricity more and more into the service of man. We are on the threshold of a big development in electrical heating and cooking. The greater perfection of Tungsten lamps . . . thousands of the most able minds are occupied in evolving newer and still more efficient illuminants, and success seems very probable. The development of wireless telegraphy and telephony is making rapid strides. The electrification of railways is coming fast. . . . A company, such as ours, interested in every branch of electrical engineering, keeping a watchful eye on every new manifestation of electrical activity, must see a bright future in these new and far-reaching vistas of useful work and progress."

The Electric Construction Company Ltd., of London and Wolverhampton, has issued a very satisfactory report for the past year. It has quite recovered from its earlier trials, and its ordinary dividend again shows an appreciable advance, going up from 3½ per cent. to 5 per cent. The works have been fully employed during the year, "and better prices having prevailed, a further improvement in profits is shown in the accounts," while the orders on hand are described as "satisfactory."

The hiring out question in connection with domestic electric heating and cooking apparatus continues to command a growing interest. Glasgow, in expressing its own views recently, has voiced the complaint of many other electrical undertakings as well—it feels itself distinctly at a disadvantage compared with gas undertakings under whose auspices gas stoves are sometimes given out free, while gas fires are let out on the hire-purchase system. The Stoke-upon-Trent Council has to be added to the list of electric supply authorities resolving to buy cookers in order to hire them out, and there is not the slightest doubt that this hiring movement will continue to spread and grow until the amount of business done along such lines will be very large.

The Court has given its decision in favour of the London Electric Wire Co. and Smiths in the trolley wire design infringement case referred to in these notes last week.

London, July 18.

Mr. Herbert Samuel, the Postmaster-General, has been bombarded with questions respecting the proposed Wireless Chain contract during the past week, a number of members of the House of Commons displaying the keenest anxiety lest the Government proposals relating to the Marconi stations and system shall be adopted by Parliament without the carefullest possible investigation being made of the merits of other systems, the Goldschmidt and Poulsen systems being specially mentioned. The anxiety is being shown by others as well as by politicians, and writers in the Press are urging the Government not to tie its hands in regard to the future. Dr. Milne, the celebrated seismologist—whose name undoubtedly carries a good deal of weight, both inside his own scientific circle and among newspaper readers who know nothing first hand about wireless telegraphy but are anxious for a scientific leading in such a matter—wrote a long letter to the "Times" the other day discussing in some detail the subject of supersession and scrap heaps, which every electrical man knows have become so big a consideration in modern electrical engineering, his comments being applied expressly to the developing state of the science and application of "wireless." Probably the argument will not appeal with the same cogency to the mind of the man who has followed the course of wireless discovery and achievement, and who sees little reason to fear that the British Government, if it signs this agreement, will find itself left alone with something "obsolete" (Professor Milne's word) before very long. But I mention the letter as an example of the factors that are at work in connection with this affair just now, and have to be reckoned with. It is the same sort of thing as one hears said in city streets and restaurants, and is perhaps a consequence of the events which have set the public all a-talking about a matter and a position that only specialists can really fully grasp, and men of affairs can only obtain a reasonable knowledge of after fairly close study, and under the advice of experts. The public has had its suspicions aroused once, and though these may have seemed to be groundless as time went on, the said public is not wanting champions who are eager to see that only the right thing is done this time. Maybe the Postmaster-General will succeed, by the numerous answers to questions, in silencing advocates of other systems, and will satisfy the House that the present proposals, mentioned here last week, are the only ones that can be proceeded with, and everybody who desires there to be no further delay in proceeding with this Wireless Chain, profoundly hopes that the question of system is not going to be put off again and again because something else "may" come along. The Postmaster is stating very plainly that what he wants is proof of performance, not guarantees, the latter being quite inadequate in absence of the former.

Even as I write these lines news comes of further controversy. A Member of the House of Commons, taking exception to Mr. Samuel's refusal to allow any other company besides the Marconi Company to tender for the Imperial Chain, moved the adjournment of the House, and secured a long debate, which automatically came to an end, without a division, because "Big Ben" struck eleven. The merits of the other systems were referred to in some detail. Leaders on the Opposition side of the House pleaded and argued for the matter to be put up to open tender, if only for a week, leaving the Post Office experts to decide. One speaker said: "If this contract is carried through without the House of Commons having the advantage of an authoritative report on an open competition, it will be nothing less than a public scandal." Lord Robert Cecil emphasised the necessity for "avoiding the appearance of favouring the Marconi Company." Mr. Samuel was, however, immovable. The Poulsen and Goldschmidt systems, no doubt, gave great promise, but "there was a difference between promising experiment and proved capacity." Only one—the Marconi—was, in the opinion of his advisers, capable of doing the work of the Imperial Chain, why, then, invite tenders? That very day he had been advised by the Engineer-in-chief to the Post Office, the President of the Institution of Electrical Engineers, and other authorities, that it was not advisable to invite tenders from the Poulsen and Goldschmidt companies at the present moment. And so, after a few words from Mr. Austen Chamberlain, who preferred delay rather than the making of the Marconi contract, the matter ended.

The Institution of Mechanical Engineers is holding a two days' meeting at Cambridge University on July 29th and 30th. The subjects to come before the meeting include the following:—Prof. Bertram Hopkinson on "A New Method of Cooling Gas Engines"; Mr. R. S. Whipple on "Modern Methods of Measuring Temperature"; Mr. R. W. Allen on "Modern Pumping Machinery for the Drainage of the Fens"; Mr. G. H. Roberts on "Engineering Research and Its Co-ordination"; Mr. R. B. Creak on "Modern Flour Milling Machinery."

Following upon the very optimistic statement by Mr. Hirst respecting the future of electrical industry, we have an equally hopeful one this week from the chairman of another old-established electrical manufacturing concern—the Electric Construction Co., to whose results I referred a week ago. This gentleman, Mr. P. E. Beachcroft, ventures the belief that the electrical industry has only touched the "fringe of the future," being on the threshold of an era of general prosperity. Electrical machinery, he predicted, would be the "motive power of the world" in the future. An enormous amount of work had to be carried out by the various electrical undertakings in this country alone, and the comparatively small percentage which the E.C.C. had obtained and the satisfactory results that they were able to show thereon, gave every reason to believe that increasing trade would benefit them. Extensions at the Wolverhampton works were proceeding, and he believed that although the company had had an exceedingly good year during 1912, their output in the future would probably be doubled.

In different parts of the United Kingdom dissatisfaction is occasionally expressed at the charges imposed by electric supply authorities upon the owners of cinematograph picture shows. Concessions have been granted in a number of places, which means that the number of applications for considerate treatment are not likely to become fewer. At Glasgow an agreement was arrived at under which all current for projector purposes will be charged for at 1½d. per unit flat rate. The Edinburgh cinematograph people have now petitioned for projector current to be charged at power rate, instead of lighting rate.

Much interest has been excited by the announcement lately made from Germany that a few months hence new lamps will be placed on the market by several well-known makers, which will consume only one-half watt per Hefner candle. Little more than the bare announcement has yet been made, but both the A.E.G. and the German Osram firm are mentioned as having such lamps available. They will be for the largest sizes, not for the everyday private consumer's requirements. It will be as well if I give here the exact wording of the announcement made by the A.E.G. representative at the annual meeting of the Vereinigung Deutscher Elektrizitätswerke, held in Breslau: "The A.E.G. is about to place a wolfram wire lamp on the market, manufactured in accordance with a new process, which, while retaining all the former advantages of these lamps, has an energy consumption of only 0.5 watts per c.p., as compared with the previous consumption of 0.9—1 watt. The lamp gives a brilliant white light. At first, these lamps will only be manufactured for high candle powers, and the A.E.G. hopes to be in a position at the beginning of the coming lighting season to place lamps for 1000—5000 c.p., and normal voltages on the market."

Propsals for co-operative or bulk supply arrangements between some of the East London municipalities continue to receive attention. Bethnal Green Borough Council, which has a reputation all its own in respect of electrical backwardness, has at last entered into an arrangement with Stepney Borough Council to take bulk supply from the latter, and so will avoid a big capital outlay for generating station, etc. Shoreditch Borough Council is also likely to negotiate with Stepney for a trunk connection with its generating station to give it a standby supply to the extent of 1500 k.w. minimum. In addition to this, Shoreditch also proposes to enter upon a large alteration and extension scheme at its Whiston Street generating station. New buildings to accommodate 10,000 k.w. of plant, one 5000 k.w. turbo-generator set being first installed therein, are proposed, with various steam and other equipment, switchgear, etc. The intention is also to get rid of five dry-back boilers and a couple of generating sets at the older power station at Coronet Street, making room for rotary converters to take the high tension supply from Stepney. The foregoing and other changes and additions will involve an outlay of close upon £100,000, but the fuel cost saving is put down at about £5000 per annum. Readers who recall controversies of old respecting the efficiency or otherwise of combining refuse destructors with electricity works' plants, will remember that Shoreditch was one of the first cases where performances were most closely scrutinised. Since those days electricity works have not been expected to show such wonderful results as the direct consequence of combined operation, the destructor being adopted more on its own merits as a sanitary and inoffensive method of getting rid of refuse, than for any ability to afford a cheap steam supply to the station engines. But it will perhaps be of interest to state that the Shoreditch destructor last year furnished sufficient steam for the generation of 715,823 units, valued at £1461, a slightly smaller volume, and £300 less than in the previous year.

The plant supersession question has forced itself forward at another London generating station, namely, Fulham, where it is proposed to at once instal a 2500 kw. tubo-alternator, taking out two 600 kw. Musgrave engine sets to make room for same and for other plant that will be required later. This station, which is of less than 4500 kw. aggregate capacity, at present contains turbine sets, high speed vertical plant, and low speed horizontal type.

The unfairness of the competition of the motor-bus with the tramway, which has to bear all sorts of burdens from which the former is at present exempt, is being brought forcibly to the notice of a large number of members of Parliament, who have been circularised on behalf of all metropolitan tramway undertakings in and around London, during the last few days. Mr. Goodyear, manager of the Croydon municipal tramways, and a very prominent member of Tramway Managers' and other like associations, has sent out the memorial referred to, in which he mentions that all tramway authorities in the area will find themselves in a serious financial position soon, and have to be a burden on the rates if free and unrestricted and untaxed competition is allowed to continue.

## PORT PIRIE ELECTRIC LIGHT.

### Duplication of Plant.

It is only two years since the Port Pirie (S. Aus.) Town Council launched its scheme for supplying the residents with electric light, but the demand has been so persistently increasing that the resourcefulness of the municipal engineer, Mr. O. J. Burt, has been severely taxed to keep pace with it. For the past nine months the plant has been working almost every night at its rated capacity, and on Saturday nights at considerable overload. Fortunately the plant is of very solid construction, and ample margin of power was allowed on the engine and producer plant by reason of which it has been able to carry this overloading. To cope with the increasing demand for electric light and power the Corporation recently decided to duplicate the plant, and tenders have been accepted for another generating set and additions to the distributing system and power-house plant.

The successful tenderers for the power plant portion of the extension were Messrs. Clutterbuck Bros., of Adelaide, who installed the present engine and producer plant. The new machinery is built according to the very latest English and Continental style, and its design embodies several improvements and outstanding features, a brief description of which will be of interest.

The gas-producing plant is of the "Mond" type, manufactured by the Power Gas Corporation, of Stockton-on-Tees, England, and consists chiefly of the following:—Generator or producer, dust-collecting box, cooling tower, rotary washers, scrubber, rotary blower for delivering blast. Slack coal is fed into the hopper fixed at the top of the producer, and is gasified by the means of a blast of air and steam. The gas produced passes to the dust box, which, by means of baffles, intercepts the particles of dust. After leaving the dust box the gas traverses a large cooling tower, in which a portion of the tarry vapours is condensed. Leaving this, the gas next enters the rotary washers, which consist of a patented rotary cleanser and tar extractor. After the gas leaves these it is almost freed from all traces of tar and foreign matter, but to give a final cleansing the gas is passed through a sawdust scrubber, after which it is conveyed to the engines. The exhaust steam from the engine required to drive the blower is utilised in the producer. A valuable by-product to the council is always made by these plants in the shape of tar, there being as a rule 16 to 17 gallons produced per ton of fuel burned. In plants having a capacity of 1000 h.p. and upwards, another by-product is obtained in the shape of sulphate of ammonia, and where this is done the combined revenue from sulphate and tar is generally sufficient to meet the entire fuel bill. There are several large plants in England and on the Continent in which the by-products are entirely recovered, and power from these is obtained practically for nothing.

The new gas engine is to be made by the Premier Gas Engine Co., the makers of the engine at present installed. Since the present one was installed, however, further improvements have been made in these engines, and the new one will have two cylinders fixed side by side on one solid bed plate, so that it will be impossible for them to get out of line. The crank shaft will be extended so that the dynamo can be directly coupled on to the engine. This method of direct coupling does away with all belts and the space required for the length of drive. In nearly every instance where plant is put in for power-station work the engine and dynamo are now directly connected. The engine is equipped with forced lubrication and a throttle governor, which controls the speed within such fine limits that the Premier Gas Co. will guarantee to run direct connected alternators in parallel. The springs on all valves are in duplicate, and should one break while running it can be replaced without stopping the engine. These engines are designed for long continuous runs, and for that purpose are of massive construction, and eminently suited for power-station purposes where stoppages of any kind are inconvenient, and reliability of supply is necessary.

For the electrical portion of the extension, tenders were received from the leading manufacturers represented in Australia, and after lengthy consideration the following were accepted for delivery of the machinery only f.o.w. Port Pirie, the Council's staff to carry out the whole of the erection:—75 kilowatt dynamo, by Vickers Ltd., of Sheffield; 50 kilowatt dynamo, by Vickers Ltd., of Sheffield; 3-wire battery booster, by the Lancashire Dynamo Co., England (agents Messrs. Newton, McLaren, of Adelaide); accumulator battery, by German Tudor Co. (Australian Metal Co., agents); switchboard, by Newton, MacLaren Ltd., of Adelaide; concrete poles, by Mr. Freeman, of Port Pirie.

The dynamos are to be of the direct current 440 to 470 volts 3-wire balancing type and filled with inter-poles, the larger machine to be arranged for use with a rotary balancer and the other with a static balancer. Each machine will be direct coupled to its own engine, and will be suitable for parallel running together or with any additional machines that may be installed at a future date. A margin of 25 per cent. overload for two hours has been specified for these generators without any injurious temperature rise. The brushes and rocker gear are to be of substantial design and accessible for adjustment while working, and the specification states that they are to run sparklessly at all loads, the brush position to remain unaltered. Spare armatures, field coils, and armature coils are to be supplied by the makers, and these will be kept in stock to replace accidental damage at any time. This precaution will render any long stoppage through damage to machinery almost impossible.

The booster will be of the hand regulated reversible type and motor driven, and is to be used for charging and discharging the two storage batteries on the 3-wire distribution system. The armatures of the three machines will be direct coupled to each other, and the whole will be mounted on one solid bedplate. The boosters are to be capable of boosting from 0 to 80 volts in either direction with a current of 100 amperes passing through the armatures without undue heating or sparking for a period of six hours. The Council have decided to include the cost of spare armatures for this machine, and also spare field coils to eliminate the risk of a failure of the supply.

The accumulator battery, which will be a duplication of the present one, will be of the well-known Tudor Co.'s make. The Adelaide Tramway Trust have batteries of similar make installed in their converter stations, and most of the largest installations in the world are so equipped.

The switchboard will be of more massive construction than the present one, and will be made up of polished slate panel supported on an iron framework. It will be arranged for the operation of the generators, the battery, boosters and the feeders to the supply mains. The instruments are to be supplied by Messrs. Evershed and Vignolles, of England, and the switches, automatic circuit-breakers and fusers by Messrs. Veritys Ltd., of Aston, England. The whole board will be fitted together and the instruments and control apparatus mounted thereon by Messrs. Newton, McLaren Ltd., of Adelaide.

A feature of the installation will be the octagonal reinforced concrete poles manufactured by a local contractor, Mr. Freeman. Concrete poles, although used widely in America, have not as yet made an appearance in Australia, but owing to the high cost of the wooden article, and the many advantages of the reinforced concrete pole, the Council have decided to instal the latter. They will be sightlier, will last longer, and will be cheaper than the wooden poles. When the new plant is put into operation Port Pirie will have one of the most up-to-date and economical stations to be seen. The new plant has been designed so that extensions can be made when necessary, so that whatever the future demand for light or power additions to the plant can readily and economically be made without discarding any of the present plant.

## MISCELLANEOUS.

It is announced in the New South Wales "Government's Gazette" that it is the intention of the Newcastle Municipal Council to apply to the Governor for permission to borrow the sum of £35,000 for the purpose of electric light extension, and additional works for the supply and generation of electricity and power. The loan will be secured by the issue of debenture or mortgage loan, having a currency of twenty years. The rate of interest will not exceed 5 per cent. per annum.

* * *

Tenders are invited by the Postmaster-General for the supply, delivery, and erection of automatic telephone switchboards, with associated equipment, at the Epping, Ryde, Hunter's Hill, Drummoyne, Wahroonga, Paddington and Waverley exchanges, New South Wales. Tenders will close on 18th March, 1914.

* * *

A damaged plate abaft the engine-room caused a serious leak in the Messageries Maritimes mail steamer, "Pacifique," while on her voyage from Sydney to Noumea, and the vessel has had to return to Sydney and dock.

* * *

The Minister for Public Works (N.S.W.) has stated in the Legislative Assembly that it is not intended to make any proposals in regard to the North Shore bridge during this session.

* * *

In reply to an application by the Newtown (Sydney) Council to the Balmain Electric Supply Company for the abolition of meter rental, the company has reduced such rentals from 10d. per month to 6d.

* * *

Rumours have for some time been current, writes our Wollongong (N.S.W.) correspondent, that it was the intention of the Colonial Sugar Company to remove their refinery from Pyrmont to Port Kembla. The Pyrmont site has been resumed, and it is understood that the refinery will have to go somewhere else. It is tolerably certain that this company is now negotiating for the acquisition of the site of the Australian Smelting Corporation Liquidated, at Port Kembla, which, since the ignominious collapse of that enterprise, has been in the charge of a caretaker, thousands of pounds' worth of new machinery lying rusting on it in a salty atmosphere. There are two offers for the site, it has transpired; one from a smelting proposition, and on the strength of this prospect a company has been formed, and has acquired a site for the erection of a hotel on a place which will rank it as the largest in the Illawarra district. There has also been speculation and an advance in land values.

* * *

The Board of Examiners of Engine-drivers have submitted to the Minister for Mines (Mr. Edden) their report upon the examinations held in terms of Section 46, Mines Inspection Act, 1901, for licenses to test and examine boilers upon metalliferous mines. The examinations took place at Sydney, Cobar and Condobolin on 20th May last. The successful candidates were:—Sydney, E. Treffom; Cobar, E. Knight.

* * *

The receipts of the Brisbane tramways during July were £26,205, as compared with £23,059 for July, 1912, showing an increase of £3145.

* * *

A poll of the ratepayers of Colac shire (V.) is to be taken shortly as to whether the council should enter into an agreement with the Silvertown Telegraph Works, Melbourne, to erect an electric lighting plant and supply the town of Colac, the council to have the right to take over the works in ten years' time.

* * *

At a recent meeting of the Melbourne City Council, the remark was made that the Footscray council was making a remarkably good thing out of its contract with the City Council for its electric supply, and, as stated in our last issue, full particulars of this and all other municipal contracts, are shortly to be presented. In the meantime Mr. Carmody, the electric superintendent of Footscray, has presented a report to his council, which shows that, while that council has an undertaking that will ultimately turn out well, it is yet far from being a source of great profit. During the month of July 47,328 units of electricity were registered on the primary meter, for which a sum of £280 3s. 4d. was paid to Melbourne City Council. During the month 18,373 units were sold for lighting purposes, returning £382 15s. 5d., and 9839 units for power, returning £82 8s. 10d.—a total receipt of £465 4s. 3d. Added to the cost of current in bulk was a sum of £134 3s. 3d. for labour, showing an apparent profit for the month of £50 17s. 8d., from which has to be found interest on capital expenditure, depreciation, printing and stationery, and wages of an additional collector about to be appointed. Worked out on a twelve months' basis on the figures for July, the result shown is:—Receipts: From consumers, £5580; equivalent for street lighting, £1500; total, £7080. Expenditure: Cost of current, £3360; wages (present staff), £1608; interest on capital expenditure of £12,000, at 5 per cent., £600; depreciation and sinking fund, at 5 per cent., £600; collector, £150; printing, etc., £100; sundries, £62; total, £6480. A present profit of £600 is thus shown, equal to 5 per cent. on the capital invested.

* * *

A novel scheme is proposed by the Christchurch (N.Z.) City Council, and is embodied in the Christchurch Electrical Supply Empowering Bill, which passed its second reading at the end of last month. The Bill is to authorise the council to expend £30,000 in the form of loans to ratepayers who desire to have electrical installations in their dwellings. The council has already been authorised by the ratepayers to borrow £120,000 for carrying out the Lake Coleridge scheme for the production of the current, and the desire is to obtain the sanction of Parliament to apply a small portion of that loan to encourage ratepayers to use their own power by advancing the amounts necessary to procure its installation, the money so advanced to be repaid in five years. It was stated by Mr. T. W. Davey, when moving the second reading in the House of Representatives, that whereas gas companies were in the habit of monopolising gas fitting, the City Council had no intention of monopolising electrical installation work, and the opposition which contractors in Auckland and Wellington had shown to the Bill was based on an entire misapprehension of its purpose and scope. "If the contractors," he said, "only knew on which side their bread was buttered, they would support the Bill, because it ensured that when their contract was completed they would get their cheque from the Council." The same system proved very successful in connection with sanitation, the repayments having come in more quickly than had been anticipated.

* * *

The shareholders and debenture holders of the British Australian Oil Company Ltd., whose properties are at Murrurundi and Capertee (N.S.W.), have agreed to the terms of reconstruction submitted by the directors. A new company is to be formed, with the same name, with a share capital of £300,000, in shares of £1 each, and a debenture capital of £150,000 first mortgage 6 per cent. participating debenture stock, carrying the same rights and privileges, mutatis mutandis, as those attached to the debenture stock of the existing company. The assets and liabilities of the existing company will be transferred to the new company. Members of the existing company will be entitled to claim for every fully paid £1 share in it, one share in the new company credited as paid up to 15s., and liable for 5s. to be called up as required.

The tender of R. Werner and Co. Proprietary Ltd., of Richmond (V.), has been accepted by State Government for the supply of refrigerating plant for the new Government cool stores at the Victoria Dock, the amount being £29,140. This selection was made in conformity with the usual custom of giving substantial preference to local manufacturers. The tenderer guarantees that, with the exception of some piping, the whole plant will be manufactured in Melbourne. The plant is of an extensive character, and comprises four 100-ton compressors and eleven electric motors, four of which are of 150h.p.; also condensers, coolers and all the appliances connected with the scheme.

* * *

The revenue of the Victorian railways from goods and live-stock traffic during the year 1912-13 amounted to approximately £2,352,000—viz., goods £2,044,000, live-stock £308,000. The figures for the previous year were:—Goods, £2,186,151; live-stock, £320,831; total £2,506,982. In 1900 the revenue from these sources was: Goods, £1,407,056; live-stock, £148,105; total, £1,555,161.

* * *

A British syndicate, to which Messrs. Biggart, Lumsden and Co., of Glasgow, who are members of the Shipbuilding Employers' Federation, belong, has formed an Iron and Steel Corporation, with a capital of £2,000,000.

* * *

The Port of London Authority has decided to send its chief engineer (Mr. F. Palmer) to the United States to obtain the latest information in regard to the handling of meat, with a view to the installation of a conveyor plant at the Albert Dock, and the more rapid disposal of frozen and chilled produce.

* * *

Some uneasiness has been caused in the minds of officers of the construction branch of the Victorian railways by the increasing difficulty of securing adequate supplies of hardwood sleepers and the growing need for the substitution of messmate, the life of which, as compared with that of hardwood, is as 12 to 20 years. So serious has the prospect become that there is talk of having to adopt either steel or concrete sleepers at no distant date. There is abundance of messmate available, but those concerned in preparing a durable track consider this below the standard required.

* * *

An agreement has been arrived at between the Victorian Railways Commissioners and Mr. C. H. Merz, the supervising engineer on the electrification of the metropolitan and suburban railways, with respect to the standard gear for the equipment of rolling stock. Most of the cars now in running on the suburban lines will be used as motor coaches when the services are electrified, but the general arrangement of the underframes, motor bogies and brake gear has been the subject of prolonged correspondence, but, this having been settled, it is now proposed to proceed with the purchase of the materials necessary to have the work carried out at the Newport Workshops. When the whole of the suburban services are electrified 729 carriages will be required. Of this number 372 will be motor coaches, and 357 trailer vehicles.

* * *

To save £1000 a year in accountancy is the purpose of the Guaranteed Railway Bill at present before the South Australian Parliament. The House passed a resolution last session to the effect that after a railway had paid for five consecutive years the guarantee need no longer be enforced, but, as the Minister of Public Works explained, a resolution would not override an Act of Parliament, and it had been deemed advisable to secure the wish of the House by embodying the resolution in an Act.

* * *

The Bathurst (N.S.W.) Municipal Council having expended £2000 in drilling 110ft. through the rock on Waterworks' Flat in order to obtain an unlimited supply of water, has abandoned the work. Their adviser in the matter of the expenditure was Mr. J. Brett, who had carried out a divining rod examination.

* * *

The Northern Sydney Electric Light and Power Supply Corporation Ltd. is endeavouring to enforce the signing of the contract for its electric lighting scheme with the North Sydney Council. They claim that as the Council has officially approved of the contract being entered into, this action cannot now be cancelled unless a Court of Law decides that the agreement is illegal. The Council is basing its action on adverse counsel's opinion in regard to the latter point.

* * *

The Bulli (N.S.W.) Shire Council has agreed to requests to extend the electric light along the main road as far as Clifton, then upwards of 10 miles of a country road will be as well lighted as a city street—better, indeed, than most of them, for the installation is much above the average in candle power.

# Tenders Invited and Accepted

It is particularly requested that the information regarding contracts open, and the successful tenderers, be forwarded to The Editor not later than Monday of each week.

The following contractions are used throughout:—S—supply; D—delivery; M—manufacture; C—construction; E—erection; P—purchase; I—installation; R—removal. Where no contractions appear, supply and delivery is understood. The date at the beginning of each paragraph refers to the closing of tenders.

## INVITED.

### Commonwealth.

Specifications, tender forms, etc., for tenders invited for the Postmaster-General's Department of the various States under this heading may be had as follows:—Victoria—Various State G.P.O.'s. New South Wales—Departmental Stores, Sydney, and various G.P.O.'s in other States. South Australia—Adelaide, Melbourne, Sydney and Brisbane G.P.O.'s. Western Australia—Departmental Stores, Perth, and various G.P.O.'s in other States. Queensland—Various State G.P.O.'s. All States—Various G.P.O.'s. If the specifications, etc., may be had elsewhere, in addition, the places will be given in parentheses.

POSTMASTER-GENERAL'S DEPARTMENT, Melbourne.—26th August.—460 coin collecting devices, electrically controlled, as per schedule No. 916.

26th August.—S. and D. of general stores, for a period of two years, from the 1st July, 1913, to the 30th June, 1915, as per schedule No. 912.

26th August.—45,000 swan neck spindles, as per schedule No. 967.

26th August.—500 letter box fronts, as per schedule No. 972.

2nd September.—1000 protectors, as per schedule No. 964.

9th September.—Steel conduit and [illegible] per schedule No. 973.

16th September.—S., D., E. and I. at the Telephone Exchange, Collingwood, Victoria, of a common battery switchboard, as per schedule No. 860, or an automatic, or semi-automatic, switchboard, as per schedule No. 859.

16th September.—Galvanised iron piping and fittings, as per schedule No. 951.

23rd September.—Sulphate of copper, as per schedule No. 956, in the undermentioned quantities: New South Wales, 140 tons; Victoria, 25 tons; Queensland, 55 tons; South Australia, 20 tons; Western Australia, 60 tons.

23rd September.—500 letter box fronts, small size, as per schedule No. 957.

23rd September.—General stores, for a period of two years, from the 1st July, 1913, to the 30th June, 1915, as per schedule No. 913.

30th September.—S. and D. of 1,017,000 pattern "A," and 1,768,800 pattern "B" insulators, at Sydney, Melbourne, Brisbane, Adelaide, Perth, and Hobart, during the years 1913-14, 1914-15, and 1915-16, as per schedule No. 974.

7th October.—S. and I. of electrically driven machinery for operating pneumatic tube services, Central Telegraph Office, Melbourne, as per schedule No. 900.

14th October.—S. and E., at the Telephone Exchange, Melbourne, of a common battery multiple switchboard, as per schedule No. 868.

14th October.—Cable boxes, as per schedule No. 877.

4th November.—D. and E. of eight automatic telephone switchboards at the Ascot, Canterbury, Malvern, Cheltenham, Footscray, Oakleigh, Sandringham, and Williamstown Telephone Exchanges, as per schedule No. 953.

POSTMASTER-GENERAL'S DEPARTMENT, Sydney.—27th August.—(1) Telephones to stores schedule N.S.W. No. 301; (2) switchboards to stores schedule N.S.W. No. 302; (3) lamps, electric, incandescent, to stores schedule N.S.W., No. 304.

3rd September.—M. only, and D. at the Departmental Stores, Sydney, of 900 waterproof capes, as per stores schedule N.S.W. No. 332.

15th October.—450 fire sheets (asbestos), as per stores schedule N.S.W. No. 326.

15th October.—Measuring instruments, to stores schedule N.S.W. No. 303; telephone parts, to stores schedule N.S.W. No. 314; switchboard parts, to stores schedule N.S.W. No. 315.

18th March, 1914.—S., D. and E. at the Telephone Exchanges, Epping, Ryde, Hunter's Hill, [illegible], Wahroonga, Paddington and Waverley, Sydney, of seven (7) automatic switchboards, with associated equipment, as per schedule No. 179.

POSTMASTER-GENERAL'S DEPARTMENT, Perth.—3rd September.—100 miles wire, twisted pair, outside distributing, to W.A. schedule No. 305.

8th October.—Expansion bolts and shields to schedule No. 297.

POSTMASTER-GENERAL'S DEPARTMENT, Brisbane.—27th August.—S., D. and E., at the Telephone Exchange, Brisbane, of 5 sections of switchboard, common battery, multiple, and other equipment to schedule No. 243, specification No. 458.

10th September.—Telephone Exchange, Brisbane, nine sections of a trunk line switchboard, to schedule No. 244, specification No. 461, and the general conditions, drawings, etc., attached thereto.

24th September.—Ironwork, as per stores schedule No. 264; pipes, cast iron, as per stores schedule No. 265; poles, iron, etc., as per stores schedule No. 266; wire, G.I., as per stores schedule No. 269.

POSTMASTER-GENERAL'S DEPARTMENT, Adelaide.—3rd September.—6500 spindles, "J," steel galvanised, as per schedule No. 304.

12th November.—One lamp signalling trunk line switchboard, of five sections, one cable turning section, and one cable storing section, one two-position recording desk, and one chief operator's desk, as specified in specification No. 431, etc., delivered at the Telephone Exchange, Adelaide, as per schedule No. 296.

POSTMASTER-GENERAL'S DEPARTMENT, Hobart.—15th September.—S. and D. of telephone material, as per schedules Nos. T.72 and T.73.

22nd September.—S. and D. of 3 motor cycles, as per schedule No. T.77.

DEPARTMENT OF HOME AFFAIRS—Naval College, Jervis Bay.—25th August.—Wrought and malleable iron railings.

DEPARTMENT OF HOME AFFAIRS—Federal Capital.—15th September.—S. of sect. 1, main power-house switchgear; sect. 2, switchgear for Diesel engine plant.

DEPARTMENT OF HOME AFFAIRS—Kalgoorlie-Port Augusta Railway.—2nd September.—M., S., and D. of 80 lb. steel rails and fishplates; M., S., and D. of iron dog spikes and steel fishbolts and nuts for 80 lb. rails.

16th September.—M., S., and D. of fifty 40-ton bogie waggons.

DEPARTMENT OF TRADE AND CUSTOMS.—26th August.—S. and D. of eight (8) automatic flashing lights.

DEPARTMENT OF DEFENCE.—Royal Australian Navy.—25th August.—S. and E. of an oil storage tank at Garden Island, Sydney.

1st September.—S. and E. of a 500-ton oil storage tank at Flinders Naval Base, Victoria.

8th September.—S. of machinery and accessories for standard 25ft. motor launches, as may be required, for a period of two years from date of contract.

### Victoria.

VICTORIAN RAILWAYS.—21st August.—Armature pinions.

21st August.—Recording air pressure gauges; mantles for petrol and air gas machines; hydraulic jacks.

22nd August.—Electric light globes, for avenue fittings; red oxide in oil.

27th August.—Mild steel bright rolled shafting.

27th August.—8in. wood stave pipes.

27th August.—M., S., and D. of 1500 glass tubes for fire extinguishers.

27th August.—20 sets of speed recorder driving gear.

27th August.—30 sets crane anchors.

27th August.—12 water cranes.

27th August.—M., S., and D. of 364 tons of 1in. steel fishbolts, with steel nuts, for 80 lb. and 100 lb. rails.

27th August.—Hollow chisels and bits.

27th August.—S. and D. of balls and ball races for 70ft. turntables. (Time extended.)

27th August.—C. and E. of steel verandahs at Toorak station.

3rd September.—S. and D. of rolled steel joists, angle braces, bed plates, clips and bolts, for renewal of bridge at John-street, Lilydale line.

3rd September.—M., S. and D. of rolled steel joists, angle braces, bed plates, clips, etc., for superstructure of bridge near Glenorchy.

3rd September.—S. of three petrol engines and pumps for use at Newport Workshops. (Fresh tenders.)

3rd September.—Steel faced machine knives.

3rd September (extended from 20th August).—M., S. and D. of (a) lathe, (b) sawing machine, (c) chisel mortiser, (d) cut-off machine, (e) moulding machine.

3rd September.—M., S. and D. of one truck traverser, complete, with motor, chills and patterns. (Fresh tenders.)

3rd September.—M., S. and D. of one emergency pumping plant.

3rd September.—Girders and superstructure for one railway and cable tramway crossing (complete), for Plenty-road crossing, Queen's-parade, North Fitzroy. (Fresh tenders.)

1st October (extended from 10th September).—Neutral track relays.

5th November.—Copper rod.

5th November.—Locomotive seamless copper tubes.

5th November.—Best Yorkshire iron angle and tees.

5th November.—Best steel boiler plates.

5th November.—Copper plates.

5th November.—100 tons of good machinery cast-iron scrap.

12th November.—Steel channel bars,

**P. & O.** COMPANY'S ROYAL MAIL STEAMERS
FOR MARSEILLES, PLYMOUTH, AND LONDON.
Leave Sydney on the subjoined dates, calling at usual ports.
FIRST AND SECOND SALOON ONLY.

| Steamer. | Tons. | Commander. | Noon. | Melb., 3 p.m. |
|---|---|---|---|---|
| MACEDONIA | 10,500 | Bennett | Aug. 23 | Aug. 26 |
| MALWA | 11,000 | Thompson | Sept. 6 | Sept. 9 |
| MOOLTAN | 10,000 | Haddock | Sept. 20 | Sept. 23 |

PASSAGE MONEY TO LONDON—
Single, £41 16s to £82 10s.
Return, £69 6s. and £123 4s
Return Tickets between Inter-State Ports are available for return by Orient, Messageries Maritimes, and N.D.L. steamers having room.
SPECIAL HOLIDAY RETURN TICKETS to COLOMBO are now issued, available for two months. Fares from Sydney, £45 2s. first saloon, and £31 18s. second saloon.
A. GORDON WESCHE, Superintendent IN AUSTRALIA, 63 Pitt-street, Sydney.

**The COLONIAL MUTUAL FIRE Insurance Company Limited.**
Principal Office: 60 MARKET-ST., MELBOURNE
Branches in all the States
Transacts Fire, Guarantee, Employers' Liability, Marine, Burglary, and Plate Glass, Accident, Workers' Compensation and Live Stock Insurances.
Send for Prospectus
W. TUCKER, General Manager

**Harringtons LTD**
**ANALYTICAL & METALLURGICAL DEPT.**
Lowest fees for all kinds of Assay, Analytical, and Metallurgical work.
Expert Advice on Ore Treatment, Bullion Refining, Smelting, etc., etc. Directed by a qualified Analyst from Messrs. Johnson and Sons, London; Assayers to Bank of England; H.M. Mint, The Council of India, etc.
**HARRINGTONS LTD.**
**386 George Street, Sydney.**

**SPECIAL NOTICE !**
**The Mount Morgan Gold Mining Co. Ltd.**
**ARE PREPARED TO PURCHASE Ores, Concentrates and Furnace Products, containing Gold and Copper, at most favourable rates.**
**ALSO TO INSPECT MINING PROPERTIES with a view to Developing, Financing, or Purchasing same.**
**Address:—MR. B. MAGNUS,** GENERAL MANAGER, MOUNT MORGAN, QUEENSLAND.

**NORD DEUTSCHER LLOYD**

REGULAR SERVICE TO EUROPE.

REDUCED FARES TO LONDON.

TO MANILA, CHINA AND JAPAN.

Via New Guinea and Yap.

Fares to Hong Kong, £40; II., £26.

Full particulars will be sent on application to—

LOHMANN AND CO., General Agents,
7-9 Bridge-street, Sydney.

Ostermeyer, Van Rompaey and Co., Melbourne; H. Muecke and Co., Adelaide; L. Ratazzi and Co., Fremantle; Thos. Brown and Sons Ltd., Brisbane.

---

**A. U. S. N. Co. LTD.**

*Fast, Regular, and Comfortable Passenger Steamers*

(also carrying cargo) from and to

MELBOURNE, SYDNEY, ADELAIDE, FREMANTLE, BRISBANE, and all QUEENSLAND PORTS.

Passage Tickets interchangeable, with other Inter-State Companies, on certain conditions.

Full Particulars at

COMPANY'S OFFICES

at all principal Australian Ports.

---

**The Mount Lyell Mining & Railway**

CO. LIMITED.

Purchasers of **Ores containing Copper, Gold and Silver.** Rates obtainable on application to the Secretary

Manufacturers of **Coke for Smelting and Foundry Purposes, Acids, Etc.**

HEAD OFFICE—
39 QUEEN-STREET, MELBOURNE.
D. G. LUMSDEN,
Secretary.

---

THE

**-PACIFIC CABLE BOARD-**

Cablegrams should be Marked

"VIA PACIFIC."

(Not Charged for.)

The quickest and most accurate route for Cablegrams from Australasia to United Kingdom, Canada, United States, Germany, New Zealand, and Pacific Islands.

This route is owned by Great Britain, Australia, New Zealand, and Canada. Australia being the largest part owner (having one-third interest), the public are urged to support the National Cable.

RATES—

| | Ordinary. | Deferred. |
|---|---|---|
| UNITED KINGDOM .. .. .. .. | 3/- | 1/6 |
| GERMANY .. .. .. .. .. .. | 3/- | 1/6 |
| CANADA .. .. .. .. .. .. .. .. | 2/4 | 1/2 |
| UNITED STATES .. .. .. .. .. | 2/4<br>to 2/8 | 1/2<br>to 2/4 |
| NEW ZEALAND .. .. .. .. .. | 4½d. | Nil |
| FIJI .. .. .. .. .. .. | 8d. | Nil |

DEFERRED RATES (IN PLAIN LANGUAGE ONLY) have now been arranged to most Countries where ordinary rate exceeds 10d. per word.

Enquiries for further information, pads of cablegram forms, maps and tariff cards, address to—

The Superintendent, SOUTHPORT, QUEENSLAND;
The Officer in Charge, 408 Collins-street, MELBOURNE; telephone 2588;
The Officer in Charge, 42 Hunter-street, SYDNEY; telephones, City 1346, City 3684;
J. Milward, Manager in the Pacific, 64 Pitt-street SYDNEY; telephones City 1346, City 3684.

---

HIGH EXPLOSIVES.

OBTAINABLE FROM ALL BOOKSELLERS.

224 pages. Price, £1/1/.

12th November.—20 tons steel ingots.

12th November.—Steel blooms, for crank pins.

12th November.—Locomotive boiler tubes.

12th November.—High-speed tool steel.

12th November.—M., S. and D. of one 15-ton electric crane for Ballarat.

12th November.—Flame arc lamps.

12th November.—Insulated copper cable.

19th November.—10 tons sulphate of copper, best quality, for electrical purposes, battery material.

VICTORIAN RAILWAYS COMMISSIONERS State Coal Mine.—22nd August.—Trinidad bitumen; slate or marble slabs.

25th August.—Voltmeter, slate slabs, "Bristol" steam pressure recorder, ammeters, wattmeter, cast steel rollers.

27th August (extended from 13th August).—S. of electrical equipment.

12th November (extended from 1st October).—S. of rope road haulage engine and electrical equipment for McBride tunnel. (See advertising columns.)

## New South Wales.

PUBLIC WORKS DEPARTMENT.—1st September.—S. of friction hoists in the veal houses, New Public Abattoirs, Homebush.

3rd September.—Efficient steam tugs for use at Bellinger River and Cape Hawke, from 1st November, 1913.

8th September.—C. of suction and rising mains, receiving tank, and engine house, Experimental Farm Water Supply, Grafton.

8th September.—S. and E. of pumping machinery, Experimental Farm Water Supply, Grafton.

27th October.—M. of steel bridge for Wilson River, Wauchope to Kempsey section, North Coast railway.

RAILWAY DEPARTMENT.—15th October.—S. of 13 direct-current motors.

## Western Australia.

GOVERNMENT TENDER BOARD. — 28th August.—Copper firebox tube plates for Railway Department.

28th August.—Steel angles, tees, plates, etc., for Railway Department.

18th September.—One improved lever punching, shearing, and angle iron cutting machine for Railway Department.

## Queensland.

RAILWAYS DEPARTMENT.—26th August (extended from 19th August).—General supplies for 1914 and 1915, for Northern Division schedule No. 1 (fixed quantities), to be for year 1914 only; schedules Nos. 2 to 30, inclusive, are for two years.

26th August.—General supplies for the years 1914 and 1915, for the Southern and Central Divisions.

2nd September.—P. of refrigerating machinery and fittings, as under:—Hall $CO_2$ compressor, with evaporators, brine circulating pump and condensers (with copper coils), and all piping connecting various parts of apparatus; brine tank and ice cans; Hercules ammonia compressor, with condensor and tank, air pump, and all ammonia piping and valves, from suction header to expansion header, and including headers; small vertical steam engine dynamo and wiring; Cameron steam pump, circulating water to cooling tower; vertical steam engine, driving fans in tower, with fans and belting; water cooling tower, including piping and tanks, 1¼in. galvanised brine pipe in building, 3000 lineal feet; 1in. ammonia expansion pipe in building, 5000 lineal feet; Lancashire boiler; building for removal.

TREASURY DEPARTMENT.—29th September.—S. about 1687 tons of cast-iron spigot and faucet water pipes, special castings, and valves, for Maryborough waterworks.

29th October.—C. and E. of central sugar mill at Babinda Creek, North Queensland.

## New Zealand.

RAILWAYS DEPARTMENT.—31st October.—S. and D. of stores for the period from April 1, 1914, to March 31, 1917.

## General.

CITY OF MELBOURNE.—29th August.—5 electrically-driven ventilating fans. (See advertising columns.)

9th September.—S. and D. of electricity recording meters and maximum demand indicators.

16th September.—S. and D. of (a) insulated copper cables, (b) three-phase transformers.

1st October.—Insulated copper cables.

7th October.—Incandescent electric lamps, and single phase transformers.

CITY OF FOOTSCRAY.—25th August.—500 five amp A.C. meters.

CORPORATION OF KADINA (S.A.) (F. W. Harris, Town Clerk).—1st September.—One 60kw. generator, driven from a 100-110h.p. engine, complete with suction gas producer, erected on foundations.

One 500 ampere-hour battery, erected and charged.

1 motor-driven booster (erected).

METROPOLITAN GAS COMPANY (V.) (A. E. Bradshaw, Subst. Secretary, Melbourne).—11th September.—P. of a total fixed quantity of 1800 tons of sulphate of ammonia, to be produced by this company during the twelve months ending 31st August, 1914.

MOUNT LYELL MINING AND RAILWAY CO. LTD. (D. G. Lumsden, Secretary, 39 Queen street, Melbourne).—20th September.—S. of stores (including electrical goods and chemicals) for 12 months ending 31st December, 1914. (See advertising columns.)

OAKLEIGH AND MULGRAVE MUNICIPAL ABATTOIRS (E. Knights, Secretary, Shire Office, Oakleigh (V.)).—22nd August.—S. and laying down a 4in. main, about 16½ chains.

TE AWAMUTU WATER SUPPLY (N.Z.).—21st August.—S. of cast-iron pipes and fittings; spiral steel pipes and fittings; drawn steel tubes and fittings.

ESTATE OF E. L. LLOYD (Executors, c/o Northmore and Hale, Solicitors, Howard-street, Perth, W.A.).—31st August,—P. of mining leases, plant, etc.

# ACCEPTED.

## Commonwealth.

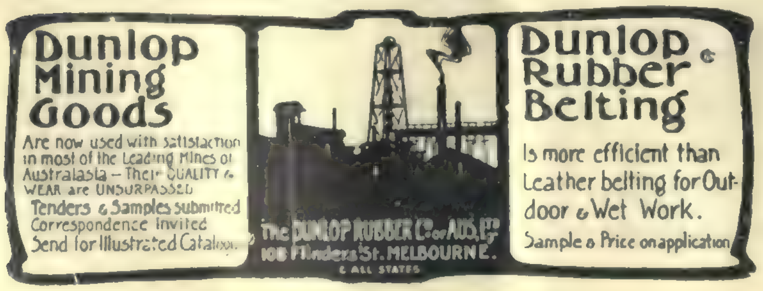
POSTMASTER-GENERAL'S DEPARTMENT, New South Wales.—S. and D. of 30,000 sleeves, jointing, for use with galvanised iron line wire, 0.107in. in diameter, 7s. 3d. per 100; 14,000 sleeves, jointing, for use with galvanised iron line wire, 0.124in. in diameter, 9s. 11d. per 100; 7000 sleeves, jointing, for use with galvanised iron line wire, 0.175in. in diameter, 16s. 11d. per 100; 9000 sleeves, jointing, for use with galvanised iron line wire, 0.196in. in diameter £1 1s. 3d. per 100.—Theodore Zwicker and Co., Melbourne.

S. and D. of 80 boxes, letter pattern, door to be fitted with small posting aperture, 5in. x 1in., £1 11s. 6d. each.—Andrew Thompson and Son Ltd., Gerber-street, Alexandria, N.S.W.

S. and D. of 60 boxes, letter and newspaper, combined, door to be fitted with large posting aperture, 5in. x 1⅜in., £1 4s. 4d. each.—Metters Ltd., Sydney.

POSTMASTER-GENERAL'S DEPARTMENT, Queensland.—6500 copper binders, for use with 400 lb. wire, 8s. 4d. per 100; 14,000 copper binders, for use with 300 lb. wire, 7s. 2d. per 100; 100,000 copper binders, for use with 200 lb. wire and insulators, pattern "A," 5s. 6½d. per 100; 32,000 copper binders, for use with 100 lb. wire and insulators, pattern "B," 3s. 2½d. per 100; 150,000 copper binders, for use with 70 lb. wire and insulators, pattern "B," 1s. 11½d. per 100; 100,000 copper tapes, for use with 200 lb. wire and insulators, pattern "A," 5s. 1½d. per 100.—The India Rubber, Gutta Percha, and Telegraph Works Co. Ltd., Melbourne.

2700 sleeves, jointing, for use with hard-drawn copper wire, 160 mils in diameter, £4 12s. 4d. per 1000; 5000 sleeves, jointing, for use with hard-drawn copper wire, 138 mils in diameter, £4 3s. per 1000; 25,000 sleeves, jointing, for use with hard-drawn copper wire, 113 mils in diameter, £3 15s. per 1000; 15,000 sleeves, jointing, for use with hard-drawn copper wire, 80 mils in diameter, £2 1s. 1d. per 1000; 30,000 sleeves, jointing, for use with galvanised iron line wire, 0.175 mils in diameter, £6 5s. 7d. per 1000; 20,000 sleeves,



Dunlop Mining Goods
Are now used with satisfaction in most of the Leading Mines of Australasia—Their QUALITY & WEAR are UNSURPASSED
Tenders & Samples submitted
Correspondence Invited
Send for Illustrated Catalog.

The DUNLOP RUBBER Co. of AUS. Ltd.
108 Flinders St. MELBOURNE.
& ALL STATES

Dunlop Rubber Belting
Is more efficient than Leather belting for Outdoor & Wet Work.
Sample & Price on application

Note this on every belt.

Be sure you get
"DICK'S"
We know there are numerous imitations. Dick's maintains its high reputation for strength and efficiency. Every belt guaranteed. Sole agents:
JAMES HARDIE & CO.
Melbourne and Sydney.

jointing, for use with galvanised iron line wire, 0.124 mils in diameter, £4 11s. 5d. per 1000.—Brabant and Co., Brisbane.

5000 sleeves, jointing, for use with hard-drawn copper wire, 67 mils in diameter, 3s. 7d. per 100; 4000 sleeves, jointing, for use with hard-drawn copper wire, 56 mils in diameter, 3s. 5d. per 100.—Theodore Zwicker and Co., Melbourne.

37 tons hard-drawn copper wire, 400 lb. per mile, £83 13s. per ton; 19 tons hard-drawn copper wire, 300 lb. per mile, £83 13s. per ton; 258 tons hard-drawn copper wire, 200 lb. per mile, £83 13s. per ton; 35 tons hard-drawn copper wire, 100 lb. per mile, £83 13s. per ton; 104 tons bronze wire, 70 lb. per mile, £92 19s. 10d. per ton; 18 tons bronze wire, 50 lb. per mile, £92 19s. 10d. per ton.—George Wills and Co. Ltd., Brisbane.

5 nauts cable, submarine, telegraph, india-rubber, insulated, light-armoured, in one continuous length, £141 per naut.—Siemens Bros. Dynamo Works Ltd., Sydney.

2178 yards cable, paper-insulated, lead-covered, 39 pairs, 12½ lb. conductor, £195 per mile.—The Western Electric Co. (Australia) Ltd., Sydney.

2552 yards cable, paper-insulated, lead-covered, 52 pairs, 20 lb. conductor, £293 per mile; 1210 yards cable, paper-insulated, lead-covered, 104 pairs, 20 lb. conductor, £423 per mile.—Noyes Bros. (Sydney) Ltd., Brisbane.

8 tons wire, galvanised steel, three strands No. 16 S.W.G., breaking strain 2240 lbs., £13 8s. 9d. per ton.—R. Johnson, Clapham and Morris Ltd., Sydney.

19,441 conduits, glazed earthenware, 2 ducts, 1s. 11½d. each; 720 conduits, glazed earthenware, 3 ducts, 2s. 2½d. each; 1688 conduits, glazed earthenware, 4 ducts, 2s. 5½d. each.—Brunswick Brick, Tile and Pottery Works Pty. Ltd., Melbourne.

5204 yards cable, paper-insulated, lead-covered, 156 pairs, 12½ lb. conductor, £450 per mile; 6800 yards cable, paper-insulated, lead-covered, 208 pairs, 12½ lb. conductor, £549 per mile; 988 yards cable, paper-insulated, lead-covered, 416 pairs, 12½ lb. conductor, £921 per mile.—The Western Electric Co. (Australia) Ltd., Sydney.

7 tons magnesia, sulphate, in 1 cwt. cases, £6 2s. 6d. per ton; 5 tons sal-ammoniac, crystals, £34 5s. per ton.—Theodore Zwicker and Co., Melbourne.

1500 pots, carporous, No. 1, 2s. 3d. each; 6000 pots, carporous, No. 2, 1s. 4½d. each.—The British General Electric Co., Ltd., Brisbane.

40 gross screws, Butterfly connecting, 1.3/16d. each.—British Insulated and Helsby Cables Ltd., Melbourne.

4000 zincs, for Callaud battery, 9.2d. each.—The Lawrence and Hanson Electrical Co. Ltd., Sydney.

1000 zincs, Leclanche, 7in. x ½in., 2.2d. each.—The India Rubber, Gutta Percha, and Telegraph Works Co. Ltd., Melbourne.

## Victoria.

VICTORIAN RAILWAYS.—S. and D. of a secondhand belt driven air compressor and one new receiver for Railway Construction Branch—Item No. 1, belt-driven secondhand air compressor, 1, at £87 10s.; item No. 1a, new receiver for air compressor, 1, at £22 10s.—Goldfields Diamond Drilling Co. Ltd.

P. of certain Westinghouse brake material, £1480 5s.—Westinghouse Brake Co. of Australia Ltd.

P. of an automatic reverse tapper, £11 15s.—Machine Tool Attachment Co.

P. of 4 patent automatic spring shunting levers, £12 1s.—H. A. Thomson.

P. of a quantity of armouring cable, £32 5s. 10d.—A. Adams and Co.

P. of a quantity of armouring cable, £1 18s. 9d.—Noyes Brothers.

PUBLIC WORKS DEPARTMENT.—S. of 30 electric radiators, for use in various Government buildings, without public tenders being invited, £117 15s.—Sutherland and Ashman.

## New South Wales.

PUBLIC WORKS DEPARTMENT.—Construction of electric passenger lift at Parcels Post Office, Sydney.—Standard Waygood Ltd. £1425.

Construction of electric goods lift at Parcels Post Office, Sydney.—Standard Waygood Ltd. £800.

Installation of electric lighting at Cessnock Post Office.—Warburton Franki Ltd. £30.

Making and erecting edible offal cages at the Public Abattoirs, Homebush Bay.—Engineering and Machinery Ltd. £589 9s.

## Western Australia.

LANDS DEPARTMENT. — 1 "Overland" motor car, £325.—Wittman Motor Supply Co.

WATER SUPPLY DEPARTMENT.—Pumping plant for Kalgoorlie, £916. — Saunders and Stuart.

RAILWAYS DEPARTMENT.—Steel leg bench vyces, f.o.r. Fremantle, 46s. 4d. per cwt.—H. T. Wright.

COLONIAL SECRETARY'S DEPARTMENT.—Coal for State steamship service at Albany, for period ending 30th June, 1914, 25s. per ton.—McIlwraith, McEacharn and Co. Pty. Ltd.

## General.

MELBOURNE AND METROPOLITAN BOARD OF WORKS.—M., S. and D. of about 420 lineal feet of 36in. cast iron pipes, also branches, bends and special castings, £1417 10s.—Mephan Ferguson Pty. Ltd.

S. and D. of one "Venturi" water meter, with tube, pressure pipe, etc., £331 5s. 6d.—Gibson, Battle and Co. Ltd.

BALLARAT WATER COMMISSIONERS.—S. of about 44 tons of 12in. and 6in. cast iron pipes, £454 17s. 6d.—C. Monteath and Son, Melbourne.

## DIVIDENDS.

The following dividends and bonuses of mining companies in Australia have been declared, and are payable on the dates noted:—

August.

21st.—Central Red, White and Blue G.M. Co., Bendigo (V.), 2s., £3200.

21st.—Spring Gully Dredging Co., Fryer's Creek (V.), 1s., £1200.

21st.—Cathcart Central G.M. Co., Ararat (V.), 2s., £5000.

21st.—Porepunkah G.D. Co., Bright (V.), 1s., £250.

22nd.—Wandiligong G.D. Co., Wandiligong (V.), 1s., £300.

25th.—Oswald Gold Mines, Maldon (V.), 1s., £1250.

26th.—Bourke's Hill Tin Sluicing Co., Emmaville (N.S.W.), 6d., £1125.

26th.—North Nuggety Ajax G.M. Co., Daylesford (V.), 1s., £1500.

26th.—Cathcart Gold Mines, Ararat (V.), 1s., £2638.

27th.—Lake View and Star, Kalgoorlie (W.A.), interim, 5 per cent. less English income tax.

28th.—Briseis Tin and General Mining Co. (T.), 6d., £15,000.

28th.—Ajax Central G.M. Co., Daylesford (V.), 1s. 6d., £2250.

September.

1st Silverton Tramway Co., Broken Hill (N.S.W.), 1s., and bonus 1s., £25,000.

1st.—Eureka G.M. Co., Walhalla (V.), 3d., £150.

6th.—Hampden-Cloncurry Copper Mines (Q.), 2s., £35,000.

18th.—Mararoa G.M. Co., Norseman (W.A.), 1s., £5000.

26th.—Sons of Gwalia Ltd., Coolgardie (W.A.), 1s., £17,500.

## BANK CLEARINGS.

The report of the Melbourne Clearing House for the week ended 18th August was:—

| | | |
|---|---|---|
| Total clearance .. .. .. .. .. .. .. | | £5,094,100 |
| Balances— | | |
| Settled by certificates .. | £462,500 | |
| Settled in coin .. .. .. .. | 158,121 | |
| | | 620,621 |
| Total clearance for the corresponding week, 1912 .. .. .. .. .. | | 5,215,242 |

## COMMONWEALTH OIL CORPORATION.

(From Our Correspondent.)

Lithgow (N.S.W.), Aug. 16.

In setting forth the claims of the Corporation for a bonus on oil produced in the Commonwealth, Mr. S. N. MacLennan, general manager of the Commonwealth Oil Corporation, says:—

"As evidenced by the recent disclosures in the Commonwealth Oil Corporation's applications for suspension of labour conditions at Newnes, they are no longer able to continue operations at that centre; and to give some idea of the magnitude of expenditure at Newnes, we set out the following figures, to the 4th of June last:—Salaries and wages (including railway), £447,905; expenditure on plant and machinery, £325,656; mining, £360,586; prospecting and surveying, £95,000; railway construction, £240,000; railway running in excess of receipts, £14,000; railway maintenance, £3000; total, £1,432,147. In connection with the above expenditure, the Corporation have employed at Newnes during the year 1908, 277 men; 1909, 487 men; 1910, 672 men; 1911, 590 men; besides about 500 men, between Torbane, Hartley Vale and Ultimo, in the mining and manufacturing of its oils, all of which they have been able to place upon the market (we regret to say at a loss, owing to the foreign keen competition). As you are no doubt aware, the shale oil industry calls for an extensive and costly plant, which has to be imported, and heavy duty paid on same, to the Commonwealth. Then, again, the shale has to be mined, broken up, and trucked to the retorts, and when the oil is extracted therefrom, we have arrived just where the American starts, whose oil gushes to the surface from a pipe driven at a comparatively small cost. We might here add that the comparison of the quality of the oil produced at this stage is beyond doubt in favour of oils obtained from shale, the light spirits recovered from the mineral shale having much greater power as also the richness of its paraffin wax and the other by-products, of which American oil is quite destitute. But the great problem is how to secure a remunerative market. Owing to the American arrangement with the European Petroleum Union, which controls the Russian and Roumanian output, the Standard Oil Trust has monopoly of Australia, except for the slight opposition of the Bataafsche Petroleum Maatschappji, represented in Australia by the British Imperial Oil Co. Ltd. The trust is a very complete organisation, and is in a position to cut rates to the retailers to such an extent as to crush out any new enterprise that is not prepared for at least eight or ten years' struggle, and consequent working at a loss. It might be remembered that reduced rates to the retailer would not necessarily mean cheap oil to the consumer. With such opposition and advantages of production, what hope has a local industry of competing without adequate protection from its Government? Then, again, the important question of Imperial defence, on which Australia has entered by her naval policy, whose boats consume oil fuel, and needs must have their own within the Commonwealth, is an important argument in favour of support.

"While subsequently a tariff would be advantageous, it might not be reasonable to handicap at present the greater percentage of an Australian public by a tariff until such times as Australia was able to produce a fair percentage of its demands for oil at fair prices to the consumer. I, therefore, am of opinion that the Government should grant a bonus of 2d. per gallon on every gallon of crude oil produced in Australia from Australian shale, in order to place the industry upon an equitable basis with foreign competition. Of course, we cannot expect the Government to grant either a bonus or a duty until they have looked into the whole of the facts and conditions of the industry; but what we specially desire from the Federal Government at the present time is some definite pronouncement that they are prepared to go immediately into the question of assisting the oil industry, which the results of the past show cannot survive the competition without some substantial Government recognition, both in respect to the bonus and orders in connection with the supply of necessary oil to them. Another factor worthy of mention is the lamentable history of the New South Wales shale industry, which only succeeded when there was a great demand, and a phenomenal price for export shale, and during a period when the production of kerosene was encouraged by 6d., and subsequently by 3d. per gallon duty, as also to the fact that labour was then 25 to 30 per cent. cheaper than to-day. Still the directors, shareholders, and others interested in the Corporation have hung on, paying out, firmly believing that the Government would recognise the importance of an oil producing industry, which to-day is receiving the keenest recognition throughout the British Empire.

The Canadian Government protects its well-oil industry (mind you, no mining, no trucking to retorts, and rotorting of shale) by granting a bonus of 50 cents per barrel of crude oil, which works out at about ¾d. per gallon. Is it not, therefore, reasonable, in view of the tremendous supply of proved shale upon the property held by the Commonwealth Oil Corporation, said to be the richest in the world, that the Government should, in its own interests, protect the valuable mineral asset which this continent has, chiefly in New South Wales and Queensland, in the almost unlimited deposits of petroleum in the form of shale, which has to be turned into oil by destructive distillation?"

Referring to the unions with which their employees are associated, the manager says:—"It is important for the organisation which these employees represent to be impressed with the fact that just at the present moment the British investors in the company are hesitating as to whether, in view of their past experience, it is good enough to invest further funds by way of salvage money. That a little reasonable sympathy and a definitte public statement from the heads of the Government to the effect that they are prepared to go into the matter seriously, and give us fair and proper support, would have a very salutary effect upon our minds, and possibly consummate the idea of obtaining the necessary

THE : : :
DIAMOND
OUTPUT :

Choice Diamonds set in platinum as ring, £14/14/-.

Diamond Cluster ring set in platinum, £10/10/-.

5 Fine Diamonds set in platinum, £12/12/-.

of our House has broken all records this year again.
WHY?

Well, we took on a Sole Agency calling for an enormous output, and to live up to it we decided two years ago to offer Diamonds (set or unset) at merely a broker's commission on the landed cost. We calculated that the commissions would be numerous enough to pay us, especially as the pleased buyers would remain customers. The experiment proved partly successful. We, therefore, are continuing it for another year. Our prices for Diamonds are less than London. There is no duty on unset gems.

FAIRFAX AND ROBERTS LIMITED,
The Oldest Jewellery House in Sydney. 23 and 25 Hunter Street.

capital to reconstruct the mines. Already the whole of the schemes have been passed by all those interested, such as shareholders, debenture-holders, creditors, etc., after considerable and laborious work, and the consent of the Court is now about being obtained. Any delay is, therefore, likely to retard the progress of the scheme. It is obvious that if those who have already invested their money in the oil industry are not impressed with the fact of putting up additional funds to save what they have already invested, it is very doubtful whether any outside people will do it, unless, perhaps, speculators. I therefore think that, in the interests of all concerned, that is, the country, as a whole, which requires the oil to be produced locally, the men who obtain employment, and the shareholders who invest their money, your union can well see its way to grant us its support and influence immediately, and I may say, in conclusion, that everyone interested is making an earnest endeavour to save the industry, and feel sure that your co-operation will not be found wanting. With regard to the men, as you are aware, our corporation is at all times prepared to pay whatever remuneration is assessed by the recognised tribunals, and they would, therefore, apart from receiving employment under ordinary conditions, receive the benefit of improved conditions as assessed by any such tribunals.''

## INDUSTRIAL.

Messrs. Simpson Bros., of Sydney, sole agents in Australasia for Worthington pumping machinery, notify that they are now running the Worthington Class C belt-driven centrifugal pumps, built for a head suction and friction included of 90ft., and also the Deane of Holyoke Model A single cylinder double-acting power pump.

* * *

The firm of Kynoch Limited, Birmingham, England, whose registered office is at Scottish House, 90 William-street, Melbourne, has, within the last 8 months, taken great strides in its gas-engine business in Australia. This year's contracts, now in hand, have a total of 3370 brake horse power. One 660b.h.p. tandem type side-by-side engine will shortly be erected at the Sons of Gwalia mine (W.A.) for general mining purposes. This is a repeat order from the company after several years of experience with the Kynoch engines. Several of these engines are working very successfully on some of the largest mines in Western Australia. Two 156b.h.p. twin cylinder engines have recently been ordered, also for mining purposes, by the Fenian G.M. Co., in that State. The South Australian Government, having called for tenders, decided to place their order for two 165 b.h.p. single cylinder engines for pumping purposes with the company. Two 330 multi-type cylinder engines will shortly be erected on the River Murray, for pumping purposes; an 80b.h.p. single cylinder engine is in the course of erection at Loxton, also for pumping purposes, and two single cylinders, each of 65b.h.p., are on order for a new pumping station to be erected adjacent to the Murray River Bridge, South Australia, making seven engines, aggregating 700h.p., on order for the South Australian Government. In Victoria, 460b.h.p., in units, are in course of erection for electrical and general factory work, and two engines, of upwards of 300b.h.p., have recently been supplied, erected and started in New South Wales, both being repeat orders.

---

Mr. William John Crothers, outdoor superintendent in the Melbourne City Council's electric supply department, died suddenly on the 13th inst., aged 56 years. Deceased had been connected with the City Council for 20 years.

A party of miners operating at Avoca (V.) are developing a reef which they discovered in a thoroughfare on the town boundary. Their shaft is down 30ft., and a trial crushing of stone (9 loads) yielded 7½ oz. of gold. They are now working three shifts.

## ROYAL MINT RETURNS.

### Sydney Branch.

| | July.<br>Fine oz. | Since Jan. 1.<br>Fine oz. |
|---|---|---|
| Gold received for coinage— | | |
| New South Wales .. .. | 7,655.00 | 60,575.44 |
| Queensland .. .. .. | 17,285.75 | 136,533.42 |
| New Zealand .. .. .. | 26,863.45 | 118,513.30 |
| Victoria .. .. .. .. | 37.98 | 115.95 |
| Northern Territory .. | -- | 140.47 |
| Tasmania .. .. .. .. | — | 138.20 |
| Western Australia.. .. | — | 158.49 |
| Papua .. .. .. .. .. | 1,026.26 | 8,516.51 |
| Other Countries .. .. | — | 127.02 |
| Coin .. .. .. .. .. .. | 22.49 | 329.10 |
| Total .. .. .. | 52,890.93 | 325,147.90 |

Gross value of above, £224,666 5s.; £1,381,139 10s. 11d.

### Melbourne Branch.

| | July.<br>Fine oz. | Since Jan. 1.<br>Fine oz. |
|---|---|---|
| Gold received for coinage— | | |
| Victoria .. .. .. .. | 43,492.45 | 270,776.68 |
| New South Wales .. .. | 250.17 | 3,141.85 |
| New Zealand .. .. .. | 8,145.57 | 38,824.68 |
| Queensland .. .. .. .. | 169.56 | 1,369.97 |
| South Australia (including Nth. Territory).. | 119.07 | 5,834.99 |
| Tasmania .. .. .. .. | 1,350.82 | 12,676.16 |
| Western Australia .. | 746.38 | 2,897.96 |
| Other Countries .. .. | — | 7.34 |
| Light Gold Coin .. .. | — | 1,141.32 |
| Unknown .. .. .. .. | 413.51 | 2,050.66 |
| Total .. .. .. | 54,687.53 | 338,721.61 |

Gross value of the above, £232,297 13s. 7d.; £1,438,796 18s. 11d.

### Perth Branch.

| | July.<br>Gross oz. | Since Jan. 1.<br>Gross oz. |
|---|---|---|
| Western Australia .. .. | 118,378.79 | 841,087.82 |
| Other Australian States.. | 14.73 | 14.73 |
| Unknown Origin .. .. .. | 208.18 | 467.53 |
| Total .. .. .. .. .. | 118,601.70 | 841,570.08 |

Value of gold (calculated at an average of £3 9s. 8d. per gross oz.), £413,129; £2,957,784.

## MIXED MEMS.

Ballarat (V.) is not satisfied to be already known as a city of Statues; it is taking care to secure the identification of spots associated with incidents in its history before the passage of time has dulled interest in them. The Eureka Stockade already has its monument, but the previous incident of the burning of Bentley's hotel by the diggers remained unrecorded. An inscribed shield is now to be put up as near to the spot as possible, and the place in Victoria-street. now occupied by handsome villas, where the diggers burned their licences preparatory to assembling in the Eureka stockade, will also be indicated. Another mark will be erected on the site of Bakery Hill from which a small party of diggers obtained the famous Welcome nugget. Other historic spots in Ballarat East are to be indicated in a special manner. On the site of the first gold discovery at Golden Point an inscribed bluestone pillar was erected many years ago.

At an extraordinary general meeting of the Commercial Banking Company of Sydney Limited, held last Friday, it was resolved that the capital of the company be increased from £3,500,000 to £4,000,000, by the creation of 20,000 additional shares of £25 each, of which £12 10s. shall be paid up. The new shares will be offered to members who already hold seven or more shares in the company.

The estimated yield of the Pioneer Tin Mining Co., Bradshaw's Creek (T.), for the six weeks ended on the 9th inst. is 68 tons of stream tin.

Mr. Holman, Premier of New South Wales, will visit Melbourne on the 23rd inst., in order to discuss with Mr. Watt several matters of interest to the two States, especially the border railways schemes. Uniform legislation with the object of putting a stop to gold stealing from mines will also be discussed once more.

The gold received at the Melbourne branch of the Royal Mint during the week ended on August 16th amounted to 22,105.17 oz.

In the course of a publication, entitled "The Tragic Story of The Waihi Strike," for which the N.Z. United Federation of Labour was held responsible, Thomas Walsh, of Auckland, was described as "an organiser of scabs," and by other offensive epithets. For the libel the Federation was last week ordered to pay £500 damages.

It was announced last week that the Meyer and Charlton G.M. Co., which owns 90 claims on the Rand, has introduced electric blasting appliances, controlled from the surface, in the hope of minimising as far as possible the danger to health arising from inhaling the small dust created in various operations. Until recently, the opinion was held on the Rand that only men engaged in machine rock-drilling and shovelling were peculiarly liable to the disease, but the Medical Commission's report of 1912 "makes it clear that on the Wittwatersrand mines the atmosphere underground is so permeated with fine mineral dust that everyone working underground is liable to contract miners' phthisis." It was also announced that the Government of the South African Union has invited Colonel Gorgas, the chief sanitary officer on the Panama Canal works, to investigate the problem of miners' phthisis on the Rand. Colonel Gorgas is a recognised authority on tropical diseases.

After our last issue had gone to press the Victorian Ministry appointed its representatives, who will confer with an equal number of members from the Labour party in the Legislative Assembly on the method of coping with miners' phthisis. The committee was, therefore, then completed, and was expected to commence its sittings within a week. The Ministerial members are Messrs. McLeod, Barnes, Gordon, Langdon, Lawson, and McGregor, the Labour members being Messrs. Hampson, Chatham, Smith, Outtrim, and Tunnecliffe, as stated last week.

The secretary of the New Gold Amalgamating Machine Ltd. has just received a cable from the company's metallurgist, Mr. Cosmo Murray, at Long Beach (N.Z.), who reports a very successful run with the machine he has been using for the demonstration on the auriferous beach sands there. The machine has fully borne out all that was claimed for it, viz.:—A total extraction of gold from the concentrates at a low cost. Mr. Murray further reports the recovery of platinum from the concentrates, and it now looks as if the problem (i.e., a reliable and cheap means of gold extraction) that has been troubling the West Coast miners for so long, has at last been solved by the advent of these machines. Details will arrive later by post.

The general manager of the Briseis Tin and General Mining Co. (T.) reports for July as follows:—"Total output of black tin, 40 tons; drift and overburden removed, 24,000 cub. yds.; Ringarooma drifts, 25,000 cub. yds.; Ringarooma overburden, 9000 cub. yds. The Mutual Hill yield for the month was 28 cwt. black tin. Wallace Properties (V.) yielded 536 oz. gold from 145,100 cub. yds., inclusive of 187 oz., and 30,300 cub. yds. from the Argo Co.'s property."

The following resolution was agreed to at last Monday's meeting of the Victorian Employers' Federation, as the outcome of a discussion on the strike of coal-yard workers against the recent award, on appeal, of Mr. Justice a'Beckett:—"That this federation desires to direct the attention of the Government to the fact that Victoria, while well to the front in all legislation for the regulation of industries, as far as employers are concerned, has no law, such as exists in South Australia and some of the other States, for the prevention of strikes and for the punishment of those who take part in them; consequently one important strike after another is occurring in this State, the most recent of which is against an award of the Industrial Appeals Court in connection with the fuel and fodder determination, which has entailed considerable inconvenience upon manufacturers and others who cannot keep their establishments at work without regular supplies of coal. This federation therefore urges that the Government should take immediate steps to bring Victoria into line with other States, in their efforts to secure industrial peace as far as possible."

The latest ground for striking is that a contract to transport wool has been let to a man who has a 7-ton motor-lorry, which would have the effect of displacing teamsters on the road. The shearers at Portland Downs (Q.) have, in consequence, suspended operations.

An exhibit of considerable scientific interest is at present on view in the Mining and Geological Museum, Sydney. It is a piece of meteoric iron discovered by a Bombala resident, six miles from Delegate (N.S.W.). The weight is 61 lb., and when struck with a hammer it gives a bell-like sound. Mr. J. E. Carne, Assistant Government Geologist, points out that these meteoric deposits, which are not confined to metallic substances, are the result of the bursting of planets. Innumerable pieces continue in their orbits in space, and are not deposited on the earth until they get within the sphere of the earth's attraction. Numerous occurrences of meteoric substances doubtless exist, but it is very seldom they are found, and thus great interest attaches to the present discovery. Mr. Carne states it has been proved beyond doubt that this is meteoric iron, and a complete analysis is being made by the Mines Department. This class of metal is not subject to oxidation to the same extent as manufactured iron, owing to a protective coating it receives during its passage through the atmosphere.

Ward and Co., stock and share brokers, Melbourne, have forwarded the new issue of their Australian Investors' Handbook, compiled to July 1st. This little half-yearly publication contains particulars of capitalisation of companies, plants, crushings, calls, dividends, etc., and is too well known to need renewed commendation.

The railway revenue of the Chillagoe Company Ltd. (Q.) for July amounted to £10,981, and for the four months of the financial year ending July 31st £35,278. For the corresponding periods of the previous year the respective amounts were £8724 and £34,120.

Enquiries are addressed to us from time to time by prospective students as to the merits of different educational courses by correspondence. From our knowledge of the various engineering, mining and electrical courses undertaken by the International Correspondence Schools, we have no doubt that, intelligently studied, the lessons and methods of instruction employed by the schools are of great service and value.

The revenue of the Great Cobar Ltd. (N.S.W.) for the quarter ended June 30th was £114,000, and the expenses were £107,000. For the previous quarter the revenue figures were £147,090, and the total expenditure £116,765. Smelting ceased for several weeks during May and June, which prejudicially affected the quarter's returns. In July the receipts amounted to £60,000 and the expenses to £45,000.

How best to deal with large quantities of low-grade copper ores is a problem which has engaged the attention of the management of the Mt. Lyell Mining and Railway Co. (T.) for some time past, and already a series of tests by the Minerals Separation process have been made which have yielded encouraging results. The directors have decided to pursue the matter further, and in order that an exhaustive and conclusive trial may be made the services of Mr. L. V. Waterhouse, late of Broken Hill, have been retained. Very large quantities of low grade ore are obtainable from the Lyell Comstock and the Crown Lyell mines, and from other portions of the company's property, and the hope is that one or other of the many flotation processes which modern metallurgical enterprise has created will be found equal to the task of rendering them of considerable commercial value. Those interested in the subject of flotation and selective processes, who may have overlooked the articles thereon which recently appeared in these pages, will be glad to have their attention drawn to those in our issues of June 26th and July 17th.

Mr. R. P. Lawrence, of the firm of Lawrence and Chalmers, who were employed by the Federal Government to make flying surveys in the Northern Territory with a view to railway construction, informed the Minister for External Affairs last week that he had covered the whole of the country from Alice Springs to the Katherine River, and that Mr. Chalmers was now completing the section between Alice Springs and Newcastle Waters. The country between Newcastle Waters and Camooweal was now being traversed, while the territory from Newcastle Waters to the Katherine River had already been dealt with. So far no engineering difficulties had presented themselves.

The West Australian Minister for Railways, Mr. Collier, stated in Parliament last week that the duty paid by the State to the Commonwealth on railway rolling stock for the year 1912-13 was £18,206 for 26 locomotives, and on rails £34,820.

The July receipts of the Brisbane Tramway Co. amounted to £26,205, as compared with £23,060 for the same month last year.

The revenue of the Prahran-Malvern Tramways Trust for the 28 days ended on July 30th was £5656 10s. 2d.

A strike of Sydney wharf labourers employed in loading wheat at Darling Harbour occurred last week, as the result of some temporary hands being replaced by permanent men at a lower wage. The strike, which appeared at one time to be likely to spread, and which for the time being held up the loading of three large steamers, has been settled by the re-instatement of the casual hands, pending a decision by the Arbitration Court as to the right of the Commissioner for Railways to alter the conditions of employment.

## Government Notice (V.).

VICTORIAN RAILWAYS COMMISSIONERS.
STATE COAL MINES.

HAULAGE ENGINE AND ELECTRICAL EQUIPMENT.

TENDERS (endorsed "Tender for Haulage Engine and Electrical Equipment"), to be addressed to the General Manager, State Coal Mines, Wonthaggi, and delivered at his office at Wonthaggi, not later than 12 noon on Wednesday, 12th November, are invited for the supply of Rope Road Haulage Engine and Electrical Equipment for McBride Tunned. P.D., £15.

Particulars at the Melbourne office of the State Coal Mines, Robb's Buildings, Collins-street, and at the office of the General Manager, Wonthaggi.

No tender will necessarily be accepted.

G. H. BROOME.
General Manager.

---

## THE UNIVERSITY OF QUEENSLAND.

APPLICATIONS are invited for the position of Lecturer in Electrical Engineering in the University of Queensland. Salary, £350 per annum, less 7½ per cent. deduction for the purchase of an endowment assurance policy in favour of the Lecturer.

The successful applicant will be required to do so much work and at such times as may be prescribed by the Professor of Engineering, with the approval of the Senate. He may be required to give courses of lectures in Applied Mechanics and Hydraulics, and to undertake general laboratory instruction.

Applications must be forwarded so as to reach the Registrar, the University of Queensland, Brisbane, not later than the 22nd November, 1913. The successful applicant will be expected to enter on duty at the University on the 1st February, 1914, from which date his appointment will take effect.

Further particulars may be obtained on application to the undersigned.

F. W. S. CUMBRAE STEWART,
Brisbane, Registrar.
25th July, 1913.

---

## Government Notice (N.S.W.).

Department of Public Works,
Sydney, 18th August, 1913.

TENDERS FOR MACHINERY, ETC.

TENDERS, specified below, will be received at this Department until 2 o'clock p.m., on the dates mentioned:—

MONDAY, 1st SEPTEMBER, 1913.

SUPPLY, ETC., of FRICTION HOISTS in Veal Houses, New Public Abattoirs, Homebush.

MONDAY, 8th SEPTEMBER, 1913.

SUPPLY and ERECTION of PUMPING MACHINERY, Experimental Farm Water Supply, Grafton.

MONDAY, 27th OCTOBER, 1913.

MANUFACTURE, ETC., of STEEL BRIDGE for Wilson River, Wauchope to Kempsey Section, North Coast Railway.

Further particulars may be obtained from N.S.W. "Government Gazette."

(6a43) ARTHUR GRIFFITH.

---

Public Service Board.
4 O'Connell-street, Sydney,
August 8, 1913.

APPLICATIONS are invited for the position of SUPERINTENDENT of TECHNICAL EDUCATION, Department of Public Instruction, N.S.W. (Educational Division); Salary, £750 per annum. Applicants should state the qualifications they possess in any branch of Technical work, and indicate their previous training or experience in an educational, administrative, or organising capacity. Copies only of testimonials or credentials to be sent. The officer appointed will be responsible to the Minister, through the Director of Education, for the proper working and control of the Technical Education Branch -- including the Sydney Technical College, Country Colleges, and Museums.

Applications should reach the undersigned not later than 1st September, 1913.

By order of the Board.
R. A. GILFILLAN,
Secretary.

---

## CITY OF MELBOURNE.

TENDERS will be received until 12 o'clock noon on Friday, 29th inst., for the Supply and Delivery of—

FIVE ELECTRICALLY DRIVEN VENTILATING FANS.

Specification may be seen at the office of the City Electrical Engineer, Town Hall.

JOHN CLAYTON,
Town Clerk's Office, Town Clerk.
Town Hall, Melbourne,
16th August, 1913.

---

## SOUTH EDNA MAY GOLD MINING Company No Liability.

NOTICE is hereby given that the First Half-yearly Meeting of shareholders will be held in the Board-room, Broken Hill Chambers, 31 Queen-st., Melbourne, on Tuesday, August 26, 1913, at 2 p.m.

Business:—To receive and adopt reports and balance-sheet to 31st July, 1913; to transact any other ordinary business legally brought forward.

By order of the Board,
FRED TRICKS, Manager.
31 Queen-st., Melbourne, Aug. 18, 1913.

---

## THE MOUNT LYELL MINING AND Railway Co. Limited.

TENDERS for the SUPPLY of STORES (including Electrical Goods and Chemicals) for the 12 months ending December 31, 1914, will be received by the Secretary, at the Company's office, 39 Queen-st., Melbourne, up to Saturday, September 20, 1913.

Schedules, with conditions and full particulars, may be obtained on application, at the head office of the Company, 39 Queen-st., Melbourne; from the General Manager, Queenstown, Tasmania; the Station Master, Regatta Point, Tasmania; the Hon. Stafford Bird, Collins-st., Hobart; and Messrs. Rudder's Ltd., 42 Pitt-st., Sydney. Neither the lowest nor any tender will necessarily be accepted.

By order of the Board,
D. G. LUMSDEN, Secretary.
Melbourne, August 14, 1913.

---

## MARAROA GOLD MINING CO. N.L.

NOTICE is hereby given that a DIVIDEND (the 19th) of 1s. per share has been declared, payable on Thursday, September 18. 1913. The transfer books will be closed from Monday, September 15, to Thursday, September 18, 1913, both days inclusive. Dividend warrants will be forwarded to the registered addresses of shareholders. By order of the Board, JOHN S. SCOTT, Secretary.
Grenfell-st., Adelaide, Aug. 12, 1913.

---

## BLACK RANGE MINING CO. N.L., Sandstone, Western Australia.

NOTICE is hereby given that the Half-yearly General Meeting of shareholders will be held at the Company's office, 47 Queen-street, Melbourne (2nd floor), on Friday, August 29, 1913, at 12 o'clock noon.

Business:—(1) To confirm minutes of last meeting; (2) to receive and adopt reports and balance-sheet; (3) to transact any other general business that may be brought forward.

WM. JACKSON, Manager.
47 Queen-st., Melbourne, Aug. 19, 1913.

---

TENDERS are invited for the Purchase or Working on Royalty of G. de Bechi and R. W. Rucker's "Improvements Relating to the Treatment of Complex Sulphide Ores," covered by Commonwealth Letters Patent No. 5952, of May 21, 1906. The inventors will dispose of the whole or part interest in the patent, or will grant licenses to work the same to fulfil the full requirements of the public. Address—C/o Phillips, Ormonde & Co., Patent Attorneys and Consulting Engineers, 17 Queen-st., Melb.

---

## CONCENTRATING.

EXPERT FOREMAN WANTED.

[illegible]

Must have Good Past Record and be able to Successfully Manage Men.

Only First Class Man will be considered.

Reply, giving fullest personal information and Salary expected to—

"NECNOC,"
OFFICE OF THIS PAPER,
SYDNEY or MELBOURNE

**BALLARAT School of Mines**

DEPARTMENTS:

CHEMISTRY and METALLURGY,
ENGINEERING and SURVEYING
ELECTRICAL ENGINEERING,
GEOLOGY and MINING
MATHEMATICS and PHYSICS.

Prospectus on Application.

F. J. MARTELL, Director.

ESTABLISHED 1860.

**BONDHOLDERS' REGISTER**

Publishes the Actual Numbers of all Drawn Bonds Throughout the World.

PUBLISHED FORTNIGHTLY.

**10s. PER ANNUM.**

73 FARRINGTON ST., LONDON, E.C.
Australian Offices,
376 FLINDERS LANE, MELBOURNE.

**"INGREY"**

**PATENT WEIGHING & RECORDING MACHINES**

ARE

**Installed in H.M. Dockyards.**
**Certified by the Board of Trade.**
**Accurate and Reliable.**
**Automatic in action and**
**Pay for themselves in a year!**

**H. A. HARVEY & CO. LIMITED, LONDON.**

Australian Representative — LASCELLES PARRINGTON & BRACHE.
London House, 97 Elizabeth Street, Melbourne.
New Zealand Buildings, Pitt Street, Sydney.

**EUROPEAN AGENCY.**

WHOLESALE buying agencies undertaken for all British and Continental goods, including—

Books and Stationery,
Boots, Shoes and Leather,
Chemicals and Druggists' Sundries,
China, Earthenware and Glassware,
Cycles, Motor Cars and Accessories,
Drapery, Millinery and Piece Goods,
Fancy Goods and Perfumery,
Hardware, Machinery and Metals,
Jewellery, Plate and Watches,
Photographic and Optical Goods,
Provisions and Oilmen's Stores,
etc., etc.

*Commission 2½ per cent. to 5 per cent.*
*Trade Discounts allowed.*
*Special Quotations on Demand.*
*Sample Cases from £10 upwards.*
*Consignments of Produce Sold on Account.*

**William Wilson and Sons,**
(Established 1814),
**25 Abchurch Lane, London, E. C.**
Cable Address: "ANNUAIRE, LONDON."

The British Postmaster-General, Mr. Herbert Samuel, informed the House of Commons last week that during the financial year some £3,000,000 had been spent on new telephone construction and development, and before long he should have to ask authority to borrow £10,000,000 for the development of the system.

Better Equipment . . .
in your Mine . . .
means Greater Profit !

Equipment that cuts out little leaks in power transmission, and so reduces costs, MUST increase the profits. Buying the best is always a good investment, for the slight increase in first cost is amply repaid by longer service and greater satisfaction.

"PIONEER" Improved
Raw Hide Belting . . .

as a power transmitter for the Mine, is unequalled. It is unaffected by heat, moisture or fumes, and is noted for its gripping power. Naturally there are sound reasons WHY we can claim these things of Pioneer Belting. We leave nothing to chance. We select the best centre cuts of the hides, tan them thoroughly in our own tannery, then make them up in our own factory, thus ensuring perfection in every detail.

We guarantee every Belt, and will make good any defect in material or workmanship.

Write for Price List.

**J. C. LUDOWICI and SON LTD.,**
PIONEER WORKS, 117 YORK STREET, SYDNEY.

**The Australasian Joint Stock Companies' Year Book,**
**1913.**

*By* ROBERT LUCAS NASH,

*Financial Editor of Sydney "Daily Telegraph," Author of "Investors' Sinking Fund and Redemption Tables," "Profitable Nature of Our Investments," Eight Editions of "Penn on the Funds" (London), etc.*

**A COMPLETE OFFICIAL RECORD** of Government Finance, The Government Debts, Corporation Loans, Banks, Insurance Companies, Gas and Water Companies, Shipping Companies, Trading and other Companies, Dairying Companies, Coal and Shale Mining Companies, Gold Mining Companies in New South Wales, New Zealand, Queensland, South Australian and Northern Territory, Tasmanian, Victorian, Western Australian Silver, Copper, and other Mines, also a

**DIRECTORY OF MINING SECRETARIES AND LEGAL MANAGERS.**

Each of the previous seven editions has grown substantially, and the last edition gave a record of £568,146,000 of capital invested, and of £26,120,000 interest and dividend payments in the year.

But on this occasion, the **EIGHTH EDITION** will record an expansion in joint stock enterprise quite unprecedented. The Australian capital dealt with (including the London contributions thereto) will be between £600,000,000 and £700,000,000 (six hundred millions and seven hundred millions), and the dividends and interest payments for 1912 exceed £30,000,000 (thirty millions), while no less than 2500 (two thousand five hundred) new companies are added to the enumeration, and the new issues by the older companies have been enormous. The dimensions of the volume are, of course, greatly extended.

**THE AUSTRALASIAN JOINT STOCK COMPANIES' YEAR-BOOK** is the only work giving such a record, and the vast growth of joint stock enterprise throughout these States and colonies renders it an indispensable book of reference.

As regards **PUBLIC COMPANIES**, the work addresses directors and leading officials, capitals, dividend paid, and much historical and current detail, such as date of registration, reserve funds, the latest accounts, bankers, and numbers of shareholders.

The **DIRECTORY OF SECRETARIES AND LEGAL MANAGERS OF MINING COMPANIES** at the end of the book is a special feature which has proved of material service to a large body of subscribers.

*Price,* 10/6; *by post, throughout the Commonwealth,* 10/8.
*Contains approximately* 600 *pages Demy Octavo* (9 x 6).
*Obtainable from your bookseller or direct from the publisher—*

*Critchley Parker,*
*Mining Standard,*
12 *O'Connell-st., Sydney.* 376 *Flinders-lane, Melbourne.*

## CONTENTS.

THURSDAY, AUGUST 28.

Editorial—
N.S.W. Mining Bill .. .. .. .. .. .. 163
Charters Towers and Depth .. .. .. 163
Leaderettes .. .. .. .. .. .. .. .. 164
News and Notes .. .. .. .. .. .. .. 165
Investor's Column—
Broken Hill South (N.S.W.) .. .. 165
Poseidon Alluvial (V.) .. .. .. .. 165
Ajax Central (V.) .. .. .. .. .. 166
Personal .. .. .. .. .. .. .. .. .. 166
Our Big Mines .. .. .. .. .. .. .. 167
Metal Quotations .. .. .. .. .. .. 167
Victorian Mining Activities .. .. .. 168
Mining in New South Wales .. .. .. 169
Mining in Papua .. .. .. .. .. .. 169
Tasmanian Mining .. .. .. .. .. .. 170
Western Australia .. .. .. .. .. .. 170
Mining in Queensland .. .. .. .. .. 170
Mining in New Zealand .. .. .. .. .. 171
An Unusual Occurrence of Arseno-Pyrite, etc. .. .. .. .. .. .. .. 171
The Coal Mining Industry .. .. .. .. 171
Stock Exchange Regulations .. .. .. 172
Queensland's "Biggest Mining Proposition" .. .. .. .. .. .. .. .. 173
New South Wales Mining Laws .. .. 173
Treatment of Selenite Gold Ores .. .. 174
Mining Inventions .. .. .. .. .. .. 174
Extraction by Volatilisation .. .. .. 175
Pyrenees Proprietary, Redbank (V.) . 175
Melbourne Suburban Tramways .. .. 176
N.S.W. Railway Construction.. .. .. 176
Victorian Railways .. .. .. .. .. .. 177
Railways and Tramways (N.S.W.) .. 177
New Zealand Railways .. .. .. .. .. 177
B.H.P. Iron and Steel Works .. .. .. 177
British and European Developments .. 178
Electrical Accidents in Power Stations 179
Miscellaneous .. .. .. .. .. .. .. 180
Invited and Accepted Tenders .. .. .. 181
Victorian Oversea Trade .. .. .. .. 183
Industrial .. .. .. .. .. .. .. .. 183
Mixed Metals .. .. .. .. .. .. .. 183
Electric Supply in Melbourne .. .. .. 186
Kynoch Annual Meeting .. .. .. .. 186

HENLEY'S
Electric Wires and Cables
AND INSULATING TAPES
ARE THE BEST.
W. T. HENLEY'S Telegraph Works Co. Ltd.
546 COLLINS ST., MELBOURNE.
61 YORK ST., SYDNEY.

BELTING!
Largest stock of all kinds of Machine Belting in the Commonwealth.
Conveyor and Elevator Belting for all purposes.
HOPKINS BROS. & ODLUM PY. LTD.
LEICESTER ST., CARLTON, MELBOURNE.
'Phone, Central 754 and 5202 Box 377 G.P.O.

COKE!
NORTH BULLI COLLIERY
Limited
Supplies best quality hard
SOUTHERN
SMELTING COKE.
(Weekly output 1250 tons.)
H. G. Hyde, Secretary
Royal Insurance Building, 16 Spring-street,
SYDNEY.

AUSTRALIAN MINING STANDARD.
PUBLISHED EVERY THURSDAY.
Forwarded Post Free to any Address.

Per Annum.
Australasia .. .. .. .. .. .. .. .. 26/-
British Possessions .. .. .. .. .. .. 32/6
Foreign .. .. .. .. .. .. .. .. .. 34/8

Payable half-yearly or yearly, in advance.

All amounts should be made payable to order of "CRITCHLEY PARKER, Bank of Australasia."

12 O'Connell-street,
Sydney.
Tel. Central 2703.
P.O. Box 331.

376 Flinders-lane,
Mebourne.
Central 7931 & 1838.
P.O. Box 253.

BACK NUMBERS OF THE "MINING STANDARD."

The following is the rate for back copies more than a month old. Applications by post must be accompanied with cash and postage added. In no case can we guarantee to supply copies, as our storage accommodation is limited.

A postcard will be sent if the number required is out of print.

For copies three months old, ninepence; six month, one shilling; and beyond that period, one penny per month per copy.

As there is a regular demand for back copies of the "Mining Standard," newsagents are requested to send back all returns uncut and in good condition, otherwise they will not be accepted.

All Returns from Newsagents must reach us by the end of each month (the whole paper must be sent). No credit will be allowed beyond this term.

Postage — British, 1d.; Foreign, 1½d.; Australasia, ½d. per copy.

Stamps will be accepted as pre-payment.

Address communications: Publishing Department, "Mining Standard."

CASUAL ADVERTISEMENTS.

The rate for this class of advertisement is governed by the position it occupies.

If it appears on leader page or amongst or next to reading matter, the rate is 15s. per inch (nonpariel) per insertion.

Towards end of reading section—
Brevier, 16 ems width, 6s. per inch per insertion.
Nonpareil, 8s. per inch per insertion.

For the convenience of advertisers, we might state that—Brevier has approximately 7 words to a line, and 8 lines to the inch 6s. Nonpareil has approximately 8 words to the line, and 11 lines to the inch—8s.

ALTERATION TO ADVERTISEMENTS.

As our publishing arrangements necessitate the "Mining Standard" being issued simultaneously in Sydney, Melbourne and Adelaide on the same day each week, advertisers wishing to change their advertising matter must supply same ten days in advance of publication.

ADVERTISEMENT PROOFS.

Proofs are submitted to advertisers in order to give them an opportunity of going over the advertisements before printing.

Advertising Copy must be typed and so arranged as to clearly indicate the display required for the more important features of the advertisement.

Any departure from the original copy will be charged for. Advertisers are specially requested to instruct their publicity departments to give us clear and definite instructions respecting changes of matter or new copy in order to avoid incurring unnecessary charges.

AUSTRALIAN MINING STANDARD.
PUBLISHED EVERY THURSDAY.
ESTABLISHED 1888.

It is requested that all business communications be Addressed to Critchley Parker.

THURSDAY, AUGUST 28, 1913.

## N.S.W. MINING BILL.

The Mining (Amendment) Bill, 1913, which has been put before the New South Wales House of Assembly by the Minister of Mines, is designed to remove anomalies that experience in the administration of the Act of 1906 has shown to require amendment, and to provide additional facilities to those already afforded under the existing Act for the conducting of prospecting operations on both Crown and private lands. Most of the new provisions under the Bill are such as call for little comment, either because they are very restricted in their operations, or because they are mere alterations of detail and not of principle. There is, however, one clause of the Bill which demands attention. Section 114 of the present Act gives to any lessee a statutory right to exemption from the performance of any labour conditions to the extent of one month for every period of six months during which double the required labour was employed, the maximum period of exemption being six months. That was a very fair and very sensible provision, and we are sorry to see that it is now proposed to abrogate it. In notes upon his Bill with which the Minister has been good enough to favour us, the explanation is given that "very little advantage has been taken of this section, and it is not considered desirable in the mining interest that it be retained, as the rights of lessees are sufficiently protected by the provisions of section 113, under which suspension for six months may be obtained from the Warden for any reasonable cause." We wish to point out that the suspension granted under section 113 does not cover the ground covered in the succeeding section. To obtain six months' suspension from a Warden is a matter not unattended with expense, and when at the end of that period of exemption another application requires to be made, it is a moot point whether or no the suspension will be granted. If, however, the lessee have employed for a period of three years double the amount of labour required by the Act, he is entitled to 6 months' exemption in any case, and at the end of that period he is in the position of one who asks a favour for the first time instead of being in the position of one begging a renewal of a favour that has been already granted. The proposal practically takes away 6 months' exemption from a company that has shown its bona fides by far exceeding the requirements of the Act during a period of 3 years. The argument that the existing privilege may be taken away because "very little advantage has been taken of this section" is not very convincing. If only one company in a hundred conduct its operations in such a way as to secure an advantage from the clause, that is no reason for the excision. In point of fact, the existing Act does not go far enough in this respect. Why should there be a maximum period of exemption of 6 months? and why should the exemption amount to only one month for every six-monthly period during which double the required labour was employed? Let us suppose that a company has employed 10 times the required labour for a period of 5 years, is it a fair thing to grant it as a right only six months' exemption? It is not sufficient to say that it can, of course, obtain the exemption from the Warden. It can do so in most cases, it is true; but the whole point is that it cannot do so as a matter of course. The maximum period of exemption might very well be doubled or trebled; and the proportion of one month's right to exemption for every six months during which double the stipulated labour is employed might with advantage be raised proportionately with the excess of the labour, so that, let us say, the employment of four times the required labour for a period of six months might entitle to 2 months' exemption, and so on. With such an approach, however slight it might be, to something like security of tenure, far more money would flow into New South Wales (and into other parts of Australia) for investment in mining than is at all likely to come into it under the present conditions.

## CHARTERS TOWERS AND DEPTH.

It is quite possible to sympathise with the people of Charters Towers in their desire to see their once great field tested at depth, without believing that the Queensland Government would be warranted in extending financial assistance for the purpose. The Government is justified in doing that only when the payable bodies in shallower ground have been absolutely or almost worked out, a barren zone has been entered, and there is reasonable ground for the belief that another payable zone exists below the barren belt. To suppose that the Government will incur expenditure on the Charters Towers field because of the contributions that that field has, in the past, made (under the laws of the State) to the revenue of the State, is not altogether reasonable. The State should not be expected to do it unless it can see a fair chance of a profit. The facts of the position, as shown by a report made by Mr. E. O. Marks, B.A., B.E., Assistant Geologist, are that the prospects for the deep ground are not particularly reassuring, and that, without having recourse to sinking in the place proposed, there is plenty of prospecting work that needs doing. Nevertheless, Mr. Marks does propose, and the proposal seems a generous one, that in the Mills United Mine testing should be done at a greater depth; what he is opposed to is the sinking of an entirely new shaft which would be no more than a prospecting shaft, and the payment towards the cost of it of the £60,000 subsidy demanded from the Government. In another mine in the district, the Pfeiffer's, the lode has been tested to a vertical depth of 700ft. below the ore shoot, and this 700ft. of ground has proved absolutely blank so far as payable ore is concerned. That is not encouraging for going to the expense of sinking the proposed entirely new shaft; and, in view of that fact, Mr. Marks' proposal for the subsidising of work on existing underlay shafts is, as we have said, erring if anything on the side of generosity. His proposal has two great points in its favour; that it will be very much less costly than the sinking of a new shaft, and that it will be doing work which should be undertaken whether the proposed shaft is sunk or not. The Government, although it will not be warranted in acceding to the proposal put before it, may perhaps find justification for accepting Mr. Marks' suggestion that it should help in the extension of existing underlay shafts for the prospecting of the reefs at depth. If the result be not pleasing to Charters Towers shareholders, it is yet hard to see how they can reasonably expect the Government to do more.

---

Whether it is easier to die for one's principles than to live for them may be left to debating societies to decide. Certain it is that to live up to them is not always an easy matter. No doubt it was a sense of duty which prompted a small party of British politicians to pay a visit to Australasia, and right valiantly they undertook the task. But certain members of the party had another conscientious conviction, and little dreamt, when they set out, that this was about to be severely tested; had they done so, the preliminary difficulty would have had to be faced of deciding between the demands of two duties which to some extent appeared to clash. There was no idea when the merry party left England that it would find Australia in the throes of a small-pox scare; but when the real state of things was made known to three of the party—three who had conscientious objections to being vaccinated—a gloom was cast over their visit such as the young lady experiences who is deprived at the last moment of her dance. Even the Governments were perturbed, and cast about to find some way in which the recently-made vaccination regulations might be evaded by the visitors. But the solution came from the most unexpected quarter. The question in the minds of the conscientious objectors was —to be firm and miss Sydney Harbour, or to yield to the vaccination and see it Of course, they had their wives with them, and there is no telling how much that fact may have had to do with the decision; but the three stalwart objectors, after a day or two's consideration, announced that they would throw conscience to the dogs and submit to the hated operation. Never before was such tribute paid to the beauties of the harbour or the fascinations of Maoriland! Three heroic Britishers, who have faced many a stormy political crowd, could not withstand the witchery of these southern scenes, and, their backs having once been turned upon their conscientious scruples, it may be expected that they will henceforth advocate a practice so generally approved of, but until now denounced by them in unmeasured terms. Saul will be amongst the prophets.

* * *

Hitherto Melbourne has been one of the holiest cities in the world. One is inclined to thank God that at the present moment there is a prospect of its being somewhat less holy than it has been. That holiness has been principally displayed in a particularly strict observance of the Sabbath. On a Sunday morning it is an impossible city for the resident who does not wish to go to Church. No trams run, and there are no trains outwards after about 10 a.m. Some years ago a decision was arrived at by the State Government that no increase was to be made in the number of Sunday trains, and this absurd determination has been rigidly adhered to, with one exception. As the result of much public outcry, it was determined to establish a mail train to carry the English mails to Sydney. And then the Government came to an extraordinary decision: it allowed passengers to New South Wales to travel by this train, but nobody was allowed to go by it to any station on the Victorian side of the border. Presumably Sydney people, or people who are so misguided as to wish to visit Sydney, have no souls that are worth saving; but the souls of those who do not leave Victoria are to be very carefully looked after. However, there is a prospect at length of a more enlightened view being taken of the necessities of the people in the way of Sunday travel. It is understood that the Government has lately been considering the matter, and that shortly the suburban time-table will undergo considerable alteration, many additional Sunday trains being provided for. There is sure to be a tremendous outcry from the extreme Sabbatarian party; but Melbourne cannot go on being unco' guid these very practical days.

* * *

It is as nearly impossible, apparently, for a resident in a town to think broadly of the general interests of his State, when local interests obtrude themselves, as it is for the generality of citizens in any one part of the Empire to think Imperially in similar circumstances. In Australia we are a fresh-air-loving people, with a strong partiality for plenty of daylight; yet, mentally, we are not one whit less disposed than people in lands less favoured with sunshine to darken our outlook and confine our field of interest to the narrowest convenient limits. "Parochial politics" and the "parish pump" are merely alliterative expressions indicative of scorn towards one of the most persistent of mental vices, from which even those who most frequently employ the phrases find it difficult at times to emancipate themselves. A recent instance of this parochialism is in point. When forming his scheme for electrifying the suburban railways of Melbourne, Mr. C. H. Merz twice over decided that the most suitable locality for the central power-station was a site at Yarraville, and, in preparation for its building, some thousands of pounds had already been spent upon railway sidings in connection with the station, when it occurred to some officers of the Railways Department that it might be advisable to erect the station elsewhere. No sooner was this fact made public than one of the Footscray councillors sought to evoke a protest against the suggestion to abandon the Yarraville site; but the circumstance that nothing was decided upon in that direction may be taken as indicative of a broader and healthier outlook on the part of most of the council. It ought to be easily within the comprehension of every representative of a body of citizens that a large matter of public policy and expenditure cannot be decided by the supposed interests of one area. The location of the central power-station will assuredly be decided irrespective of any claim which may be made on behalf of Footscray.

* * *

One outcome of the recent inter-State conference of representatives of the Sydney, Melbourne, and Adelaide Stock Exchanges is a revised scale of brokerage charges, which is to come into force on September 1. Those investors who are familiar with the present rates, particularly in low-priced stocks and shares, will recognise the favourable nature of the changes made, and there can be no doubt that their tendency will be to encourage freer business than the Exchanges have been doing of late. There have been, and, unfortunately, still exist, many adverse circumstances which have had the effect of discouraging investment in certain directions, and anything that can be done to counteract these will make for the good of business generally, both the public and the brokers being ultimately benefited. The new scale is as follows:—Investment Stocks.—On deposits and stock, price not exceeding 1/-, commission 0½d. in the pound on face value; over 1/- to 3/-, 1d.; over 3/- to 5/-, 1½d.; over 5/- to 10/-, 2d.; over 10/- to 20/-, 3d.; over 20/- to 30/-, 4d.; over 30/- to 40/-, 5d.; over 40/- to 50/-, 6d. on face value; over 50/-, 1 per cent. The rule remains unaltered which stipulates that in the case of shares in investment companies the commission shall be charged by the seller only, excepting in transactions at net prices, or in the shares of companies not on the official lists. Mining Shares.—Price not exceeding 1/- per share, commission 0½d.; over 1/- to 3/-, 1d.; over 3/- to 5/-, 1½d.; over 5/- to 10/-, 2d.; over 10/- to 20/-, 3d.; over 20/- to 30/-, 4d.; over 30/- to 40/-, 5d.; over 40/- to 50/-, 6d. per share; over 50/- 1 per cent.

* * *

When presiding at the annual meeting of Kynoch Limited recently, Mr. Arthur Chamberlain, junr., had the advantage of speaking on behalf of a company which could boast of due consideration for its employees. It would be pleasant to be able to think that such consideration was more common than is known to be the case; but that liberal treatment finds a ready response from employees is the common experience of those who indulge in that luxury. Mr. Chamberlain was able to say that he had little fear that the labour troubles which a few months ago vexed employers in various industries in the Midland counties of England would injuriously affect his firm, which had always sought to keep on friendly terms with its employees by listening to their grievances and endeavouring to meet just demands, as, for instance, that for higher wages in consequence of the increased cost of living, which was not the direct result of the increased cost of production. It was generally accepted, he said, that during the past 10 or 15 years the cost of living had increased 15 per cent., but in the same period wages had not increased, on the average, more than 7 per cent., while profits had seldom been better than they are to-day. He considers, therefore, that reflections upon the "irresponsibility of work-people" should be withheld until their wages were at least equivalent to what they were in 1896. He could not help sympathising with those who were demanding the minimum wage, and so far from blaming them for all the trouble, he asked himself what the employers would be doing and saying if the position were reversed—wages considerably higher and profits very much lower? And it is a further gratifying fact that the chairman's remarks on this point were endorsed by some at least of the shareholders. The management of Kynoch's had no trouble with their own people or with the unions, because all were satisfied that they were fairly treated; their minimum wage had always been a fair one, and when, at the beginning of this year, they took out some figures for the sake of ascertaining how their workers stood to-day compared with ten years ago, they found that they paid their men 17 per cent. more, and their women 23 per cent. more, than in 1903. Mr. Chamberlain, however, was moved to add that although, so long as the agitation was for a more reasonable distribution of the profits of industry, they were sympathetic; should the trade unions go beyond that, and begin to want to settle how they were to run their business, and whether they were to employ non-unionists along with unionists, and other matters of that kind, they would have to reconsider their position and settle whether or not they would join the Employers' Federation, of which they were now invited to become members. There are many firms and companies in Australia who could say with equal truth that their employees receive ample consideration, but these, like Kynoch Limited, strongly resent attempts on the part of unions to take control of their businesses.

## NEWS AND NOTES.

There is no doubt (says the "Tasmanian Mail") [illegible] railway connection between the North Heemskirk field and Zeehan being warranted. The Heemskirk Tin Syndicate are meeting with gratifying success in their sluicing operations at Tasman River, and, with improved means of transit, several other properties thereabouts would be worked. Then, by an extension of the railway, the splendid agricultural and grazing land at Granville Harbour would be tapped, and a large amount of freight provided.

Amongst the benefits which will accrue to the north-western mining districts of Tasmania by the completion of the Mount Lyell Company's Lake Margaret hydro-electric scheme must be numbered the saving in firewood, which has of late years been growing increasingly scarce, and just lately has been particularly so. In their latest half-yearly report the directors of the Mount Lyell Blocks Copper Corporation say:—"Firewood has been very scarce, and so difficult to obtain, that arrangements had to be made with the Union S.S. Co. for a supply of coal to be delivered at Kelly Basin, but bad weather has made shipments very irregular, and work on the mine has been interfered with." In the same way the Zeehan and adjacent districts will be benefited should the State Mining Engineer's Lake Rolleston project be carried out and the electric power be utilised by the mining companies, as it surely would be by the biggest concerns.

It has been decided to wind-up voluntarily the Royal George (Bendigo) Mining Co. (V.), Mr. S. J. Wilson, of Melbourne, being appointed liquidator.

The secretary of the Hydro-Electric Power and Metallurgical Co. Ltd. (T.) reports as follows for the period ended August 21:—Power House.—Sheeting of sides of transformer house, power house, has been completed, also part of roof completed; expect to finish roof in about 10 days. Forms for concrete foundations to support floor under construction. Pipe Line.—This work is well advanced. Most of the men are engaged on pipe-laying, clearing rock, excavation for piers and other foundations, and building same. Transmission Line.—The work of clearing timber on the line is being pushed on, men working between Waddamana and Bothwell.

The Princess Dagmar G.M. Co., California Gully (V.), had the misfortune on Saturday afternoon to lose its engine-house by fire, the disaster being attributed to the delivery pipe of the air compressor becoming red hot and exploding. In order to avoid injury to the machinery, no water was thrown on to the flames, and the fire was allowed to burn itself out. The engine-house and plant were insured in the [illegible] for £2795. The men working at the [illegible] level were raised through the Golden Age [illegible] two miners working below 1815ft. had to scale the ladders to safety before they could be brought to the surface. Arrangements have been made with the Golden Age Company to raise stone through the Golden Age shaft.

The machinery and plant of the Nuggety Gold-Mining Syndicate, Maldon (V.), was sold by auction last week for £265. The purchasers, Messrs. Miller & Co., then submitted it in lots, and over £100 worth was sold, though the battery and the suction gas plant were not sold.

A new gold-bearing reef has been discovered near the old Scabben Flat diggings, at Trunkey (N.S.W.), which is 6 feet wide and 80 yards in length. It is reported that a parcel of five tons of the ore which was crushed at Hunter's Alma battery yielded over 3 oz. to the ton.

The Miners' Union at the Seddonville State Colliery (N.Z.), by means of a ballot, by 42 to 36, declined to join the new industrial and political organisations of the Federation of Labour. All other unions in the Westport district are affiliating.

The directors of the North New Jubilee mine, Scarsdale (V.), have decided to ask Government assistance under the Mining Development Act towards the cost of deepening their shaft.

During its last half-year the Wandiligong (V.) Gold Dredging Co. won 1354 oz. of gold, valued at £5557, from about 254,100 cubic yards of dirt, the No. 1 plant working for 22 weeks and the No. 2 for 24 weeks. The total yield to date has been just over 17,470 oz., the value of which was £71,191. It is estimated that the area remaining to be dredged will give eighteen months' work for No. 1 plant and less than a year's for No. 2.

A call of 5s. per share has been made by the Australian Wood Pipe Co. Ltd. upon the new issue of 10,000 shares, payable on September 25.

The Broken Hill Proprietary Block 10 mine (N.S.W.) is "not done with yet," says Mr. Colin Templeton. The company's 101st dividend (1s. per share and bonus of 1s.) is payable on September 24, and the distribution will absorb £10,000.

The directors of the Mararoa G.M. Co., Norseman (W.A.), have advised shareholders that they have decided, on the recommendation of the general manager, Mr. Wm. Henderson, to acquire leases comprising 54 acres which adjoin the company's present leases on the east. The area comprises the original Sydney Norseman leases, and through it runs an entirely distinct lode formation to that at present being worked by the company. The leases were taken up for the company by Mr. Henderson at the cost of pegging, and he is hopeful that the results of the development of the lode in the leases will be satisfactory. From workings in the new area 676 tons were crushed at the State battery for a recoverable value of 33s. per ton. The position of the leases is advantageous, as the necessary power can be supplied from the company's compressor plant by connecting it by means of a pipe line.

It was reported at Johannesburg (South Africa) last week that authoritative accounts had been received of the discovery of a new gold field near Kito, in the Congo Free State, which is likely to rival the Rand itself in wealth and importance. Certainly it will more than do so, should the statement that the reefs yield 70 per cent. of gold prove to be anything but a bold exaggeration.

## THE INVESTOR'S COLUMN.

### Some Companies Attracting Attention To-day.

(By Our Exchange Reporter.)

### Broken Hill South (N.S.W.).

It was only natural to expect that the report of the operations for the half year of this great mining corporation would have an effect upon the prices of the shares, for, although the members of the Room had been generally in the dark as to what the profits would be, there was an impression that the metal prices had been sufficiently good to ensure the usual satisfactory results. This confidence can hardly be said to have been justified, for the falling-off in the net earnings has been very pronounced, so much so that it must have come as a great surprise to many of the market operators. The figures for the three last half-yearly terms are as follows:—June, 1912, £156,640; December, 1912, £217,776; and June, 1913, a little under £120,000. There has been, therefore, a falling off in the net profits of nearly £100,000 as compared with those of the immediately preceding period, and the diminution has been owing largely to three different causes, namely, decreased production, owing to the Silverton Tramway strike, lower average metal rates, and increased costs of production. Perhaps the figures most worthy of attention in connection with the company's affairs are those relating to the total mining costs per ton of crude ore and the total net profit per ton. They compare as follows, taking the last three half-years' operations into consideration:—Cost, June, 1912, 19s. 8.1d.; December, 1912, 19s. 3.2d.; June, 1913, 22s. 7.5d. the net profits being 12s. 5d., 15s. 8d., and 12s. 10d. respectively. The dividends paid for the half-year amounted to £160,000, in two disbursements—one of 10s. and the other of 6s. per share. As these payments exceeded the profits by £40,000, the surplus liquid assets brought forward from the last half-year have been correspondingly reduced. It may be asked whether under the circumstances the Board was justified in paying away so large an amount as £100,000 in February, and the answer would probably be in the negative—provided it could be shown that the directors were gifted with second sight, and were aware that the Silverton Tramways were going to cease running for some weeks. The payment in June of 6s. per share was also natural enough in view of the strong financial position of the company and the recovery in the price of lead, and it is unlikely that the action of the Board will awaken a single dissentient among the shareholders, for the disapprobation of mining investors is kept well in hand—that is, if it ever exists, when substantial dividends are forthcoming. The question that the shareholders in the company would like to have answered, is what will be the probable profits and dividends for the coming term? This will depend mainly upon the metal market, and it is worth noting that lead and spelter are now £20 7s. 6d. and £20 12s. 6d. respectively, as compared with an average price during the half year ending December, 1912, of £17 10s. 8d. and £24 11s. 2d. The ore reserves are equal to about nine years' work, and there are also accumulated [illegible] with good metal contents) totalling 320,000 tons, which it is expected will shortly add to the revenue of the company—it is very plain, therefore, that if the distributions to the shareholders are to be maintained even at the rate of the profits for the last term (reduced, as they were, by labour troubles and lower metal rates)—that is, at, say, 12s. or 24s. per annum—then the shares must be regarded as an excellent investment. It must be kept in mind, however, that although lead is worth about £3 per ton more than the average price for the last six months, that spelter is about £4 lower; in addition to this, the market in lead can hardly be regarded as sound, inasmuch as the price is no doubt being abnormally kept up owing to the cessation of mining operations in Mexico owing to the unsettled state of affairs. The buying quotation for the shares is at about £7 9s.—that is, for the paids. This is a considerable reduction on the prices recently ruling, but the tendency seems to be towards a still lower range of value.

### Poseidon Alluvial (V.).

During the week a very much better feeling was shown for the shares in this company, with the result that prices improved from 6s., which has been for some time the best buying offer, to 10s. 6d. sales—and more wanted at the same quotation.

In the face of this support, owners grew more disinclined to realise, and it is not improbable that some further advance may be made. There is as yet no great improvement in the position of affairs at the mine, certainly not sufficiently so to warrant the rise in the price of the shares. All panelling operations and consequent gold production have been stopped for the present in order to allow the wash to be properly drained, and although this work seems to be progressing favourably, there has not so far been any pronounced reduction in the volume of water overhead, the slum or slurry still continuing unpleasantly in evidence. Such draining operations and consequent period of waiting cannot be avoided in most alluvial mines of any importance, and in the interests of the shareholders it is most sincerely to be hoped that the work will be thoroughly completed before any attempt is made to start gold production. In fact, if the board had not been tempted into embarking on a course of gold winning before the mine was sufficiently opened up and drained to permit of the yields being maintained, it is quite certain that the position of the company's affairs would have been very different to what they are to-day. This is, however, being wise after the event, and the directors were no doubt actuated by a natural anxiety to get on to the dividend list as soon as possible. They relied on their manager probably, but in alluvial mining the water problem is one both dangerous and difficult to solve, and the man at the helm must not only be honest and energetic, but possessed also of great nerve and experience.

There seems to be a feeling that the newly appointed manager has these necessary qualifications, and it is mainly attributable to this belief and market confidence that the better support for the shares has been forthcoming. Both the main lead and the tributary gutter, which gives the company its name, carry wash which is payable and of good extent, the average value being apparently about 25 dwt. to the fathom, and the width of the main channel, as far as proved, up to nearly 300ft. Under these circumstances the mine, despite the two serious setbacks which it has experienced, should eventually become a good payable concern.

The present rise in price is perhaps a little premature, but it is a good evidence of public confidence in a stock when the market thus gets ahead of the mine. Very likely also some of those investors who paid high prices for the shares have been watching the market closely with the object of averaging when the proper time arrived for doing so, and they have probably felt that it is better to be a little premature than to run the risk of missing an opportunity. As the market quotations once touched 37s., it is possible that some of the shares (with calls added) may have cost their owners not far short of 40s., 8s. or even 10s. would not, under such circumstances, seem too much to pay in order to bring down the average rate of the holding.

## Ajax Central (V.).

Quite the most exciting market sensation for some time has been the sharp setback in the price of shares in this company. Some weeks ago they stood very steadily at 40s., but with the starting of the extra ten head of stampers (making 20 head in all) a more pronounced support was forthcoming, and with but slight intermediate fluctuations the quotations improved until a sale of 50 shares at 46s. 9d. was recorded. This was the high-water mark, and the tide then commenced to set in in the opposite direction, Ballarat giving the market a lead, and on Monday morning a buyer at 43s. 6d. was supplied. This transaction seemed to give the market a fright, and in the afternoon, after a buyer at 42s. 3d. had taken a parcel of 500 shares and apparently checked the selling for a while, the downward movement was resumed in the hall until 41s. was accepted, this being the quotation at close of business. The anxiety to realise was somewhat similar to that manifested when the North Nuggety Ajax began their sensational decline about 18 months ago—the fall on that occasion, however, was accompanied by very heavy transactions, thousands of shares changing hands daily—while in the case of Ajax Central the quotations have weakened nearly six shillings without apparently more than a thousand shares changing hands. North Nuggety Ajax were also being dealt in at much higher rates—the top price being 87s. as against 46s. 9d. as previously mentioned.

There has naturally been great anxiety shown as to what is the cause of the weakness, but although it may be taken that someone "is in the know," the market generally is unaware.

There are three or four important matters for consideration in connection with the company's affairs, and it is probably some disappointment in connection with one or more of them which has affected the market. In the first place, the first crushing with the full 20 head of stampers may not be turning out as well as expected. It will be remembered that the last two yields were remarkably good, the stone going a little more than an ounce to the ton. Now that the increased power is available, it is almost certain that material of lower grade, which it will pay well to treat, will be put through the mill, for if the directors were to endeavour to keep up high average yields by picking the richer stone, they would be deceiving the shareholders, and unworthy of their position. It may safely be assumed that as far as possible the stone is being taken from all parts of the mine, and whatever the result will be it will be a fair criterion of the average value.

This week's report from the mine probably was the cause of some of the selling, for it was stated therein that the reef both north and south at the No. 7 level is not looking as well as previously. These developments were not unexpected, for it is obvious that a reef must sooner or later deteriorate, either in size or value. As the level stands the two faces are about 220ft. apart, so that a large amount of good stone has been opened up here.

The crosscut east for McMillan's lode at the No. 6 level has been driven 212ft., and is in clean country. It is probable that some of the shareholders are becoming doubtful whether this prospecting work will be attended with success. Such are some of the contingencies to be taken into consideration by those who are interested in the stock, but it is also not unlikely that the memory of the North Nuggety Ajax collapse in share values has made investors in the adjoining mine very quick to take alarm; but it may be pointed out that the position of the Ajax Central is different, inasmuch as the ore reserves contained in two vertical reefs, which have been well opened up at several different levels, and sampled by being put through the battery as driven on, while in the other case the highly payable yields were being obtained from one large flat make or wing of stone, the value of which was nothing like so definitely known. Despite the market uneasiness, which strongly indicates that something is wrong, it is difficult to believe that the very commendatory expert opinions upon the mine are unreliable. The mine manager appears to have reported the adverse developments at the No. 7 level with commendable promptness, the market movement taking place after the official announcement. It is generally the other way about.

## PERSONAL.

### Death of Mr. William Knox.

A cable message was received on Wednesday morning by the family of Mr. William Knox, announcing his death, and the news as it got abroad, though not unexpected, owing to the long illness which had compelled the deceased gentleman to abandon all his public and many of his private undertakings, produced a feeling of profound regret in the city.

Mr. Knox, accompanied by Mrs. Knox and some members of his family, left Australia last March for the purpose of recuperating his health, if such might be. His active public life had been given up three years previously, and even at that time there had been grave fears for his recovery. Amongst the many public and semi-public positions which he had held, the following may be mentioned. He was a director of the Broken Hill Proprietary Co., the Mount Lyell Mining and Railway Co., the Hampden-Cloncurry copper mines, and the Bank of Victoria; President of the Melbourne Chamber of Commerce from 1904 to 1908, and of the General Council of Chambers of Commerce of Australasia from 1905 to 1907. He represented the South-Eastern Province in the Victorian Legislative Council for four years. He was elected to the first House of Representatives in March, 1901, for the electorate of Kooyong, and remained a member of that Chamber up to the time of his serious illness three years ago. In 1902 he was appointed on the Victorian Royal Commission on Local Government, and in 1904-5 he sat on the Royal Commission on Navigation. Mr. Knox was one of the founders and an ex-President of the Chamber of Mines of Victoria, and was one of the chief movers in the formation of many of the leading mining companies in Australia. He was always a strong advocate of the rifle-club movement, and, prior to its coming into existence, of a complete cadet system.

Deceased was born on April 25, 1850, and was educated at the Scotch College, Melbourne, later on engaging in banking pursuits until the great success of the Broken Hill mining field turned his thoughts in that direction. His death occurred at Folkestone, Kent.

Mr. R. Thurston Evans, who went out to the Federated Malay States earlier in the year as Manager and Attorney of the Salak South Tin Dredging Company, has resigned his position, and will shortly be returning to Australia. It is understood that a difference with the Board on a question of policy was the cause of the resignation.

Mr. William Densham, F.I.A.V., has been elected by the council of the Incorporated Institute of Accountants, Victoria, to fill the vacancy on the council caused by the death of Mr. J. R. A. Milligan.

For the first time the name of Mr. R. O. Blackwood now appears amongst the list of directors of the Broken Hill Proprietary Co. in the half-yearly report. Mr. E. Neale Wigg resigned his directorship last March, and Mr. Blackwood was elected to the vacancy.

Mr. Hiley, late of the North-Eastern and Great Northern Railways of Great Britain, has been appointed general manager of the New Zealand railways, and will take up his duties on his arrival in New Zealand.

Mr. Thomas Parker, formerly of Levuka, Fiji, but lately resident at Georgetown, Etheridge (Q.), died there on the 15th inst. at the age of 80. Mr. Parker arrived in Australia in 1853, reaching profession a chemist, he found employment in that capacity there, but soon caught the gold fever and joined in many of the rushes of those exciting days. He had little success as a digger, however, and accordingly resumed his profession on the various fields which he visited, and it is in the character of a dispensing chemist that he will be best remembered by old miners. He was also known in New Zealand, Queensland, and Fiji.

Dr. Arthur Wade, D.Sc., A.R.C.S., who, as mentioned in these pages three weeks ago, has been appointed by the Federal Government to make an expert report on the prospects of the Papuan oil fields, has notified the Minister for External Affairs that he will go from London direct to Papua, via Singapore, and will not visit Melbourne until the task has been completed. Dr. Wade expects to reach Papua about the middle of October. He is regarded as one of the highest authorities in the world on oil production, and was entrusted with the preparation of a syllabus of four years' training for petroleum prospectors and engineers by the Imperial College of Science. He carried out a great deal of exploratory and prospecting work in oil-bearing country between 1908 and the present year.

As Mr. J. R. Pound, M.Sc., who was recently appointed lecturer in chemistry at the Zeehan (T.) School of Mines, would be unable to take up the duties until January, the committee are making another appointment.

Mr. R. V. Barton, manager of the Broken Hill Junction mine (N.S.W.), has resigned his position on account of differences with the directors on matters of policy.

Mr. C. W. Jones, New Zealand manager for Huddart, Parker & Co., has been elected president of the Wellington Chamber of Commerce.

Mr. Rockett (acting inspector at Kalgoorlie), Mr. Winzar (formerly manager of the Eulaminna mine, Murrin), and Mr. Phenix (of the Associated Gold Mines of W.A.) have been appointed as mining inspectors by the West Australian Government. All three are practical mining men of wide Australian experience, and are stated to hold School of Mines diplomas.

Mr. Percy Mackennal, metallurgical accountant at the Mount Lyell Company's offices, died in the Queenstown (Tasmania) Hospital last Thursday night, after a short illness, from hemorrhage of the brain. Deceased, who was 47 years of age, joined the service of the Mount Lyell Company in 1898, and was very popular in the Mount Lyell district. Deceased was a brother of Mr. Bertram Mackennal, the Australian sculptor.

Mr. E. F. Pitman, Government Geologist and Under Secretary of Mines in New South Wales, returned last week to Brisbane after a two months' tour of the mining centres of Queensland. He expressed surprise at the great extent of the coal and mineral resources of the State.

In giving evidence before the New South Wales Public Works Committee on the proposed railway from Barraba to Bingara, Mr. R. Schloesser, representing the Gulf Creek copper mine, stated that the prosperity of the mine depended on the construction of this route. The shaft was down 450 feet, and the ore was showing as freely as ever; but, being low grade, better means of transport were absolutely necessary for the ore, and also for coke for the blast furnaces. The company had spent £59,000 since 1906 for a return of £6000.

In a recent arbitration case before Mr. Justice Sim, at Wellington (N.Z.), his Honour said that in the preference to unionists clause the Court would have to insert a provision for an open door, otherwise the union might seek to make a close corporation of the organisation. It was suggested to his Honour that the clause as it stood in the recommendations appeared to make for compulsory unionism. "There's nothing compulsory," replied the judge. "If a worker does not join the union he may be brought before the Court and fined, and there's an end of it."

The gold received at the Melbourne branch of the Royal Mint during the week ended on the 23rd inst. amounted to 13,309.34 oz.

# OUR BIG MINES.

## Examinations of their Yearly and Half-Yearly Reports.

(By a Mining Accountant.)

### Mount Bischoff Tin-Mining Co. (T.).

The report for the half year ended June 30, 1913, is the usual poor production. It is really a lamentable affair: not because of the actual results to be reported, but because of the manner in which the report itself is presented.

An early start is made in the directors' report, with the statement that the net earnings for the half-year were £41,632. As a matter of fact they were £33,865, the difference being due to income tax and depreciation allowance, which are just as much a cost as are wages or stores.

As £36,000 was paid in dividends, the distribution was £5632 in excess of the net profit, the carry forward being reduced to £102,818 as against £104,953 brought forward. This in itself, taking into consideration the sound position of the company, is not a very serious matter; the objection lies in the manner, intentional or otherwise, in which the fact is obscured.

The general manager's report announces that the output of ore from the mine totalled 116,728 tons, of which 106,063 tons was delivered at the mills for crushing and concentration, and 10,665 tons, being very low grade, was rejected; 580 tons of concentrate was obtained. That finishes all reference to the output. The customary remark about the average grade, expressed in terms of concentrate obtained, is missing, though the loss is not by any means a severe one. What was the assay value of the ore, or what was the yield of tin are not, as usual, considered deserving of mention. Stoppage of work on the mine, owing to the exceptionally dry season and consequent failure of the water supply, was responsible for the output being greatly diminished. In dealing with alluvial mining operations, the loose terminology that has become almost universally adopted creates confusion. Thus, dirt, crush-dirt, ore, crushing material, stone, etc., are used as synonyms perhaps with the idea of avoiding monotonous repetition, certainly with the effect of destroying clarity of meaning. Then, again, ore and concentrate are often used to designate the same thing, though to the average understanding they mean two quite different products, a difference that is recognised also in general mining practice. It is a pity that this undesirable, and quite unnecessary, contradiction in terms is allowed to flourish as it does. The Bischoff report is a victim to the malady. The metallurgist, in this brief account of operations, states that the total quantity of ore smelted was 1644 tons, which produced 1117 tons of tin. Here concentrate is really what was meant, not ore. The omission by the general manager regarding the yield of tin from the mine may be in some measure repaired by the metallurgist's statement that of the 1644 tons of ore (?) smelted, 588 tons, yielding 372½ tons of tin (equal to a yield of 63 per cent.), was smelted on account of the company, and 1056 tons, which produced 744½ tons of tin, on public account. The average assay of the metal was 99.88 per cent. tin. Working back from this, it can be calculated that the ultimate yield of tin was 7.76 lb. per ton of ore milled. The yield per ton of tin-bearing material originally handled was 7.05 lb. of tin. But what was the assay value of this material is a complete guess. Nine per cent. of the material was rejected by a process of preliminary sorting, being "very low grade." Being unprofitable to treat, it was not ore. Yet it contained tin, the amount of which is not stated. Further, there are the milling and smelting losses to be allowed for, matters upon which a dead silence is preserved. With the above explanatory remarks, the following comparative table may be introduced:—

Comparative Table A.

Output from the Mine.

| | —Half year ended— | | |
|---|---|---|---|
| | June, 1912. | Dec., 1912. | June, 1913. |
| At the mine— | Tons. | Tons. | Tons. |
| Tin-bearing material handled .. .. | 130,712 | 131,028 | 116,728 |
| Tin-bearing material rejected | 17,534 | 13,700 | 10,665 |
| Ore delivered at the mill | 113,178 | 117,328 | 106,063 |
| Concentrate produced .. .. .. | 600 | 600 | 580 |
| At the smelting works— | | | |
| Concentrate smelted (A) | 602 | 617 | 588 |
| Yield of tin | 404 | 405 | 372 |
| Concentrate smelted (B) | 1,028 | 1,448 | 1,056 |
| Yield of tin | 725 | 1,017 | 745 |
| Total concentrate smelted | 1,630 | 2,065 | 1,644 |
| Total yield of tin | 1,129 | 1,422 | 1,117 |

Note.—A means on company's account.
B means on public account.

It is interesting to note that the concentrate (A) that was smelted totals 27 tons more than was produced during the last three periods. The tonnage of concentrate periodically returned for a long time past is too uniform not to be above suspicion. The ultimate yield of tin per ton of ore has also been remarkably constant, being 7.70, 7.97, and 7.76 lb. for the last three periods, in order of time. The corresponding yield per ton of material handled is 6.91, 6.90, and 7.05 lb. of tin. The percentage of material that was rejected runs as follows:—13.4, 10.5, and 9.13. These figures are calculated upon the information in Table A, which is all that is to be gleaned from the report.

The next subject to claim attention is the costs. The usual tabulated statement of working costs is shown in the report, testifying to a total of 4s. 11.787d., as against the previous 4s. 8.390d. This is the only attempt but one to aggregate the expenditure under headings that indicate the actual operations at the mine. And there is the inevitable omission again. On what basis the costs are calculated, the report quite fails to state. This question could at once be settled by reference to the accounts, if these fulfilled their function. But they do not. At least they do not fulfil their proper function, though this may not be true of their actual purpose. When the accounts are turned up they reveal the information that salaries and wages absorbed £25,598, stores cost £3487, etc. Yet for some obscure reason the item "mine developments, £1289," is shown as the solitary and lonely representative of a class of work. The other items refer merely to objects. Evidently mine development is treated as a redemption charge, though the balance-sheet apparently contradicts this assumption. As it is written off as incurred each period, it might just as well be shown as a revenue charge direct. The only difference, then, would be that the name "mine development" would disappear, and the amount £1289 would be spread over the inane "salaries and wages, stores, etc." Perhaps this particular item will afford a clue as to the basis of the costs. Here is the list of working costs, as published:—

Table B.

| | s. | d. |
|---|---|---|
| Mining, including new works, stores, etc .. .. .. .. .. .. .. .. .. .. .. | 2 | 10.557 |
| Aerial ropeway, including maintenance | 0 | 1.798 |
| Milling and concentrating, including maintenance and ore bagging .. .... | 1 | 2.698 |
| Prospecting and developmental work .. | 0 | 2.649 |
| Electric running .. .. .. .. .. .. .. .. | 0 | 0.682 |
| Surveying .. .. .. .. .. .. .. .. .. .. | 0 | 0.576 |
| Assaying and sampling .. .. .. .. .. .. | 0 | 0.739 |
| Races and dams .. .. .. .. .. .. .. .. | 0 | 1.604 |
| Administration .. .. .. .. .. .. .. .. | 0 | 2.484 |
| | 4 | 11.787 |

If the 106,063 tons of ore treated be taken as the basis, this figure must be multiplied by 2.649d., the cost of prospecting and development work. The result is £1171. Trying the 116.728 tons of material originally handled gives £1288 as the result. This latter tonnage, then, is evidently the basis of the working costs. Referring to the list it will be noticed that the cost of smelting the tin concentrate is omitted. And so is the freight on the concentrate. Those are both genuine working costs. Just here a severe dislocation takes place. The Tin Account would seem to be comprehensive enough in name to warrant a search being made there. "Carriage of ore, £1762;" "Freight on tin and tin ore, £385," can be found, but after that there is a blank, so far as the smelting is concerned. This may be distributed over salaries and wages, stores, etc., or it may not be included in the Tin Account at all. The Tin Account makes no mention of fuel for smelting.

The total of the expenses shown in this account is £35,897. The working costs shown above would take £28,950 of this amount, leaving £6947 to cover the expenses incurred at the smelting works at Launceston. This sum may be sufficient, but it is hardly likely. Even if it were sufficient, the working costs may not include many of the items shown in the Tin Account, and allowance for these would still further reduce the £6947. It would seem as if a separate account was kept at the smelting works, and by some strange oversight it is never published with the other accounts, only its balance being transferred to those. Thus, on the credit side of the published Tin Account is to be found those two items:—

| | |
|---|---|
| By proceeds of tin .. .. .. .. | £76,301 |
| ,, balance, tin on hand .. .. | 4,743 |
| | £81,044 |

If all the operating costs are shown in the Tin Account, this £81,044 must be the gross proceeds. Leaving out £4743, the estimated value of the tin on hand, the remaining £76,301 is far too small to account for the sale of 1117 tons of tin, with prices ranging from £180 to £210 per ton. It would easily cover the sale of the 372 tons of tin produced in the company's account, but not the 745 tons on public account. The report, of course, omits the average price received for the tin produced. In the absence of such necessary information, and because of the lack of lucidity in the accounts, the exact cost of producing tin from the company's own ore can not be determined. All that can be reasonably deducted is that if the profit on the customs smelting at Launceston be added to the profit on the tin produced from the mine, the total net profit, after allowing for the deductions shown in the Profit and Loss Account, amounted to £91 per ton on the 372 tons of tin produced in the company's account. If tin were to fall, say £50 in price, the profit probably would suffer more than the indicated proportion. For it is reasonable to assume that the lower price would not stimulate production among the many small mines, and this would react to the detriment of the customs smelting business of this company. Fortunately, tin is still at a high price, and so long as this continues the company should maintain a high rate of profit. Its subscribed capital is exceedingly moderate, being only £29,600. The dividend for the last two half-years amounted to nearly three times the capital. The company has had a wonderful record, and should have a long and profitable life still ahead of it. Its ore reserves have not been published for some considerable time. The leading features of its recent financial history are shown in the following table:—

Financial History.

| | —Half-year ended— | | |
|---|---|---|---|
| | June, 1912. | Dec., 1912. | June, 1913. |
| Revenue .. .. .. .... | £78,598 | £87.061 | £78,239 |
| Expenditure .. .. .. | 38,401 | 38,614 | 38,468 |
| Written-off .. .. .. | 5,707 | 5,602 | 5,906 |
| Net profit .. .. .. | 34,490 | 42,845 | 33,865 |
| Dividend .. .. .. .. | 36,000 | 39,000 | 36,000 |
| Carry forward .. .. | 101,108 | 104,953 | 102,818 |
| Subscribed capital .. | 29,600 | 29,600 | 29,000 |
| Capital expenditure .. | 5,026 | 4,654 | 8,427 |
| Liquid assets .. .. | 51,876 | 57.213 | 56,612 |
| Liabilities .. .. .. | 2,375 | 2,919 | 7,245 |
| Surplus of liquid assets .. .. .. .. | 49,501 | 54,294 | 49,367 |

# METAL QUOTATIONS.

## By Cable.

(From Our Correspondent.)

### London, Tuesday.

The low tone of the industrial metals during the previous week was emphasised last week, there being a further considerable decline in values, practically all round. This was especially noticeable in the case of tin with respect to metal to be delivered three months' hence, for which the quotations ranged from £186 to £186 15s.

COPPER.—Spot metal was quoted on Tuesday at £69 7s. 6d., showing a fall of 8s. 9d. since Friday, followed by £69 3s. 9d. and £68 15s.

For three months' delivery, Monday's rate was £69 15s., the fall being 1s. 3d. per ton; then came £69 6s. 3d., £69 3s. 9d., and £68 15s.

Electrolytic, which opened the week at £73 5s., showing a rise of £1, went on Tuesday to £73. then to £72 10s., and on Thursday to £72 5s. Yesterday's price was £72 15s.

TIN.—Monday's quote for spot was £187 15s., a fall of 5s., and the same rate prevailed on Wednesday; then came £188, followed by a return to £187 15s.

Three months' parcels were taken on Monday at £186 5s., a fall of 15s., Tuesday's quote being £186; then came a rise to £186 10s., and a further one to £186 15s.

LEAD.—Monday's middle price was £19 13s. 9d., a decline of 6s. 3d., but later quotations were £20, £20 7s. 6d., and £20 5s.

SPELTER brought £20 13s. 9d., as against £20 15s. in the previous week.

SILVER.—The market rates were 27¼d., 27 5/16d., and 27 7/16d.

ANTIMONY.—"Star" brand was stationary at £29, and 50 per cent. ore at £6 10s. per ton.

WOLFRAM (70 per cent. ore).—Last week's price of 33s. 6d. per unit, or £117 5s. per ton, was maintained.

MOLYBDENITE showed no change from 2s. 8d. per lb., equal to £298 14s. per ton.

MANGANESE (50 per cent. ore) improved from 9¾d. per unit, or 40s. 7½d. per ton, to 10d. per unit, or 41s. 8d. per ton.

---

The British Chamber of Commerce, Paris, the official representative of the Commonwealth in France, reports:—The following are the latest quotations on French markets:—Copper, £68 4s.; tin (Havre), £201 4s.; antimony, £40 8s.; lead (Rouen and Havre), £23 4s., (Paris) £23 8s.; zinc (Havre), £22 16s., (Paris) £22 16s.

# VICTORIAN MINING ACTIVITIES.

## Ballarat and District.

(From Our Correspondent.)

Another bore has been started at the old Berry United lease, between the bore that bottomed at 429ft. and another that bottomed at 363ft. The Government drill is being employed, but the site does not meet with the approval of local experts, who consider the site too far east. These bores are 1000ft. apart. The last bore put down by the Government proved nothing of consequence. Should the present bore fail it is likely that the next bore will go down between the 429ft. bore and the shaft. The present syndicate was formed to resume the search for the lost Berry Lead, beyond the old Berry Consols Extended and Spring Hill Leads workings.

The position at the Williams' Fancy reef is promising, and every confidence is felt in the bottom (No. 7) south drive making good at the appointed time. Another month or less should see the face up to the big break, beyond which in the level above the long shoot of gold made its appearance, since which development the shareholders have received 7s. 6d. per share in dividends. When the break is met the drive will be turned westerly, and 70 or 80ft. of driving was necessary in the No. 6 level before the stone made again. Present indications are that the lode will be producing milling ore well before the stopes at No. 6 level give out, a matter of about five or six months. Fair faces of 5 dwt. stone are showing at the No. 6 level.

A healthy change in the country at the Central Plateau has occurred, the face of the 700ft. north drive at latest displaying about 18in. of well mineralised and laminated stone in the bottom. A little gold is also discernible, and the country seems more settled. There are veins rising off the stone, and on the west side, a little back from the face, where a short crosscut is being put out to test the full width of the formation, they have 2 to 3ft. of gold-bearing ore, lying on the hanging wall. The east crosscut has gone into clean country, and having passed the third seam, will likely be stopped, as the indications point to the shoot of gold making any day in the north drive. It is thought that the stone is pitching northerly, as the face of the 700ft. level is a short distance past the point at which the shoot of gold made in the level above.

The 1030ft. south drive at the Llanberris No. One is opening up stone of really good quality at times, and full faces of payable ore are exposed in the stopes above and also in the 1130ft. level. The yield—495 oz.—advanced 20 oz. on the previous return, and gave a profit of about £500, or within £100 of the amount necessary to provide a dividend of 6d. They have started west at the 930ft. level in the hope of picking up the same run of quartz, as the east crosscut failed to locate it, and they now have the same objective in the 1230ft. level recently started, and which is already in gold-bearing stone.

## Bendigo and District.

(From Our Correspondent.)

The gold production for the week ending August 23rd, 1913, amounted to 2868 oz. 8 dwt. The principal producers were Central Red, White and Blue, 358 oz. 2 dwt.; Great Northern, 165 oz. 10 dwt.; Carlisle, 158 oz. 12 dwt.; South New Moon, 156 oz. 2 dwt.; Golden Pyke, 143 oz.; Ironbark, 124 oz. 9 dwt.; Princess Dagmar, 106 oz.; Williams' United, 96 oz. 7 dwt. Four dividends were announced, aggregating £3697 10s., viz.:—Golden Pyke, 1s., £1372 10s., total to date £78,057 17s.; Carlisle, 6d., £900, total to date £56,700; Great Northern, 6d., £750, total to date £168,700; Virginia, 6d., £675.

Princess Dagmar operations have had a set back, owing to the engine house being destroyed by fire on Saturday. As the work in the 867ft. interdiate level will be carried on through the Golden Age mine, pending re-equipment, the output will be curtailed to some extent, and last week's yield of 106 oz. from 158 tons was regarded as very satisfactory, as the front stopes above the timber were not drawn upon, on account of timbering and filling up. The amalgam return indicated that the gold was of finer sample than of late. Fair gold is still visible in the leading stopes, and more quartz of a spurry character is being met in the level, associated with the synclinal fold, and containing gold in apparently payable quantities. In stoping north from the crosscut connecting the rise over 867ft., the reef enlarged to 12in., and is of payable quality. In rising over these stopes, there has been a greater width of quartz than disclosed at intervals in stoping, a little gold also showing. It was originally intended to beat the reef upward toward the three stopes near the north boundary from the present workings, which would necessitate the inclusion of the lower grade material traversed for some time in the rise. As these upper stories are in fair grade ore and easily accessible from the next mine, it is very probable that operations will at once be recommenced on this portion of the reef, where the better grade shoots exists close to a break in the hanging wall. The opening up of the new reef on the "Pyke" fold, at 1845ft., will have to be deferred till the machinery is available.

Johnson's Reef had a firing in the rise on the 781ft. east back, exposing 18in. of good-looking quartz and a few colours of gold. The back is considered identical with that in the Princess Dagmar 867ft. stopes, at 240ft. further north. Work having been conducted through the latter company's shaft, rising will have to be postponed for several weeks. Meanwhile the extension of a crosscut off the No. 2 shaft at 600ft. will be proceeded with, to tap the same channel at about 400ft. south. In driving south on the Collmann west leg, on the Paddy's Gully line, very little alteration in prospects has been observed. Golden Age favourable prospects at the north shaft were quite maintained with the second breaking in the 655ft. north level, a fair sample of gold being found in 9in. of footwall stone, showing above a small fault recently uncovered. The spurs in the intervening between the hanging wall are well mineralised, but still of low value. The hanging wall will be reached with the next few breakings, but it appears unlikely that much stone will be found bedded along it. After driving another 20ft., stoping will be commenced at about 30ft. from the end, where the former company ceased milling. The south level has been commenced from 68ft. in. on 18in. of spurry quartz. There should be a firing in this end before this appears in print. Over the back of the level the crushing material is 2ft. wide. The stone broken in the north level is being reserved for a trial milling. At the main shaft there has been another firing in the third stope on the south boundary, again dislodging fair gold where the hanging wall is broken. This shoot is evidently connected with that in the stopes at 150ft. further north, giving some assurance of premanency. The leading stope off the south end of the lease will be drawn upon during the current term. As the last breaking here produced stone of profitable quality, fair results are anticipated in increasing the height of these workings. Less gold has been seen in the four back stopes nearer the shaft, but a slight improvement was noticeable in the leading stope from this end. At the eastern shaft on the Paddy's Gully line, a slight mishap caused the suspension of work for a few days. The east back of a small reef, intersected in shaft sinking, was again disclosed with the 1580ft. crosscut. It also proved small here, and the resumption of shaft sinking will probably be determined upon before the crosscut is extended to the corresponding west leg. The better yield of 72 oz. 15 dwt. from 100 tons was obtained.

Golden Pyke have an improvement in the 447ft. main level, since picking up the displaced portion of the main east back. This level is now 90ft. from the Constellation boundary, where the hanging wall carries 12in. of reef of payable quartz. After a recent breaking the quality of the footwall spurs also improved, and the prospects are now more favourable for both companies than in driving this end for some time past. The stopes take from 12in. to 2ft. of stone, the larger width being in the south end, where several colours of gold are occasionally visible at 15ft. to 20ft. under the cap. This stope is about 100ft. from the Golden Age boundary, and probably 300ft. north of the 655ft. crosscut in the latter mine. The position of the cap here, at well above the 447ft. level, makes it difficult to recognise as the turnover of the Golden Age 655ft. east back, which exists at 540ft. in the latter property. This represents a pitch of between 30ft. to 40ft. per 100ft. over the length of reef channel intervening. The Golden Pyke 543ft. north level has been squared to the boundary on 10in. of fair grade stone. The leading overhead stope is not of such good quality nearer this end of the lease, the faulting not being so rapidly inclined southward. A stope has been resumed a little ahead of the No. 3 rise at 200ft. north of the shaft. There is 3ft. of profitable stone. This stope will be extended to reach the rich shoot of quartz traversed in the No. 3 rise some weeks ago, and should materially influence the gold production if drawn upon to any extent. Satisfactory prospects continued to be disclosed in the south stopes. From the rise above the 643ft. level, at 150ft. south of the shaft, a stope has been started north on 18in. of gold-bearing quartz. This will later reveal the bottom of the high grade stone found in connecting the 543ft. level, by the No. 1 rise opposite the shaft. The stope going south is in 3ft. of promising stone, but has not shown much gold so far. The 743ft. crosscut will be continued this month. This crosscut is 90ft. short of the lower extension of the main formation. In stoping on Chadwick's reef, further east, there is 10in. to 12in. of payable stone.

Constellation sent in the more satisfactory return of 52 oz. 8 dwt. from 77 tons. This result was due to the location of better quality stone in understoping the 525ft. level northward and in the stopes above. The 643ft. south level is looked to later to furnish interesting developments with the increasing height of the stoping, as the lower portion of one of the Golden Pyke good shoots should enter the lease for a limited distance at this depth. The 420ft. north and south levels will be started during the next fortnight, on the completion of the machinery at the north shaft.

Great Northern broke some stone of good quality in the 1180ft. north level on the McDuff for the greater part of the week, in third stope north of the old winze. The height of this more highly auriferous quartz above the level is important, as the stone showed a tendency to pitch underfoot for some time, and of late a reversal of pitch has been noticed in this end, which will keep the spurs overhead for some distance further. From this stope there is nearly 400ft. of ground to open up to the Virginia boundary, and the spurs afford about 10ft. of crushing material. In stoping toward the shaft from the crosscut, at 700ft. north, a width of 8ft. of spurs is taken, revealing fair gold. The stopes along the western hanging wall are operating on the larger reef at about 760ft. from the shaft, taking 7ft. of payable quartz. The deeper level on the same back has not yet disclosed anything of value. At 2680ft. the north shows a few inches of low grade stone adhering to the west back of the deepest reef, but no gold is visible.

Virginia had the distinction of declaring a 6d. dividend during the progress of the strike, disbursing £675. Working under restriction, payable yields have been obtained by concentrating attention on the quartz allied to the McDuff back above 1250ft. In anticipation of the strike, the company had made preparations to work this stone to advantage with a limited number of miners. There are 14 men employed underground at present, despite the attitude of the unionists, and it is expected that the present rate of output will be maintained.

Central Red, White and Blue have extracted a number of excellent specimens from the locality of the No. 2 winze belowe 318ft., in stoping close to the rails. There is 5ft. to 8ft. of rich stone in these upper stopes along the hanging wall. Though limited in extent, this reserve is sufficient to sweeten the crushings for some weeks, as only a small portion of the richest stone is included weekly. The stope close to the No. 5 winze has not been drawn upon for the last fortnight. This portion of the reef is to be reserved till the stopes reach the winze from the main level.

Goldfields South, having successfully contested an application for forfeiture of the lease, lodged on the grounds of non-fulfilment of the covenants of the Mines Act, will resume operations immediately. The objective will be the continuation of the reef, from which the Victoria Proprietary tributers are getting good yields, at 120ft. from the boundary. The shaft is deep enough to reach the formation by extending one of the lowest crosscuts. It is considered that the company were close to the reef when operations were suspended owing to financial pressure, about 18 months ago. Closer to the boundary the stone is of lower grade, the adjoining company having failed to locate anything payable in rising at 20ft. from the end of the lease.

## Castlemaine and District.

(From Our Correspondent.)

Interest is considerable as to the permanence of the improvement at Spring Gully. The adjoining ground is being pegged out, both to the north and south. The manager reports a continuance of satisfactory prospects in following the pitch of the eastern system of spurs to the south of the main shaft, in the 240ft. level, and intermediate stopes. The level is advanced to 109ft. in the vicinity of the Thomson's break, and has shown a little gold in the spurs throughout. Three stopes are in progress on the spurs, as well as two others just begun, to go out 100ft. There is 7in. to 2ft. of spurry quartz in sight, showing gold, and a like feature marks the second and third stopes. From the first stope to the No. 1 boundary, there is nearly 500ft. of ground not yet tested, but crosscutting will be done in order to do that. At 200ft., along the east side of the north intermediate, 3ft. of crushing material is available, showing gold. The 170ft. north level is in 105ft., and also shows an improvement. The bottom slide is showing, and carries 12in. gold-bearing quartz. In addition to this, there are 16 men engaged in driving levels, etc. The dividend that was declared was distributed as follows, amongst 130 shareholders:—Bendigo, £679; Castlemaine, £219; Melbourne, £163; Adelaide, £60; Sydney, £15; other Victorian districts, £20. A laudable action was the granting of a percentage bonus to the mine employees. The sum given was about £20, and worked out at about 11s. per head. The half-yearly report contained some interesting information. The company was registered in 1894, in 24,000 shares, of £1 each. The amount called up, 7s. 2d. per share, £7977; first dividend, August, 1898; total dividends equal £3 1s. per share, £73,200; amount crushed to date, 134,000 loads, for 50,065 oz., valued at £205,326. The shaft is 730ft. deep, and the north shaft is down 310ft.; 40 head of stampers; value of plant, £10,703. Since its inception to date receipts have totalled £223,249, including—Calls, £7977; gold and pyrites, £205,574; crushing, £6939. The chief items of expenditure were: Plant, £10,703; wages, £82,975; material, £13,910; firewood, £11,233; insurance, £1888. Mr. C. W. Steiner has been commissioned to make an exhaustive survey, report and plans of the whole of the workings, and expects to finish the task within a few weeks.

The manager of the South Wattle Gully reports excellent prospects at the 300ft. level, on the west leg, where 2ft. of stone is carrying galena and a good amount of pyrites. They have opened out south to provide for stoping. The drive is in 8ft., and gold has been seen daily in breaking out.

Campbell's Creek bucket dredge had a fall in returns last week. A full run only gave 63 oz. Although this is 40 oz. less than the previous two weeks, it is over the payable mark. Another 6d. dividend was declared last week.

### Maldon.

(From Our Correspondent.)

There is nothing fresh to report anent the South German Co. The intermediate drive, 150ft. below the 1750ft. level, is being continued north, and is now advanced over 100ft. The stone in the face is of good appearance, and discloses traces of gold in prospects. A crushing of 50 tons gave 17 oz. 15 dwt., and pyrites and sand added 12 oz. 12 dwt., making 30 oz. 17 dwt. in all. An additional 708 tons of sand and slimes gave 59 oz. Baxter and party (tributers) crushed 155 tons for 73 oz. At the end of the week work was retarded in driving the intermediate level, owing to repairs having to be effected to a shoot. Maloney's Red, White and Blue kept up its recent average, 57 tons yielding 16 oz. 5 dwt. gold. Similar quality stone is being broken out and crushed.

Derby United, at 680ft. level, has risen over the east crosscut to 20ft., and the stone was cut out on the floor. The machine was shifted out of the east rise, and a rise was started in the end of the main level. It is up 12ft., showing 10in. of laminated stone. At the 350ft. level stoping is being done, both north and south, from Lyman shaft, on low grade stone. A crushing of 320 tons yielded 50 oz. 13 dwt., with pyrites and sand yet to treat.

The manager of the South British Syndicate, Mr. R. McAuley, which has been working a claim south of the Oswald's Gold Mines, has resigned his position. Before appointing a successor, Mr. McKenzie (chairman of directors) visited the mine in order to obtain a report on the prospects. A small battery had lately been installed, and its first crushing did not prove payable, only a few dwt. per ton being obtained. The shareholders hold 576 shares, 76 being fully paid up. The others have paid in £3 each. Last year the mine returned 77 oz. from 151 tons. The last report from the manager read: 210 level north is out 163ft., in nice body of stone. At 160ft. level payable gold was struck, going strong underfoot. A winze has been sunk on it for 6ft., without change. South from the crosscut 7ft., nice looking stone is showing in the face.

During the fortnight Oswald's Gold Mine has treated 419 tons for 231 oz. 8 dwt. They are rising at 600ft. south on the east wall. The reef is 8in. wide, and nice looking, being worth 3 dwt. The stone at 500ft. level south is from 3ft. to 5ft. wide, and for the last 50ft. has gone as high as 1½ oz. to the ton, but the stone is now pinching. They are stoping with two machines at 600ft. on stone up to 7ft. wide, and worth from 10 to 15 dwt. to the ton. At Tabletop they are also breaking stone from a 3ft. reef worth up to half an ounce.

Over a year ago the Maldon Prospecting Association was formed, and it got a promise from the then Minister of Mines (Mr. McBride) to assist them up to £1000 on the £ for £ basis. Great efforts were made to get the shares taken up, but only 180 were placed. The trouble was that no locality had been chosen as a site for the test shaft. A meeting of shareholders was held last week, and a resolution was carried to wind up the company, and return the money, less incidental expenses.

The machinery of the Nuggety syndicate was auctioned off last week. The whole was bought in one lot by Messrs. Miller and Co., for £265. It was afterwards put up in lots, and £100 worth was sold. The sand and cyanide plant was bought by Mr. Archbold, of Chewton. The battery and suction gas plant was not sold by the purchasers.

From the two mines at the Newstead end, favourable reports come. Blow Reef has got within about 30ft. of its 400ft. sink. The shaft has been enlarged at 360ft. for the plat. The country is hard. As soon as bottom is reached men will be put on crosscutting east, and others will break out crush-dirt. In the east end of the shaft gold-bearing leaders are dipping towards the reef, which passed out of the shaft higher up. The gold-bearing leaders are taken as a good indication of the value of the reef when it is cut. Crushing is in progress from the 260ft. level north of the rise.

Uncle Sam has completed the plat at 190ft., and a start has been made to open out on the reef, which was cut the other week, and which is 5ft. wide, with good prospects on the footwall. Judging by the underlay in the old workings, the lode should be cut within 40ft.

## MINING IN NEW SOUTH WALES.

### Bathurst District.

(From Our Correspondent.)

Bathurst, Aug. 22.

The new reef at Scabbing Flat, near Trunkey, appears to be a find of considerable importance. A trial crushing of 30 tons yielded 96 oz. of gold. So far, the prospectors (McKellar Bros.) have only trenched along it, so that whether the values will continue in depth remains to be proved. The reef is a big one, and runs 8ft. or 9ft. wide in places. The prospectors have but a small area of ground of 2 acres, through which the reef can be traced from end to end. Other speculators have taken up blocks, both north and south of them.

A brick and tile company is being formed at the present time to work the very extensive deposits of clay on the Kelso side of the Macquarie River. The capital is £25,000, in shares of £1 each. Exhaustive tests of the clay made at the Sydney brick works show it to be of a quality unsurpassed in the State, and, with the latest up-to-date machinery, should make it a most remunerative industry. The clay is also eminently fitted for the manufacture of earthenware pipes; and, as a sewerage scheme is now in progress at Bathurst, and other western towns are shortly to follow suit, there can be no question that there is a fine opening for works of this description.

Potter's Silver Lead Syndicate, at Condobolin, has despatched its first parcel of ore to the Cockle Creek works. A winze from the bottom level has gone down on good grade ore 18in. thick. The main shaft is also being sunk to open up another level, when it is anticipated a large output can be regularly maintained. In addition to this, there are some thousands of tons of seconds at grass that will be concentrated as soon as the machinery is completed.

Development work at the new Iron Duke copper mine, at Orange Plains, is of a decidedly encouraging character, and rich ore is being bagged to be sent away for treatment. It is understood that the new railway will pass through this company's leases. This will doubtless be the means of stimulating the copper mining industry in the neighbourhood.

Active work is in progress at the Mineral Hills silver-lead mine, and rich ore is being bagged and sent away. It would appear, however, that as depth is attained the values are not so satisfactory.

### Southern District.

(From Our Correspondent.)

Messrs. Twyford and Read, the successful prospectors at Mt. Dromedary, are still working on their show of reef, and have now a fairly large heap at grass, from which samples have shown good. They are reported to be negotiating for a small battery. Messrs. Cook, other parties, who got a prospect of a reef, are driving from a shaft 60ft. deep, to pick up the reef on the underlay. None of the other prospectors have struck the reef, or any branch of it.

From the Yambulla mining field the principal news is that the recent bismuth-silver-gold lode, towards Whipstick, is to be put on the market in the form of a 24,000-share company.

Mr. F. W. Bassett, recently manager of the Falkner mine, which, when first struck, years ago, yielded sensationally rich stone, has got a group of Bendigo mining people to buy the lease; they intend to erect a battery, and treat all stone down to 5 dwt.

At Wolumla, another mining centre of that region, which has for some time been very quiet, a four months' suspension of labour conditions has been granted to Mr. J. Walsh, for two holdings at Mount Mouseu. The granting of this concession is grumbled at locally. It is thought that, in the interest of the mining industry, an inquiry by Royal Commission into the operation of this provision of the law would prove instructive.

### Sunny Corner.

(From Our Correspondent.)

Sunny Corner, Aug. 22.

Mining matters are somewhat dull just now. The drilling operations at the Nevada mine proved fruitless, and the Sulphide Corporation has turned the option down. The result is not altogether unexpected, as those who have had experience in the mine previously assert that it is useless to look for anything at a depth, the ore body being more inclined to the horizontal than otherwise. The drills were put in at an angle, but nothing worth while was found. It is stated that there is a three feet vein in the bottom of the winze, and the only hope of finding anything bigger seems to be in following this. The late Louis Lloyd made £1100 out of this mine years ago, when copper was only £40 a ton; so, at the present price, it is well worth following up.

At the Sunny Corner mine there are about 12 men employed, but, if the application for suspension, which has been lodged, be granted, these will probably be knocked off. It is reported that negotiations are proceeding with the Goldfields Drilling Co. to test this ground with the drill, and the plant lately working at the Nevada is being held here for the purpose, though the crew will be transferred to other places.

Mr. Carne, Assistant Government Geologist, inspected the mine on Saturday last, but his report is not yet available. Indications seem to point out that this mine resembles its neighbour, the Nevada, and that the ore does not go down, but runs out horizontally, or nearly so, in a north-westerly direction. If so, this would bring it under the site occupied by the old plant of the former lessees.

Work at the Yerranderie silver mines still continues very slack; in fact, never in the history of Yerranderie has the field been so dull.

### Lithgow District.

(From Our Correspondent.)

Lithgow, Aug. 22.

An application for suspension of labour conditions for three months on the Sunny Corner lease was posted at the Mining Registrar's office, Sunny Corner, during the week, by Mr. C. H. J. Clayton, on behalf of the Sunnyside Syndicate Ltd. The reasons given for the applications are:—"That substantial expenditure has been incurred in mining operations on the lease, and the lessee is temporarily unable to continue such operations, and requires reasonable time within which to make necessary arragements."

The teams that for months past have been carting between Perthville and Burraga have gone off the roads, the reason being that the Lloyd Copper Co. has concluded arrangements for the haulage of its matte and goods by means of traction engines and trucks. It is understood that the company will effect a saving of something like 12s. 6d. per ton as compared with haulage by team. Considerable doubt is expressed as to whether the engines will be able to negotiate the very heavy grades at certain points of the road, and drivers of horses are not looking forward with any degree of pleasure to meeting the traction engines on the road. The engines are of the powerful Marshall 28h.p., sitting on springs. There is a staff of four men, and it is understood that when matters have got into full swing, two shifts of twelve hours each will be worked, two men to each shift, and that Rockley will be the shift-changing place.

## MINING IN PAPUA.

Messrs. H. W. Clark and K. S. Hungerford, who are on their way to bore and test the property of Guinea Gold, No Liability, at Yodda Valley, Papua, writing to the secretary of the company from Woodlark Island, under date July 19, state that from inquiries made they consider the property a very promising one. The company's registration in Papua has been effected, the local agents being Burns, Philp and Co. Ltd., Samarai. An option over 10 miles of Tamata Creek has been secured, and this, with the Yodda Valley property, is said to be the cream of Papuan dredging properties. In regard to the difficulties of transport of machinery, etc., to the site, a local man has agreed to enter into a contract with the company to deliver the plant on the ground at £4 15s. per ton, and so certain is he that the work can be carried out, that he has agreed not to make any charge at all if unsuccessful. The administrator (Mr. Staniforth Smith) has promised to do all he can to facilitate the company's operations, and has arranged for runners from the field to Port Moresby, whence information can be transmitted by wireless, so that no delay should be experienced in this respect. Guinea Gold No Liability is a recently-formed company, with a capital of £1500 in £10 shares, of which 50, fully paid, go to the vendors, the remainder having been issued at £5 on application, the balance of £5 to be paid if the telegraphic report of Messrs. Clark and Hungerford, who are at present testing the ground, is satisfactory. In that case it is proposed to form a large company with a capital of £150,000 in £1 shares, to work the leases, the present option company to receive 375,000 shares in the larger company. The leases comprised in the option have all been worked with payable results by box slucing, but as they are now not rich enough for this method to be employed, they have recently been declared open to gold dredging, which was formerly not allowed. The owners estimate that the ground contained in the leases will average between 2½ and 5dwt. of gold per yard. A good depth of water is available to the head of Buna Bay, 65 miles from the field, and where the Burns, Philp steamers call at intervals of six weeks, and a good road from the Bay to the field has been cleared by the Government. Native labour, at 10s. per month, can be easily secured, also firewood and timber suitable for building barges. A wireless message received from Messrs. Clark and Hungerford on August 5 stated that four miles of Monai River, Woodlark Island, had been pegged and applied for.

## TASMANIAN MINING.

### Mount Lyell District.

(From Our Correspondent.)

Queenstown, Aug. 22.

Although the smelting returns of the Mount Lyell Company for the four weekly period ending on August 6th were not as good as might reasonably have been expected, they were a considerable improvement on those of any similar period since the disaster in October last. Only two furnaces were running during the term, as against three for the preceding month, and while the aggregate quantity of material furnaced was only 19,828 tons as compared with 25,768 tons for the previous four weeks, the copper produced was 53 tons more. Certainly with 7000 tons of North Lyell ore treated it was only fair to assume that a better return would be obtained, but evidently the grade of the North Lyell ore was a good deal below the average 6 per cent. As a matter of fact, it would not be worth more than 4½ per cent. It must, however, be remembered that very great difficulties have had to be surmounted in order to get the mine in proper working order, and very often circumstances have rendered it practically impossible to get an extraction on lines which would ensure a fair average value of the ore throughout the mine being secured. The trouble in this connection has now been overcome, and the proportion of high grade ore now being won is appreciably higher than it has been for months past, with the result that the average grade is being kept well up to 6 per cent.

The output from the North Lyell mine has reached about 2000 tons a week, and, as ore treating is in progress whenever possible, and the number of men employed has lately been considerably increased, there is every probability that within the next month the output will have got back to the old average of 10,000 tons a month. The main bulk of the output is coming as usual from the 1100, 1000 and 850 feet levels, while a small tonnage of excellent grade ore is being won from the 700ft. level, and the 400ft. and 500ft. levels are also contributing a limited quantity to the general output.

At the Mount Lyell mine the output of pyrites, which had been interefered with by the rough weather practically stopping open cut operations is again up to the normal, and about 700 tons a day is being won. With only two furnaces in blast at the reduction works and the comparatively small amount (12,567 tons) of pyrites treated last month, they have been able to get ahead with this material, and there is now a fair tonnage of it accumulated, so that any increased supply of North Lyell ore coming forward can be dealt with.

Regarding operations at the Comstock mine, it will be noticed that only 225 tons of this ore were treated during the last four weekly period. For some time past it has been generally understood that, owing to its comparatively refractory character, the management has not been too anxious to handle any more of it than was absolutely necessary. Further, it is worth only a little over 3 per cent. copper—a value which is not calculated (with only a small quantity being furnaced) to add much to the metal production. Anyway, it seems as if the smelting of Comstock ore has been discontinued, as for weeks past none has been sent to the reduction works, and comparatively few men are now at work at the mine. Some of these are engaged in development work at the various levels, and the ore broken in the course of doing this is being stacked at the mine. Other work in hand is the extension of No. 5 tunnel, which will prove the ore bodies at a depth of about 100ft. below the present lowest workings. Altogether, it looks as if the management, now that it has got the North Lyell mine into fair productive order again, does not intend to bother about the Comstock ore, but will leave the latter to be exploited in the future by some process other than direct smelting. Anyway, when a company has a mine which can produce, say, 10,000 tons of 6 per cent. and easily treated ore a month, it can afford to allow its low grade proportion, such as the Comstock, to wait until some method or process has been discovered by which this class of ore can be treated profitably on a self-contained basis. And just now, for reasons which are obvious, 3 per cent. ore isn't much good to the Mount Lyell Company. During the past six weeks, and up to the time of writing, only two furnaces have been in operation at the reduction works. It is, however, anticipated that there will shortly be an improvement in this direction. The output from the North Lyell mine should shortly reach 10,000 tons a month, and, provided they can maintain an output of between 4000 tons and 5000 tons a week of pyrites from the Mount Lyell mine, it will be possible to keep three furnaces in fairly constant operation.

As far as numbers are concerned, the Mount Lyell Company's labour supply is adequate; but, from the point of view of efficiency, there is a good deal to be desired. All told, they now have over 1000 men employed at the mines alone; but, notwithstanding this, they cannot send out as much ore as they used to do in days past, when the total number of men employed was only about 800; and, as wages are now appreciably higher than they were, the working costs of the company, so far as mining is concerned, must naturally show a corresponding increase.

At Lyell Blocks, the work of hanging the cage to run to the 1100ft level, where a chamber has been cut and winding wear installed to haul the dirt broken in deepening the shaft another 200ft. is finished, and sinking from the 1140ft. point has been resumed. The rise through the 26ft. of ground between the drive from the 1000ft. level of the Blocks shaft and the drive from the North Lyell workings at the 1000ft. level has been completed, and permanent connection between the two mines is now established at this depth.

## WESTERN AUSTRALIAN MINING.

(From Our Correspondent.)

Kalgoorlie, Aug. 18.

The treatment plant on the Corinthian North is nearing completion, and the output in October should be 6000 tons with the slimes plant in swing. Up to date the 20-head mill has treated 8889 tons for a yield by amalgamation of £5827, or 13s. 1d. per ton. The residues contain another £9282, or 20s. 11d. per ton, making the total value 34s. per ton. Allowing 3s. for loss in residues, and taking costs at 15s. per ton—Mr. R. Hamilton's figures quoted from his report on the mine dated February 18, 1912—there is a prospective profit of 19s. per ton, or £5700 per month. It is only fair to Mr. Hamilton to point out that in his report he estimated the recoverable value of the 108,200 tons, in sight at the time of his visit, at 23s. 2d. per ton, but that no pyritic sulphide ore, which is much richer than the oxidised, was included. Mr. Hamilton recently re-examined the mine on behalf of a London syndicate, who acquired an option on the 60,000 unplaced shares. The lode outcrops for a distance of 2650ft., and, at 100ft., is 27ft. wide for the first 700ft. driven. Developments are now being pushed ahead at 200ft., where the ore is proving much richer than in the shallower ground. The slimes plant, now nearing completion, consists of tube mill, agitators, mechanical thickeners and Ridgway vacuum filters, and is expected to make an extraction of 90 per cent.

The Black Range Co., after publishing no return since January, and declaring no dividend since December, has come to light with a return of 3076 tons for £6326 and profit of £1032, and declared its 82nd dividend of 1s. per share, or £3625, due August 15. On an original paid-up capital of £6750 the mine has produced 166,619 tons for £624,229, and paid £236,468 in dividends, besides paying for equipment and development out of gold won.

If it were not for the probability of granite cutting off the lode at a shallow depth, now intensified by the experience of the adjoining Greenfinch, Melbourne could be congratulated on finding a worthy successor to the Black Range in the Edna May. Already the mine has produced £18,350 from 3246 tons, or £5 13s. per ton, exclusive of gold in residues, and practically all won from ore taken for a length of nearly 250ft. at the 75ft. level. The lode ranges up to 44ft. wide, and the stopes now being worked are being taken out at an average width of 17ft., and show an average value of 32½dwt., or 130s. per ton against the 85s. per ton estimated to be the value of the ore in the mine by Mr. M. F. Williams, the manager. The costs, even with the stamps running half-time, as in July, were only 15s. per ton, exclusive of the £2866 for new equipment, while during last year the Black Range treated 30,300 tons at a cost of £57,000, or 37s. 7d. per ton. Even after allowing for treatment of residues, the Edna May costs would be half those of the Black Range. In his report on the mine, Mr. A. E. Morgans estimated costs at 18s. per ton.

Although the value of the ore-shoot in the east drive at No. 5 level in the Victorious has improved to 85s. per ton, that is a long way below the 152s. and 300s. showing in the bottom of winzes Nos. 2 and 3, at 55ft. and 69ft. respectively below No. 4 level. The cause of the alarm in the market is that ore stoped from above the intermediate drive 50ft. below No. 4 level, where values were 240s. per ton, although included in the July crushing, failed to raise the grade, and evidently sulphide ore cannot be treated by the present plant. A parcel of 100 tons of high grade sulpho-telluride ore is being carted to Broad Arrows—18 miles—railed to Golden Gate—20 miles—and then carted half a mile to the company's sulphide mill on the Iron Duke lease for treatment. If this treatment proves successful, it means the installation of roasters and Krupp ball mills on the Victorious, which also means money and time, especially as a large block of sulphide ore would have to be developed before the installation of such a plant could be justified. In the meantime the scrip will be the plaything of market operators.

## MINING IN QUEENSLAND.

### Anakie Field.

(From Our Correspondent.)

Sapphiretown, Aug. 15.

Repeated representations have been made during recent years by the Sapphiretown Progress Association to the Federal Customs Department suggesting that a substantial duty be placed upon cheaply cut foreign sapphires with the object of fostering the Australian lapidarian industry, and indirectly assisting the gem mines by giving him more encouragement to get a few of the best of his gems cut and marketed as finished products. This lends additional interest to an extract from the mining index which is being compiled by Mr. B. Dunstan, Queensland Government Geologist, a copy of which was sent to the Progress Association and read at a recent meeting. The extract points out that while doublets are dutiable, reconstructed or synthetical gems are admitted to Australia free. Mr. Dunstan states emphatically that an import duty should be placed on all gems that are not natural products, whether paste, doublets, reconstructed, or synthetical. This would remove the existing irregularities at the Commonwealth Customs ports, whereby different interpretations are placed on the wording of the tariff as to what constitutes precious stones.

A new buyer arrived here recently and is endeavouring to open a direct market with France in Australian sapphires. He states that he was unable to see any specimens of sapphires at the Agent-General's office in London (a matter that should be remedied).

A largely increased number of miners have been employed around Sapphiretown lately. The washing machines are taxed to their utmost capacity, and a new and up-to-date plant is being erected.

The Minister for Lands of New South Wales is enquiring, through the Agent-General in London, as to a new method of sterilising milk by electricity. The discovery has been made by Dr. Beattie, of the Liverpool University, that under certain conditions the passage of a high voltage current through milk will destroy 99 per cent. of the bacteria contained therein, without in any way altering the quality and substance of the milk as an article of food.

After foreshadowing reduced rates for wireless communications between Europe and America, Mr. G. Marconi informed shareholders at the general meeting of the Marconi Wireless Telegraph Co., that he hoped soon to give interesting information respecting a new subsidiary company, which was being formed in Australia. Mr. Godfrey Isaacs, managing director of the company, said that the day was not far distant when passengers at breakfast on board ship would exchange wireless telephone messages with their friends ashore.

## MINING IN NEW ZEALAND.

### Ministerial Statement.

In spite of the industrial troubles at Waihi and Reefton (N.Z.), during the last financial year, the Dominion Minister of Finance, Mr. James Allen, in making his budget speech, was able to state that the output of gold amounted to £3,035,510, as against £3,492,362 for 1911-12, and there seems to be little doubt that the output for the current year will be quite up to the average.

The coal mining industry continues to prosper. The output of coal for 1912-13 amounted to 2,177,615 tons, as against 2,066,073 tons in 1911-12, being an increase of 111,542 tons. Since the previous budget a revaluation of the assets of the State coal mines had been made, which showed, as was expected, that the assets were not in all cases worth their book value, and the Under Secretary of the Mines Department in his report on the matter recommended additional writings off, as under:—Point Elizabeth No. 1 colliery, £25,000; Seddonville, £10,000; briquette works, £6000; Wellington depot, £600; Dunedin depot, £400; Charming Creek prospecting, £2966—total, £44,966. He also advised that 10 per cent. instead of 5 per cent. should annually be written off for depreciation in future in respect of both the old collieries and the briquette works, and that such amounts should be computed on the gross total capital expenditure in each case, and not merely on the balance not written off, as hitherto.

Mr. Allen went on to refer to "certain proposals relative to establishing the iron and steel industry in the Dominion made by the Ethelburga Syndicate. On the motion of the Prime Minister a special Select Committee was appointed to go into the matter, and after an exhaustive inquiry the committee reported that it could not recommend the acceptance of the proposals in their then form. The proposals of the syndicate involved an expenditure by it of about £650,000, spread over five years, in buying out the rights of the present lessees of iron mining property near Parapara (Collingwood), and in putting down a modern plant for the production of iron and steel on a fairly large scale. They also involved the payment of a Government subsidy at the rate of 5 per cent. annually. This subsidy would have amounted to £32,500 per annum, and was to continue for a period of 10 years, at the end of which term the syndicate was to hand over the whole enterprise to the Government without further payment. During my recent visit to England (Mr. Allen continued), the matter was brought before me again, but on an entirely new basis. The Government has decided to submit the various proposals to a committee of experts for examination and report.

---

During July the Talisman Consolidated Gold Mining Co., Karangahake, crushed and treated 4020 tons of ore for a return of bullion valued at [illegible] 5s. 8d. The costs for the past month totalled 49s. 7d. per ton, made up as follows:—Mine development, 12s. 6d.; mining, 18s. 11d.; milling, 16s. 3d.; general expenses, 1s. 11d. The total amount won from the mine to date is [illegible]. The company's 35th quarterly dividend (1s. 9d. per share) is payable on September [illegible], and will absorb £30,187 10s., making the total of dividends and bonuses since reconstruction, £818,969.

During July the New Zealand Crown Mines, Ltd., Karangahake, crushed and treated 1468 tons of ore for a return of bullion valued at £2367. Compared with the return for the corresponding period of last year, when 2128 tons yielded £3506, this shows a decrease of £1139. The total amount won from the mine to date is £860,782.

The crosscut being projected from No. 5 shaft to No. 4 shaft at the 1300ft. level in the Waihi mine, which intercepted the Royal reef early in the month, passed through 7ft. to 8ft. of quartz, and is now being advanced in country rock. When passed through in sinking the shaft, the lode was not payable, but nothing can be said as to the value or width of the ore body at this level until further work has been done upon it. When the connection is made the water from the Dreadnought reef, which caused the sinking of No. 4 shaft to be suspended for the time being, will be drained off, and work in the shaft resumed.

Good progress is still being made with the extension of the main crosscut (Thames Deep Levels) at the 1000ft. level. A total distance of 367ft. has been driven since the present contract was commenced. The country in the face is still quite dry, and of an easy nature for working, but requires timbering to keep secure. There is still a further 285ft. to drive to complete this drive to the point abreast of the Kuranui-Caledonian shaft, where the responsibility of the Deep Levels Mining Board terminates.

A telegram received at Auckland on the 12th inst. stated that 63 tons of ore had been crushed at the Mountain King mine, Kuaotunu, for a return of 87 oz. gold, of the value of £261.

With the object of considering the position of the company, the shareholders of the Old Hauraki mine were called together on the 11th inst. Mr. Charles Hudson, the chairman of directors, said that in the past the company had been a great gold-producing one, but a great deal had lately been absorbed in working expenses. In all, some £22,000 had been spent in exploiting the mine, and a big source of expense had been the operations necessary in connection with keeping the property dry. Mr. Shepheard, who had lately been in charge, had worked the country in a most systematic manner, but he was unable to say now where even a colour of gold could be found. The only possible solution of the difficulty lay in obtaining more capital and sinking a new shaft to tap fresh ground. The directors were unanimous in saying that the mine should be shut down. They did not suggest that the company should go into liquidation, but that the work should be temporarily stopped and protection applied for for 12 months. A resolution to stop and seek 12 months' exemption was agreed to without dissent.

The following are the crushing returns for July for the Consolidated Goldfields Company's properties. The Progress mill ran 16 days and crushed 3280 tons, yielding 662 oz. 11 dwt. of bullion valued at £2741 5s. 11d.; cyanided, 2320 tons, yielding 162 oz. 14 dwt. of bullion valued at £602 13s. 4d.; estimated value of sulphrettes produced (48 tons) £527. Cost per ton for mining, 12s. 6.76d.; milling, excluding retreatment of old tailings and disposal of concentrates, 2s. 9.12d.; general expenses and bullion charges, 1s. 8.97d.—Wealth of Nations mill ran for 24 days and crushed 1950 tons, yielding 531 oz. 6 dwt. of bullion valued at £2199 10s.; cyanided 1323 tons, yielding 252 oz. 3 dwt. of bullion valued at £858 7s. 2d.; estimated value of sulphurettes produced (12 tons), £64. Cost per ton of mining, 11s. 5.48d.; milling, 4s. 2.45d.; general expenses and bullion charges, 2s. 5.19d. The small tonnage was due to the collapse of two mortar boxes. Low tonnage may be expected for August.—The Blackwater mill ran 23 days, and crushed 3704 tons, yielding 1449 oz. 19dwt. of bullion, valued at £5846 1s.; cyanided 946 tons, yielding 108 oz. 8 dwt. of bullion, valued at £383 0s. 2d.; estimated value of sulphurettes produced (38 tons), £370. Cost per ton of mining, 14s. 0.6d.; milling, 3s. 5.15d.; general expenses and bullion charges, 2s. 11.03d.

Mr. T. E. Y. Seddon, M.P., recently wrote to the Minister of Mines asking what the Government intended doing in regard to the Ross Goldfields Reconstructed Company, as he understood that those interested in the company had applied for a subsidy. The Minister's answer was as follows:—"The company was informed that I was unable to authorise any further subsidy, but in the event of a loan being applied for I would be prepared to recommend that the same be granted, provided the board's report was favourable. No application for a loan has, however, so far been made, and, therefore, no further steps have been taken in the matter."

---

## AN UNUSUAL OCCURRENCE OF ARSENO-PYRITE IN THE BALLARAT DISTRICT.

By L. W. G. Buechner.

In the well-known New Kohinoor mine on the Ballarat West line, there is an unusual occurrence of arsenopyrite in the 580ft. level. On this level the main crosscut was driven west, and at 165ft. the Consols lode was tapped. The original company drove both north and south on this line of country. In the north drive, at a distance of 425ft., the first crosscourse was met travelling 57° 3'. The general strike is 75° 30'. The drive was continued along the crosscourse for 40ft., when the Consols country was again picked up. After driving a few feet on the track of the lode, through crushed country rock and quartz, a large irregular mass of arsenopyrite was struck. The drive was continued through ore body for about 100ft. before the regular country was again picked up. At 745ft. from the main crosscut a second crosscourse was met. All traces of the Consols lode were lost after passing through this crosscourse on the north side.

Whilst reopening the drive in 1911, when the late Mr. J. S. Trethowan was interested in the mine, there was ample evidence that the body of arsenopyrite was a very exensive one. At short prospecting crosscut was driven a few feet east, and it was seen that the ore became intermingled with the quartz in irregular masses. As the drives have been worked many years before, there had been every opportunity for decomposition. There was a persistent and unpleasant "garlic" odour always noticeable. The exposed surface of the ore along the walls and back was quite white, with oxidised arsenopyrite, and when the film of arsenolite had been removed, both orpiment and realgar were to be seen in varying stages of decomposition and colouration. At a depth of two to four inches decomposition ceased, and solid arsenopyrite was shown to be present in abundance. Water lead percolating through the surrounding country stained the quartz a rich golden brown colour, which became lemon yellow on exposure on the surface. The gold content varied from two to fourteen pennyweights, but the cost of reduction rendered it impossible to recover it. Professor Hart has shown that the gold in arsenopyrite found in the Ballarat district is usually about four pennyweights.

For the figures already mentioned, the writer has to thank Mr. W. Baragwanath, Ballarat.

---

## THE COAL MINING INDUSTRY.

### New South Wales.

### Northern District.

(From Our Newcastle Correspondent.)

The time of the Wages Board appointed to inquire into certain claims of the Northern District miners was largely taken up this week in hearing evidence with regard to deficient places worked by machine men in Pelaw Main colliery. The term "deficient" is applied by miners to any working place, where, by reason of water, bad roof, dirt, or other cause, it is not possible for a man to make an average wage for a fair day's work. The custom of the districts—both Newcastle and Maitland—is for the manager to make up the wages of men working in such places to what is regarded as a fair thing, or, in some cases, to the rate paid to first-class shiftmen. The machine men in some of the places in Pelaw Main contended that they could not make a fair wage, and they argued that they should have their wages made up to 12s. 4d. per day, and that then 1s. per day should be added for working in water. The board decided that one of the two places complained of was deficient, and that the other was not. In announcing the decision, His Honour Judge Edmunds, chairman of the board, said:—"The board has decided that a deficient place is one where a capable and competent workman, working full pit time, is prevented from earning 12s. 4d. per day. That decision is not to be taken as governing other questions which may come before the board, but is for the present case only. As regards working full pit time, we could find no other expression to use, but we do not intend to include among those who do not work full pit time those who occasionally come out before time, and have good reasons, such as ill-health, or that they have finished their cutting, for doing so. It is intended to apply to persons who make a habit of continually coming out before the knock-off time. Such persons, under such circumstances, would not be able to put forward a claim for compensation. We decided, on the admission of the manager of Pelaw Main, that Hicks's place was deficient, and we came to the conclusion that Mr. Scott (the manager) had not made out his case for deductions, and the sum paid for consideration should be increased by 13s. 2d. The board is not satisfied that the place of Foster and mate was deficient." After giving the decision, the board resumed the hearing of the small coal and other questions before it.

What strikes the outsider as peculiar is that men who admittedly were getting 12s. or 13s. a day, have been able to get their case before the board, while others who, if their word is to be taken, are in a far worse position in other mines, have not yet had a hearing. Pelaw Main is one of the lodges which has always made trouble over any grievance—real or fancied—that the workers there might have, and they have cost the federation a tidy penny during the last eight or nine years. In some cases they have acted like spoiled children, and apparently they wish all the rest of the federation to stand aside until they are fully satisfied. Other men, with far more cause for complaining, have not stopped work with the same haste that has characterised the Pelaw Main men, and the result has been that they have not had quite the same consideration at the hands of the federation.

The half-yearly meeting of the Caledonian Collieries Limited showed that the company has done good work during the last six months, notwithstanding stoppages caused by congestion on the railways between Maitland and Newcastle, floods, etc. At the present time, the five collieries of the company are putting out coal at the rate of over 1,600,000 tons per annum, and when the new colliery of Aberdare South begins to produce coal, this company will have an annual output of 2,000,000 tons. The present output is by far the largest by any colliery company in Australia, or, in fact, by any south of the line. The new colliery of Aberdare South will be laid out in the most up-to-date manner, and will be able to put out a large quantity of coal, when fully developed. The company has declared an interim dividend of 8 per cent. per annum on the cumulative preference and ordinary shares for the half year ended July 5.

The report of the Australian Agricultural Company for the year 1912 shows that £13,572 was expended in opening up the top seam of coal at Hebburn colliery, in the South Maitland district, and £2937 in connection with the maintenance of the Aberdare-Cessnock railway. The profits in the colliery and railway department for the year show a decrease of £3513, as compared with the profits of 1911. Notwithstanding that the demand for coal from the company's pits remained steady throughout the year, the increased cost of production, caused chiefly by the shortage of labour and the increased rates of pay, had the effect of reducing the profits in this department. The new tunnel into the top seam at the Hebburn colliery is complete, and arrangements for the drawing of coal from the tunnel have been made. In its pastoral business, the company made a large profit on the year's transactions.

## Southern District.

(From Our Wollongong Correspondent.)

The North Bulli Company continues making improvements to the colliery plant and also at the coke ovens, which suggests that the company is confident of trade for an increased output. Electricity is the power here, and a new and larger power-house is just about completed. There is only one engine in it at present, but foundations are being prepared for two more of Belliss, Morcom make. The power-house is ventilated by means of a dome over the full length—an idea of the manager, Mr. J. Gray's. The coking plant also is having the hand labour for conveying the canisters to the ovens displaced by electric motor trucks.

The Mt. Kembla Company is giving Sullivan coal-cutting machines a trial: there are half a dozen machines of Jeffrey and Goodman makes at the mine, which have been in use for some years. One Sullivan machine, of a consignment of four, arrived last week at the colliery. The deficiency place difficulty is a great incentive to the installation of cutting machines.

There are knotty points in wages board awards as well as in statutes. One of these is raised by the unfortunate stoppage of the new tunnel of the Excelsior colliery, whereby a number of miners temporarily lost their places. Five who were working at the old tunnel were discharged, and a like number of those displaced by the stoppage were given their places. The point is, whether the "first to come last to go" provision of the award can be so applied, the circumstances being that the two tunnels work upon independent cavils. The "first to come last to go" principle was a union claim which the adjudicator who issued the first award allowed, and it has been in each award since. The employers opposed it strongly. The effect of it, of course, is to limit the manager's power of choosing his men. It is, of course, intended for application in circumstances in which it is necessary to reduce hands.

The Bellambi Company apparently contemplates extensive additions to or improvements of their shipping facilities, as they are applying for a special lease of 67 acres adjoining their present jetty, the intention specified being jetty and tramlines and mooring buoys.

## Western District.

### Truck Supply at Collieries.

(From Our Correspondent.)

Lithgow, August 21.

A certain amount of discontent has existed for some time among the miners of the Western district, caused through the scarcity of trucks. In many of the mines few trucks are available in the early morning when the miners arrive at the pit. The matter is very annoying, both from the employers' and the miners' points of view. The miner naturally does not care to waste two or three hours either above or below the ground, even if at the end of that time he is assured of being able to work. On the other hand, the manager thinks he has a distinct grievance if the men go home, should trucks and skips be available some little time later.

Some time ago six miners at the Vale of Clwydd mine were given 14 days' notice; two because, it is alleged, they did not wait the agreed time, and the other for refusing to go down, as there was an apparent shortage of trucks. The matter was, however, taken up by the Miners' Federation, with the result that the men have been reinstated. This is satisfactory to the men, but it does not preclude the possibility of further similar cases arising. The miners' secretary (Mr. F. Gregory) has taken up the matter, and is negotiating for a meeting between representatives of the miners and the managers of the associated mines, with the view of arriving at a general arrangement as to the number of skips that should be available before the miners go down, and also as to how long a miner should wait in the pit for further supplies of trucks and skips. It is expected that the conference will be held next week.

The supply of trucks for dispatch of lime and cement from Portland has somewhat improved of late, and during one week recently a record was made in the matter of the quantity of cement sent away, viz., 2600 tons, in addition to a quantity of other products.

## STOCK EXCHANGE REGULATIONS.

### Conditions of Quotation.

A long time was devoted at the recent conference of the Stock Exchanges of Sydney, Melbourne and Adelaide, held at Melbourne, in considering the conditions to be imposed on companies seeking quotation on the official list of the Exchanges. It was recognised that these bodies were in a position of great delicacy with respect to the investing public, who looked to them to exercise some discretion in registering companies by excluding such as are not bona fide. As a result the following additional conditions of quotation were agreed upon and will come into force on September 1st. At the present time, on application for quotation, certain particulars must be furnished by the company, as per form supplied by the Exchange, but the committee will, in future, require the following additional conditions:—

"That the company shall be of sufficient magnitude and importance; and that the shares shall be well distributed.

"That, if the company is not registered under the Victorian Companies Act 1910, the prospectus—(a) Shall have been printed and circulated: (b) Sets forth:—(i) Particulars of the property acquired, or to be acquired; (ii) the amount paid, or to be paid in money or otherwise, to vendors, concessionaries, owners of property, or others on the formation of the company, or to contractors for work to be executed; (iii) the terms on which the capital is issued; (iv.) whether the shares are preferred, ordinary, or deferred, and the privileges or otherwise attaching thereto, or governing each class; (v) in offering debentures or other credit securities, full particulars of how the issue is secured, the terms of redemption, and the underwriting terms, if any; (vi.) the amount paid or to be paid for goodwill, patent rights, trade names, or other assets of a like character; (vii) the minimum subscription on which the directors reserve power to proceed to allotment. [Quotation will be refused if, in the opinion of the committee, allotment has been made on such a minimum as to be detrimental to the interests of subscribers by either providing insufficient working capital, or overloading the capital with fully paid up shares.]

"That share or stock certificates—(a) Shall comply with the following conditions:—(i) The authority under which the company is constituted, the amount of the authorised capital, and the address of the head office of the company or of the branch office which issues the certificates, to be printed on the face; (ii) certificates to be for one hundred or fifty shares each; the number to be printed in words in the body of the certificate, and in figures in the margin to the left and right; (iii) certificates for less than fifty shares to have the number written in words in the body of the certificate, and in figures in the margin to the left and right, in spaces provided for that purpose. 'Under............Shares' to be printed in a prominent position on the face of the certificate; (iv) no rubber stamp to be used for the purposes of (ii) and (iii); (v) stock certificates to conform to the above, reading '£ Stock' instead of 'Shares'; [The committee have no objection in companies other than mining companies to certificates for larger numbers than 100 shares or £100 stock, provided that the company is willing to allow division by transfer deed, and will on delivery of certificate endorse signed transfers 'Scrip held in Office to meet this transfer.']: (b) Shall in the case of preference shares, bear on the face the conditions of the preference: (c) Shall, in the case of debentures and debenture stock, in addition to legal requirements, state on the face the authority under which the company is constituted, the issued capital of the company, the due dates of principal and interest, the authority under which the issue is made (i.e., articles of association and resolutions), and on the back the conditions of security, issue and transfer: (d) Shall be impressed with an embossed or engraved seal of the company.

"That the articles or rules shall provide (or shall not provide to the contrary)—(a) That none of the funds of the company shall be employed in the purchase of, or in loans upon the security of its shares; (b) that share or stock certificates shall be issued gratis to shareholders; and that, if so desired, every shareholder shall be entitled to receive several certificates in reasonable denominations; (c) that the charge for a new certificate issued to replace one that has been worn out, lost, or destroyed, shall not exceed one shilling; (d) that all certificates shall be issued under the common seal of the company, and shall bear the manuscript signatures of one or more directors and the secretary or legal manager; (e) that the company shall have no lien on its shares except for uncalled capital, and unpaid calls on the specific shares on which such calls are unpaid; (f) that there shall be no restriction as to transfer of paid up shares in Limited Liability companies, nor as to transfer of any shares in No Liability companies; (g) that stock shall be transferable in multiples of £1; (h) that no transfer fee shall be charged; (i) that in the case of joint holders of shares or stock any one of such persons may vote; but if more than one of such persons be present at a meeting in person or by proxy, the person whose name stands first on the register of members shall alone be entitled to vote; (j) that the minimum number of directors shall be three; and that, in cases where two directors form a quorum, the chairman of a meeting at which such a quorum is present shall not have a casting vote; (k) that the qualification of a director shall be commensurate with the size of the company; (l) that directors as a board shall not be paid as part or whole of their remuneration a commission on or a percentage of profits; (m) that directors may act notwithstanding any vacancy in their body, but, if and so long as their number is reduced below the number fixed by or pursuant to the regulations of the company as the necessary quorum of directors, the continuing directors may act for the purpose of increasing the number of directors to that number or of summoning a general meeting of the company, but for no other purpose; (n) that no individual director shall have power to appoint another person to take his place for any period on the board, except with the consent of a majority of his co-directors; (o) that there shall be no provision for life-directorships or other permanent appointments of an irrevocable character, or revocable only by special meetings of shareholders; (p) that a director must disclose the nature of his personal interest in any contract or arrangement at the meeting of the directors at which the contract or arrangement is determined on, if his interest then exists, or, in any other case, at the first meeting of the directors after the acquisition of his interest, and that he shall not vote in respect of any such contract or arrangement; (q) that the company shall have power to remove any director before the expiration of his period of office; (r) that the directors shall have power to appoint and remove solicitors at their discretion; (s) that no person, not being a retiring director, shall be eligible for election to the office of director at any general meeting, unless he or some other member intending to propose him has at least fourteen clear days before the meeting left at the office of the company a notice in writing duly signed signifying his candidature for the office or the intention of such member to propose him; provided that in the case of a person recommended for election by the directors ten clear days' notice only shall be necessary. Notice of each and every candidature shall, seven days previously to the meeting at which the election is to take place, be served on the registered holder of shares; (t) that the borrowing powers of the board shall be expressed; (u) that unclaimed dividends shall not be forfeitable; (v) that no director or other officer of the company shall during his continuance in office be eligible as an auditor of the company; (w) that the auditors (other than the first auditors, and those appointed to fill casual vacancies) shall be appointed, and their remuneration be fixed by the company in general meeting, and that ten days' notice of candidature shall be given by any one other than a retiring auditor; (x) that notices and reports and balance-sheets shall be sent direct to every shareholder at least seven days before the date of the meeting to which they relate, or at which the business therein set out is to be considered, and that two copies of each of these documents shall at the same time be forwarded to the secretary of the stock exchange; (y) that in a company issuing participating preference shares the ratio of participation of preference or ordinary shares in respect to dividend shall be fixed, and not variable; (z) that dividends of No Liability mining companies shall be divisible among shareholders in proportion to the number of shares held.

"That a short precis be furnished of all agreements mentioned in the prospectus or filed with the Registrar-General, including all particulars of underwriting agreements, and whether the directors are directly or indirectly interested in the underwriting.

"That a statement be furnished setting forth whether the brokerage paid has been limited to members of stock exchanges, and whether any brokerage or consideration has been paid or is payable to the directors or provisional directors.

"A number of the foregoing requirements refer to Limited Liability companies only, and many are compulsory under the Victorian Companies Act 1910, but are included for the information of solicitors and company managers who may be desirous of applying for quotation of companies which are not registered in Victoria."

## QUEENSLAND'S "BIGGEST MINING PROPOSITION."

### Proposed Deep Shaft.

About two months ago Mr. Thomas Mills, of Charters Towers, laid before the Queensland Minister of Mines, Mr. J. G. Appel, proposals for the sinking of a deep shaft on Charters Towers for the purpose of testing the ground at depths to which it is hardly likely that private enterprise would without Government assistance. He therefore applied for a subsidy at the rate of £ for £ on the amount expended on machinery, material and labour, the total extent of the subsidy to be £60,000, to be spread over three or four years. The scheme may be outlined as follows:—

To form under the Companies Act of Queensland a company to be called Day Dawn Deeps Ltd., with a capital of £300,000 in 600,000 shares of 10s each, of which 300,000 shares will be contributing. Mr. Mills informed the Minister that terms had been provisionally agreed upon between the Mills' Day Dawn United and the Brilliant Deeps companies and himself, whereby the former company will surrender about 150 acres of their leases and the Brilliant Deeps the whole of their 114 acres, and it was proposed to apply for about 40 acres of unoccupied Crown land to the north (the surface rights being reserved). And he explained that this large area of about 300 acres was required to permit of a thorough prospect of the deep ground and to afford a reasonable prospect of a reward commensurate to the very large amount of capital which must first be expended. A large surface area was also required, because the surface buildings would necessarily be extensive, and the stacking of the rock taken from a shaft 4000ft. deep and 20ft. in diameter would of itself require a large area. It was also asked that a special Act might be passed enabling the granting of a special lease of 300 acres in lieu of six leases of 50 acres each, to each of which the ordinary labour covenants would attach. The proposed shaft, situated in Lissner Park, would be a round one, lined with either brick or concrete, and to be equipped with the very latest improved mining machinery, and it was estimated that these preliminaries, the development of the lodes and the connection with the two mines mentioned would cost approximately £150,000. On no account would the work be undertaken until the necessary capital was assured.

It was further stated that the Day Dawn and Brilliant lodes had already produced gold to the value of £12,400,000, and the present aspect of workings gave good grounds for believing that more deposits of good ore lay at depth awaiting development. A noteworthy feature of the scheme was that neither the Mills' United nor the Brilliant Deeps company would receive any cash for their properties; the sole consideration given to them would be in shares, though it was expected that the two companies would find a large proportion of the working capital; and no cash or shares were to be given to anyone in respect of the flotation of the company. In selecting the machinery to be put upon the property attention would be paid to the desirability of treating at a profit ore of a grade which had hitherto had to be discarded.

Before adopting or rejecting a proposition of such magnitude Mr. Appel properly referred the matter for the opinion of his departmental experts, and Mr. E. O. Marks, Assistant Government Geologist, furnished a long report on the scheme. In this he says:—"I can only suppose that my opinion is desired by the Government, like any private investor, as to whether the deep shaft proposal as it stands is a sound mining speculation, whether some modification is desirable, or whether the whole is to be condemned as unsound. It is with no small amount of regret that I have to come to the conclusion that the scheme as outlined requires considerable modification before it can be regarded in a favourable light." This conclusion is supported at considerable length by Mr. Marks, who insists upon the desirableness of prospecting both of the reefs (Day Dawn and Brilliant) for fresh shoots of ore with as much thoroughness as profitable working will justify. The prospecting which he advises, he says, will all be necessary whether the proposed shaft is sunk or not, though it might possibly cost a little less per foot if the shaft is sunk first; and he estimates that two underlay shafts of 800ft. each could be made for £16,000, while 3000ft. of driving would cost £15,000, making a total of £31,000. He strongly recommends that this be done first of all, and that the deep shaft be left in abeyance for a time.

Mr. Marks plainly indicates that he is not in favour of mining methods followed at Charters Towers. "It appears to have been a general rule that so soon as ore is found it is mined, its removal being but little behind the progress of development work, and often ahead of arrangements underground for its economical mining, either as regards ventilation or handling. It is also seldom in a mine that sufficient ore is in sight at any time to justify the erection of treatment plant at the mine, although the mine may in its career produce much more than sufficient to have rendered the erection of plant an economy. The result is the archaic method still in vogue in Charters Towers of carting the ore to a customs battery, and, after crushing, carting the sands to a cyanide plant. The handicap which the uneconomical mining, cost of carting, and profit on treatment must be to the mines, is of course due to an insufficiency of working capital or the smallness of the mine." Returning to the consideration of Mr. Mills's scheme, the Assistant Government Geologist expresses doubt as to whether the cost of this deep shaft has not been underestimated, in which case it will be found that the proposed capital is insufficient to complete the work; neither is he sure that so large a shaft is desirable, or that anything would be gained by having it circular instead of retaining the more usual rectangular form. Mr. Marks summarises his results as follows:—"While desirous of seeing further prospecting done from the present workings, I am strongly of opinion that the present prospects do not justify the enormous outlay which the shaft contemplated would necessitate, particularly in view of the fact that the prospecting work suggested would be equally necessary even if the shaft is sunk first. If the prospecting work is unsuccessful the shaft would not be required, while if successful it would enable the location of the shaft to be selected with a view to economy in later working. If it is decided to sink a shaft, it will be highly desirable that the question of the size and shape be thoroughly investigated in regard to the advantages and probable cost of the different types, as Messrs. Mills and Millican's estimates of £18 and £25 per foot for the circular shaft appear to be little better than guesses, and may quite possibly be greatly exceeded."

On the 5th inst. the Cabinet decided that, in view of the report of the geologist, the application of Mr. Mills could not be entertained. This, however, did not end the matter, for on the 18th a large and representative deputation from Charters Towers waited upon the Premier, Mr. Denman, and urged that the assistance asked for should be given, to aid the "biggest mining proposition attempted in Queensland." Like his colleague, the Minister of Mines, the Premier relied upon Mr. Marks's report, and said it seemed to him the sensible course to follow his recommendations. He was averse, however, to turning the proposal down, and would obtain further expert advice.

## NEW SOUTH WALES MINING LAWS.

### Proposed Amendments.

### Coal Mines Regulation.

The Coal Mines Regulation (Amending) Bill, 1913, proposes to amend the consolidated Act of 1912 in some important respects. After defining the explosives permitted to be used, it provides for the appointment of certificated deputies in all mines required to be under the control of a certificated manager, or in which safety lamps are used, or which are dry and dusty. Deputies must be at least 23 years of age and have had at least 5 years' practical experience in mining, and must show that he can accurately test inflammable gas. The necessary certificates may be granted to any man who has acted for three months during the five previous years as deputy, fireman or shotfirer at any mine. It is proposed to permit the holder of an ordinary engine-driver's certificate to take charge of a hauling engine on a plane or road at any mine. At the present time inspectors are not under the Public Service Acts as regards leave of absence, retirement, etc.; this Bill would bring them under those Acts. Colliery owners are to furnish corrected plans from time to time. Managers are to allow a representative of the men to inspect a place where any accident has occurred, and provision is made for notification of minor accidents to machinery, etc. When wages are paid on quantity of coal produced the coal is to be weighed before screening. In every newly-opened seam to main intake airways are required. In shafts of less than 150ft. in depth ladders may be used, but beyond that depth cages are to be fitted. Only "permitted explosives" may be used in mines not both naturally wet and free from inflammable gas; these are to be charged for at actual net cost, and a suitable place for storage is to be provided. The restriction hitherto placed on mining engineers acting as inspectors on behalf of the men is removed. Proper provision for sanitation is required in all coal mines. The provisions recently made under an Imperial Act regarding travelling on haulage roads, and requiring the provision of separate travelling roads in mines are adopted in the Bill.

### Mines Inspection.

The Mines Inspection (Amendment) Bill, 1913, amends the Mines Inspection Act, 1901, the provisions of which are, where applicable, extended to quarries, smelting works, and dredges. It brings within the meaning of the term "mineral," not only any substance which is a mineral for the purposes of the Mining Act, 1906, but other substances which are, or may be, worked or mined for in "quarries." This will have the effect of bringing brickworks under the provisions of the principal Act. The provisions of the principal Act applied to dredges and smelting works relate, among other things, to the employment of certificated engine-drivers. Six months' time is here allowed before the provisions relative to certificated engine-drivers are to become applicable. All dredges and smelting works are to be under the control of a responsible person to be nominated by the owner. A manager may be absent for recreation not exceeding two months in any year, subject to the appointment of an experienced person to act in his absence.

A candidate for certificate as manager, being a graduate of a University or School of Mines, is exempted from passing an examination in technical subjects, other than the Mines Inspection Acts and Regulations, subject to his having had three years' practical experience in a mine, including eighteen months working regular shift as a miner or timberman. Certificates of competency as mine manager are divided into two classes, viz., lode and alluvial. No certificates of service as mine manager will be granted after the first day of July, 1914.

During a period of four years after the Act comes into force, certificates of service as engine-driver may be granted. Provision is made for the recognition of "engineers'" certificates of competency granted by any duly constituted and recognised authority as equivalent to "engine-drivers'" certificates. An inspector may grant a provisional permit to act as engine-driver to any person holding a certificate granted outside New South Wales, such permit to be in force for not more than one month. The Board of Examiners may require evidence of physical fitness of applicants for certificates of competency or service. Engine-drivers' certificates are divided into classes—winding, ordinary, electric motor, etc.; and such certificates shall be valid only in respect of the class of machinery therein described.

Inspectors under the Coal Mines Regulation Act may act as inspectors under the principal Act in relation to quarries and smelting works within their respective districts.

The owner of every mine in which not less than ten persons are ordinarily employed underground for two months or more is required to keep a plan and sections of such mine, and deliver a copy thereof to the Chief Inspector; the Minister may also require the owner of any mine employing less than ten men to furnish such plan and sections. The owner of every mine, quarry, etc., is also required to furnish annual returns of the quantity and value of the mineral obtained therefrom.

The Governor is empowered to make regulations relative to the working of machinery and the preservation of life and property in connection with dredges and smelting works.

### Mining (Amendment) Bill, 1913.

This Bill is designed to remove certain anomalies that experience in administering the Act of 1906 has shown to exist. Provision is also made for further facilitating prospecting operations on both Crown and private lands.

Section 114 of the present Act gives to any lessee who has employed double the required labour on his lease a statutory right to exemption from the performance of any labour conditions to the extent of one month for every period of six months during which double the required labour was employed. The maximum period of exemption is six months. Very little advantage has been taken of this section, and it is not considered desirable in the mining interest that it be retained, as the rights of lessees are sufficiently protected by the provisions of section 113, under which suspension for six months may be obtained from the Warden for any reasonable cause.

All Crown lands, leases (other than pastoral leases), homestead and irrigation farms, and suburban holdings, are made private lands for the purposes of the Act. At present they are Crown lands, exempted from occupation under miner's right, but open to application for mining leases. The applicant is required to lodge a survey fee and one year's rent, and to pay such compensation for surface damage as may be assessed by the Warden. The Crown Lands (Amendment) Act, 1908, provides that these leases may be converted into conditional purchases, which are private lands for the purposes of the Mining Act. This provision, and the fact that the prospector may obtain an authority to enter without payment of survey fee, renders the amendment necessary in the mining interest.

Crown lands reserved for public purposes or leased for other than pastoral purposes are exempted from occupation under miner's right. Alluvial auriferous land cannot be leased unless special difficulties exist owing to depth or wetness of the ground; therefore such reserved or leased lands cannot be mined at all for surface alluvial. Provision is now made to throw such lands open to application for lease.

No lease can at present be granted to mine for opal unless the Prospecting Board certifies that difficulties and cost would attend mining on the land applied for. Reserved or leased lands, exempted from occupation under miner's right, are therefore locked up against opal mining unless the difficulties referred to exist. It is therefore necessary to make provision for the grant of leases where the opal is obtainable by the individual miner. The area is limited to that which can be held under miner's right as a reward claim.

The Mining Act, 1906, extended the principle of royalty to the Crown to all leases of private lands, and at the present time the only mining titles under which royalty is now payable are ordinary leases of Crown lands to mine for gold or minerals other than coal or shale, and claims held under miner's right. It is now proposed to extend the principle to ordinary mining leases, and concurrently to reduce the annual rental from 5s. to the nominal amount of 1s. per acre. It is further proposed to allow an exemption amounting to £500 of the gross output before any royalty becomes payable, and the amount of rent paid may be deducted from the royalty payable. This clause is not made retrospective; but, by applying existing provisions, lessees may be allowed to surrender their leases, and apply afresh under the new conditions.

A special section is designed to meet the demand for greater facility in gaining access to private lands. It empowers the Warden or Warden's clerk to grant an interim authority to enter and to forthwith mark out the land required upon payment of a deposit not exceeding £1. This authority will enable the holder to prospect the land for one month pending the holding of an inquiry to assess rent and compensation. Such interim authority will be granted in respect of gold, and of other minerals, if the Warden knows that the land is open to mining for all minerals, but will not be granted in respect of land held under any mining title, or the subject of a prior application for authority to enter. The principal grounds of complaint which it is sought to remove are that the applicant for authority to enter is kept waiting until the Warden (who may be at a distant part of his district) is available, and a date fixed for an inquiry to assess rent and compensation. Any period from fourteen days to two months may be lost in this way, and when eventually the prospector gains access to the land he may find that a few days' prospecting is sufficient to prove the land to be valueless. The proposed interim permit can be granted under favourable circumstances in a few hours, provided there is no doubt as to the Crown ownership of the minerals; the deposit required is limited to 20s., but may be less at the discretion of the Warden or the Warden's clerk, and the prospector will be enabled to test his area without delay.

It is proposed to make further provision for the conduct of investigations by the Sludge Abatement Board; empower the taking of evidence on oath, and enable the board to prevent the discharge of polluted water into streams, although the total proportion of solids in the water does not exceed 800 grains to the gallon.

Where complaint is made to the Warden that a tenement is not worked in accordance with the Act and Regulations, the Warden may declare such tenement forfeited. The declaration is made in open court, and cases have occurred where the defendant has been enabled to distance the complainant in a race to take fresh possession of the tenement. Provision is therefore made empowering the Warden to fix a future date for the declaration of forfeiture, and to give the complainant beforehand notice to enable him to take possession.

Clauses 4 to 7 inclusive deal with mining on private land which has been alienated without any reservation of minerals to the Crown, and which is not mined upon by or under the authority of the owner. The Warden is authorised to grant authority to enter and prospect the land, or such of it as is not occupied bona fide for mining, or improved, or under cultivation. The holder of such an authority may apply for a lease, subject to the payment to the owner of rent and compensation for surface damage, to be assessed by the Warden. A percentage of the net profits is also payable by the lessee to the Crown on behalf of the owner, who will receive such percentage (in addition to the rent and compensation) less a small charge for administration. In order that owners may be given time to develop their land, or allow others to do so, it is proposed to bring these provisions into force after the lapse of four years.

Clause 11 authorises the Governor to resume any private land required for the purposes of a mining village, subject to payment of compensation, to be assessed by the Warden or any other person the Minister may appoint.

# TREATMENT OF SELENITE GOLD ORES.

## The Niemann Process.

Readers of the "Mining Standard" will remember that three years ago we published articles by Mr. J. H. Niemann describing his investigations of radio-active ores found in the Northern Territory. The new process here described for extracting gold from selenite ores found in the same area is really an outcome of continued, persevering investigations in the same direction, for, having reached a certain point, Mr. Niemann came to the conclusion that it was necessary for him to come south and to devote his whole attention to the subject. A few Adelaide friends financed him in this, and coming down to that "city of culture," bringing a few hundredweights of ore, the Federal Ore Company was formed and experimental works were erected at Kilkenny (S. Aus.). Here he has worked ever since, and is now in the fortunate position of being able to claim as his a discovery which promises to make this plentiful but apparently useless class of ores from the far north a valuable commercial asset.

Although first discovered in 1817, little reliable information on the properties of selenium was available for Mr. Niemann's guidance, and he was compelled to investigate its peculiarities for himself, and these he has summarised as follows:—

It (selenium) resists the passage of electricity when heated, and also in the dark. It conducts electricity on exposure to light. It acts on photo negatives in the dark. If spread on copper under a negative and exposed to light it will etch the image on the copper. It converts an alternating electric current into a direct current. It forms an extremely volatile cinnabar-red compound with arsenic, a silvery compound with copper and a coppery compound with silver, and gives a black alloy with gold and mercury. It colours glass amethyst when added during the manufacture of same, and also by its emanations—ergo. It penetrates glass and other matter. Its emanations penetrate glass bottles and prevent the oxidation and discolouration of certain chemicals, etc., which usually oxidise and deteriorate readily, e.g., solution of ferrous iodide, ferrous sulphate, olive oil, etc. (These all retain their green tint in the laboratory when selenium emanations are present, for apparently an indefinite period.) Under similar conditions these emanations cause the deterioration of chemicals which are usually stable, such as nitric acid, nitrate of cobalt, etc. If heated to over 200 degrees Fah. it develops instantly a heat at least twice as great. When combined with gold it forms a compound so light that it floats away on surface of water, hence no alluvial gold is found near seleniferous gold reefs; hence also the gold is lost by flotation when the ore is crushed in battery. The glossy-black or dark bronze compound of selenium and gold is also volatile. When the ore is tested by smelting in a crucible the gold is lost. If it be roasted in the same way as sulphide and telluride ores it is also sublimed and lost. When amalgamation is attempted the bulk of the amalgam floats away as a selenide of mercury and gold. If any amalgam be recovered, and an attempt be made to retort it, the mercury does not distil over pure, but portion sublimes as a selenide, and portion is left as an intractable alloy. When the ore is treated by ordinary cyanide processes so much gold is lost at every stage that only a fraction of the total value is recovered, whereas by my process I have recovered from four-ton parcels of ore as much as 12 times the assay value, as indicated by ordinary fire tests, and never less than four times, as much ore, assaying 4 dwt., gave from 16 dwt. upwards when operating on Pine Creek ores.

The outcome of Mr. Niemann's metallurgical researches has been to demonstrate that 16 dwt. of gold may be recovered from stone which apparently contains only 4 dwt., and that, when the gold has been extracted, copper and silver left in the tailings may be recovered by smelting in a reverberatory furnace. Recently some auriferous selenide copper ore was assayed (by different assayers), and showed 4 to 6 oz. of gold. By ordinary processes it yielded less than 1 oz. Mr. Niemann treated ore from the same sample, and obtained 8 oz. 6 dwt. of gold.

The ore on which most of these experiments has been made has come from the main line of reef in the Northern Territory, which extends for about two miles, and which has been worked on and off for years. The surface stone is rich, but from the mineralised ore below it has been impossible to obtain gold in payable quantities by present methods. The last crushing, made about two years ago, yielded from 4 to 5 dwt. The same stone treated at Kilkenny by the Niemann process yielded 16 dwt. When one realises that if this process be practicable and reliable, as Mr. Niemann claims it is, the whole of this reef may be re-opened and worked at a profit; and that other gold deposits of the Commonwealth, at present lying idle, may be workable, one realises something of its vast possibilities. Already, in addition to those from the Northern Territory, the following ores have been "successfully and cheaply" treated:—Gold-bearing copper ore from New South Wales, which carries sulphur and selenium; arsenical ore from Victoria, carrying sulphur and selenium; and pyritic ore from Victoria, after being blended with selenide ore. On the cheapness of the treatment special emphasis is laid, and it is claimed that it is no more expensive than the treatment of the ordinary free-milling gold. It is extraordinary that, although selenium is as widespread as sulphur, little effort has been made hitherto to deal with it practically. Fourteen years ago a patent was taken out for colouring glass with selenium, and another patent exists for using it as a means of etching on copper. Aldon's Textbook of Physics, in use at the School of Mines, gives an experiment which acknowledges that gold, acted on by selenium, will volatilise; and in this last named fact lies the real secret of Mr. Niemann's process, and the reason of previous failures to treat auriferous selenide ores.

One of Mr. Niemann's greatest difficulties was to persuade enquirers and sceptics that it might be possible for ore to contain more gold than the assay showed; but his own process apparently proves that, with selenide ores, the ordinary assay fails, just as cyaniding fails, and for much the same reason. In the first place, in assaying the selenide of gold forms a skin on the outside of the lead button, and is hammered off. During cupelling a portion of the selenide of gold is sublimed. A certain amount of selenium remains with the gold recovered, and when nitric acid is added it forms selenic acid, which has the property of dissolving gold; so that more is lost. Selenium has a natural affinity for gold, and in all smelters there is a heavy loss from sublimation or volatilisation. This has escaped notice, because, when mixed with selenium, gold resembles iron in colour, and this black mixture volatilises under the influence of heat, and so escapes when ore is treated in the ordinary way. By ordinary cyanide method, a portion of the gold floats away as selenide of gold during the preliminary crushing with water. After the gold has been deposited on the zinc—or other metal-shavings—it is apt to re-dissolve. Finally, as already pointed out, gold with selenium sublimates during roasting and smelting, and so escapes.

These were the difficulties which Mr. Niemann had to neutralise, and he set himself to discover a method by which the properties of selenium might be turned to account, and become an asset rather than an obstacle in the way of success. By his process the power which selenium has of making gold volatile is not only corrected, but is utilised and controlled. The oxidation of sulphides, selenides, and arsenides of gold is checked, from the initial crushing to the final smelting—so that practically the whole of the gold is extracted and recovered. One particular recommendation of the method is the suitability for dry countries. From the beginning the crushing and grinding of the crude ore is done with cyanide solution, and not with water, and the same solution is used again and again, so that there is not the waste of water which characterises ordinary cyanide methods. Mr. Niemann has subjected each step of his work to severe tests, has left nothing to chance or accident, and has courted the fullest investigation. On behalf of the Federal Government, Capt. Matthews tested his method, and expressed himself satisfied. It seems that the inventor is satisfied in claiming that his work has passed the test stage, and that his treatment is ready for practical use. If the present promise be fulfilled the Northern Territory of Australia may yet come into its own as a mining country.

# MINING INVENTIONS.

Mr. Fred. Walsh, Patent and Trade Mark Attorney, George and Wynyard streets, Sydney, informs us that the following applications have been advertised as accepted and open to public inspection:—

No. 5750 (19/7/12), "Gold from Selenide Ore."—The "selective affinity" of selenium for gold and the formation of soluble seleno-cyanide of gold are utilised together, with the peculiar thermal and electrical properties of selenium. Oxidation and reduction of the base metal compounds are carefully prevented throughout the process.

No. 7211 (26/11/12). "Extraction of zinc and manganese."—Complex zinc lead ores are heated with sodium bisulphate without fusion to convert the zinc and manganese into soluble sulphates, which are lixiviated. The resultant solution, containing a triple salt of sodium, zinc, and manganese sulphates, is electrolysed, producing zinc and manganese dioxide. The sulphate solution is regenerated.

## EXTRACTION BY VOLATILISATION.

### The Howe Process.

Some months ago it was mentioned in these columns that Mr. Ben Howe, manager of the Gwalia Consolidated Ltd., Murchison Goldfield (W.A.), had invented a process for recovering gold from refractory ores by a process of volatilisation. At that time the process had been tried on only a small scale, but the results of those preliminary experiments were so satisfactory that a plant capable of dealing with 30 tons of ore per diem was erected at the mine for the purpose of testing it on a commercial scale, and the results of trials with this plant fully justified the claims put forward for new method of treatment. In the early part of this month Mr. Howe was in Kalgoorlie, when he made the following statement to a representative of the "Kalgoorlie Miner":—

"It has been well known for many years that certain gold ores when roasted were liable to lose some of their gold contents through volatilisation. This occurred even when they were roasted alone. If they were mixed with salt before roasting, and given what was known as a "chloridising roast," this loss was even greater. This loss of gold in roasting is, in my opinion, more common than is generally recognised, and means a big monthly loss to many mines in this State. This loss can be easily demonstrated in the assay office, and is worthy of the attention of metallurgists on roasting plants. Now it is this principle, which up to now has been the bane of the metallurgist, and which he has heretofore always tried to avoid, that I have turned to account by making it a means of recovering the gold from the ore. It has been a surprise to most people to find how complete this volatilisation of gold is in many ores when mixed with salt, and heated to the right temperature; and, further, how easy that gold is to recover. In our experimental furnace at the Gwalia Consols, in Wiluna, a theoretical extraction of 95 per cent. of the gold was common. When the process has been running a little time, and men get into the exact conditions required, I do not see any reason why such high extractions should not be obtained in practice. After the gases from the furnace have been cooled down, and the dust removed, the gold is taken out by filtering through damp coir matting. At present we only pass it through two such filters at the Gwalia, but these are not sufficient, and I think a third or a fourth even may be required. With this filtering area we should get a complete recovery of the gold.

"The details of the process as at present running are quite simple. The ore is crushed dry, in a ball mill, with 900 mesh screens, five per cent. of salt being added to the broken ore as it feeds into the mill. This mixture of crushed ore and salt is fed direct into a rotary brick-lined furnace, 27ft. long by 5ft. diameter, making two revolutions per minute. The raw ore under these conditions roasts in the first 9ft. of the furnace, and volatilisation takes place in the next 18ft. When the ore gets to the end of the furnace it has lost its gold, and goes direct to the dump as tailings. By the way, these tailings look like fine cinders, what the men call 'little [illegible] clinkers,' and are a grand solution of the dust problem, as they would not blow off the dumps in a high wind.

"The temperature required in the furnace is somewhat higher than that usually attained in a roasting furnace, and is obtained by gas firing from a wood generator. We had a lot of trouble with the gas firing for some weeks, but now the men have got the hang of the generator they have no difficulty in keeping up a good quality of gas to supply the furnace. This generator is worked by pressure, not suction. Air at about 6-8 inches water gauge is blown into the generator from a small Root's blower, and the same blower also supplies hot air for mixing with the gas before burning. The arrangement is very simple and well under control of the man in charge of the furnace. He controls two valves, one which admits air to the generator, and so determines whether he makes more or less gas, and the other, which regulates the air for burning with the gas, and which determines whether he shall have a long flame going well to the back of the furnace, or a short, very hot flame, impinging right at the mouth of the furnace. With these two valves he can regulate the heating of his furnace to a nicety. The smaller the furnace the more difficult is it to regulate this heat; but with a large furnace too much gas does not heat the huge mass in a few minutes, nor under poor gas would the large furnace cool down very quickly. Large furnaces therefore require less attention than smaller ones, and I think in the future a furnace about 9ft. outside diameter by 90ft. long, treating 100 tons per day, will be a good size. Such furnaces, built up of boiler plate, rivetted together, would not be very expensive. This regulation of temperature is certainly a very important item in the process, but the men who are running the shifts on the present furnace have, without exception, never done any furnace work before, and yet they have no difficulty in knocking out 90 per cent. of the gold throughout their eight-hour shift. You may imagine, therefore, that with ordinary care and skill a furnace could be run as easily as an Edwards' roaster.

"So much for the ore and its manipulation. Now let me describe the collecting of the gold. The gases are very hot as they come out of the furnace, and carry a good deal of dust, 5 per cent. of the total ore, say. We pass these gases through a dust chamber, and then into a wooden box, 5ft. x 5ft. x 18ft. long. The first 6ft. of this box is brick lined to withstand the heat, and the whole of the top—18ft. long—is covered by a perforated tray which is kept full of water. This water runs through the perforations into the box as a constant shower. It is picked up again at the bottom of the box by a centrifugal pump, and returned to the upper tray, thus keeping it in constant circulation. I should have mentioned that the perforated tray is divided into two parts—one for the dust portion of the box and the larger one for the gold collecting portion. Each portion has its own separate pump. The 'dust' pump picks up its water from the bottom of the box, as already mentioned, and passes it over a couple of Spitzkasten and a wooden table, like an amalgamation table—the former to remove the dust and the latter to cool the water somewhat, before returning it to the top perforated tray. The "gold" pump simply circulates the water bottom to top all the time, but a small proportion, say 15 per cent., passes through a gavity filter, similar to those used in clarifying cyanide small particles of gold from the solution. From these filters the gold is removed as a black sludge, similar to cyanide gold slimes, and is smelted in a similar manner.

"The shower of water in the gold collecting area falls on the cocoanut matting filters of peculiar design, and it is through these wet filters that the fumes are made to pass. At present we pass it through one, and then another of these coir filters, and so recover about 85 per cent. of our gold. During the next few weeks we shall try a third, and perhaps even a fourth, filter. We should have done this before, but you must know that cocoanut matting does not grow out at Lake Way, and when one has run out of stores of this kind it is necessary to wait about six weeks before new supplies can be obtained. This remark applies to a good deal of our experimental work, which is therefore not quite as quick nor as thorough as could be carried on in a town. I forgot to say that at the end of the box we have a small Sirocco fan, consuming about 3 h.p., which provides the draw for the furnace and the box. A little odourless steam is all that comes though this fan. I think I have told you enough now to show you that the process is simple and cheap—that is, where fuel and salt are cheap. Of fuel at present we are burning about 16 per cent. of the ore treated, but this will be considerably reduced with a longer furnace. The salt we obtain by spraying the mine water on the outside end of the furnace, whereby the water is evaparated and the dry salt constantly scraped off.

"I cannot say we have obtained anything like perfection yet with the process, but we have amply proved that gold can be successfully, economically, and simply recovered from a gold ore by volatilising with salt. Rome wasn't built in a day, and a perfect gold extraction process cannot be built up in a few weeks. We only commenced our experiments in the latter half of last year, and since then the process has made wonderful strides. It is too early yet to say how far this process might even take the place of the cyanide process on the ores of this State, but there is no doubt that it has its particular field, where it will soon find ready acceptance—that is, on ores with which the cyanide process entirely fails to deal or deals with at least only very unsatisfactorily. Such ores, for instance, are copper and antimony ores. In the case of copper ores more salt, even up to ten per cent., is required, but to compensate for this increased cost it is found that 80 to 90 per cent. of the copper contents are also recovered from the ore by merely passing the gold collecting solutions over scrap iron."

In reference to the above process the following letter appeared in the "Engineering and Mining Journal" (New York) on June 28:—

"In the 'Journal' of June 7, 1913, I notice an abstract of an article by Ben Howe on "Gold Recovery by Volatilisation' which has been going the rounds of the technical press as something new.

"Since the 'Journal' has also quoted Mr. Parmalee's discussion of the article, and stated that this method was worked out by Edwin C. Pohle and me in 1897 and 1898, there is not much more to say on the subject. However, the volatilisation of gold by this method was discovered by me as early as 1893, while experimenting on Cripple Creek ores at Aspen, Colo. After going to the Globe works in Denver in 1896, I found that Mr. Pohle of that plant had made a similar discovery with silver ores, so we began to work out the method as stated.

"Our work was published in full in the 'Journal,' August 29 and September 19, 1903, and is quoted in Rose's 'Metallurgy of Gold.' Our patents were taken out in U.S. and in all foreign countries where mining operations exist, and are noted in the 'Journal' of October 31, 1903.

"The process for gold ores, as described by Mr. Howe, is identical with our experiments. The size to which the ore is crushed, the type of furnace used, the temperatures maintained, the percentage of salt required, the method of condensing the fumes and collecting the gold and the character of the gold slime obtained, might easily have been taken from our note books.

"We had no difficulty in collecting gold fumes in the manner described. Those of the base metals were more difficult to collect, but we succeeded in making a commercial recovery of all valuable metals or fumes in our experimental plant. The advance in metallurgy and in mechanical appliances since our work was done, together with a better knowledge of the character of the base-metal fumes would no doubt enable me to simplify and improve the process considerably at the present time.

STUART CROASDALE.

Douglas, Ariz., June 12, 1913."

## PYRENEES PROPRIETARY, REDBANK (V.).

### Geologist's Report.

Mr. W. Baragwanath, geological surveyor in the Victorian Mines Department, has furnished the Minister of Mines with the following report on the Pyrenees Proprietary mine, at Redbank, about 15 miles from Avoca, but in the Maryborough mining district:—

''The Pyrenees Proprietary Gold-mining Company commenced operations early in 1909, and the main workings at present consist of a main shaft sunk 94ft. westerly from the former No. 5 south shaft to a depth of 435ft., with three compartments to a depth of 325ft., and four below. Levels are opened out at 250ft., 325ft., and 425ft. below the sill and drives, chiefly southerly, extended along the line of lode. Two distinct reefs have been exploited. Of these the eastern formation has been worked from the 250ft. level upwards, and connected with the shallow shafts of the early miners. The western formation, on which the 350ft. level has been driven, lies about 30ft. west of the eastern body, and extensive stoping above the 350ft. level reaches to some height above the 250ft. level, and for a length of over 300ft. At the 425ft. level the position of the western formation has not been located, and, with this object, the present survey was carried out.

''The structure of the mine reveals a series of west-dipping beds of alternate sandstone and slate, all highly metamorphosed—apparently regionally—with laminated quartz lodes, varying from a thread up to several feet in thickness, and conforming in strike and dip to the enclosing strata. Occasionally the quartz gives out completely, leaving only a track or ''back.'' At the bottom level (425ft.) a crushed track up to a foot in width has been driven on for nearly 700ft., without any sign of quartz making in it.

''At times two or three parallel dykes, from 1in. up to 18in. in width, separated by laminated quartz, occur. At other places the laminated quartz forms on one or other side of the dyke, and again elsewhere on either side. In this respect the lode in part bears a striking resemblance to Cohen's lode at Walhalla, but differing in this feature that the lode here is inter-bedded. The age of the dyke is undoubtedly newer than the deposition of the quartz. It is desirable that a short crosscut be put in westerly at, say, 50ft. north of connecting rise.

''Should the crosscut recommended at the lower level prove the downward continuity of the lode, the main drive should be turned westerly at the southern end, and the lode followed. While evidence of a southerly pitch on the eastern lode exists, the shoot of stone on the western lode does not appear to pitch rapidly, but rather to be of the nature of a nearly vertical body. The downward continuation of the shoot on the eastern lode below the 250ft. level should be looked for by crosscuts easterly at intervals along the 325ft. level, between 150ft. and 300ft. south of the shaft.''

# ENGINEERING AND ELECTRICAL SECTION

THE FAMOUS
"Brimsdown"
"Wirum"
BRITISH MADE Lamps.
The most popular, reliable and economic lamp on the market.

Sole Agents—
THE
LAWRENCE & HANSON
Electrical Co. Ltd.
405 LONSDALE ST., MELBOURNE.
33 YORK ST., SYDNEY.
and at WELLINGTON, N.Z.

## MELBOURNE SUBURBAN TRAMWAYS.

As a business move on the part of the Victorian Railways Commissioners, the increased service lately provided on the St. Kilda-Brighton electric tramway has proved very successful, the traffic having already increased to such an extent as to more than cover the additional operating cost. It is expected that further additions to the number of cars running will be made by or before December, a five-minute service being the object aimed at for the busiest portions of the day. Eleven new car-bodies, built by contract in Adelaide, have arrived, and will be available when the track has been altered to permit of the faster service being run. Nothing definite has resulted, as yet, from the proposal of the St. Kilda and Brighton municipal councils to purchase the line from the Government, but complaints are still made at every council meeting of the condition of the roads along which it runs. It was agreed at last week's meeting of the St. Kilda Council to recommend that the Commissioners fill in their track with wood blocks, as well as to protest against the condition in which the track is kept. A complaint was also reported from the Melbourne Motor-Omnibus Co., respecting the height of the tram rails above the road level in Fitzroy-street. To this the Commissioners replied that, owing to the pounding which the asphalt received from heavy motor vehicles (such as those of the company in question) passing over it, often at high rates of speed, it was a difficult and expensive matter to keep the surface even for any length of time.

The offer of the Kew Council to purchase from the Melbourne Tramway and Omnibus Co. the horse tramway from Victoria-street Bridge through Kew has been accepted, and the Council has in preparation a Bill to be presented to Parliament giving authority for the purchase and the subsequent electrification of the line. The Hawthorn Council was less successful in its attempt to purchase the Burwood-road horse tram with the object of electrifying it, but has congratulated Kew on securing its wishes.

The Councils of Fitzroy, Northcote, and Preston have practically decided upon an electric tramway from Fitzroy to Preston, and passing through Northcote, connecting at the Fitzroy end with the existing cable tramway. It is estimated that a double line will cost £9000 a mile for the track only. The line will have a total length of 5½ miles—3½ in Preston, 1¾ in Northcote, and a quarter of a mile in Fitzroy. It is expected that the cost of the line, including alteration to the Merri Creek-bridge, a railway crossing, purchase of land and other contingencies, would be about £80,000.

The Prahran Malvern Tramways' Trust has accepted the tender of Messrs. Duncan and Fraser for the building of ten bogie cars at £815 each. This will bring the Trust's rolling stock up to 63 cars. The Trust has expressed its willingness to construct an electric tramway along Malvern-road from St. Kilda-road to Burke-road, Malvern, subject to the formal consent of the councils of the cities of Melbourne, Prahran and Malvern being obtained.

At a public meeting at Coburg, attended by about 500 persons, convened by the opponents of the proposed electric tramway scheme for Coburg, as set out in the report of the Railways Standing Committee, it was decided that the present time is inopportune to proceed further with the scheme so far as that district is concerned, but that in the event of a Bill being introduced into Parliament authorising the formation of a Trust to construct the proposed lines a clause be inserted directing that a referendum be taken. Also, that the Coburg Council engage the services of an expert to report upon:—(a) The costs and prospects of an electric tramway system; (b) the cost and prospects of a motor omnibus service over the same routes. The result to be submitted to the ratepayers prior to the referendum.

### The Middle Park Line.

The report of Mr. F. A. McCarty, electrician, on the proposed electric tramway from Prince's Bridge to Middle Park was presented to the South Melbourne Council at last week's meeting. Mr. McCarty states that the distance covered would be 3 miles 20 chains, and his scheme provided for double track, overhead construction, electical works and sub-station equipment, ten passenger cars, car depot, offices, etc. The gauge recommended is 4ft. 8½in., now recognised as a standard for street tramways, 90 lb. girder rails, with 95 lb. rails on curves. He suggests that, in order to improve the appearance of the streets traversed, efforts be made to induce the Postal Department and Melbourne Electric Supply Co. to utilise a top section of the tramway side poles, and that the cars should be of similar pattern to those at Malvern and Prahran. A site at Hanna-street is suggested for the car depot, and he estimates the capital expenditure at £63,373. On the question of revenue, Mr. McCarty states that he had no definite guide to follow, but working on a population basis at 14s. per head, he found that, as there were 23,500 people residing within a quarter of a mile of the route, they would on this basis return a gross annual revenue of £16,450. It is explained that the Adelaide tramways returned £2 1s. 5d. per head of population served, Prahran and Malvern 15s. 11d., the Fremantle, in the first year of operations, an average of 16s. 6d. per head. This enabled him to form the following estimate:—Expenditure, 300,000 car miles, at 9d. per mile, £11,250; interest on capital expenditure, at 4½ per cent., £2852; renewals, reserve fund, £1103; total, £15,207. Receipts, £16,450. This shows a profit of £1240 in the first year, which he considers very encouraging, as the revenue would undoubtedly increase year by year. The foreshores, cricket ground, factories, picture shows, etc., would attract a lot of traffic, population would be increased by the facilities for travel, and there would, he thinks, be considerable traffic when the new markets are established there by the Government.

---

## N.S.W. RAILWAY CONSTRUCTION.

The N.S.W. Minister for Works, with the approval of the Cabinet, has accepted the terms of Messrs. Norton Griffiths and Co. for railway construction, under the following conditions:—

(a) The work to be entrusted to this firm under the present proposed agreement should cover only £3,000,000 worth of work, viz., the remaining sections of the North Coast railway, the line to the Dorrigo, and the railway from Condobolin to Broken Hill.

(b) That the total supervision charges should be 5 per cent.

(c) That no percentage should be paid on land, plant, rails, bridge material, or signalling and interlocking gear.

(d) That if at any time the Director-General of Public Works should come to the conclusion that the work is not being carried out satisfactorily, expeditiously, or economically, the Minister may forthwith cancel the agreement, paying only for the work completed.

(e) That, should any dispute arise between the Department and the supervising firm on any of the larger questions affecting the agreement, the same shall be submitted to a board of arbitrators, consisting of the Director-General of Public Works, the local representative of the Norton Griffiths Co., and an umpire, to be appointed by the Chief Justice.

(f) That the work shall be completed within two and a half years from the confirmation of the agreement.

(g) That the plant to be used shall first be approved by the Director-General of Public Works, and when purchased abroad shall be inspected and passed by our consulting engineer in London.

(h) The accountant for the supervisors shall be an officer of the Public Works Department, and all their accounts shall at all times be open to inspection by the persons authorised by the Minister.

(i) That the workmen shall be employed on the day-labour system, and shall receive the same wages, holidays, and other privileges in all respects as the men directly employed by the railway construction branch of this Department.

(j) That the supervisors provide a guarantee to the amount of £50,000 for the faithful carrying out of this agreement.

(k) That the agreement shall not be binding until approved by a resolution of both Houses of Parliament.

Mr. Griffiths states the possible objections to the scheme, but answers them and points out the advantages as under:—

"The objections that may be raised to this proposed arrangement are as follows:—

1. That we are making an agreement with one big firm for the carrying out of our work without allowing other firms the right of competing for the work.

2. That we are relying very largely indeed upon the good faith and capacity of the supervising firm by entering into an agreement whereby it is paid, not by results, but by a percentage upon cost—a condition of things, which, if the firm were dishonest, might mean an inducement to extravagant expenditure.

3. The possibility that, even with the support of the powerful financial group with which the Norton Griffiths Company is associated in London, the increase of a million and a half a year to our normal borrowing may in some degree affect the prices of our ordinary loan issues.

These objections, however, are, I think, more apparent than real.

The advantages are that, in the first place, the firm in question has acquired such a world-wide reputation for efficiency in carrying out great public works for both British and foreign Governments that the idea of its sacrificing this reputation for the sake of making a small illegitimate profit is hardly worth consideration; and besides the firm is hopeful of obtaining further and larger public works on similar terms from this and other Australian Governments, among these being the underground railways of Sydney. Besides all this the power vested in the Minister to terminate the agreement at any moment constitutes an effective protection to the interests of the Department.

On the financial side of the matter I am convinced that the fact of having a group of financiers as powerful as those interested in the Norton Griffiths Company in London standing behind our loan issues will make it easier for us to raise the larger sums contemplated than it is to-day to obtain the money necessary to carry on our normal expenditure on public works.

The advantages of adopting the scheme are of course, self-evident. It would mean not only that the railways directly concerned would be completed within two and a half years instead of eight or ten, but the whole of the money voted by Parliament for ordinary railway construction, as well as the whole staff of the Department, would be immediately available for the construction of other lines in various parts of the State which have been or are likely to be, approved by Parliament; but the construction of which, under ordinary conditions, could not be undertaken for years to come."

It was the Cabinet's intention to treat the consideration of the scheme as a non-party matter; and the papers were laid on the table of the House on Wednesday, but on Thursday Mr. Wade, the Leader of the Opposition, gave notice of a motion of censure on the Government in connection with the proposal, to the effect that the agreement is "a highly unsatisfactory way of financing public works and fraught with grave dangers to the interests of the State." The House thereupon adjourned, and subsequent Cabinet meetings have taken place. Ministers now contemplate party action being taken to defeat the censure motion, and, that being disposed of, the vote on the agreement proposal being left open to members to vote as they wish.

Mr. Wade, speaking at Campsie on Friday, pointed out that the Labour Government were proposing to place in the hands of "this firm of so-called bloated capitalists" the power to expend £3,000,000 at a remuneration of £150,000 to themselves, irrespective of the amount of work done for it, and exclusive of whatever they might earn in addition by providing the loan; and characterised their position as being one enjoying privileges which nobody else in New South Wales ever had before.

## VICTORIAN RAILWAYS.

Mr. J. Thomson, Honorary Minister, who is representing the Victorian Minister for Railways, Mr A. A. Billson, during that gentleman's illness, received a deputation last week which asked that the Rosstown railway, between Oakleigh and Brighton, built some years ago by private enterprise, but long since laid idle and still unused, should be taken over by the Government and made a going concern in the interests of the large population in the district. The line is 5½ miles long, and, in addition to the statement that it could be bought for less than £20,000, the deputation pointed to the success of tramways which connected one suburb with another directly, without the necessity of travelling into and out of Melbourne. Mr. Thomson, in reply, said he was of opinion that railways were more urgently needed in the country districts; they were already complaining of the amount of money to be spent on electrifying the suburban lines. Yet the Government was doing its best for both the city and the country, and when it went out of office it would be known as the "Railway Construction Government." The Railways Commissioners said that fully 50 per cent. of the population to be served by this line had access to railway communication, and they were strongly of opinion that the traffic on the line would be meagre. They estimated that upwards of £40,000 would be required to place the line in a proper state, and that would mean £60,000 altogether. He would lay the request before Mr. Billson, and it would have his best consideration.

Although increased wages, amounting to £63,000, and additional camping allowances to the extent of £3000 have been secured to Victorian railway men and will be retrospective to July 1st, there will be delay in actual payment of the increases for a few weeks yet. This has resulted from the expressed wish of the men in various grades that the Commissioners will receive deputations from each grade in order that the views of the men may be heard. This is now being done, and the work of revising the wages sheets will follow.

The rolling stock of the Victorian railways is steadily increasing. Since July 1st four locomotives of the "A2" class have been delivered from the Newport workshops, and Messrs. Walker and Company, of Maryborough (Q.), have supplied four engines of the "DD" class, forming part of their contract of twenty. Seventy-seven goods waggons have been supplied from Newport, and 133 by private firms. The classes of trucks which have been placed in running are as follows:—Constructed at Newport workshops—"I" (15-ton goods waggon), 56; "Q" (26-ton flat bogey), 11; "QN" (ballast hopper), 2; "U" (louvre trucks), 8—77. Constructed by private contract—"I" (15-ton goods waggon), 133—210.

The Victorian Railway Commissioners may anticipate a further scolding, either in Parliament or from outside. Last week they accepted tenders for the supply of locomotive, car and waggon tyres, to be supplied as required before the end of June next, from the following:—Friedrich Krupp (Germany), Vickers Limited, Brown Bayley Steel Works, Cammell Laird and Company Limited, Steel Peech Tozer, John Brown and Company Limited (Great Britain), Fraser and Chalmers Limited (United States of America), at rates.

Some doubt has been raised by officers of the Victorian Railways Department as to whether, after all, the site at Yarraville, selected by Mr. Merz for the central power-house of electrified suburban railways, is the most suitable one. It is stated that in the event of certain port improvements being made by the Melbourne Harbor Trust, difficulty may be created in finding sufficient supplies of water for cooling the generating machinery. Another possible site has been picked out, and this will be submitted when the matter is brought before Mr. Merz, and the Commissioners state that neither loss nor delay will be entailed should a change be made. No work has been done at the power-house site, but a loop line has been laid at a cost of between £8000 and £9000 to the coal sidings. It is stated, however, that if necessary, this can be extended and utilised for goods traffic.

## RAILWAYS AND TRAMWAYS (N.S.W.).

### Chief Commissioner's Report.

The annual report of the N.S.W. Chief Commissioner for Railways and Tramways, Mr. T. R. Johnson, shows that the net earnings were reduced by £285,382, and the surplus by £318,761. The gross earnings for the year ended with June 30th amounted to £8,503,551, the working expenses to £6,217,071, leaving net earnings £2,286,480, interest on capital £2,132,082, leaving surplus £154,448. This was for railways and tramways together; the earnings and working costs of the two branches of the service respectively were:—

| | Railways. | Tramways. |
|---|---|---|
| Gross earnings .. | £6,748,985 | £1,754,566 |
| Working expenses | 4,644,881 | 1,572,190 |
| Net earnings .. | 2,104,104 | 182,376 |
| Interest on capital | 1,917,200 | 214,832 |
| Surplus .. .. | £186,904 | Loss £32,456 |

Railways.—Including 101½ miles opened for traffic during the year, the number of miles of railway in operation on June 30, 1913, was 3930. In addition, there were 534¾ miles of railway under construction, and 636 miles authorised but not yet commenced. On the year, the railway gross earnings increased £257,512, while the working expenses increased £475,290. The increased working cost has been very largely caused by awards of Wages Boards as well as by the improved classifications granted to the technical and clerical staffs, which, together, account for £222,875 of the increase, the balance having been the result of additional appointments rendered necessary by increased business. It should be borne in mind, however, that the traffic wages staff award, which will cost £61,905 per annum, only came into force on April 16 last, so that the year under review has only borne a proportion of this extra expenditure, amounting to £12,897, whereas the ensuing financial year will bear the full charge, or an additional amount of £49,008. The award by the Engine-drivers, Firemen and Cleaners' Board, issued on July 16 last, will cause a further expenditure of £62,000 in 1914, or a total additional cost in sight of £111,008; and there are other claims coming forward which will considerably augment this increased wages expenditure.

During the year 79,490,012 passengers were carried, an increase of 8,783,284, without any train accident resulting in loss of life to any of the passengers. The provision of safety appliances has been continued.

In the past six years £3,951,981 capital has been expended on new rolling stock, £2,186,809 on additions to stations and lines, £2,770,071 on duplications and deviations, and £670,762 on the goods relief line to Glebe Island.

During the first half of the year the work of relaying, re-railing, and re-sleepering was seriously retarded by the difficulty experienced in obtaining a sufficient supply of rails and sleepers, and the continuous rainfall which prevailed during the last three months greatly interfered with the progress of all outdoor work. The total length of line wholly or partially renewed by re-laying, re-sleepering, or re-railing is 227 miles 28¼ chains, and 313 miles 51 chains have been re-ballasted, making a total of 540 miles 79¼ chains of line either partially or completely renewed. In carrying out this work 453,755 sleepers and 110,905 cubic yards of ballast were used. The total weight of rails used in re-laying and repairing work during the year amounted to 13,038 tons. Duplications, deviations, and regrading have also been energetically carried on.

Tramways.—Over 12 miles of new tramways were opened during the year, making the total 207¾ miles. The total capital expenditure on lines open for traffic on June 30, 1913, was £6,699,305. The expenditure charged to capital account during the year amounted to £1,034,981. The total earnings amounted to £1,754,566, as compared with £1,581,393 last year, being an increase of £173,173, or 10.95 per cent. The working expenses amounted to £1,572,190, as compared with £1,331,413 for the previous year, or an increase of £240,777. The percentage of expenditure to receipts is 89.61 per cent., as compared with 84.19 per cent. last year. The net result, after providing for working expenses and interest on the capital invested, is a deficit of £32,456, as compared with a surplus of £57,696 last year. During the year 294,455,452 passengers were carried, as compared with 266,789,546 in the previous year, or an increase of 27,665,906, without any tram accident resulting in loss of life to any of the passengers.

During the past financial year, says the report, but little progress seems to have been made towards a solution of this problem, and it is necessary again to emphasise the need for prompt and vigorous action. The most satisfactory results would undoubtedly be achieved by the construction of one section of the proposed city railway, say, from the Central Station to Wynyard-square, and concurrently the electrification of the Illawarra line. This would give relief at the railway station, where it is much needed night and morning, and at the same time, by making it possible to run suburban trains through to Wynyard-square, relieve the present surface trams of much overcrowding.

The total staff employed on June 30 numbered 41,322; the average throughout the year being 39,831, viz.: Railways, 30,661; tramways, 9170; as compared with 26,574 and 7921 respectively for the previous year, or an increase of 5336. The value of the concessions and advances made to the whole of the staff, whether engaged on capital or working expenses account, represent a cost at the rate of £282,230 per annum, in which the wages staff will participate to the extent of £226,378 per annum.

## NEW ZEALAND RAILWAYS.

A contract has been let by the New Zealand Public Works Department for the construction of a tunnel 75 chains in length on the main trunk line, between Okahukura and Stratford, and about two miles from the former place. The price is given as approximately £100,000, and the work is to be completed in three years.

The estimated revenue from the Dominion railways for the current financial year is £4,200,000.

When the Government took office in July, 1912, new construction work on main and branch railways was in progress at twenty-one different points, and provision was made on last year's Public Works Estimates for continuing work on practically all these lines. The total expenditure on new construction, apart from additions to open lines, amounted, during the year, to £684,196. The contract with Messrs. McLean and Sons for the construction of Arthur's Pass tunnel, between Bealey and Otira, was formerly determined on December 23, and the work has since then been continued by the Public Works Department. It is proposed, however, to invite tenders at an early date for the completion of the tunnel.

In pursuance of its purpose to build cheap and light railways in rural districts which it is desired to open up for the Public Works Department obtained authorisation for several such lines last session; the difficulty is to find the money for these as well as for main line construction. The Government has, therefore, acceded to the request to allow private enterprise to undertake such work, subject to conditions which will carefully safeguard the public interest. Legislation giving effect to this proposal will be introduced this session.

Mr. Massey, the Prime Minister, assured a deputation lately that there was little doubt of construction being resumed shortly on the Waihi-Tauranga section of the East Coast railway. The section was authorised by the Ward Government in 1911, and that a sum of £15,000 was voted that year for this section. The work was started in March, 1912, but after about £5000 had been expended work was stopped.

The interest earned by the railways on the cost of construction during the year ended March 31, 1913, is the second highest on record—namely, £4 0s. 9d. per cent.—notwithstanding large increases in the wages of the staff.

The amount placed on the Estimates on account of working railways is £2,931,250; the sum actually expended last financial year was £2,817,141.

## B.H.P. IRON AND STEEL WORKS.

In making his half-yearly report to the directors of the Broken Hill Proprietary Co. (N.S.W.), which has now been issued to shareholders in conjunction with the directors' report and statement of accounts, Mr. G. D. Delprat states that work in connection with preparations for the company's iron and steel works at Newcastle is advancing very rapidly. "During the half-year the designing of the various plants connected with these works was completed, and practically the whole of the orders for the heavy machinery and buildings were placed. Pile-driving for the foundations of the blast furnaces and hot-air stoves was finished. These foundations would be ready to receive the iron superstructure as soon as it was due to arrive. The New South Wales Government has pushed on vigorously with the dredging on the river, the sand resulting from the dredging being pumped on to the low-lying land, in consequence of which a large area of land—which previously had been under water at high spring tide—was now well raised, being in some places as much as 12ft. above the highest known tide. This dredging is carried on day and night, two dredges being at work practically all the time. In one place on the water frontage there is now a depth of 25ft. at low water, where in the past there had existed a depth of about 10ft. only. At this place the company are building a jetty for landing the heavy machinery on arrival, and on this jetty will be placed a travelling steam crane, capable of lifting 60 tons net weight in one lift; such a powerful crane was considered necessary, as some parts of the rolling mill will weigh at least 40 tons each. This jetty is already connected with a temporary railway line, over which all the machinery, etc., will be transported to the various sites which it will eventually occupy permanently, and the necessary foundations are being put in, so as to be in readiness on arrival of the heavy pieces of machinery. Owing to a scarcity of suitable houses in Newcastle, it has been found necessary to build residences for some of the principal officers, and this is now being done.''

---

## BRITISH AND EUROPEAN DEVELOPMENTS.

(From Our Correspondent.)

London, July 25.

I have referred here on several occasions to the excellent and most interesting work that has been done for some years past under the supervision of Dr. Alexander, the Medical Officer of Health for Poplar (London), in the production and distribution of electrolytic disinfectant fluid. The fluid is distributed to the public from seven depots, and it is also employed for purifying the water at a number of swimming baths, and for cleansing and disinfecting a number of elementary school classrooms. Dr. Alexander shows that the cost of materials used in producing 54,388 gallons of the fluid was only £101, including about £60 for electricity—9555 units at 1½d. per unit, 4 tons of chloride of magnesium, and over 8 tons of salt, plus caustic soda and water. These are the figures for the past year, during which the results attending the application of the fluid in all the directions mentioned above have been most satisfactory. A number of authorities have been watching and reporting upon the swimming bath feature of the work, as it is recognised that such places are a source of infection which ought to receive more attention, so that the dangers lurking there may be remedied by such methods as have been adopted by Dr. Alexander in five baths for the last three or four years. Dr. J. G. Forbes has lately referred to the matter in the following terms:—''Briefly, the fluid is prepared by the electrolysis of a saturated solution of magnesium (3 tons), together with salt (4½ tons), and caustic soda, which produces over 27,000 gals. of electrolytic fluid at a cost of just under £2 per 1000 gallons. The capacity of four of the Poplar baths varies from 75,000 to 85,000 gallons; for these an amount of electrolytic fluid of 20 to 30 gallons is added during the filling of the baths. A smaller bath holding 39,000 gallons receives 10 gallons. Subsequent additions of the fluid are made at intervals of two or three days, according to the condition of the water and the number of bathers. The bath is emptied and cleansed at regular intervals of about 7 to 10 days. The advantages claimed for this method of disinfection are:—(1) The water is purified both chemically and bacteriologically by the oxidising and germicidal properties of the fluid. (2) The water from its purification is far pleasanter to bathe in, clear and invigorating, and free from the usual unpleasant odour. The cleansing of the bottom and sides is much more easily accomplished, owing to the absence of slime commonly found at the deep end of the bath. (3) The cost of purification and cleansing by means of electrolytic fluid is very considerably less than the costly process of emptying, cleansing and refilling with clean water at frequent intervals. At the same time the primary object has been to provide a clean bath for the bathers, rather than to effect economy in the use of water.'' Dr. Forbes adds:—''There can be no doubt, therefore, that the value and practical use of the electrolytic method of disinfecting swimming baths shown in the Poplar district, clearly demand its general application to all swimming baths.''

The Wolverhampton Corporation electricity works, with an increased output of 15 per cent. for the year, has a total of 12,293,917 units. The net profit was £8392, the highest yet recorded, notwithstanding all the adverse influences to which reference has been made here. The increase in cost of fuel was 25 per cent., but in June last year, in order to economise in this connection, a new battery was installed and the advantages realised have been great, so that notwithstanding the increased cost of fuel (25 per cent.), the actual increased cost of generation per unit sold only amounts to 3.4 per cent. The units generated at the refuse destructor station amounted to 1,697,706 units, representing a revenue of £1415.

The West Ham Corporation electricity department generated 3½ million units more than in the preceding year, but only paid 5 per cent. more (average) for its coal, and owing to very considerable reduction in coal consumption, due to increased output and the improved methods of production, there was a total coal consumption of 260 tons less than in the previous period. The total units generated were 34 millions, 27½ millions of which were sold—17½ millions for power, 6 millions for traction, and 141,575 units for heating and cooking. The area has been splendidly worked in respect to catering for power load, and the excellent progress of previous years continues, though industrial disputes are calculated to have reduced power consumption by a million units. Mr. J. W. Beauchamp, the engineer and manager, says that there has been a gratifying increase in the number of moderate size power consumers at standard rates, ''a class of business which is most desirable and capable of further development.'' The total h.p. of motors connected has risen to close upon 18,000. With coal at 11s. 6.4d. per ton the total costs (including .335d. capital costs) were 0.908d. per unit, a fall of 1 per cent. as compared to the previous year, when coal was 10s. 11.4d. The price obtained for private lighting was 2.62d., and for power and heating 0.65d.

In connection with its dock improvement schemes for facilitating the loading and unloading of big steamers, the Port of London Authority has before it at present tenders by a number of firms for the provision of over 40 electric cranes (lifting from 30 cwt. to 3 tons, according to speed) for the north side of the Royal Albert Dock. In part, they will take the place of about 30 hydraulic cranes now in service, these being transferred to another dock. They will be luffing cranes of 60ft. radius. The work involves a new crane track, the laying of electric mains, etc. In the Royal Albert Dry Dock, for giving better facilities to those engaged in ship-repairing operations, additional mains will be laid. One of the London municipal councils has entered into an agreement with the Port of London Authority, under which it will provide for electric supply to the new pumping station. The foregoing works form part of costly and far-reaching improvement projects, which were decided upon by the Authority some time ago. One of the features of the increasing activity at the London docks is the growth of Australian shipping, both trading and emigration, and very close attention has been devoted to this aspect of affairs. This attention has been directed partly to the care of cargo and partly to the provision of greater convenience for females and children.

The Yorkshire Electric Power Company has its new waste heat power station at Barugh nearly completely; it will add 5000kw. to the plant capacity. The concern continues to improve its position. The past half-year's increase in gross revenue was large, the total being £10,240, as compared with only £5805 for the corresponding half of the previous year, but the high price of coal was a handicap. However, the net profit is £6972, as compared with £3349.

At Kingston on Thames the electricity department suffered heavily, for it has to show a loss of £1255 for the year, of which £1093 represents exceptional coal costs. At Norwich the coal cost advanced by 20 per cent., added to which there was a heavy burden of expenditure consequent upon the remarkable floods.

Large numbers of electrical and engineering factories have issued their notices closing down for about ten days for the annual holidays; the London County Council is closing down its meetings until October; engineering and scientific societies are at rest; and the House of Commons has heard the Government announce the annual Slaughter of the Innocents, so that it, too, may get away for that vacation which everybody industrial prays may be prolonged. The wireless chain matter still stands in the forefront of politics, the press devoting a good deal of space to criticisms of the Postmaster-General for not being willing at this late date to further consider systems other than the Marconi. The Poulsen advocates say that they have not had fair treatment meted out to them, and Sir Joseph Larmor has written a letter of great weight and length to the ''Times'' urging the wisdom of the Post Office and the Admiralty constructing the stations, or some of them, themselves. In brief, this very eminent scientist advocates the setting up of some official staff of experts or authorities for wireless telegraph experiment, research, and other work, instead of the nation being dependent upon private interests in respect of a matter of such great concern. The unfortunate thing is that this controversy has run so closely on party lines that there is just now a disposition to regard any criticism or suggestion that does not originate on the Government side as being inspired by the desire to gain party advantage and embarrass the powers in authority. But whatever may be the immediate issue of the discussions in respect of effect on the Marconi contract for the Imperial Chain, there is reason to believe that men of affairs and leaders of thought and opinion among the general public have to-day a broader view of wireless telegraphy than was the case a year ago; this will lead to a wider recognition of the need for this department of scientific application to be nationally organised and developed in order that in so important a matter the Empire shall not be dependent upon private interests and the servants of private enterprises. Anxiety is still being shown lest there should be a monopoly set up, and lest anything should be done to prevent the fullest possible scope being allowed for advance in wireless science and practice.

Since the above notes were written, Mr. Herbert Samuel, the Postmaster-General, has written to the ''Times,'' replying to some of the arguments advanced by his critics and advisers. An electrical journal may brush aside much that appears in all of this correspondence, but the following references to Sir Joseph Larmor's proposal may be quoted, as they may be taken as representing the up-to-date and future policy of the British Government concerning the technical aspect of wireless telegraphy:—''Sir Joseph Larmor emphasises the importance of the State seeking and using in this connection the best scientific knowledge that the country holds, and encouraging continuous inquiry and experiment in the rapidly-developing science of radio-telegraphy. The Government would indeed be to blame if it did not make such provision. Steps have already been taken. I have been fortunate in enlisting the assistance for a period of years of Mr. Duddell, F.R.S., the president of the Institute of Electrical Engineers, who has been recommended to me by all his colleagues on Lord Parker's Advisory Committee, as well as by others, as the scientist best qualified to lead in such a task. Grouped around him will be the ablest of the engineers dealing with wireless telegraphy attached to the various Government departments. It is intended that when occasion arises a committee analogous to Lord Parker's should be invited to meet to consider particular aspects of the problem. The scientific man who regards the Imperial wireless stations from the standpoint of the theorist would wish them to be from the outset the perfect products of long and patient experiment. But the strategist says he must have them now. The Government is compelled to pay heed first to the strategist, while reserving full scope for the theorist as well. We go now to the contractors who have the experience, the designs, the staff to enable the stations to be quickly built. Once built the Government takes complete control of them. It forms its technical committees; it trains its scientific staff; it places its new stations at their disposal for experiments; and it retains full liberty to replace whatever system is first installed by whatever better thing their later researches may discover or evolve.''

In England and Germany alike, legislation providing for the compensation of the worker who is injured in the course of his employment was followed by very close attention, comparatively speaking, to the improvement of the means and devices for the protection of those engaged in industrial occupations. Generally speaking, regulations are adopted for a works, which, if faithfully complied with, will ensure safety of life and limb, except in cases where unusual circumstances arise. Everybody knows, however, that precautions and regulations are every day being disregarded, perhaps through forgetfulness, perhaps through foolhardiness. Prosecutions of workers who have broken rules, in works and in collieries, are not infrequent, their chief intention being to awaken the rank and file to their own responsibility as well as to their liability to penalty. There is such a readiness to hold owners and managers responsible when anything in the way of a breach of regulation occurs, that it is only right that it should now and again be brought forcibly home to subordinates that they have still got to look after their own welfare, and, in so far as one may endanger the lives of others, after that of the whole of their fellow-employes. A vast amount of ingenuity has been exercised and capital expended in providing added safeguards during the last two or three decades, and there is to-day being fairly generally applied a science of accident prevention. In such large and modernly-equipped factories as those of the Allgemeine Elektricitas Gesellschaft, in Berlin, one may find excellent examples of the extent to which protective devices are being employed on the Continent. The A.E.G. claims to have gone far beyond the prescribed limits of the 1884 and 1885 Workmen's Accident Insurance Acts in this connection. Every month leaflets and descriptions of safety devices and arrangements in force in the factories are distributed to the various departments, and lantern lectures have recently been given on the subject by Mr. G. Osenbrugge, who is described as the A.E.G. ''social engineer.'' A few particulars have just been given in the company's official organ, to which reference may be profitably made here. In all the works there is a complete absence of transmission gear, each machine having an individual electric drive, while the large railway traffic taking place in the yards or grounds is controlled by strict regulations. Small transport trolleys, which are much used, are fitted with iron frames, which enclose the wheels directly above the rails, in order to protect the feet of workmen. Special safety apparatus is used on presses and stamping machines to prevent the operator from placing his hand under the press while these processes are proceeding. It includes levers for starting the machines which occupy both hands, protecting sleeves which can be pasted together, and other devices. Shaping machines have mounted on them protecting gratings, which catch the shavings, preventing them from flying off when working brittle material. Operators on welding machines are protected against injury from particles of molten metal by a mica screen placed over the electrodes, and the machines are also surrounded by a hood to prevent the shower of sparks given off from injuring anyone standing in the neighbourhood. Workmen at the large lathes were formerly subjected to considerable danger owing to the fact that they could not reach the disengaging lever from the point at which they were standing. For this reason the A.E.G. disengaging devices, which are connected with the controllers, are led round the entire circumference of the table. In order to prevent the premature insertion of the hand in the rotating drums of centrifugals, the latter are provided with double covers which can only be opened when the machines are stationary, or with a single cover which is connected to a belt-shifting device in such a manner that it is impossible to open the drum while it is in use. Particular care is taken to prevent accidents to the eyes. Workmen with the chisel have to wear protecting goggles. The workmen employed in autogenous or electric welding must be protected by coloured glasses, helmets, asbestos gloves, leather aprons, etc., against the injurious effects of light and heat. Ample precautions are also taken in the caustic works for drawing off the nitrosulphuric gases through stoneware exhaustors, and for the precipitation of the gases in stoneware towers. Open forge fires have a draught for carrying off the smoke in every case. Straight ladders are fitted at the ends with points, or with rubber or lead in order to prevent slipping. Crane ladders attached to vertical walls are fitted with back bars. The washing apparatus in which metals are washed with benzine is equipped with devices which, on the ignition of the benzine, immediately allow an extinguishing mass to fall or cause the lid of the apparatus to come down. The throwing in levers for compressed air hammers, which move vertically, have a protecting cover placed above them in order to prevent any pieces of iron which may fall off the anvil from causing the machine to start prematurely. In the grinding department the emery discs are surrounded by strong hoods and are also provided with exhaustors which carry off the unhealthy grinding dust. A great source of danger exists in the slicing lathes or similar machines, owing to the ends of rotating material which project from the machine, on which account these ends are placed in protecting tubes.

For the protection of the hair of female workers, which, because of its elaborate dressing, ribbons, and so forth, has often been a source of considerable danger in most factories, a special form of headgear is in vogue, while, in addition, all rotating parts of the machinery, such as spindles, shafts, etc., are carefully covered.

Notwithstanding all the precautions that are taken, however, accidents are bound to occur in factories of such large dimensions and employing so many thousands of hands. Therefore, ample provision is made for first aid. Stretchers are everywhere available, and there is also an ambulance station equipped with the latest medical and hygienic apparatus, and motor-car ambulance waggons are also included in the equipment for conveying injured "cases" either to the hospital or to their homes.

## ELEC. ACCIDENTS IN POWER STATIONS AND FACTORIES.

(From Our Correspondent.)

London, July 4th.

The big blue book (271 pages), containing the annual report of the Chief Inspector of Factories and Workshops, which always appears at about this time of the year, has just been published. As usual, it contains a vast amount of most valuable information collected (during the year 1912) by an army of official inspectors, experts and reporters, as to developments, improvements, accidents, fatalities and general conditions that call for observation. Those interested in particular departments, whether from the technical, social or legislative points of view, will dig out what concerns them, but we doubt whether the document receives anything like a proper share of the public attention. The daily press, speaking generally, dismisses it with a few lines, and the average worker, of course, never sees it, nor knows how much there is in it concerning his fellow workers' mistakes, foolhardiness, misfortunes, and so forth. It is mostly by specialist writers, perhaps in the technical press, that it is critically examined, and in such organs nowadays there is not a great deal of space to spare to consider many of its points in detail. There are in it again this year texts for a hundred useful articles informing the factory owner and the engineer, and warning the factory employee, but we must limit our attention here chiefly to electrical considerations. Mainly, we will as usual refer to the report, always full of timely comment for electrical men, of Mr. G. S. Ram, H.M. Electrical Inspector of Factories, but before doing so we mention a few points from one or two other statements selected from this bulky document. One of the Department's inspectors has urged the use of frosted globes and the better placing of electric lamps in printing works, with the object of reducing "glare." Other inspectors refer to the satisfactory results attending the use of mercury vapour lamps in different factories, one of them mentioning that such form of lighting is said to be softer to the eyes, and that in consequence complaints of headaches are less frequent amongst the workers.

Among the special reports is one on the artificial lighting of iron foundries by Mr. R. D. Wilson, made as the result of visits to forty such foundries in different parts of the Kingdom in order to ascertain the efficiency of the artificial illumination. It appears that, so far as the actual carrying on of the work is concerned, the intensity of the illumination of the foundry is of little importance. At the moment of pouring ample light is derived from the molten metal itself, and the previous and subsequent processes can be and often are carried out with the aid of supplementary light obtained from portable lamps. Insufficient light is undesirable from the point of view of accidents, caused by stumbling during the passage from one part of the foundry to another, especially when handling metal or when passing near moulding pits or parts of the foundry in which metal has been recently poured. In other words, "general" rather than "local" illumination seems to be the important matter to be considered.

Mr. Wilson's report is a very complete one, and it will no doubt be of great interest and value to those concerned with foundry management, as well as to illuminating engineers and contractors concerned with industrial works installations, both gas and electric. A number of special characteristics are stated showing that for efficient lighting the illumination of iron foundries should be high compared with other rooms. Points relating to shadows are covered, and reasons stated why the most satisfactory method of lighting is by means of powerful units fixed as high as possible above the floor and spaced comparatively close together. For the lighting of a given area it is preferable to have two sources of, say, 1000 c.p. each, rather than a single source of 2000 c.p. Tables are attached to Mr. Wilson's report detailing the method adopted in the foundries visited. He concludes by saying that the investigation appears to show that the illumination received on a horizontal plane one foot above the floor level in—

Well-lighted iron foundries does not fall below 0.5ft. candle.

Fairly-lighted iron foundries does not fall below 0.3—0.4ft. candle.

Moderately-lighted iron foundries does not fall below 0.2—0.3ft. candle.

Poorly-lighted iron foundries does not fall below 0.1—0.2ft. candle.

Badly-lighted iron foundries is below 0.1ft. candle.

"It would seem, therefore, that the lighting cannot be deemed to be adequate unless the illumination received on a horizontal plane one foot above the floor level is not less than one-third of a foot candle over any part in which work is being carried on or over which any person is liable to pass."

Mr. Evans, the Glasgow inspector, after visiting many electrical stations in the Northern Division, reported:—"Apart from fatalities, accidents from shock, unaccompanied by serious burning, are often not reportable. I heard of more than half-a-dozen in the course of the year which had been sufficiently serious to cause unconsciousness of half-an-hour and upwards, but in each case the person, after regaining consciousness, resumed work in a few hours. It is noteworthy, however, that such accidents narrowly miss proving fatal. In the general administration of the regulations the chief difficulty is the technical ignorance of the users and the time consumed in necessary explanation. The supply companies almost invariably show readiness to meet the requirements in their most exacting interpretation, and on points where trade opinion in past years has been divided, e.g., the insulating or earthing of resistance frames for starting switches, etc., there are instances of companies revising their own regulations and adopting the earthing of all such metal which might get accidentally charged."

Turning now to the electrical report by Mr. Ram, we may summarise the accidents of the year 1912 thus:—

I. Accidents in generating and sub-stations—

| | |
|---|---|
| (a) Mechanical or non-electrical | 371 |
| (b) Electrical | 74 |

In (a) there were 11 fatalities, seven of them being through falls. In (b) four were fatal, three of them occurring to men engaged cleaning, repairing, etc., at "live" switchboards or other "live" conductors.

II. Accidents in factories, not electrical stations, numbered 283, fifteen being fatal; five of the fatalities were to unskilled persons working on or near live conductors, and nine are described as "miscellaneous."

Out of 13 accidents occurring at switchboards to men engaged in ordinary routine work ten were due to mistakes on the part of the switchman, producing heavy arcing at the switch, with consequent burns. The accidents to men cleaning or repairing on live switchboards or other live conductors always form one of the largest and most instructive classes as showing the risks which are often taken unnecessarily by station engineers and attendants familiar with the dangers. Out of 33 such cases three proved fatal, and they occurred on extra-high tension, three-phase switchboards. In one case a contractor's representative while discussing matters with the station engineer, who warned him of danger, forgetfully touched a live terminal. The second case was to a man engaged cleaning dead parts of the gear whilst adjoining conductors were alive. The third occurred to a competent engineer when acting under the supervision of his superior officer. A compartment of the switchboard normally closed up by slate slabs held in position by bolts, and not designed or intended for use as a switchboard passage-way, was opened up by the removal of one of the slate slabs for the purpose of tracing out certain connections. One man entered through this opening, having then to crawl under various obstructions in order to see the connections at the back of the most distant panel, and the second man, who was in charge, started to follow him. The man in front touched a live conductor and was killed. Mr. Ram comments here:—"How it occurred that two trained men, who apparently knew of the dangers, came to run such a risk on a matter which was apparently of no urgency is inexplicable. The investigation might have been made at the week end, when the board could have been entirely dead." Of the non-fatal high-tension accidents, four occurred to men working close to apparatus, which they knew to be live, apparently quite regardless of the risks which they were taking. Most of the accidents under this heading were through short circuits when working on direct current, medium pressure switchboards for traction or general three-wire supply. A number were caused by the use of ordinary metal tools, e.g., spanners, files, pliers, hack-saws, steel rules, when working at the back of switchboards. Other short circuits were made whilst cleaning the switchboards. Six accidents were due to short circuit in changing the connections of measuring instruments, either through the medium of metal tools or by the wires touching the frame direct. In one case, following on the changing of the connections of a wattmeter, a disastrous fire occurred, completely destroying the switchboard at which the accident happened and another switchboard at a distance. Out of seven accidents to those engaged on switchboards supposed to be "dead," six were on high-tension boards. In another class one accident (fatal) was due to a man walking in the dark into a cable which was under test in the yard of a substation.

The causes of the 283 electrical accidents occurring in factories appear below (the smaller figures show the fatal cases, which are included):—

| | |
|---|---|
| Arcing of switches | 23 |
| Arcing of fuses | 8 |
| Shock or burns from fuses when replacing fuse-wires | 27 |
| Portable apparatus, connectors and flexible wires | 61 |
| Unprotected conductors, switches, terminals, fuses, etc. | $27^{1}$ |
| Working on or near live conductors— | |
| Skilled persons | 32 |
| Unskilled persons | $33^{5}$ |
| Miscellaneous accidents in electrical manufacturing and repair works—mostly in testing operations | 32 |
| Adjusting brushes and cleaning commutators, and flashing at commutators | 9 |
| Miscellaneous | $31^{9}$ |
| Total | $283^{15}$ |

While the total number here is 7 less than in the previous year, the fatal cases have grown from 7 to 15.

### Fires in Power Stations.

After an interval of several years in which no serious fires have occurred in public supply generating stations, there are three recorded during the year under review. One occurred in a high-tension station where a new high-tension switchboard had just been completed. The fire originated under the floor of the working platform, and was apparently caused by the breakdown of the insulation in a joint box in which a concentric cable from a turbo-alternator was split up into two single cables passing on to the switchboard. The arc was apparently maintained for some minutes before the plant could be shut down. Owing to its position and resulting fire, it was impossible to immediately get to the control board, and the fire quickly assumed such proportions that the fire brigade had to be called in. Considerable damage was done to the control board of the new switchboard, the fire following the run of the cables. The supply of electrical energy was completely stopped for one night, but the duration of the stoppage would have been much shorter had not water got on to one section of the high-tension switch gear—a part of the old board which had not been replaced—necessitating a complete drying out before re-starting. Although the switchboard was chiefly affected the fire was not caused by any default in the design. Incidentally the fire showed the value of teak as a material for switch-room floors. The floor, which was of this material, although burned away where the arcing occurred, was at a short distance away practically undamaged, and did not lead to any extension of the fire. As the joint box at which it was supposed the breakdown originated had been tested a few days previously to three times the working pressure, the cause of the breakdown is unexplained.

The second fire occurred in a direct current station giving a three-wire supply and a supply for traction. The fire originated below the switchboard gallery where the cables emerge from the cable trench and rise up the wall to the switchboard, and where also the shunt regulators were placed. It does not appear to be known precisely where the fire originated, but it quickly spread amongst the cables and following them up through the space between the switch gallery floor and the wall practically destroyed the main three-wire switchboard on the gallery. In this case, the arrangement of the cables and wires below the switchboard platform was very crowded owing to the growth of the station since the supply was first commenced, some twelve years earlier, and gave little chance for saving the situation in the event of a fire once starting. This fire also resulted in a total cessation of the electricity supply and involved the hasty erection of a temporary switchboard pending reconstruction.

The third fire appears to have been primarily due to a man working at the back of a traction switchboard making a short circuit to the earthed metal framework. The switchboard was in a room adjoining the engine-room and on a higher level, and on the opposite side of the room was the three-wire general supply switchboard. The man was severely burned by the resulting arc and the coverings of adjacent cables caught fire. This fire was, however, put out by the staff, by means of chemical extinguishers. A few minutes afterwards, an alarm was given that smoke was coming up from the basement—two floors below—where the cables from the generating plant and the feeders passed through to the switchboards and to the street. It was found impossible to enter the basement on account of the smoke, and very quickly a fierce fire was raging. The fire followed the cables leading up to the switch-room, passing through the space between the floors and the walls left open for their accommodation, and completely destroyed both the traction and the general supply switchboards. The latter board was quite new, having only just been completed and put to work at a cost of several thousands pounds. There was nothing whatever of an inflammable nature about this switchboard, the fire feeding entirely on the insulating coverings of the cables. A battery was connected to the traction board, and no doubt contributed to the spread of the fire, as it was subsequently found to be completely discharged. The rate of discharge of the battery appears, however, not to have greatly exceeded the normal maximum rate of discharge, as the main circuit-breaker, which was on another switchboard and was found to be in order, had not come out. How the fire amongst the cables in the basement started is not apparent, but it may have been due to breakdown of insulation owing to momentary rise of pressure following on the original short circuit at the traction switchboard. The complete breakdown of the electricity supply in this case involved more serious consequences than in the others owing to a number of works being dependent upon it for power purposes. Temporary switchboards had again to be hastily constructed.

These fires, especially as coming after several years of apparent immunity from such disasters, afford object lessons of great importance to those in charge of or who are responsible for the equipment of electrical stations. In all three cases, it was the covering of the cables that burned and spread the fire, and although some of the cables were in so-called "fireproof" composition tubes, these appear to have been of little if any use in checking the spread of the fire. That where the cables are in a covered trench or under a ceiling or roof, they are most readily attacked has been further clearly demonstrated in the case of a fourth station fire which has occurred since the period covered by this report. In this last case the cables were in a subway some six or seven feet in height and were laid on insulators on racks on each side of the gangway. All the cables within about two feet of the roof of the subway had their insulation completely burned off, but those nearer the ground were practically undamaged. In many of the older stations the cables and wires behind the switchboards and in cable trenches and subways are hopelessly mixed up so that should a fire be started at any point it would be impossible to prevent it from rapidly spreading and involving the whole. It is a common practice in electrical stations for the cables to be taken from trenches or subways up the wall of the building to the switchboard gallery, the floor of the gallery being cut away, leaving a permanent opening some 12 inches wide all along for the cables to pass through. Two of these fires show the danger of this opening in the floor by allowing the fire to pass upwards and involving the switchboards in the gallery or room above. So long as cables with inflammable insulation are used in electrical stations, it is obvious that some safer system of isolating and protecting them is necessary if the possibility of such disasters is to be prevented. There are no doubt difficulties in many stations on account of the large number of cables which have to be accommodated, but it might be practicable in many cases to separate the cables in channels of brick or stoneware in such a way as would prevent the spreading of a fire from cable to cable. The small wires for instruments, regulating resistances, etc., are often a source of danger, being poorly insulated and looped about anyhow at the backs of the switchboards. It is generally recognised that inflammable woodwork, particularly soft wood, should not enter into the construction of switchboards, yet I recently found a new high tension three-phase switchboard in a public supply generating station practically enclosed in woodwork; the bus-bars were just below a matchboard ceiling, and the whole passage-way at the back of the open-fronted cells was enclosed by deal boarding.

Whilst there has been a very great advance in the design of high-tension switchboards during the last few years, the same attention has not been given to the design of direct current medium pressure boards. These switchboards are commonly arranged so that it is impossible to do any work upon them without danger of making a short circuit. There is much room for improvement in this respect, not only in the relative arrangement of the conductors at different potentials, but as regards the conductors and the earthed metal framework which supports the slate or marble panels. Many of the short circuits due to men working on the live conductors have been between one conductor and the earthed framework. There is nothing impracticable in protecting the framework by slate or other suitable material and protecting bolt heads on the front of the panels in such a way as to overcome this danger, or in putting more divisions between adjacent conductors of opposite polarity, and the extra cost involved would be well repaid by the increased security against accident and breakdown. Some extra space would no doubt be required, but this again would be an advantage, as a common fault with these switchboards is that the apparatus and conductors are much too cramped together. Watt-hour meters in which the main current of the circuit passes through the instrument are not unfrequently found on switchboards. These instruments require periodical calibration or comparison with a standard instrument, often involving risky work at the back of the board in making the temporary connections for the standard and in re-instating, no provision having been made for the ready connection of the standard instrument. Some of the accidents from short circuits already referred to were due to this operation. Instruments having a current coil as a shunt to a resistance in the main circuit are to be preferred as tending to obviate the necessity for breaking and making main connections for purposes of calibration, with an additional advantage that the meters can be placed away from the switchboard where they are less liable to the influence of stray fields. In comparatively few stations are there provided any insulated spanners or special tools for use on live switchboards. Where any work has to be done, ordinary engine room tools are used with attendant risk of making short circuits.

Although my report, as usual, deals mainly with unsatisfactory conditions and dangerous apparatus which I have come across during my visits, I have also seen much that is excellent and which is very useful to point to as a standard in the less satisfactory places. In many cases the regulations are well observed and precautions beyond those actually required have been adopted. In other instances, however, the regulations have not been attended to, and engineers and others who should be familiar with the requirements have confessed to being totally unacquainted with them, and others again seem to think that there is no need for them to take any steps to effect compliance until the matters have been pointed out to them by an inspector. Some also seem to take much trouble to work as near the border line as possible. Thus, new switchboards are erected with the bare minimum of space at the back, although there may have been several feet to spare at the front—a practice liable to lead to difficulties later on if any alterations or additions needing more space are required at the back. Others again fail to see that the regulations are intended to provide for safety and are not merely arbitrary rules without a purpose.

Of 18 fatalities directly due to electric shock, five were on high pressure or extra-high pressure alternating current systems. Ten were on medium pressure alternating systems; six of these were shock to earth on three-phase systems of which the pressure between phases was 440 volts or less, and as the neutral point was earthed in probably each case, the pressure received would not exceed 250 volts in any instance. One was from a 200 volt single-phase system. Of the two on direct current systems, one was on a 460 volt three-wire system, but not having the middle wire earthed, and the other on a 220 volt two-wire system.

In only nine cases is it clear that any attempt was made to resuscitate the victim by means of artificial respiration. In several it was certainly not attempted. In the cases in which it was tried, the duration of the effort varied considerably. In one case it was kept up for two hours, in another for three-quarters of an hour, and in a third for ten to fifteen minutes, in each case with medical aid, whilst in a fourth it was continued until the arrival of a doctor who pronounced the patient dead. In two further cases the patients were taken in ambulance waggons to the hospital, and in one of them only was the treatment continued during the journey. In two other cases the treatment was continued, apparently without medical aid, for half an hour, and in another for a few minutes only as the patient "appeared to be dead." Mr. Ram quotes authorities to emphasise the importance of immediate and long-continued efforts for resuscitation.

## MISCELLANEOUS.

The Port Melbourne (V.) Council last week adopted the report of the Electric Light Committee, which advised that in anticipation of the municipality's scheme of electric lighting coming into operation at an early date, Mr. F. E. Winwood be appointed foreman and electrical inspector under specifications to be drawn up by the town clerk, at a salary of £3 17s. per week; that two linesmen be engaged by the surveyor at the wages board rate of 10s. 6d. per day; that employes under the electric lighting branch have the same privileges in regard to holidays, etc., as the Council's ordinary outdoor service.

* * *

The Minister for External Affairs, Mr. Glynn, is obtaining data for the purpose of a permanent survey of the central route for the Trans-Continental line from Oodnadatta to Pine Creek via the McDonnell Ranges, and estimates of cost and time are being prepared. It is the declared policy of the Government to connect this line from Newcastle Waters and Anthony's Lagoon with the railways of Queensland, and the possibility is to be kept in view of the future linking up with the railways of New South Wales and Western Australia. A bill for the construction of a line to the Katherine River is also being prepared, and provision is to be made for a survey to Bitter Springs.

* * *

The Council of the Victorian Institute of Engineers has agreed to the following motion:—''The engineering adjudicator nominated by the Victorian Institute of Engineers to judge the Federal Capital designs submitted in world-wide competition, and who was one of the two judges who selected the design—afterwards premiated—by Mr. W. Burley Griffin, of Chicago, has consistently urged that the correct and honourable course was to invite that gentleman to himself advise before any modification or alteration of his concept was assented to. The Council of the Institute expresses its satisfaction, and its approval, of the Government's action in adopting that course, and is of opinion that no further action is advisable or necessary until Mr. Griffin has had an untrammelled opportunity to report.'' This motion was agreed to after consideration of requests from bodies in other States that the Prime Minister should at once appoint a technical board to decide upon the plan to be adopted.

* * *

The annual dinner of the Victorian Institute of Electrical Engineers was held at Hosie's Cafe, on Thursday evening last, and was attended by some fifty members and their guests. The ''Specification for remote control feeders,'' as the menu was headed, embraced dishes of the most technical and terrifying descriptions, from ''chokers, with laminated cores,'' to ''Polyphase 50 cycle cheese,'' but proved in the result as excellent as if it had been described in the more conventional French. Apologies were received from those unable to be present, including the Premier, Mr. Watt, who was detained by a Cabinet meeting; and the toasts included that of ''Our Guests,'' proposed by Mr. H. R. Harper and responded to by Mr. A. Cameron, and of ''Hammer, Pliers and Compasses, and the Societies representing them,'' proposed in a witty impromptu speech by Mr. W. J. Newbiggin, the President of the Institute. A first-class musical programme was contributed to by Messrs. A. Hart, Sheldrick, Simpson, and Roy Brennan, as well as by Mr. Locke Fraser, whose songs and recitations were enthusiastically applauded. Messrs. Westwood and Noel Murray, who were responsible for the arrangements, are to be heartily congratulated on the success of the evening.

# *Invited and Accepted Tenders*

It is particularly requested that the information regarding contracts open, and the successful tenderers, be forwarded to The Editor not later than Monday of each week.

The following contractions are used throughout:—S—supply; D—delivery; M—manufacture; C—construction; E—erection; P—purchase; I—installation; R—removal. Where no contractions appear, supply and delivery is understood. The date at the beginning of each paragraph refers to the closing of tenders.

## INVITED

### Commonwealth.

Specifications, tender forms, etc., for tenders invited for the Postmaster-General's Department of the various States under this heading may be had as follows:—Victoria—Various State G.P.O.'s. **New South Wales**—**Departmental Stores, Sydney, and various G.P.O.'s in other States.** South Australia—Adelaide, Melbourne, Sydney and Brisbane G.P.O.'s. Western Australia—**Departmental Stores, Perth, and various G.P.O.'s in other States. Queensland—Various State G.P.O.'s. All States—Various G.P.O.'s. If the specifications, etc., may be had elsewhere, in addition, the** places will be given in parentheses.

POSTMASTER-GENERAL'S DEPARTMENT. Melbourne.—2nd September.—1000 protectors, as per schedule No. 964.

9th September.—Steel conduit and fittings, as per schedule No. 973.

9th September.—1000 reinforced concrete poles, as per schedule No. 959.

16th September.—S., D., E. and I. at the Telephone Exchange, Collingwood, Victoria, of a common battery switchboard, as per schedule No. 860, or an automatic, or semi-automatic, switchboard, as per schedule No. 859.

**16th September.—Galvanised-iron piping and** fittings, as per schedule No. 951.

23rd September.—Sulphate of copper, as per schedule No. 956, in the undermentioned quantities: New South Wales, 140 tons; Victoria, 25 tons; Queensland, 55 tons; South Australia, 20 tons; Western Australia, 60 tons.

23rd September.—500 letter-box fronts, small **size, as per schedule No. 957.**

23rd September.—General stores, for a period of two years, from the 1st July, 1913, to the 30th June, 1915, as per schedule No. 913.

30th September.—S. and D. of 1,017,000 pattern **"A," and 1,768,800 pattern "B" insulators, at Sydney, Melbourne, Brisbane,** Adelaide, Perth, and Hobart, during the years 1913-14, 1914-15, and 1915-16, as per schedule No. 974.

7th October.—S. and I. of electrically-driven machinery for operating pneumatic tube services, Central Telegraph Office, Melbourne, as per schedule No. 900.

14th October.—S. and E., at the Telephone Exchange, Melbourne, of a common battery multiple switchboard, as per schedule No. 868.

14th October.—Cable boxes, as per schedule No. 877.

4th November.—D. and E. of eight automatic telephone switchboards at the Ascot, Canterbury, Malvern, Cheltenham, Footscray, Oakleigh, Sandringham and Williamstown Telephone Exchanges, as per schedule No. 953.

25th November.—Galvanised iron piping, as per schedule No. 952.

POSTMASTER-GENERAL'S DEPARTMENT. Sydney.—3rd September.—M. only, and D. at the Departmental Stores, Sydney, of 900 waterproof capes, as per stores schedule N.S.W., No. 332.

15th October.—450 fire sheets (asbestos), as per stores schedule N.S.W. No. 326.

15th October.—Measuring instruments, to stores schedule N.S.W. No. 302; telephone parts, to stores schedule N.S.W. No. 314; switchboard parts, to stores schedule N.S.W. No. 315.

18th March, 1914.—S., D. and E. at the Telephone Exchanges, Epping, Ryde, Hunter's Hill, **Drummoyne, Wahroonga, Paddington and Waverley,** Sydney, of seven (7) automatic switchboards, with associated equipment, as per schedule No. 179.

POSTMASTER-GENERAL'S DEPARTMENT. Perth.—3rd September.—100 miles wire, twisted pair, outside distributing, to W.A., schedule No. 305.

8th October.—Expansion bolts and shields to schedule No. 297.

8th October.—S. of milliammeters.

8th October.—Telephones, common battery, adjustable bracket sets.

POSTMASTER-GENERAL'S DEPARTMENT. Brisbane.—16th September.—Telephone Exchange, Brisbane, nine sections of a trunk line switchboard, to schedule No. 244, specification No. 461, and the general conditions, drawings, etc., attached thereto.

24th September.—Ironwork, as per stores schedule No. 264; poles, cast iron, as per stores schedule No. 265; poles, iron, etc., as per stores schedule No. 266; wire, G.I., as per stores schedule No. 269.

18th November.—Bronze wire, as per schedule No. 273.

POSTMASTER-GENERAL'S DEPARTMENT. Adelaide.—3rd September.—6500 spindles, "J," steel galvanised, as per schedule No. 304.

11th November.—One loop-signalling trunk line switchboard, of five sections, one cable turning section, and one cable storing section, one two-position recording desk, and one chief operator's desk, as specified in specification No. 431, etc., delivered at the Telephone Exchange, Adelaide, as per schedule No. 296.

POSTMASTER-GENERAL'S DEPARTMENT, Hobart.—15th September.—S. and D. of telephone material, as per schedules Nos. T.72 and T.73.

22nd September.—S. and D. of 3 motor cycles, as per schedule No. T.77.

6th October.—Galvanised iron wire, as per schedule No. T.78.

DEPARTMENT OF HOME AFFAIRS—Federal Capital.—15th September.—S. of sect. 1, main power-house switchgear; sect. 2, switchgear for Diesel engine plant.

24th November.—Water supply pumping plant for Canberra.

DEPARTMENT OF HOME AFFAIRS—Kalgoorlie-Port Augusta Railway.—2nd September.—M., S., and D. of 80 lb. steel rails and fishplates; M., S., and D. of iron dog spikes and steel fishbolts and nuts for 80 lb. rails.

16th September.—M., S., and D. of fifty 40-ton bogie waggons.

DEPARTMENT OF DEFENCE.—Royal Australian Navy.—1st September.—S. and E. of a 500-ton oil storage tank at Flinders Naval Base, Victoria.

8th September.—S. of machinery and accessories for standard 25ft. motor launches, as may be required, for a period of two years from date of contract.

### Victoria.

VICTORIAN RAILWAYS.—28th August.—Pig iron, enamel notice plates, high speel tool steel.

28th August.—Round iron, green system boards.

29th August.—Sawn bluestone coring, shortening balls, slates.

29th August.—Kerosene tubing.

1st September.—Lithographic zinc plates.

1st September.—Locomotive seamless copper tubes.

1st September.—2 light standards.

2nd September.—"Thermit" (semi-steel cans), dartium (the new alloy).

3rd September.—Cast steel hammer blocks.

3rd September.—S. and D. of rolled steel joists, angle braces, bed plates, clips and bolts, for renewal of bridge at John-street, Lilydale line.

3rd September.—M., S. and D. of rolled steel joists, angle braces, bed plates, clips, etc., for superstructure of bridge near Glenorchy.

3rd September.—S. of three petrol engines and pumps for use at Newport Workshops. (Fresh tenders.)

3rd September.—Steel faced machine knives.

3rd September (extended from 20th August).—M., S. and D. of (a) lathe, (b) sawing machine, (c) chisel mortiser, (d) cut-off machine, (e) moulding machine.

3rd September.—M., S. and D. of one truck traverser, complete, with motor, chills and patterns. (Fresh tenders.)

3rd September.—M., S. and D. of one emergency pumping plant.

3rd September.—Girders and superstructure for one railway and cable tramway crossing (complete), for Plenty-road crossing, Queen's-parade, North Fitzroy. (Fresh tenders.)

10th September.—M., S. and D. of pipework, etc., for dust exhauster plant.

17th September.—M., S. and D. of one hair teasing machine.

1st October (extended from 10th September).—Neutral track relays.

5th November.—Copper rod.

5th November.—Locomotive seamless copper tubes.

5th November.—Best Yorkshire iron angle and tees.

5th November.—Best steel boiler plates.

5th November.—Copper plates.

P. & O. COMPANY'S ROYAL MAIL STEAMERS
FOR MARSEILLES, PLYMOUTH, AND LONDON.

Leave Sydney on the subjoined dates, calling at usual ports.

FIRST AND SECOND SALOON ONLY.

| Steamer. | Tons. | Commander. | Noon. | Melb., 3 p.m. |
|---|---|---|---|---|
| MALWA | 11,000 | Thompson | Sept. 6 | Sept. 9 |
| MOOLTAN | 10,000 | Haddock | Sept. 20 | Sept. 23 |
| MOREA | 11,000 | Andrews | Oct. 4 | Oct. 7 |

PASSAGE MONEY TO LONDON—
Single, £41 16s to £82 10s.
Return, £69 6s. and £123 4s

Return Tickets between Inter-State Ports are available for return by Orient, Messageries Maritimes, and N.D.L. steamers having room.

SPECIAL HOLIDAY RETURN TICKETS to COLOMBO are now issued, available for two months. Fares from Sydney, £45 2s. first saloon, and £31 18s. second saloon.

A. GORDON WESCHE, Superintendent IN AUSTRALIA, 63 Pitt-street, Sydney.

The COLONIAL MUTUAL FIRE Insurance Company Limited.

Principal Office: 60 MARKET-ST., MELBOURNE

Branches in all the States
Transacts Fire, Guarantee, Employers' Liability, Marine Burglary, and Plate Glass, Accident, Workers' Compensation and Live Stock Insurances.

Send for Prospectus.
W. TUCKER, General Manager

Harringtons LTD

ANALYTICAL & METALLURGICAL DEPT.

Lowest fees for all kinds of Assay, Analytical, and Metallurgical work.

Expert Advice on Ore Treatment, Bullion Refining, Smelting, etc., etc. Directed by a qualified Analyst from Messrs. Johnson and Sons, London: Assayers to Bank of England; H.M. Mint, The Council of India, etc.

HARRINGTONS LTD.
386 George Street, Sydney.

5th November.—100 tons of good machinery cast-iron scrap.

12th November.—Steel channel bars.

12th November.—20 tons steel ingots.

12th November.—Steel blooms, for crank pins.

12th November.—Locomotive boiler tubes.

12th November.—High-speed tool steel.

12th November.—M., S. and D. of one 15-ton electric crane for Ballarat.

12th November.—Flame arc lamps.

12th November.—Insulated copper cable.

12th November.—M. and D. of one 60h.p. electric motor and accessories.

19th November.—M., S. and D. or cast steel wheel centres for A2 engines and new truck stock.

19th November.—Brass locomotive tubes.

19th November.—150 tons pig iron.

19th November.—10 tons sulphate of copper, best quality, for electrical purposes, battery material.

VICTORIAN RAILWAYS COMMISSIONERS—State Coal Mine.—1st September.—Annealed double cotton covered copper wire; annealed enamelled copper wire; angle steel; carbide, fullerboard paper; micanite sheets; horn fibre.

12th November (extended from 1st October).—S. of rope road haulage engine and electrical equipment for McBride tunnel.

STATE RIVERS AND WATER SUPPLY COMMISSION.—1st September.—S. and D., at Werribee railway station, of 10,630ft. of 6in. diameter pipe and 1690ft. of 8in. diameter pipe, together with the necessary bends, tees, crosses, fire plug tees, distance pieces, valves, and fire plugs as per schedule. Tenders may be for either wood or cast iron pipes..

### New South Wales.

PUBLIC WORKS DEPARTMENT.—1st September.—S. of friction hoists in the veal houses, New Public Abattoirs, Homebush.

3rd September.—Efficient steam tugs for use at Bellinger River and Cape Hawke, from 1st November, 1913.

8th September.—C. of suction and rising mains, receiving tank, and engine house, Experimental Farm Water Supply, Grafton.

8th September.—S. and E. of pumping machinery, Experimental Farm Water Supply, Grafton.

8th September.—C. and E. of a self-supporting steel chimney at the Power House, State Timber Yard, and Building Workshops, Uhr's Point.

8th September.—S. and D. of hooks, chains,

**A. U. S. N. Co. Ltd.**

*Fast, Regular, and Comfortable Passenger Steamers*

(also carrying cargo) from and to

MELBOURNE, SYDNEY, ADELAIDE, FREMANTLE, BRISBANE, and all QUEENSLAND PORTS.

Passage Tickets interchangeable, with other Inter-State Companies, on certain conditions.

Full Particulars at

**COMPANY'S OFFICES**

at all principal Australian Ports.

**The Mount Lyell Mining & Railway**

CO. LIMITED.

Purchasers of Ores containing Copper, Gold and Silver. Rates obtainable on application to the Secretary

Manufacturers of Coke for Smelting and Foundry Purposes, Acids, Etc.

HEAD OFFICE—

39 QUEEN-STREET, MELBOURNE.

D. G. LUMSDEN,
Secretary.

**THIS POWER FOR MOST PROFIT!**

Here is the Engine for you, Mr. Mine Manager—the right power for the Mine, operating with the cheapest fuel obtainable.

No waste power, and no useless wear and tear and vibration. These are some of the prominent features of the

**ATLAS DIESEL OIL ENGINE.**

Test your present Engine, see if it consumes more than 0.55 lbs. of fuel per B.H.P. per hour. If it does, you are losing money which the Atlas Diesel would save for you. Power waste is a serious thing, and one that is often overlooked. You probably use a considerable amount, then you owe it to yourself to see that there is no leakage.

"Atlas Diesel" Engines are the only true Internal Combustion Engines, as they require no devices for ignition.

Easy to run, always reliable, and made from 15 H.P. upwards.

Send for full particulars or call and see the Engine working.

**STAWN LTD.,**

Engineers, **343 KENT STREET, SYDNEY.**

ALFRED RONALDS.

Will the relatives and friends of the late Alfred Ronalds (author of Ronalds' "Fly-Fisher's Entomology") please communicate with—

Critchley Parker,
"Mining Standard,"
Melbourne or Sydney

and beef trees for veal, mutton, and pork houses, and alterations to hangers, etc., New Public Abattoirs, Homebush Bay.

7th October.—S. and D. of 500 tons of iron spikes for 60 lb. rails.

27th October.—M. of steel bridge for Wilson River, Wauchope to Kempsey section, North Coast railway.

RAILWAY DEPARTMENT.—15th October.—S. of 13 direct-current motors.

SYDNEY HARBOUR TRUST.—1st September. S. of skip car and tripping rails for concrete plant on gantry at Jones' Bay; also of runway tracks for hand-power travelling bridge cranes, to be erected in cargo sheds at No. 1 berth, Dawes' Point to Miller's Point. (See advertising columns.)

8th September. S. and D. of steel roofing and runway brackets for cargo sheds, No. 6 jetty, Woolloomooloo Bay. (See advertising columns.)

## Western Australia.

GOVERNMENT TENDER BOARD. — 18th September. — One improved lever punching, shearing, and angle iron cutting machine for Railway Department.

18th September.—50 tons of charcoal for State battery, Wiluna.

2nd October.—700 brass boiler tubes for Railway Department.

## Queensland.

RAILWAY DEPARTMENT. — 2nd September. — P. of refrigerating machinery and fittings, as under: — Hall CO. compressor, with evaporators, brine circulating pump and condensers (with copper coils), and all piping connecting various parts of apparatus; brine tank and ice cans; Hercules ammonia compressor, with condensor and tank, air pump, and all ammonia piping and valves, from suction header to expansion header, and including headers; small vertical steam engine dynamo and wiring; Cameron steam pump, circulating water to cooling tower; vertical steam engine, driving fans in tower, with fans and belting; water cooling tower, including piping and tanks, 1¼in. galvanised brine pipe in building, 3000 lineal feet; 1in. ammonia expansion pipe in building, 5000 lineal feet; Lancashire boiler; building for removal.

TREASURY DEPARTMENT.—4th September. —Cutting and lengthening of the bucket dredge "Maryborough," and other work in connection therewith.

29th September.—S. about 1687 tons of cast-iron spigot and faucet water pipes, special castings, and valves, for Maryborough waterworks.

29th October.—C. and E. of central sugar mill at Babinda Creek, North Queensland.

## South Australia.

SUPPLY AND TENDER BOARD.—9th September.—S. and D. at the Public Stores, Port Adelaide, of 4000 porcelain insulators, No. 5, to exhibited sample. Customs duty to be paid by contractor.

9th September.—S. and D. at the Pintsch's gas depot, Adelaide railway station, of about 75,000 galls. of high-test kerosene oil, suitable for manufacture of Pintsch's gas, having a fire test of not under 300 deg. Fah., and a flash point of not less than 245 deg. Fah. closed test, subject to test specified in English Petroleum Act of 1879.

14th October.—S. and D. in trucks on wharf, Port Adelaide, of 800 solid drawn, best toughened copper tubes, for locomotive boilers, 10ft. 8¼in. long x 1 7-8in. outside diameter x No. 10 I.W.G. thick at the end, gradually tapering to No. 12 I.W.G. at the other end. Customs duty (if any) to be paid by contractor.

## New Zealand.

RAILWAYS DEPARTMENT.—31st October.—S. and D. of stores for the period from April 1, 1914, to March 31, 1917.

## General.

CITY OF MELBOURNE.—29th August.—5 electrically-driven ventilating fans.

29th August.—Cast-iron pit-frames, and covers for roadways.

9th September.—S. and D. of No. 6 tar carts, of a capacity of about 600 gallons each.

9th September.—S. and D. of 2000 cubic yards of sand.

9th September.—C. of two pipe culverts and a pipe drain in Carlton.

9th September.—S. and D. of electricity recording meters and maximum demand indicators.

16th September.—S. and D. of (a) insulated copper cables, (b) three-phase transformers.

1st October.—Insulated copper cables.

7th October.—Incandescent electric lamps, and single phase transformers.

8th October.—Insulated copper cables. (See advertising columns.)

CITY OF SOUTH MELBOURNE (V.) (E. C. Crockford, Town Clerk).—10th September.—S. of coal.

CITY OF COLLINGWOOD (V.) (W. R. Butcher, Town Cilerk).—1st September.—E. of galvanised iron shed, 40ft. x 15ft. at Quarries; E. of cast iron urinal, in Peel-street.

TOWN OF COBURG (V.) (Charles Andrews, Town Clerk).—3rd September.—S. of ironmongery, oil and grease.

CORPORATION OF KADINA (S.A.) (F. W. Harris, Town Clerk).—1st September.—One 60kw. generator, driven from a 100-110h.p. engine, complete with suction gas producer, erected on foundations.

One 500 ampere-hour battery, erected and charged.

1 motor-driven booster (erected).

CITY OF TOWNSVILLE (Q.).—8th September.—S. of a complete condensing plant, comprising condenser, an Edwards' patent air pump, and circulating pump, the circulating pump to be direct-coupled to a quick, self-lubricating engine, the air pump to be either direct coupled or through gearing to some well-known make of steam engine. Specifications at Town Clerk's offices, Sydney or Brisbane.

CITY OF LAUNCESTON (T.) (C. W. Rocher, Town Clerk).—13th October.—Section i., S. and D. D. of transformers, etc.; section ii., S. and D. of feeder cable, etc.; section iii., S., D. and E. of high tension switchboard, etc.

MUNICIPALITY OF RICHMOND (N.S.W.) (A. V. Grimwood, Town Clerk).—4th September. —S., E. and Maintenance of 40 street lamps.

SHIRE OF BRAYBROOK (V.) (W. J. Andrew, Shire Secretary).—5th September.—S. of 8 n.h.p. traction engine and road roller (convertible).

METROPOLITAN GAS COMPANY (V.) (A. E. Bradshaw, Subst. Secretary, Melbourne).—11th September.—P. of a total fixed quantity of 1800 tons of sulphate of ammonia, to be produced by this company during the twelve months ending 31st August, 1914.

MOUNT LYELL MINING AND RAILWAY CO. LTD. (D. G. Lumsden, Secretary, 39 Queen-street, Melbourne).—20th September.—S. of stores (including electrical goods and chemicals) for 12 months ending 31st December, 1914.

ESTATE OF E. L. LLOYD (Executors, c/o Northmore and Hale, Solicitors, Howard-street, Perth, W.A.).—31st August,—P. of mining leases, plant, etc.

MAFFRA WATERWORKS TRUST (V.) (B. A. Smith, M.C.E., 352 Collins-street, Melbourne). —Contract No. 1, S. and E. of pumps, etc.; contract No. 2, C. of settling tanks and reservoirs; contract No. 3, S. of cast-iron pipes, valves, etc.; contract No. 3a, alternative for supply of 6in. wood pipes; contract No. 4, S. of galvanised iron pipes and fittings; contract No. 5, pipelaying; contract No. 6, E. of cottage.

## ACCEPTED.

### Commonwealth.

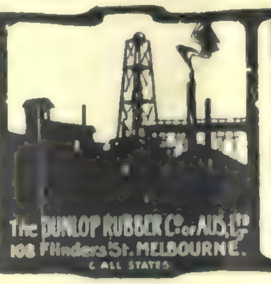
POSTMASTER-GENERAL'S DEPARTMENT, Victoria.—10,600 bridle rings, size No. 1, £55 13s.; 13,400 bridle rings, size No. 2, £93 16s.; 2900 bridle rings, size No. 3, £23 4s.; 1000 cable clamps, size No. 1, £11 9s. 2d.; 1000 cable clamps, size No. 2, £12 10s.; 1000 cable clamps, size No. 3, £12 10s.—Boehme and Owen, Melbourne.

1000 sleeves, jointing, £1 19s.; 250 sleeves, terminating, 15s. 1d.; 6 tons wire, steel galvanised, £108 3s.—F. Vanderkelen and Co., Melbourne.

13,880 spindles, steel galvanised, £274 14s. 2d.; 133,000 spindles, steel galvanised, £2216 13s. 4d.; 5850 spindles, J, underarm, £91 8s. 1d.—Williams and Co., Brunswick, Vic.

POSTMASTER-GENERAL'S DEPARTMENT, Queensland.—13,200 yards cable, paper-insulated, lead-covered, 4 pairs, 12½ lb. conductor, £37 per mile; 8740 yards cable, paper-insulated, lead-covered, 39 pairs, 12½ lb. conductor, £167 per mile; 6622 yards cable, paper-insulated, lead-covered, 78 pairs, 12½ lb. conductor, £249 per mile; 2400 yards cable, paper-insulated, lead-covered, 78 pairs, 12½ lb. conductor, £286 per mile; 5 miles wire, hard-drawn copper, braided, 100 lb. conductor, £8 per mile; 150 miles wire, tinned copper, rubber insulated, and braided, £7 per mile; 660 yards switchboard cable, £142 per mile.—Siemens Brothers Dynamo Works Ltd., Sydney.

13,620 yards cable, paper-insulated, lead-covered, 13 pairs, 12½ lb. conductor, £78 per mile; 11,651 yards cable, paper-insulated, lead-covered, 26 pairs, 12½ lb. conductor, £130 per mile; 15,632 yards cable, paper-insulated, lead-cov-


The DUNLOP RUBBER Co. of AUS. Ltd
108 Flinders St. MELBOURNE.
& ALL STATES

**Dunlop Mining Goods**

Are now used with satisfaction in most of the Leading Mines of Australasia – Their QUALITY & WEAR are UNSURPASSED

Tenders & Samples submitted
Correspondence Invited
Send for Illustrated Catalogue

**Dunlop Rubber Belting**

Is more efficient than Leather belting for Outdoor & Wet Work.

Sample & Price on application

**"FIBRO-CEMENT" Fireproofing**

Everyone about to build should obtain full particulars of this cool, acid-proof, ant-proof and fire-resisting material. The slates for roofs and the sheets for walls and ceilings are specially suited for the Australian climate. Used by the Federal and State Governments and by all the leading Architects and Builders.

**ECONOMICAL AND EVERLASTING.**

Full particulars, etc., from Sole Agents and Importers—

**JAMES HARDIE & CO.** Melbourne & Sydney

[illegible], 52 pairs, 12½ lb. conductor, £194 per mile.—W. T. Henley's Telegraph Works Co. Ltd., Melbourne.

2000 coppers for Daniell battery, 3 5-8d. each; 2000 [illegible], copper, for Daniell battery, 2 5-8d. each; 18,040 yards cable, paper insulated, lead covered, 104 pairs, 12½ lb. conductor, £305 per mile; 1769 yards cable, paper insulated, lead covered, 312 pairs, 12½ lb. conductor, £733 per mile; 660 yards cable, paper insulated, lead covered, 26 pairs, 12½ lb. conductor, £156 per mile; 594 yards cable, paper insulated, lead covered, 52 pairs, 12½ lb. conductor, £230 per mile; 6500 tapes, copper, for use with 100 lb. wire, £3 1s. 6d. per 1000; 14,000 tapes, copper, for use with 300 lb. wire, £2 10s. per 1000; 150,000 tapes, copper, for use with 70 lb. wire and insulators, pattern "B," 16s. 3d. per 1000; 17 miles wire, two twisted conductors, tinned copper, rubber insulated, cotton covered, braided, flame resisting, £4 12s. per mile; 73 miles wire, three twisted conductors, tinned copper, rubber insulated, cotton-covered, braided, flame resisting, £6 7s. per mile.—British Insulated and Helsby Cables Ltd., Melbourne.

2,000 tapes, copper, for use with 100 lb. wire and insulators, pattern No. 6, 15s. per 1000.—Haes and Eggers Ltd., Sydney.

7720 yards cable, paper insulated, lead covered and taped with brass ribbon, 20 pairs, 20 lb. conductor, £220 per mile; 164 miles wire, twisted pair, outside distributing, £22 10s. per mile; 130 miles wire, twisted pair, tin annealed copper, vulcanised india-rubber insulated, taped and braided, £13 per mile; 40 miles wire, tinned copper, No. 22 S.W.G., vulcanised india-rubber insulated, taped and braided, £7 per mile.—Messrs. Noyes Brothers (Sydney) Ltd., Brisbane.

2640 yards switchboard cable, £511 (lump sum).—The Australian Metal Co. Ltd., Sydney.

## Victoria.

VICTORIAN RAILWAYS.—S. and D. of W.I. [illegible] for 15 [illegible] vans and 12 "FF" horse [illegible] carriages, 2in. x 1-8in., £1 1s. each; item 24, knee, 6in. x 6in. x 1¼in. x [illegible], 2 square holes, 2 round holes), 5d. each; item 29, hinge gudgeon, long, 2s. 4d. each; item 30, hinge gudgeon, short, 2s. 4d. each; item 37, bottom hinge bracket, for gates, 7in. x [illegible], 1s. 8d. each; item 38, top hinge bracket, for gates (right hand), 7in. x 9 1-4in., 1s. 11d. each; item 39, top hinge bracket, for gates (left hand), 7in. x 9 1-4in., 1s. 11d. each.—Cowley's [illegible] Ironworks Pty. Ltd.

P. of 1 "Worthington" duplex pump, £190.—[illegible] and Co.

P. of 1 portable petrol-driven concrete mixer, and [illegible] hopper, £241.—Australian Metal Co. Pty. Ltd.

## Western Australia.

WATER SUPPLY DEPARTMENT.—Water [illegible]: item 801, £2 15s. 9d.; item 807, £5 10s. [illegible]; item 809, £2 14s. 6d.; item [illegible], £2 [illegible].—A. W. Dobbie and Co. Ltd.

PUBLIC WORKS DEPARTMENT.—Sewerage [illegible], rates applicable on application.—W. Sandover and Co., G. Wills and Co., F. W. Burke.

## General.

CITY OF MELBOURNE.—S. of insulated copper wire, £1175.—Siemens Bros. Dynamo Works Ltd. This [illegible] contract of British Insulated and Helsby Cables Ltd., which was accepted for the above at the last meeting of the council. In accordance with one of the conditions of their tender, the B. I. and H. Cables Ltd. were not prepared to proceed with the contract at the price quoted.

S. of 10 arc lamp brackets, £47 10s.—Dowell and Langdon.

## DIVIDENDS.

The following dividends and bonuses of mining companies in Australia have been declared, and are payable on the dates noted:

### August.

28th.—Briseis Tin and General Mining Co. (T.), [illegible], £[illegible].

28th.—Alma Central G.M. Co., Daylesford (V.), [illegible], £[illegible].

29th.—Golden Pyke G.M. Co., Bendigo (V.), [illegible], £[illegible].

29th.—Carlisle United G.M., Bendigo (V.), 6d., [illegible].

30th.—Great Northern G.M. Co., Bendigo (V.), [illegible], £750.

### September.

1st.—Silverton Tramway Co., Broken Hill (N.S.W.), 5s. and bonus [illegible], £25,000.

[illegible]—Eureka G.M. Co., Walhalla (V.), 3d., £[illegible].

[illegible]—Hampden Cloncurry Copper Mines (Q.), [illegible], £[illegible].

[illegible]—Campbell's Creek G.M. Co., Campbell's Creek (V.), [illegible], £[illegible].

17th.—Tongkah Compound, Siam, 1s., £2500.

18th.—Mararoa G.M. Co., Norseman (W.A.), 1s., £5000.

24th.—Broken Hill Prop. Block 10 (N.S.W.), 1s., and bonus 1s., £10,000.

25th.—Zinc Corporation (N.S.W.), pref. 2s., less income tax, £24,569.

26th.—Sons of Gwalia Ltd., Coolgardie (W.A.), 1s., £17,500.

30th.—North Mt. Farrell S.-L.M. Co. (T.), 3d., £1000.

## BANK CLEARINGS.

The report of the Melbourne Clearing House for the week ended 25th August was:—

| | | |
|---|---|---|
| Total clearance .. .. .. .. .. .. .. .. | | £4,396,609 |
| Balances— | | |
| Settled by certificates .. | £410,500 | |
| Settled in coin .. .. .. | 38,290 | |
| | | 448,790 |
| Total clearance for the corresponding week, 1912 .. .. .. .. .. .. .. .. | | 4,882,994 |

## INDUSTRIAL.

In specifying in our issue of last week the gas engines on order from Kynoch Limited for the South Australian Government, a total of seven engines was given, aggregating 700h.p., whereas the total h.p. should have been given as 1200. Messrs. Kynoch's gas engines range from 26 b.h.p. to 660 b.h.p., and are made in four different patterns, viz., single, tandem, coupled, and multi-cylinder.

* * *

Nine installations of the Draeger Rescue apparatus have been completed at different English Rescue Station, the latest additions being at Bristol and the Somerset Coal Owners' Station. The "Draeger" has also won the American scientific gold medal for the most efficient safety device invented during the last three years.

* * *

Messrs. Gardner, Waern and Co., the sole agents in Australia for the S.K.F. ball-bearings, have been forced, owing to the greatly increased demand for this article, to remove to new and larger premises at 334 Kent-street, Sydney. The firm also carry stocks of all sizes of self-aligning radial bearings, adapter bearings, single and double thrusts, plummer blocks, and hanger blocks. Another speciality is their high-pressure system acetylene welding plants. A range of electric motors and generating plants, from 1 to 60 horse power, are always ready for prompt delivery.

## VICTORIA'S OVERSEAS TRADE.

The total imports of Victoria for July represented £2,106,666, as compared with £2,053,612 for the same month last year. The following are the items most closely connected with mining and engineering interests, the figures for 1912 being given in parentheses:—Gold (bullion and specie, £21,707 (£4200); implements and machinery, £102,645 (£105,601); iron and steel, £107,777 (£97,268); leather, £31,106 (£23,148); rubber goods, £47,217 (44,460); timber, £86,423 (£96,624). The corresponding figures for the first seven months of the two years were as follows:—Totals, £13,761,979 (£14,155,155) — Gold (bullion and specie) £254,997 (£246,213); implements and machinery, £760,946 (£[illegible]); iron and steel, £818,267 (£731,756); leather, £169,052 (£156,003); rubber goods, £385,265 (£316,060); timber £556,771 (£547,169). The aggregate exports for July were £828,687 (£1,221,700), of which sums £802,638 (£1,186,846) represented Australian produce. The special items were:—Gold (bullion and specie), £121,690 (£607,702); implements and machinery, £65,858 (£29,053); leather, £19,605 (£21,566); rubber goods, £2380 (£4549). The corresponding figures for seven months were:—Totals, £7,704,008 (£10,647,665), of which £7,463,748 (£10,360,282) represented Australian produce. Gold (bullion and specie), £362,562 (£2,766,394); implements and machinery, £211,968 (£128,695); leather, £120,635 (£117,812); rubber goods, £50,284 (£35,828).

---

The traffic receipts of the Deniliquin and Moama Railway Co. (N.S.W.) for the half-year ended on June 30th, amounted to £7548, making with the balance (£27,004) brought forward a total of £34,552, against which there was an expenditure, including a dividend at the rate of 5 per cent. per annum paid in February, amounting to £8223, leaving a balance to credit of revenue account of £26,329. From this another dividend at the rate of 5 per cent. has been paid, and £23,204 has been carried forward.

## MIXED MEMS.

It had been hoped that the Victorian Parliamentary Committee on Miners' Phthisis would have sat last week, but, owing to the illness of the Minister of Mines, the meeting was postponed.

George Stanley Perkins was charged at the Kalgoorlie (W.A.) Police Court last Saturday with having had in his possession gold-bearing ore reasonably supposed to have been stolen. Evidence was given to the effect that when the premises occupied by Perkins were searched by detectives a small furnace and other appliances were discovered in the cellar, the chimney of the furnace being connected with the dining-room chimney. A small quantity of ore and material used in smelting gold were found alongside the furnace. Perkins pleaded guilty, and was fined £50 and costs. A miner, who rented a room from Perkins, but declared that he knew nothing about the gold treatment plant, was discharged.

The New South Wales Parliamentary Standing Committee on Public Works has recommended the construction of the North Shore bridge on the cantilever principle, from Dawes Point to Milson's Point, in accordance with the scheme submitted by Mr. J. J. C. Bradfield, of the Sydney Harbour Bridge and City Transport. The bridge would carry four lines of railway, one 35ft. roadway, one 17ft. 6in. motorway, and one 15ft. footway. The total cost is estimated at two and three-quarter millions.

Owing to strikes, the output of coal from British mines for 1912 was diminished by over 9,000,000 tons. The average yearly production is 380,000,000 tons.

The New Zealand estimates provide for a vote of £33,850 towards mining interests. The items include advances to sufferers from pneumoconiosis, £400; assistance to prospecting, £6000; races, drainage, and waterworks on goldfields, £500; bonus for mineral oil, £500; working expenses of diamond and other drills, £500; expenses of mining court at Auckland Exhibition, £1000; purchase of motor car for Inspector of Mines, £350; School of Mines, £3000; Westland Goldfields Jubilee (pound for pound), £300. In addition, the State coal mines have £349,649 allotted to them, the large increase upon last year's expenditure of £234,677 being due to an extra £100,000 granted to the Point Elizabeth mine.

The amount expended on telegraph extensions in New Zealand during the last financial year was £422,672. On March 31 there were 12,508 miles of telegraph lines and 41,892 miles of wire. The length of submarine cables within the Dominion was 374 knots. The report of the Postmaster-General's department states that the most outstanding feature of the year's work was the extension of the radio-telegraphic system. Two low-power stations at Wellington and Auckland respectively are in successful operation, and have proved of great convenience, particularly in connection with shipping. One high-power station at Awanui and another at Awarua are completed, and a low-power station at the Chatham Islands is approaching completion. It is confidently anticipated that these stations would meet the requirements of navigation. A tender for automatic telephone exchanges has been accepted. The expenditure will be considerable, but the ultimate saving in working expenses and the increased convenience to the public should compensate for the additional outlay.

Mr. R. N. Kotze, mining engineer to the South African Union, in his annual report on the Rand mines, paints a sad picture of the evils of phthisis amongst the men working in them, and of its consequent ill effect upon the industry, stating that phthisis had killed off the best miners, and left inexperienced men of mixed nationality who were incapable of dealing with the huge output. Sir Lionel Phillips, of the firm of Wernher, Beit and Co., commenting on these remarks, says that they are applicable to last year, but that since that time a marked improvement in the conditions under which miners worked and in their health had occurred.

The Victorian Government last week formally announced its decision to co-operate with the Federal Ministry in arranging for the comfort and entertainment of the distinguished visitors who will come to Australia next year in connection with the congress of the British Association for the Advancement of Science. Facilities will be given to enable the visitors to inspect the industries of the State. "We are going to lay ourselves open," said Mr. Watt, "to meet the wishes of the Commonwealth Arrangements Committee so far as Victoria is concerned, and we hope that our example will be followed by other States."

In connection with the deviation of the railway on the Blue Mountains (N.S.W.), it is expected that the double line will be completed round the Bluff as far as Blaxland Junction about the middle of next month. On the excavation work between Blaxland and Valley Heights some 250

**THE : : : DIAMOND OUTPUT :**

Choice Diamonds set in platinum as ring, £14/14/-.

Diamond Cluster ring set in platinum, £10/10/-.

5 Fine Diamonds set in platinum, £12/12/-.

of our House has broken all records this year again.
WHY?

Well, we took on a Sole Agency calling for an enormous output, and to live up to it we decided two years ago to offer Diamonds (set or unset) at merely a broker's commission on the landed cost. We calculated that the commissions would be numerous enough to pay us, especially as the pleased buyers would remain customers. The experiment proved partly successful. We, therefore, are continuing it for another year. Our prices for Diamonds are less than London. There is no duty on unset gems.

**FAIRFAX AND ROBERTS LIMITED,**
The Oldest Jewellery House in Sydney. 23 and 25 Hunter Street.

men are now employed. Steel sleepers are being laid on this line.

The strike in connection with the wheat labour transport at Sydney, which was temporarily settled by the return of the men, pending an action against the Chief Commissioner of Railways, has now been concluded by the temporary hands, who were the original cause of the trouble, accepting a rate of pay compromising between the remuneration claimed and that offered.

The three men, George Digney, Samuel Downing, and Richard Downing, who were recently arrested as they came off shift at the North Nuggety Ajax mine, Daylesford (V.), and were subsequently charged with having stolen gold from the mine, were found guilty by a jury of twelve at the Ballarat Supreme Court on the 19th inst., the Chief Justice, Sir John Madden, presiding. The jury, however, desired that the men's previous good character should be taken into consideration. They thought that the men did not realise the gravity of the offence, and there appeared to have been some laxity in the management of the men, which had placed temptation in their way. In passing sentence, the Chief Justice declined to take any notice of the jury's comment on the management of the mine, which he considered well ordered and well conducted. He heartily concurred in the verdict. The jury need entertain no concern about having found the accused guilty, as there could be no doubt as to their guilt. Gold stealers in a mine were thieving from the pockets of shareholders who had invested capital in it, and were thus stifling a very important industry. There seemed to be a pitched battle between gold stealers and the Legislature, and it was useless to talk about temptation being placed in their way, as the whole community was struggling against the evil of gold stealing. The prisoners were each sentenced to two years' imprisonment, with hard labour. Peter McMahon, who had been arrested on a similar charge, declared on oath that the shift boss had told him that if he found any specimens to bring them to him. He (witness) was doing that when the police met him at the shaft and searched him. McMahon was found not guilty, and was discharged.

Owing partly to interruption of work on its claim during the half-year (only 96 hours having been done in the last fortnight), the Tongkah Compound Company, Siam, the production of tin fell to 9 tons, as compared with 32 tons in the previous term, and this fact, taken in conjunction with the lower prices ruling for tin in the world's market, has necessitated the dropping of the bonus to shareholders. The ordinary dividend of 1s. per share will, however, be payable on September 17th, which will absorb £2500, making the total distribution to date £85,000, or 34s. per share.

Some New South Wales Government officials visited Lithgow and Portland on the 20th inst. in connection with the proposal to establish Government cement works (writes our Lithgow correspondent). Several places in the State have been visited, and a report will, later on, be made to the Public Works Committee on the possibilities of the various districts examined. Prospecting for limestone has been in progress for some time near Irondale, and there seems to be some probability of a site in that vicinity receiving favourable consideration.

It is stated, on the alleged authority of Mr. Haynes, K.C., of Perth, that Mr. H. Chinn is about to institute legal proceedings against certain Eastern State newspapers. These proceedings were delayed, on Mr. Haynes's advice, till the Federal elections were over, as Mr. Chinn's dismissal was a new factor, but Mr. Chinn has not consulted Mr. Haynes with respect to suing the Federal Government.

The Cowley Foundry Proprietary Ltd., of Ballarat East, has secured another contract with the Victorian Railways Commissioners for the supply of 200 steel trucks, to be completed within six months.

Contrary to expectation, the quarantine regulations in Sydney have apparently had no evil effect on its oversea trade. The July trade of Australian origin, according to a return prepared for the Minister for Customs, exceeded by £161,591 that of the same month in last year.

A proposal is on foot in Sydney to establish an open exchange. It is stated that the scheme has the support of a financially strong body of commercial men.

The Radium Hill Company, at a special meeting of directors, have declined an offer received for the purchase of their property, but have submitted an amended offer to the would-be purchasers.

A deputation representing the King Poseidon G.M. Co., of Tarnagulla (V.), last week asked Mr. J. Thomson, honorary Minister, but representing the Minister of Mines in his absence, for a Government grant of £1500 to assist in developing the mine, offering as security the plant, which cost between £3000 and £4000. They had sunk 90 feet, and the shaft was in excellent order. The company had expended something like £7000, and between the three mines on the field about £20,000 had been expended. The Minister promised to ask his colleagues to obtain a report on the subject; he would then be in a position to judge whether the money could be advanced or not. A second deputation represented the Great Poseiden Company, on the same field. Being troubled with water, the company has been experimenting with the freezing process with the object of overcoming that difficulty. Mr. F. Russell said the company had expended £9638 when the shaft sinkers came along, and it was their money that had been keeping the mine going. The shaft sinkers had expended £8868. It was estimated that £1500 would be required for the actual work of freezing, £1500 for sinking and timbering, and £500 to keep the reef frozen until the commencement of opening out operations. In this case also Mr. Thomson promised to lay the matter before Mr. Billson on his return. A third deputation asked for assistance in the treatment of low-grade ore at Stawell, and was advised to fill in an application and send it in for consideration.

The New Zealand Treasurer's estimates for the current financial year provide for £30,000 for development of the State coal mines, as well as £2600 as the Dominion's share of the estimated deficiency on the Pacific cable.

The Marconi Wireless Telegraphy Company Limited will pay a dividend for the year ending December 31st, 1912, of 20 per cent., against 20 per cent. on ordinary shares for the previous year. The sum of £100,000 is carried to reserve, and a balance of £145,000 is carried forward.

The following recommendation was adopted by the Senate of the Sydney University in regard to Matriculation for Engineering at a recent meeting: (a) That by-law 6 (e), chapter x., be amended by the omission of the words, "and one of the following languages:—Latin, Greek, French, or German"; that section 20 of chapter xxi. of the by-laws be amended by the addition of the following words:—"Provided that before graduation candidates shall be required to pass an examination at the higher standard of the matriculation examination in Latin, Greek, French, or German, unless they have passed at that standard in one of these subjects at the matriculation examination." (b) That the provisions of the amended by-laws, chapter x., section 6, and chapter xxi., section 20, shall apply to those engineering students who at this date have completed the course of engineering without matriculation through their not having satisfied the examiners in the higher-language test.

It has been found necessary by the authorities of the Post and Telegraph Department to revert to the practice, temporarily abandoned, of making a small charge for licences for experimenting in wireless telegraphy. The charge was initiated, as also was the licence itself, for the purpose of minimising the inevitable confusion which would follow on indiscriminate use of wireless by amateurs, in whose hands, in very many cases, the system would be little more than a toy. When their apparatus became at all effective there was a danger that private communications sent between official stations would be tapped, and for this reason also it was thought proper to discourage private installations, and originally a fee of £3 3s. was charged for a licence. As some genuine experimental work was being carried on, however, by amateurs, as there was no desire to quench investigation and invention, the fee was first of all reduced to a guinea and then abolished. In reviving it, the secretary of the Central Postal Administration, Mr. Oxenham, expresses the belief that no bona fide student will find the guinea fee a serious obstacle to his work.

## Government Notice (V.).

ENGINE DRIVERS AND BOILER ATTENDANTS.

EXAMINATIONS for CERTIFICATES will be held in the country districts (Gippsland excepted) during October and the early part of November. The Board will sit at any of the following places where there are sufficient candidates:—Bendigo, Kyneton, Castlemaine, Maryborough, Ballarat, Ararat, Stawell, Hamilton, Warrnambool, Geelong, Seymour, Benalla, Wangaratta.

Applications should be lodged before the 12th September. Forms of application and copies of the regulations may be obtained at this office or from the Inspectors of Mines and Inspectors of Factories.

R. U. BIRRELL,
Secretary to Board of Examiners.
Office of Mines,
Melbourne, August 22, 1913.

## Government Notices (N.S.W.).

Sydney Harbour Trust Office,
Circular Quay, August 22, 1913.

TENDERS FOR—

(A) SKIP CAR AND TRIPPING RAILS.
(B) RUNWAY TRACKS.

SEPARATE TENDERS will be received at this office up to 2 p.m. on Monday, the 1st proximo, for the undermentioned works:—

(a) Supply, etc., of Skip Car and Tripping Rails for Concrete Plant on Gantry at Jones' Bay;

(b) Supply, etc., of Runway Tracks for Hand-power Travelling Bridge Cranes, to be erected in Cargo Sheds at No. 1 Berth, Dawes' Point, to Miller's Point.

Full particulars and forms of tender may be obtained on application to the Engineer-in-Chief of the Trust.

HAROLD F. NORRIE,
(7a11) Secretary.

Sydney Harbour Trust Office,
Circular Quay, August 22, 1913.

TENDERS FOR STEEL WORK.

TENDERS will be received at this office up to 2 p.m. on Monday, the 8th proximo, for the Supply and Delivery of Steel Roofing and Runway Brackets for Cargo Sheds, No. 6 Jetty, Woolloomooloo Bay.

Forms of tender and full particulars may be obtained on application to the Engineer-in-Chief of the Trust.

HAROLD F. NORRIE,
(7a12) Secretary.

## Y WATER (EMMAVILLE) TIN CO.
### No Liability.

NOTICE is hereby given that a Dividend (20th) of one shilling per share on all the issued shares in the capital of the Company has been declared, due and payable at the registered office of the Company, No. 360-6 Collins-st., Melbourne, on Saturday, September 13, 1913. Dividend warrants will be posted direct to shareholders. Transfer books and share register will be closed from Friday, September 5, until Friday, September 12 (both days inclusive). By order of the Board,
H. L. SHACKELL, Acting Manager.

FOR SALE.

TWO COMPLETE MERTON FURNACES, 3-hearth type, 10 rabbies, 80ft. revolving conveyors; almost new. Also 30-TON NEW ELMORE CONCENTRATOR, No. 5 vacuum pump; very low price accepted.

MILLER & CO PTY. LTD., Machinery Merchants, 27 Queen's Bridge-street, South Melbourne.

## CITY OF MELBOURNE.

TENDERS will be received until 12 o'clock noon on Wednesday, 8th October, for Supply and Delivery of—

INSULATED COPPER CABLES.

Specification may be seen at the office of the City Electrical Engineer, Town Hall.

JOHN CLAYTON,
Town Clerk's Office, Town Clerk.
Town Hall, Melbourne,
August 21, 1913.

---

## BROKEN HILL PROPRIETARY BLOCK 10 CO. LTD.

NOTICE OF DIVIDEND.

NOTICE is hereby given that a DIVIDEND (the 101st) of 1s. per share and BONUS of 1s. per share has been declared, payable on September 24, 1913. Transfer books close on Wednesday, September 10, 1913, at 3 p.m. By order of the Board,
JOHN BRANDON, Secretary.
31 Queen-st., Melb., Aug. 20, 1913.

---

## FOR SALE.

ONE TANGYE SUCTION GAS ENGINE, 170 I.H.P., and Generator, complete; also ONE TANGYE SUCTION GAS ENGINE, 75 I.H.P., and Generator, complete.

Specifications can be seen at Co-Operative Brick Co. Pty. Ltd., 120 Queen street.

---

TENDERS are invited for the Purchase or Working on Royalty of C. W. Eccleston's "Improvements in Ore Concentrators," covered by Commonwealth Letters Patent No. 12,699, of October 6, 1908. The inventor will dispose of the whole or part interest in the patent, or will grant licenses to work the same to fulfil the full requirements of the public. Address: c/o Phillips, Ormonde and Co., Patent Attorneys and Consulting Engineers, 17 Queen-street, Melbourne.

---

## FOR SALE.

THREE-STAMP JOSHUA HENDRY MILL.

Stampers, 1000 lb., with Feeders.

Good order; very low price accepted.

MILLER & CO. PTY. LTD., Machinery Merchants, 27 Queen's Bridge-street, South Melbourne.

---

## THE CARPATHIA TIN MINING CO., No Liability.

NOTICE is hereby given that the First Yearly General Meeting of the shareholders of this Company will be held at the meeting room, Chamber of Commerce Buildings, George and Grosvenor-sts., Sydney, on Tuesday, September 2, 1913, at 12 o'clock noon.

Business:

To receive the Directors' Report and Balance-sheet for the period ended July 31, 1913;

To appoint an Auditor or Auditors in place of Messrs. F. H. Norton and Hudson, public accountants, who retire, but are eligible for re-appointment, and to fix the Auditor or Auditors' remuneration;

And to transact any other business that may be brought before the meeting, in terms of the rules of the Company.

By order of the Board,
R. VERNON SADDINGTON, Secretary.
Sydney, August 22, 1913.

---

## RENISON BELL PROSPECTING AND MINING CO., No Liability.

NOTICE OF DIVIDEND.

NOTICE is hereby given that a Dividend (7th) of 6d. per share has this day been declared on all shares in the above-named Company, and will be payable at Hobart on Thursday, September 11, 1913. The transfer books of the said Company will be closed from the 1st to the 11th prox., both days inclusive. By order of the Board,
J. SMITHIES, Manager.
Hobart, August 19, 1913.

---

## CAMPBELL'S CREEK DREDGING CO., N.L.

NOTICE is hereby given that a Dividend (34th) of 6d. per share has been declared, due and payable at the registered office of the Company 3rd floor, Broken Hill Chambers, 31 Queen-st., Melbourne, on Tuesday, September 9, 1913. Transfer books close from September 2nd to September 9th, both days inclusive. A. F. SHOWERS, Manager.

---

## THE ZINC CORPORATION LTD.

NOTICE is hereby given that a Dividend (8th) of two shillings per share, less income tax at the rate of 1s. 2d. in the £, has been declared, payable on September 25, to preference sharholders registered on August 29. Transfer books will close at 5 p.m. on August 28, and re-open on August 30.
J. M. STOKES, Local Secretary.

---

TENDERS are invited for the Purchase or Working on Royalty of E. E. Thibault and E. P. Suiter's "Improved Amalgamator," covered by Commonwealth Letters Patent No. 19,261, of September 7, 1910. The inventors will dispose of the whole or part interest in the patent or will grant licenses to work the same to fulfil the full requirements of the public. Address: c/o Phillips, Ormonde and Co., Patent Attorneys and Consulting Engineers, 17 Queen-street, Melbourne.

---

## BROKEN HILL WATER SUPPLY LTD

NOTICE is hereby given that a Dividend (80th) of 1s. 6d. per share and Bonus of 1s. per share has been declared, payable on October 1, 1913. Transfer books close on September 17, 1913, at 3 p.m.
By order of the Board,
THOS. ROLLASON, Secretary.
31 Queen-st., Melb., Aug. 26, 1913.

---

MINING REFORM AND MILLIONS.

WHY! HOW! WHERE!

ASK YOUR BROKERS FOR A COPY.

---

## CONCENTRATING.

EXPERT FOREMAN WANTED.

Must have Good Past Record and be able to Successfully Manage Men.

Only First Class Man will be considered.

Reply, giving fullest personal information and Salary expected to—

"NECNOC,"
OFFICE OF THIS PAPER,
SYDNEY or MELBOURNE

---

# THE UNION BANK OF AUSTRALIA LIMITED.

### BALANCE-SHEET, 28th FEBRUARY, 1913.

#### LIABILITIES.

| | | |
|---|---|---|
| Capital: | | |
| Authorised | £6,000,000 0 0 | |
| Issued | 4,500,000 0 0 | |
| Less reserve liability | 3,000,000 0 0 | |
| Paid up | | £1,500,000 0 0 |
| Reserve Fund— | | |
| Invested in the names of trustees as per contra, £1,000,000; not specifically invested, £500,000 | 1,500,000 0 0 | |
| Balance of undivided profits | 149,002 12 6 | 3,149,002 12 6 |
| Circulation | 201,327 0 0 | |
| Deposits (including inscribed stock deposited) | 22,170,879 8 11 | |
| Bills payable and other liabilities (including reserves held against contingencies) | 1,707,766 6 3 | 24,079,972 15 2 |
| | | £27,228,975 7 8 |

#### ASSETS.

| | | |
|---|---|---|
| Specie on hand, and cash balances | | £3,858,828 10 0 |
| Bullion and advances on bullion | | 189,569 2 4 |
| Money at call and short notice in London | | 675,000 0 0 |
| Investments | | |
| On account of reserve fund | | |
| Consols, £703,125; local loans 3 per cent. stock, £229,443; guaranteed 2¾ per cent. stock, £33,496; Transvaal Government 3 per cent. guaranteed stock, £33,936 | £1,000,000 0 0 | |
| Other Investments | | |
| Consols and other stocks of, or guaranteed by, the British Government, £137,028 12s. 10d.; Indian and Colonial Government stocks, £331,852 3s. 9d.; municipal and other securities, £321,175 14s. 4d. | 790,056 10 11 | 1,790,056 10 11 |
| Balance of remittances and drafts in transit, and bills receivable at London office | | 3,978,057 19 5 |
| | | £10,491,512 2 8 |
| Bills discounted, loans and other securities at the branches and in London | | 16,229,308 7 9 |
| Bank premises in Australia and New Zealand | | 390,683 13 3 |
| London leasehold premises | £142,304 19 4 | |
| Reserves against same and accrued interest | 24,833 15 4 | 117,471 4 0 |
| | | £27,228,975 7 8 |

### STATEMENT OF PROFITS.

| | | | |
|---|---|---|---|
| Balance of undivided profits on 31st August, 1912 | | | £148,348 16 4 |
| Less Dividend and bonus January, 1913 | | | 105,000 0 0 |
| Leaving a balance of | | | £43,348 16 4 |
| Profits of the past half year after making provision in respect of bad and doubtful debts, and other contingencies | | £337,085 11 3 | |
| Less: | | | |
| Remuneration to the local directors, and salaries and allowances to the colonial staff | £111,418 6 8 | | |
| General expenses in the colonies, including rent, taxes, stationery, etc. | 43,585 4 4 | | |
| Remuneration to the board of directors and auditors, salaries of London office staff, rent, taxes, stationery and general expenses | 17,171 11 0 | | |
| Income tax | 9,256 13 1 | 181,431 15 1 | 155,653 16 2 |
| | | | £199,002 12 6 |
| Deduct | | | |
| Transfer to reserve fund | | | 50,000 0 0 |
| Balance of undivided profits at this date | | | £149,002 12 6 |

H. F. STURGIS, }
JOHN DENNISTOUN, } Directors.
HUGH FLOWER. }

A. C. WILLIS, Manager.
C. M. C. SHANNON, Accountant.

London, 1st July, 1913.

### AUDITORS' CERTIFICATE AND REPORT.

In accordance with the provisions of section 113 of the Companies (Consolidation) Act 1908, we report to the shareholders as follows:—

We have examined the above balance sheet with the books at head office, and have had access to the branch accounts transmitted to the head office from Australia and New Zealand. We have verified the correctness of the cash, money at call and short notice, investments, and the bills of exchange sent to London, and have obtained all the information and explanations we have required, we are of opinion that such balance sheet is property drawn up so as to exhibit a true and correct view of the state of the company's affairs according to the best of our information and the explanations given to us, and as shown by the books of the company and the said branch accounts.

WHINNEY, SMITH and WHINNEY,
(Chartered Accountants. } Auditors

London, E.C., 1st July, 1913.

# ELECTRIC SUPPLY IN MELBOURNE.

## City Council and Municipalities.

The special report prepared by Mr. H. R. Harper, Melbourne City Electrical Engineer, respecting the statements made by certain members of the Council that the city electric supply undertaking was showing a distinct loss on the supply of current to outside municipalities, and that the rates charged to the suburbs are considerably lower than those levied in Melbourne, was considered by the City Council at its meeting last Monday.

Mr. Harper states that Footscray received its first supply of current in December, 1911, and that the annual consumption now is well over 400,000 units. From December, 1911, to May, 1913, the average price realised was 1.70d. a unit from Footscray, and 2.11d. from Melbourne consumers. It is pointed out that the prices as between the Melbourne consumers and the Footscray Council are not on a comparable basis, as the Melbourne prices are based on the unit sold or delivered to the consumers' premises, after having incurred a loss in transit of 14.6 per cent., whereas the Footscray price is based on the unit delivered at the boundary of the city in the form of high tension current with a loss of only one per cent. Mr. Harper states that in making any further comparisons it must be distinctly borne in mind that the prices received from the Melbourne consumers cover not only the working expenses and capital charges in regard to the power-house and management, but also the cost of maintenance and the capital charges of the city's distribution system which is necessary to the city supply. The Footscray price was not intended to cover any costs (beyond the special feeder to the boundary) whether of maintenance or of capital charges on the distributing system in the city area. The Footscray supply did not require any portion of the city's distributing system, and therefore was not debitable with the costs in regard to it. Footscray, having its own reticulation or distributing system, incurred all charges in connection with distribution in its own area.

Costs debitable to the Footscray bulk supply are divided under four headings—generation, distribution, management, and capital charges. He states, in respect to generation, that the same cost for each unit sent out from the power-station is taken regarding the bulk supply for Footscray as is charged to the city consumer. It could be easily argued that inasmuch as large consumers assist to rapidly increase the output and thereby justify the installation of larger and more economical plant the cost of generation to such consumers might be expressed in a lower figure.

As to distribution, Mr. Harper points out that the expenses, as a rule, are not proportional to the number of units supplied, but are rather proportional to the number of consumers connected. To the average city consumer, the cost of distribution was .145d. per unit sold. The average consumption was about 2000 units a year for each consumer. They had many consumers in the city, however, taking a great deal more than this quantity, and the cost (.145d.) was inversely proportional to the quantity consumed. For instance, the cost of distribution in the case of a consumer taking 10,000 units per annum was equal to .029d. a unit sold, and the cost to a consumer taking 400,000 units, which was about the Footscray consumption, was equal to .007d. a unit. This figure was about one-half of the cost debited to Footscray. It would be seen, therefore, that a very ample figure has been included in the bulk supply costs for distribution.

Dealing with the question of management, Mr. Harper says that the average consumption of electric power in the city is about 2000 units a year. This involved a cost of £2 a year in management, equivalent to .24d. a unit sold. The cost of management to a consumer taking ten times this quantity would therefore be equal to .024d. a unit sold, and the cost to a consumer taking only 600 units a year would be equal to .8d. a unit. On similar lines, the cost of management for the Footscray supply, on the basis of 400,000 units a year, would be .001d. a unit sold, which was one thirty-sixth of the amount that had been debited against this supply. If the bulk supply for Footscray was debited at the rate of .24d. charged to the average consumer in Melbourne, the council would have to pay, on a consumption of 400,000 units a year, £400. It was pointed out that in the city the cost of management must amount to over 50 per cent. of the revenue obtained, while Footscray paid cash each month.

In dealing with capital charges, Mr. Harper states that with its present demand Footscray required about 3 per cent. of the plant at the power-house for its own use. Was it right, then, he asks, that the bulk supply should be debited with the same capital charges as were paid by the city consumer. The special feeder from the power-station supplied not only Footscray but the cordite factory, the abattoirs, and a few other consumers. The average price received for all current sold to Footscray, Mr. Harper shows, was 1.688d. a unit, while the cost of supplying it was 1.225d., leaving a profit of .463d. a unit, which was equal to 27 per cent. of the selling price, or 38 per cent. of the cost.

The Department, it is stated, is not selling current to Footscray at a loss. The Footscray supply is productive of a substantial profit, which is swelling the net profits of the undertaking as a whole, and will be of material assistance when the time arrives to reduce charges to the city consumers. . . I am afraid that, notwithstanding reports to the contrary, Footscray is making little or no profit out of its supply undertaking, and it cannot be expected to do so during the first few years of its existence. Its charges are 5d. for lighting and 2d. for power. It is interesting to note that in the year 1910 the average price in London per unit sold was 3.42d. for lighting and 1.16d. for power, or a general average of 2.54d. for all supplies, including meter rents. As a further matter of interest, I might point out that the Melbourne Electric Supply Company is supplying the Prahran-Malvern Tramways' Trust with current for the tramways at the rate of about 1,500,000 units per annum at a price which works out at 1.09d. The company has, however, to provide all sub-station plant, for converting the high tension alternating current into that suitable for the tramways, and at the same time has to supply the necessary attendance to operate this machinery. The result is that for the high tension current the company receives about .878d., while the Council is obtaining 1.7d. for a similar supply to Footscray. In concluding his report, Mr. Harper asserts that the Footscray supply is productive of a substantial profit to the City Council, which would be of material assistance when the time arrived to reduce charges to city consumers.

At the general meeting of the Melbourne City Council, held on Monday last, the City Electrical Engineer's report on the cost of supplying current to Footscray was submitted without any finality being reached. On an amendment by Cr. Crighton to a motion (afterwards withdrawn), by Cr. Bell that the whole matter be referred to a committee composed of seven members of the Council for final investigation, it was resolved that the full council go into committee on the 8th prox., for the purpose of dealing with Mr. Harper's report, and to obtain his explanation of alleged sins, omitted and committed.

Judging by the discussion which preceded this resolution it would seem, as a matter of fact, that the council stands self-convicted of sheer inability to decide what is wrong, or that anything is wrong, in connection with the administration of this department, for in speaking to both the motion and the amendment, nearly every councillor who rose to his feet admitted ignorance of electrical matters, after which the discussion raged around the advisability or otherwise of appointing an independent commission to be composed entirely of qualified engineers, or at least to be presided over by one. The chairman of the Electric Supply Committee (Cr. Davies) stated that the knowledge possessed by that committee was no doubt superficial, but that it was obviously better than no knowledge at all. He added that he would welcome an independent commission to investigate the affair, but deprecated the high feeling which had prevailed in connection with it among members of the council.

The mayor, who supported the proposal to defer the discussion until the councillors had had time to digest the details of the engineer's report, stated that he personally had every faith in Mr. Harper's professional ability, and was convinced that that gentleman would court the fullest inquiry into the conduct of his department.

There can hardly be any doubt that Mr. Harper's report shows conclusively enough that there has been very little justification for the storm which has been raised about his ears. The price per unit to the Footscray Council is an average one, which pans out at 1.7d. for current delivered to the Footscray boundary only, after which that council has to bear all charges and losses incurred in its distribution to consumers. If Mr. Harper's figures be correct (and it is inconceivable that they should not be, seeing that they are always open to investigation and criticism, and having further regard to his known integrity and professional ability), the Melbourne City Council makes a clear profit of a fraction under ½d. per unit on a total average cost of generating and transmitting current to Footscray of 1.225d., or nearly 40 per cent. of the cost. It is true that the figures in the report show that the Footscray Council, after paying for current and bearing the cost and loss of distributing it, equal to 4d. per unit, charges consumers 5d. per unit for lighting, and therefore makes 1d. per unit profit under that head; but, as this shows a profit of 20 per cent. compared with nearly twice that amount realised by the M.C.C., it will be seen how much better off the latter body is by the comparison.

Until the matter is thoroughly investigated at the full committee meeting to be held, any further comment would seem to be mere idle conjecture. Meantime, Mr. Harper's statements and figures are perfectly clear, and should not tax excessively the intelligence of Melbourne City Councillors.

---

# KYNOCH ANNUAL MEETING.

The 17th annual general meeting of Kynoch, Limited, was held at the Lion Works, Witton, near Birmingham, on June 30th, Mr. Arthur Chamberlain, jun., presiding.

The report of the directors stated that the balance-sheet showed a net profit of £126,267 10s. 8d. To this had to be added the sum of £24,599 14s. 5d. brought forward from last year, making a total of £150,867 5s. 1d. The interim dividend of 2½ per cent. paid on the preference shares, debenture interest, etc., paid and accrued, and debenture stock redemption fund amounted together to £54,331 19s. 4d., and the directors' fees would absorb £5000. The directors recommended a final dividend of 2½ per cent. on the preference shares, making 5 per cent. for the year; that a dividend of 2½ per cent. be paid on the ordinary shares, both these distributions being free of income tax; that a sum of £40,000 be written off capital expenditure and investments, and that the balance of £29,347 15s. 9d. be carried forward to next year's account.

The chairman, after congratulating shareholders on the fact that they, in common with other industries, had passed through a period of bad times and had entered upon a new and prosperous period, stated that last year the debenture stock, with accrued interest, stood at £247,000; this year it stood at £235,000, a reduction of about £12,000. The creditors last year stood at £517,630, and this year were £387,068, a reduction during the year of £130,562, though even then he would call their attention to the fact that the creditors exceeded the debtors by as much as £201,265. The reduction in the creditors was a very satisfactory one, but the excess of creditors over debtors was not a matter that called for congratulation. Stock, despite a more than usually conservative pricing, was £60,000 higher than last year. They had to thank the present good trade for that. Debtors were down £18,000. The company's investments were not what were called gilt-edged securities, and they did not, for the most part, yield a higher rate of interest. They were made with the object of extending the company's sphere of influence, and forming relations with other companies doing a similar business, or a business in some way connected with theirs, and with the idea of getting a mutual increase of orders for each other, rather than with the idea of placing surplus money out at interest. That object had been attained. The year just past had been an uneventful one. During the period Mr. A. T. Cocking and he had visited South Africa and spent five-and-a-half weeks at their factory fourteen miles from Durban, and amongst their customers at Johannesburg and elsewhere. The factory, which he saw for the first time, was the best laid-out, built, and equipped one it had ever been his lot to go over. They also found satisfaction existing amongst their customers, and he did not think they need have the least anxiety as to the company's position in South Africa. The reduction of £130,000 in creditors was not going to stop there, but it would be hard to persuade the directors that it would be either right or proper to distribute more than 2½ per cent. dividend on the ordinary shares while the excess of creditors over debtors was so large as it was that day. They had to consider the possibilities of troubles before them, such as a decline of the present good trade, the tremendous increase in the cost of everything they bought and used, and the serious position of the labour market as they saw it that day. Mr. Chamberlain then referred at length to the then recent labour troubles in England, and claiming that the reason why that company had been exempt was that it had always made a point of keeping on good terms with its workmen by listening to grievances, redressing wrongs and increasing wages as the cost of living went up.

---

The remarkable decline of 32,000,000 in the number of passengers carried on British railways in 1912 as compared with 1911 is attributed in part to the competition of motor-omnibus services in London and other large cities, and in part to the coal strike.

It is calculated that to purchase the British collieries, which Mr. S. Walsh, M.P. for Ince, Lancashire, proposes to nationalise, would cost about £135,000,000.

## CONTENTS

THURSDAY, SEPTEMBER 4.

P

EDITORIAL—
- Australia for Ourselves .. .. .. .. 187
- The Eternal Railway Question .. 187

Leaderettes .. .. .. .. .. .. .. .. 188
News and Notes .. .. .. .. .. .. 189
Investor's Column—
- Mount Cuthbert (Q.) .. .. .. .. 189
- New Chum Consolidated .. .. .. 189
- Elsmore Tin (T.) .. .. .. .. .. 189

Brief Comment .. .. .. .. .. .. .. 190
Personal .. .. .. .. .. .. .. .. 190
Our Big Mines .. .. .. .. .. .. .. 191
Metal Quotations .. .. .. .. .. .. 192
Tasmanian Mining .. .. .. .. .. .. 192
Victorian Mining Activities .. .. .. 193
Mining in New South Wales .. .. .. 194
Western Australian Mining .. .. .. 194
Mining in Queensland .. .. .. .. .. 194
Mineral Returns .. .. .. .. .. .. .. 194
Mining in New Zealand .. .. .. .. 195
The Coal Mining Industry .. .. .. .. 195
Visit of British Association, etc. .. .. 196
Industrial Metals Prices .. .. .. .. 196
Commonwealth Oil Reconstruction .. 196
Round Hill (T.) .. .. .. .. .. .. .. 197
Publications Received .. .. .. .. .. 197
South New Moon (V.) .. .. .. .. .. 197
Melbourne Tramways .. .. .. .. .. 198
Adelaide City Council .. .. .. .. .. 198
The Trans-Australian Railway .. .. 198
Border Railway .. .. .. .. .. .. .. 199
Victorian Railways .. .. .. .. .. .. 199
The Newport Dust Exhauster .. .. 199
South Australian Railways .. .. .. 199
British and European Developments 199
Miscellaneous .. .. .. .. .. .. .. 200
Invited and Accepted Tenders .. .. 201
Public Works (N.S.W.) .. .. .. .. 203
Industrial .. .. .. .. .. .. .. .. 203
Reports of Companies and Corporations .. .. .. .. .. .. .. .. 204
Dividends .. .. .. .. .. .. .. .. 204
Mixed Mems. .. .. .. .. .. .. .. .. 204

FIRE. . BRICK

Our Products have proved their superiority.

FIRE CLAY GOODS For Every Purpose.

Darley Fire Bricks will withstand the most intense heat, and will not shrink. Our bricks are made near Bacchus Marsh, Victoria, and we supply all the States.

Specialties
High-Grade Firebricks & Retorts.

*Prompt Delivery. For Prices, etc., write to—*

DARLEY F. B. Co.,
Oliver's Lane, Flinders St. Melbourne

COKE!
NORTH BULLI COLLIERY
Limited
Supplies best quality hard
SOUTHERN
SMELTING COKE.
(Weekly output 1250 tons.)
H. G. Hyde, Secretary
Royal Insurance Building, 16 Spring-street,
SYDNEY.

AUSTRALIAN MINING STANDARD.
PUBLISHED EVERY THURSDAY.
Forwarded Post Free to any Address.

| | Per annum. |
|---|---|
| Australasia .. .. .. .. .. .. .. .. .. .. | 26/- |
| British Possessions .. .. .. .. .. .. .. | 32/6 |
| Foreign .. .. .. .. .. .. .. .. .. .. .. | 34/8 |

Payable half-yearly or yearly, in advance.

All amounts should be made payable to order of "CRITCHLEY PARKER, Bank of Australasia."

12 O'Connell-street,
Sydney.
Tel. Central 2703.
P.O. Box 331.

376 Flinders-lane,
Melbourne.
Central 7931 & 1838.
P.O. Box 253.

### BACK NUMBERS OF THE "MINING STANDARD."

The following is the rate for back copies more than a month old. Applications by post must be accompanied with cash and postage added. In no case can we guarantee to supply copies, as our storage accommodation is limited.

A postcard will be sent if the number required is out of print.

For copies three months old, ninepence; six months, one shilling; and beyond that period, one penny per month per copy.

As there is a regular demand for back copies of the "Mining Standard," newsagents are requested to send back all returns uncut and in good condition, otherwise they will not be accepted.

All Returns from Newsagents must reach us by the end of each month (the whole paper must be sent). No credit will be allowed beyond this term.

Postage British, 1d.; Foreign, 1½d.; Australasia, ½d per copy.

Stamps will be accepted as pre-payment.

Address communications: Publishing Department, "Mining Standard."

### CASUAL ADVERTISEMENTS.

The rate for this class of advertisement is governed by the position it occupies.

If it appears on leader page or amongst or next to reading matter, the rate is 15s. per inch (nonpareil) per insertion.

Towards end of reading section—
Brevier, 16 ems width, 6s. per inch per insertion.
Nonpareil, 8s. per inch per insertion.

For the convenuience of advertisers, we might state that Brevier has approximately 7 words to a line, and 8 lines to the inch 6s. Nonpareil has approximately 8 words to the line, and 11 lines to the inch 8s.

### ALTERATION TO ADVERTISEMENTS.

As our publishing arrangements necessitate the "Mining Standard" being issued simultaneously in Sydney, Melbourne and Adelaide on the same day each week, advertisers wishing to change their advertising matter must supply same ten days in advance of publication.

### ADVERTISEMENT PROOFS.

Proofs are submitted to advertisers in order to give them an opportunity of going over the advertisements before printing.

Advertising Copy must be typed and so arranged as to clearly indicate the display required for the more important features of the advertisement.

Any departure from the original copy will be charged for. Advertisers are specially requested to instruct their publicity departments to give us clear and definite instructions respecting changes of matter or new copy in order to avoid incurring unnecessary charges.

AUSTRALIAN MINING STANDARD.
PUBLISHED EVERY THURSDAY.
ESTABLISHED 1888

It is requested that all business communications be Addressed to Critchley Parker.

THURSDAY, SEPTEMBER 4, 1913.

## AUSTRALIA FOR OURSELVES.

We of Australia might do well to clear our minds of cant. As it is, we talk an awful lot of it, and think almost as much as we talk. Especially may these remarks be held to apply to the Labour party. It is not so many years ~~ago that~~ the cry throughout the Commonwealth was for a White Australia. It was a quite reasonable and natural cry; but it was not quite honest. It was to shut out the Chinese and Japanese, to shut out any coloured people, that this policy was advocated. And we were led to believe that all European peoples—French, German, Italian, or Greek—would be as free to enter Australia as people of the British race. But more recently there has been growing a very marked disinclination to accept any people who are not English-speaking.

It is in Western Australia that this tendency has made itself most noticeable, because it is there that non-English-speaking Europeans have most largely found employment. Most of them obtain work in the mines, and the argument against them was that it was dangerous to employ in such operations men who did not understand the English language. The argument was quite a sound one, but there is very little reason to believe it to have been the true one. The real object was, and is, to keep all foreigners out of the country. Mr. Collier, the State Minister for Mines, was kind enough to give the show away the other day when he moved the second reading of the Mines Regulation Bill. According to this measure, any person unable to speak English fluently and intelligently shall not be employed in any mine, and not more than one alien shall be employed for every ten British. Let this be noted. If 100 Frenchmen and Germans speaking English more perfectly than the average Englishman were to present themselves for employment in a mine employing 100 men, but capable of employing 1000, not more than ten of them could be taken on. That is to say that, although the employment of these men would be attended with no more risk than the employment of men of Anglo-Saxon race, and although the mine was 900 men short of its requirements, nine-tenths of these desirable workmen would have to be rejected for no other reason than that they had the misfortune to be born aliens. In other words, it is not the language, but the race that is the test.

But Mr. Collier showed his hand even more plainly than this. On a Labour member interjecting that Mr. Collier's regulations for the drastic administration of the present language test were driving thousands of foreigners into the timber mills, the Minister said, "Then we shall have to provide legislation to meet that difficulty also." At last, then, we are getting the truth in regard to the treatment of aliens; but there is still plenty of humbug talked about the policy adopted. The real objective of the Labour party is still kept dark, but it is not difficult to ascertain. As, at first, it was the coloured man; as, next, it was the non-English-speaking man, white or coloured; as, now, it is the man of alien race, whether English-speaking or not, whom the Labour party desires to exclude; so we may be sure that, when the veil is fully removed, it will be found that the intention is to shut out all men from overseas, and keep Australia purely and simply for the Australians. When that is the case employers will be able to rely upon getting a good four hours' work done for about sixteen hours' pay.

## THE ETERNAL RAILWAY QUESTION.

The question of the gauge of the Australian Trans-continental railway has not yet been settled, and Heaven alone knows when it will be. As our readers are aware, this paper has declared itself in favour of the 4ft. 8½in. gauge for reasons that may be summarised thus:—

(1) It is the standard gauge throughout the greater part of the world.

(2) It would cost less to alter the 5ft. 3in. lines to 4ft. 8½in. than to alter from 4ft. 8½in. to 5ft. 3in.

(3) This gauge was agreed to long ago, and there is really no reason why the question should be re-opened.

(4) The opposition to the standard gauge on the part of the Melbourne press and Melbourne politicians generally being mainly a matter of selfishness and of inter-State hatred, there is very little chance of the gauge they advocate being adopted, so that an abandonment of the 4ft. 8½in. gauge means practically the abandonment of the principle of uniformity.

It was by the two latter reasons that this paper was most strongly swayed, and it will be noticed that they are reasons of expediency. But, because we hold this view, there is no reason why we should adopt unreservedly the attitude of the extreme advocates of conversion to the standard gauge, and there is much force in the arguments put forward by Mr. James Alexander Smith in a letter which appeared in "Engineering" on May 30th, and on which that paper mainly based a leading article which was published in its issue of July 18th. Mr. Smith's views are to be taken seriously because they are the views of an engineer who knows what he is talking about, and who, even if he be regarded as an extreme advocate of the broad gauge, is not to be regarded as having assumed the advocacy of that gauge in any spirit of petty parochialism, such as actuates the Melbourne daily press. In this letter he raises questions that are not ones so much of engineering as of finance. This point of view certainly demands very serious consideration. The board appointed by the Federal authorities to deal with the question estimated the cost of the conversion of all Australian lines to the standard gauge at a little over £37,000,000. Mr. Smith doubts the correctness of the estimates; and he may be right. He also puts forward the supposition that the alleged likelihood of the cost of conversion of the New South Wales lines to the broad gauge amounting to over £19,000,000 was responsible for the finding in favour of the standard gauge. Now, it is obvious that, if Mr. Smith's assumption that this figure is hopelessly excessive be correct, much of the argument in favour of the standard gauge goes by the board. We are assuredly not going to attempt to decide the question as between the Board and Mr. Smith; but we will go so far as to say that, where so many millions are involved, the greatest care must be taken to see that the sums of money asked for are reasonable. Mr. Smith urges powerfully that the estimate of the cost of altering the New South Wales lines from the standard to the broad gauge at £5,000 per mile is shown to be inordinate by the fact that it is nearly one half the total cost of the New South Wales lines built and equipped under very extravagant conditions. That is a matter which can only be satisfactorily settled by experts who are not mere departmental men anxious to do the best they can for their respective States, and not mere experts in one particular branch of railway engineering, but men representing every branch of it, and, above all, by men who are men of affairs, able to consider the question from a business point of view.

In the present state of the London money market millions cannot be raised cheaply. The British financiers are going to consider not merely what interest they will receive on their money, but also what saving in freight charges will accrue from the work undertaken, for it is not to be forgotten that the British financier will be vitally interested in the adoption of the gauge that will give the lowest possible operative expenses. If the amount to be borrowed for the purpose of the construction of this line is to be larger than it ought to be, interest can only be paid on the money borrowed by the imposition of unwarrantably heavy freight charges, and that will not suit the London capitalist, who will, we may be quite sure, want full value for the money he expends. This is a question of economics rather than engineering; and, while we believe firmly, as we have said before, that the 4ft. 8½in. gauge should be accepted, it can certainly only be accepted on a reasonable basis. The cost of alteration of gauge in any and every State must be made the subject of very careful inquiry and consideration. The cost of the scheme must be made as low as possible consistent with utility, and it must be made quite certain that the Commonwealth is not exploited for the advantage of any one State.

---

The news which we published in a recent issue of the pegging of ground in the Bathurst district (N.S.W.) for steatite directs attention to that commodity. Better known as soapstone, it is used in the manufacture of porcelain, for tailors' chalk, for the tipping of gas burners, for the lessening of friction in machinery, and for the removal of grease from cloth. But it cannot be said that there is any great demand for it, though, since the customs duty on French chalk and white foundry facing has been imposed, there has been more possibility of disposing of the product. Practically the only soapstone quarry in Australia is at Wallendbean, in the Cootamundra division of New South Wales, where last year 168 tons of the stuff were quarried, of which 57 were ground to powder and 107 sold as rough lumps. Some parcels of the raw material were shipped to Europe.

* * *

The rejection of Mr. Wade's motion of censure on the New South Wales Government by no means settles a much-vexed question. On the contrary, it seems well calculated to aggravate a controversy which, in passing, seems to have caused some irremediable ruptures in the ranks of the Government's followers. A feature of our legislative system is that in it the real issue may become so terribly involved as to be positively lost. In the case of the Norton-Griffiths agreement the issue is in grave danger of meeting that fate. Pending the tabling of the agreement this week, the little factions may have time to cool off and calmly review the situation, so that the matter may be decided on its merits. It is merely a question of whether the ratification of the agreement is or is not likely to be inimical to the interests of the country. The issue, however, has become so shackled to party interests that it seems probable that on these alone will it be decided. That is a matter for genuine regret.

* * *

The undisguised disgust of the Prime Minister, Mr. Cook, at the tone adopted by Senator De Largie, the chairman of the Select Committee appointed by the Senate to inquire into the dismissal of Mr. Henry Chinn from his position, will be shared by every man in the community who appreciates an open mind in one who is to act as judge upon another man's actions. The indecency of appointing a committee from the Senate, in all the circumstances, was sufficiently apparent from the first. The Senate has an overwhelming majority of Labour members; how then could it be supposed for a moment, at any time, and particularly so at the present juncture when the parties in the Lower House have each other metaphorically by the throat, that a committee nominated from the Senate would be a fit tribunal to take evidence and pronounce judgment upon this action of the Cabinet, or any member of it. Mr. Chinn's appointment was made by the Labour Ministry at least very largely as a reward for services to that party at the previous general election; so much even Mr. O'Malley will not deny, whatever may be thought of the fine scorn which both he and Mr. Chinn affect for testimonials. The reasons for which the present Prime Minister decided upon his dismissal have not yet been given, but, probably, they would have been made known sooner or later, although Mr. Cook is said to have expressed a hope that the matter would be allowed to die out. Whatever they were, if an inquiry must needs be made, it should most certainly be undertaken by parties who are above suspicion of prejudice, and not by a Select Committee chosen from a chamber which is almost entirely at daggers drawn with the offending Minister or Ministers. But the immediate cause of Mr. Cook's fine scorn was certain utterances attributed to Senator De Largie, who, as chairman, is supposed to hold an even balance in the conduct of the inquiry. The chairman is stated to have said: "I can promise the Prime Minister and his supporters that the country will know a great deal about the Chinn case before it is finished with. No more scandalous piece of persecution has ever taken place." To which Mr. Cook replies: "No more scandalous thing has ever occurred under our free institutions than that a gentleman should pronounce that judgment upon a case beforehand and have the responsibility of conducting it. No more scandalous thing has been seen in Parliament than to permit a gentleman who has so expressed himself to conduct such an inquiry. Why, might I ask, should there be any further inquiry? Here we have the report and the verdict from the chairman before a tittle of evidence has been taken." The majority of electors would no doubt be glad to know the reasons for Mr. Chinn's dismissal, and a very large proportion of them are disposed to think that Mr. Cook's silence on the matter is attributable to his unwillingness to wound still further the feelings of a public servant whom he has found it proper to displace. It is to be hoped, for his sake, that when in the end the whole truth is told, Mr. Chinn's friends will not find that they have acted unwisely towards him.

* * *

Renewed attention is perforce called to the matter of proper housing for the working classes and the destitute by the report recently made to the New South Wales Parliament by Professor R. F. Irvine, of the Sydney University, who had been appointed a Royal Commission to inquire into the question. The state of things revealed as existing in that long strip running from Woolloomooloo Bay south-westerly to beyond the central railway station, and embracing Woolloomooloo, Surry Hills, and Redfern, would disgrace any city in the world, and certainly has no excuse in a capital in this young country. To explain how these now miserable tenements came to be built is an easy matter; it would be far from easy for anyone who had the effrontery to attempt it to explain why they have been and are still allowed to encumber the ground, foul the air, and spread filth, sickness, vice, and death amongst the people. Of course, the fact is not lost sight of that Sydney is not the only big city which has slums, nor the only one in Australia; it happens to be the one whose filthiness has most recently been brought to the light of day. It so happens that about the time when Professor Irvine was completing his inspection or preparing his report, Mr. C. J. Parr, the mayor of Auckland, was visiting Australia and noting what was being done in New South Wales and Queensland in providing suitable workmen's homes. In Queensland the Government has erected hundreds of such houses, and the worker who takes one pays no rent, but has to find 25 per cent. of the total cost, and the balance of 75 per cent. is advanced by the State at 4 per cent. and is made repayable in weekly instalments on building society lines. To do this the Government makes use of the Savings Bank deposits. The cottages are comfortable five-roomed dwellings, and the size of the sections in Brisbane is about 33ft. by 100ft., but in smaller towns and country districts the sections are larger. The average cost of the houses is between £300 and £400. Mr. Parr also visited Daceyville, the workers' home village, about 4 miles from Sydney, where about 50 cottages are now occupied by working people, the rents ranging from 15s. to 18s. a week. The McGowen Government expected that by employing day labour, getting timber from the State sawmill, bricks from the State kilns, and so on, it would be able to build houses cheaply enough to let them for 10s. a week, but in this they and the workers were disappointed. And to the higher rent has also to be added the expense of travelling to and from the city, so that the Daceyville experiment cannot be accounted a success. It was, however, an honest attempt to meet a pressing demand, and, if it serve no other purpose than to show that socialistic schemes and theories do not always work out true to expectations, it may not be altogether lost labour.

---

## NEWS AND NOTES.

By an error in the examination of the Mt. Bischoff Co.'s half-yearly report which appeared in our last issue under the heading of "Our Big Mines," the dividend distribution was stated to be £3632 in excess of the net profit. The amount was really, as the context clearly showed, £2135.

Our San Francisco correspondent writes under date July 28th:—There is nothing special to report in mining. There is a rush on in Alaska, about 60 miles from Dawson, to rich placer ground on several creeks. In Nevada there has been a stir near Mina, where rich quicksilver or cinnabar deposits have been opened. In White Pine country, the drilling for potash is attracting attention. The new silver camp of Rochester has produced about 140,000dol. since February, and promises fair results. The large mills of the Buckhorn and Aurora companies are being erected as fast as possible in Eureka and Mineral counties.

The first instalment of £15,000 having been paid over in connection with the purchase of the Mount Oxide Copper mine, it may be expected that its successful flotation in London is a foregone conclusion.

In adding a bonus of 1s. per share to the quarterly dividend of 1s. 6d., the directors of the Broken Hill Water Supply Ltd. specially point out to shareholders that this bonus must be regarded as in return of capital. The dividend and bonus, which are payable on October 1st, will amount to £6250.

In compensation for the damage lately done by fire at the Princess Dagmar mine, California Gully (V.), the Atlas Fire Insurance Co. will pay £1642. The property was insured for £2795.

The fortieth dividend of the Y-Water (Emmaville) Tin Co. (N.S.W.), namely, 1s. per share, will amount to £2000, bringing the total distribution to date up to £44,000. The dividend is payable on September 30th.

The Wallaroo and Moonta Mining and Smelting Co. (S. Australia) will pay a dividend of 1s. per share on September 23rd. The last five quarterly dividends have been 2s. per share, and this reduction by 50 per cent. had an immediate adverse effect on the stock on the Adelaide Exchange, the price falling from 42s. to 38s. 9d.

In the West Australian Legislative Assembly last week the Mines Regulation Bill, which was rejected at the end of last session, was again brought in. The salient features of the bill are the restriction of stopes to 10 feet and of rises to 20 feet; the abolition of contract work; the reduction of the working week to 44 hours; the prohibition of night shifts and all Sunday work, except of essential necessity. A nominee of the Mines Regulation Board is to be appointed to decide all appeals and disputed questions, and to have the powers of a Royal Commission, when directed to make investigations, and the powers of a court of petty sessions. Under the Bill no persons unable to speak English fluently or intelligibly shall be employed in any mine, and not more than one alien shall be employed for every ten British in a mine.

The Pioneer Tin Mining Co. Ltd., Bradshaw's Creek (T.), will pay its 24th dividend (6d. per share) on the 15th inst., the distribution amounting to £4031. Transfer books close on the 8th inst.

There is a strike at the Federal territory, caused by notice having been given that from last Monday the pay of offside machine men would be reduced from 12s. to 9s. 6d. a day. It is claimed by the union officials that the wage given by the State award is 12s., and that, as offside men do the same work as the machine men, their pay should be the same. On Monday about 300 men were affected, and there was locally a prospect of the trouble spreading, although the assistant Minister of Home Affairs, Mr. Kelly, thought that it had arisen out of a misunderstanding which could be adjusted almost immediately. The administrator of the Federal Capital territory, Colonel Miller (he said), had gone to Canberra to make an investigation, and the first news he expected to receive from him was that the men were again at work.

The gold purchased by the banks at Bendigo and Eaglehawk (V.) during August amounted to 15,122 oz. 4 dwt. 15 gr., as compared with 14,850 oz. in July, with 14,293 oz. in August, 1912, and 13,710 oz. in August, 1911.

## THE INVESTOR'S COLUMN.

### Some Companies Attracting Attention To-day.

(By Our Exchange Reporter.)

### Mount Cuthbert (Q.)

At the close of the week the shares in this company were taken at 17s., an advance of 2s. per share on the ruling rates recently. This was the highest price touched for a considerable while, and the tone of the market indicated a confident feeling for the future success of the stock. This confidence is probably associated to some extent with the progress of the railway construction to the field, and on this account it may be expected that the market for the shares will continue to improve, although intermediate fluctuations will no doubt take place, so that practically for the first time in the history of the company transactions may before long be recorded at par. This reflection recalls the fact that the original investors in the company had a most unfortunate and unusual experience, for scarcely had the flotation been completed, which was with great eclat and to the accompaniments of enthusiastic statements concerning the prospects of the venture, than the great financial collapse in America occurred, with the result that the prices of the industrial metals fell heavily—something like £55 per ton being the difference recorded between the highest and lowest quotations for copper. Under these circumstances those investors who were successful applicants for Mount Cuthberts had scarcely time to congratulate themselves before the bottom fell out of the market—one or two sales were recorded at 15s. or 16s., those following in the vicinity of 10s. were few; and after fairly numerous transactions spread over a year or more, 2s. was touched. When it is remembered that there had not been any disappointing developments at the mine, and that there seemed to be but one opinion, and that a favourable one on the prospects of the company, it will be seen that the collapse in the value of the shares was unusually severe, even in a market where the fluctuations are pronounced and extreme. Since this knock-out, which was several years ago, the company has been steadily opening up the most promising ore bodies on its different leases—and with generally successful and encouraging results. The work has, however, exhausted the large original working capital, and a debenture issue of about £30,000 was made a year or so ago. This may be sufficient, together with a calling power of 1s. per share, to provide for the current expenses until the railway connection is effected. Further funds will then be required for mining and reduction plant equipment, but the necessary amount should be easily obtainable, provided the metal market is firm, by the sale of the 80,000 unissued shares in the company, making the number 240,200 altogether.

Such a capital would not be unduly large, and if the block of shares were taken by one of the strong financial groups in London, and the stock "listed" on the London Stock Exchange, then it may be taken as certain that a substantial rise in prices will ensue. Before that happens, however, a lot of dust will have blown across some of the North Queensland plains and a lot of money been sunk in the mines. The question now to decide is: Are the shares worth buying? Well, probably, yes. That is for those who can afford to lock them up for the next twelve or eighteen months, and take no notice of the intermediate fluctuations. The prices then will probably be substantially higher, one good reason for such an assumption being the fact that Cuthbert's are very popular among Queensland investors. There is also a general impression on the Melbourne Stock Exchange that the company may prove to be another Hampden, but it would perhaps be as well if those who are of this opinion were to make a careful estimate of the dimensions and values of the ore bodies of the two companies. The Duchess mine is something unusual, both in its richness and downward persistency, even among the many valuable deposits of copper-bearing material in the North Queensland mineral fields, and it is doubtful whether anything to equal it will be found in the Mount Cuthbert leases, or anywhere else, for a long while to come.

### New Chum Consolidated (V.).

Bendigo is a goldfield of the past and of the present, for there may be found there old leases on which the operations have been maintained for close on 50 years, and in close proximity such a remarkably successful modern mine as the Central Red, White and Blue. Now and then some of these old enterprises, with, in many instances, records of substantial success, put forward once again a claim—and receive it—for the consideration of the investor.

There could be few better illustrations of such a resuscitation of interest than that now being afforded by the New Chum Consolidated Co. Part of the present holding was at one time privately owned, and after large quantities of gold had been won, it was amalgamated with the adjoining mine on the same line of reef, the owners receiving 8000 (fully paid-up) of the 28,000 shares into which the company was formed, under the present name. Further success attended the operations, a sum of £131,000 being paid altogether in dividends, the last being in 1891. During this period the saddle formations had been followed continuously downward until the workings attained as great a depth (speaking from memory) as any in Australia—that is to about 4000ft. Under these conditions, and owing to the failure to discover any further payable reefs, the patience, and perhaps the funds, of the shareholders became exhausted, and, despite the consolidation with adjoining enterprises with records of similar earlier success, the shares became practically worthless in the market. Recently some prospecting has been carried in the vicinity of 660, close to where one of the richest of the old formations was worked, and some promising stone was uncovered, running up to about 4ft. in thickness, and showing an occasional color of gold. Several small crushings have been put through and shown the value to be about 4dwt. This, although scarcely payable, was regarded as a favourable indication, and as there is a distance of about 1200ft. to the northern boundary, the prospects may be regarded as promising.

A crosscut which is to be put in at an intermediate level is regarded as having a good chance of meeting with better results. There are also, at a higher level, the continuations of reefs worked by the Old Chum and the New Shenandoah companies; these can be prospected without much difficulty, and there are also favourable possibilities in connection with them.

The number of shares, which had been increased to 38,000 in order to provide for the inclusion of adjoining mines, has been materially reduced by forfeitures, and there are probably not more than 25,000 now in issue. This is after allowing for the placing among the shareholders of a parcel of 5000 at 2s. The recent rise in price to 4s was caused by an improvement in the workings southward on the reef at 660ft.; more gold showing after a firing out. The improvement was not, however, of a permanent character, and the last sales of the shares have been at 3s. 3d.

It is hard to express an opinion on their value, for they are decidedly a gamble at present, but bearing in mind the past record of the mine, and the fact that a fair-sized gold-bearing reef is now being opened up—with a long stretch of country to be prospected northward—it may be that a small investment at 2s. 6d., if they ease to that, will not be found unjustified.

### Elsmore Tin (T.).

For the last few months the quotations for this stock have shown an improving tendency, and prices have risen from about 6s. to 8s. sales and buyer, the seller asking 10s. This improvement is justified by the recent returns, which have been of good payable quality, the last clean giving nearly 15 tons of tin, with the result that all outstanding liabilities have been paid, and there is now close on £1000 in hand. Under these more favourable conditions it may be assumed that the date of payment of dividends is not far distant, and as the capital is rather smaller than usual, the shareholders are naturally not anxious to sell.

The company, which has so far been somewhat of a disappointment, came into existence many years ago, when there was a decided boom in Tasmanian tin mining ventures, the prospects and returns of the Briseis and Brothers' Home No. 1 leading to the formation of a number of other enterprises, both of the hydraulic pump and bucket-dredging descriptions. The demand for leases was so great that the owners formed very exalted ideas of their value, or it may have been of Victorian gullibility, and asked prices for them, in some instances, absolutely beyond all reason.

The consequence of these exorbitant prices was that in order to supply the public demand for this form of investment, tin-bearing areas were sought for, and found, mostly in and around the Inverell district of N.S.W. These particular areas and deposits had been worked by individual effort, and in a desultory, though successful manner, for years, the great drawback being the want of an adequate water supply. A number of companies were formed, such as Cope's Creek Central, Y-Water, Melbourne Cope's Creek, Bourke's Hill, Elsmore, and others, and it may be remarked, in passing, that the operations of these companies have been generally successful, over £100,000 having been distributed in dividends among the shareholders—a result which compared very favourably with that obtained from the Gladstone, Briseis Extended, Dorset, and other much-boomed and thoroughly disappointing Tasmanian contemporary ventures.

Among the New South Wales companies which so far have not fulfilled the earlier hopes of many investors must be mentioned Elsmores. Some very rich returns were obtained for a while after the operations had been started, and as the capital was small, there being only 24,000 shares, prices rose in a limited market to well over 20s. The yields were, however, on a small scale, and as the output did not increase, but, on the contrary, fell away, the quotations steadily declined, until they were at quite a nominal figure—it is only quite recently that the market interest has revived. The great trouble of the company has been, and still is, its water supply. If this could be assured on a scale sufficiently large to maintain the full working of plant and machinery, then the shares would be well worth buying at much higher prices than they are at present, for the tin deposits are of excellent quality, but, unfortunately, this does not seem to be certain, that is, for a continuous period of some years.

It may be said, however, without going into details, that the position with regard to this all-important matter for the company is much sounder han has been the case for a long while, and, under the circumstances, it seems certain that the shareholders will receive a good run of dividends.

## BRIEF COMMENT.

The appearance of a mine on the list of dividend-payers almost immediately after the commencement of active operations is unusual enough to deserve some notice. The Carpathia Tin Mining Co., Ardlethan (N.S.W.), has been in existence for ten months, during which it has paid in dividends the sum of £10,407, besides holding in reserve the sum of £2500, and carrying forward a little over £6000. As the total proceeds from the sale of tin just exceeded £25,000 the profit shown leaves a round sum of only £5000 to be charged against preliminary expenses, opening up mine, ore extraction, and also a variety of other expenses incidental to the suckling stage of the mining company. This information is not given in detail, although promised, and should enable anxious shareholders to determine what the position is when it is available.

No doubt, Dr. Logan Jack's report on the property will clear the atmosphere, but as he is unable to complete this for a fortnight, he asks that shareholders and directors should be good enough to suspend judgment pending its receipt. Dr. Jack certainly offers some encouragement in the statement that the assays, "so far as they have come to hand," are beyond his expectations, which, from a man of such status, can only be taken to mean one thing. Otherwise, the utter absence of any statement of a committal nature is somewhat significant, and may mean anything.

If, as is alleged, the Carpathia is merely a huge deposit of tin-bearing ore to which the ordinary methods of mining would not apply, then the fractional cost of winning the £25,000 worth of tin, together with other charges mentioned, can hardly be looked on with suspicion. Just at present, however, it certainly looks too good to be true, and, under those circumstances, it is hardly to be wondered at that more definite and practical information is sought.

Other leases at Ardlethan, apparently very much in the prospecting stage, are being helped along with reports that "rich floaters" are being formed, etc., a vague enough definition at the best of times. Another report is of a rich find at Germanton, on which the outcrop is traceable for a length of 150ft., one cut through which showed a "solid ore-body 6ft. wide, without any walls in sight." It is to be hoped that no one takes such statements too seriously, as the stage of development the property is in shows this particular statement to be obviously wrong, and made probably for want of something better to say.

The management of the Oxide Creek Ltd. (Q.), states that the crosscut from the bottom of the winze at 200ft. has now reached the hanging wall, proving the width of the lode to be 17ft., averaging 30 per cent. copper over the whole width, and that ore is ready for shipment as soon as teams are available. This refers to shipping ore of a grade of 50 per cent. and over. The quantity of this available is not stated, but, no doubt, it represents a carefully-picked parcel, not excessively difficult to obtain from a wide ore body of an average value of 30 per cent.

The estimate of ore reserves in the Bullfinch Proprietary (W.A.) at 31st December last, viz., 177,300 tons, of a value of 46s. 2d. per ton, recalls the estimate made by Mr. D. L. Doolette about three years ago. This estimate was briefly put at 15,000 tons, worth 10 oz. per ton, which, converted into hard cash, would be £600,000. The present estimate of 177,300 tons at 46s. 2d. per ton shows a gross value of £409,268. The figures speak for themselves.

The first annual report of the Iodide (Mineral Hill) Company (N.S.W.) is rather a cheerless affair, and a total ore reserve of less than 10,000 tons, of which only 3450 tons is first grade, is not a very reassuring offset against the unpaid liability of £14,000 on the purchase of the property, although cash in hand amounts to £2204, and ore at refinery represents £3835, which latter is rather a questionable asset until proceeds are in the bank. The results of development work was not encouraging as a contrast to values previously reported, and the suspension of sinking at 200ft., said to be temporary, closes up the prospect of improvement in that direction for some time, the only hope being in lateral development.

The number of Maltese employed on the Mount Lyell M. and R. Company's property (T.) is gradually decreasing, and it is reported that a further batch have left the mine with the intention of returning to Malta. From what can be ascertained regarding the character of the few of these people who are in Australia, it seems that they would be a very desirable class of immigrant, as they are reputedly industrious, thrifty, and sober as a whole. Moreover, they are hard workers, and, so far as experience has shown, specially suited for quarrying and heavy manual labour. They have not, however, shown themselves to be adaptable to bush work, as they are not to be compared to the native born as bush workers or axemen.

The presence of the Maltese in Australia is shrouded in some mystery, but it appears that a year or two ago the Admirality closed down on some extensive works in Malta, which caused many of the islanders to be thrown out of employment. This led to a wealthy Maltese providing or creating a fund whereby a number of his countrymen could secure a free passage to other countries which were seeking immigrants.

The laboratory tests on Hercules (T.) ore have been completed, with such results as to indicate that the flotation process may be successfully applied to West Coast ores. A zinc concentrate assaying 50 per cent. zinc, 4.25 per cent. lead, and 8 per cent iron, together with a lead-iron product assaying 15 per cent. lead, 22.9 per cent. iron, and 15 per cent. zinc, was obtained as the result of the tests from ore assaying 9 per cent. lead, 28 per cent. zinc, and 14 per cent. iron. Apart from the lead-iron product, for which a market might be found, a concentrate carrying 50 per cent. zinc is satisfactory, and much may be expected as the result of further experiments now being conducted on an additional parcel of ore.

## PERSONAL.

Mr. William Jamieson, chairman of the Mt. Lyell Mining and Railway Co. (T.), left Melbourne last Friday, accompanied by Mrs. Jamieson, on board the "Themistocles" on a six months' tour to Europe.

Mr. J. F. C. James, formerly assistant-registrar and for the past 10 years chief clerk at the Melbourne University, died at his residence, Surrey Hills (V.), on the 26th ult., after a long illness. Deceased was a son of a former registrar of the University.

Mr. P. C. Holmes Hunt, M.I.C.E., F.I.C., has resigned his position as engineer to the Metropolitan Gas Co., Melbourne, to become the local chairman of the Colonial Gas Association in succession to Mr. George Swinburne, who has been appointed on the Inter-state Commission. Mr. Hunt also succeeds Mr. Swinburne as a director of the Broken Hill Water Supply Ltd.

Mr. Elwood Mead, chairman of the Victorian Water Supply Commission for nearly six years, notified the Government last week that he had received an invitation from the University of California to take the professorship if Rural Institutions there. The information was received with very great regret by Ministers, and immediate consultations were held to devise a plan for retaining the services of a gentleman who is recognised on all hands as at the very head of irrigation engineers. By those amongst the general public who have taken an interest in Mr. Mead's work in putting the State's irrigation schemes on a practical and effective footing, it was received with something like dismay. Several proposals were made; Mr. Mead's work in Australia could be lightened for him if New South Wales would join with Victoria in making a joint offer of £2000 a year (his present Victorian stipend) as a retainer, for which he would act as expert adviser on irrigation to both States, leaving him leisure to pursue the research work to which he is so devoted; or, the Federal Government itself might secure Mr. Mead's services for the whole Commonwealth. While these were being talked over, Mr. Mead himself made it clear that neither of them would be acceptable to him; he would either stay in Victoria or go to California. "You can state positively," he said, "that I shall either continue to hold my present position of chairman of the State Rivers and Water Supply Commission of Victoria, or I shall accept the professorship of Rural Institutions in the University of California, which has been offered to me. I shall not consider any alternative proposal. It has been suggested that an increase of salary would probably induce me to remain in Victoria, I wish to say clearly that I do not want an increase of salary. If I accept the professorship it will be at a smaller salary than the £2000 that I am drawing in Victoria. Personally, I am very well satisfied with my present position. I like Victoria, and do not wish to leave it. On the other hand, the offer made to me to return to America has its attractions. I have two sons and some property in California, and the professorship would enable me to devote considerable time to research and educational work." It therefore rests with the Victorian Government to make such necessary changes in its staff as may enable it to retain Mr. Mead for at least a few years longer. He is still a comparatively young man, his age being 55, and a further period of five years might well be spent in Australia if acceptable conditions can be arranged. It must have been very gratifying to Mr. Mead, as it was to everybody else, to note the absolute unanimity of Parliament in its expressions of appreciation and regret, and the Cabinet should find encouragement in this to act promptly, boldly, and generously in providing such amelioration as the occasion requires.

Mr. Richard Tayler Vale, who for many years represented a Ballarat constituency in the Victorian Legislative Assembly, and was a Minister without portfolio in Sir George Turner's Ministry, 1894-9, but has now for some time acted as librarian to Geological Survey Branch of the Mines Department, celebrated his 77th birthday last Saturday.

Mr. J. J. Niven, one of the founders of the Niven Engineering Works, died at Napier (N.Z.) on August 13, at the age of 60 years. It is some time since Mr. Niven severed his connection with the foundry, and since then he has taken an active interest in the trawling industry. He was a member of the Engineering Commission appointed by the Seddon Government to report on railways workshops' plant. He had been a member of the Napier Harbour Board, the Borough Council, and the Licensing Bench.

Included in the British Parliamentary party now on a visit to Australasia is Sir Joseph Walton, Bart., a wealthy colliery proprietor who represents the Barnsley division of Yorkshire in the House of Commons. Sir Joseph, who is 63 years of age, was first returned to Parliament in 1897. He was created a baronet in 1910. Another member of the party is Sir C. B. Stuart-Wortley, K.C., chairman of the City and South London railway. He has been in the House of Commons, where he represents one of the divisions of Sheffield, since 1880. He was Parliamentary Under-Secretary for the Home Department in the Ministry of Lord Salisbury, and was chief delegate of the Government at the International Conference on Industrial Property at Madrid in 1890 and at Brussels in 1897 and 1900. In 1895 he became a Church Estates Commissioner, and in 1896 a Privy Councillor. He is chairman of the City and South London Railway. The fact that Lady Stuart-Wortley is a daughter of the late Sir John Everett Millais, P.R.A., will interest many. A third member of the party is Mr. J. Norton Griffiths, whose name has lately been prominent in Australia, and particularly in New South Wales, in connection with the £3,000,000 for railway construction in that State. He is about 42 years of age. He has some military experience, and was captain and adjutant in Lord Roberts' headquarters staff. He is a Fellow of the Geographical Society and a Fellow of the Zoological Society. He is also a member of the Institute of Mining and Metallurgy and the Institute of Mining Engineers. In the House of Commons he represents Wednesbury. Mr. Hamar Greenwood is a barrister, was born in Ontario, Canada, in 1870, and was private secretary to Mr. Winston Churchill, when Under-Secretary for the Colonies. Mr. Greenwood is a brother-in-law of another of the visitors, Mr. L. S. Amery, barrister-at-law, and a prominent journalist. Mr. Amery was born in India about 40 years ago. Lord Emmott is the present Secretary for the Colonies. Born in 1858, he represented Oldham in the House of Commons from 1899 to 1911, when he was raised to the peerage. Another of the visitors is Mr. Thomas Lough, a member of the Royal Archaeological Society of Ireland and of the Statistical Society. He is 63 years of age.

The remains of the late Mr. William Knox have been embalmed, and will be brought from England to Melbourne for interment. The immediate cause of death was a second paralytic stroke, and, a specialist from London, who had been summoned to Folkestone, having declared recovery hopeless, Mr. Knox passed away peacefully in the presence of Mrs. Knox, a son, and two daughters. Mrs. Knox, with those of her family who accompanied her to England, will leave for Australia on the 19th inst.

Mr. A. A. Watkins, M.I.E.E., late manager and engineer of the Musselburgh and District Electric Lighting and Traction Co. Ltd., Scotland, has joined the staff of Messrs. G. B. Lincolne and J. K. Macdougall, consulting engineers, Melbourne.

The gold received at the Melbourne branch of the Royal Mint during the week ended on August 30th amounted to 1321.85 oz.

# OUR BIG MINES.

## Examinations of their Yearly and Half-Yearly Reports.

(By a Mining Accountant.)

## Broken Hill South Silver Mining Company, N.L.

### Review of Half-Year ended June 30, 1913.

The facility with which a glissade from the pinnacles of prosperity can be accomplished is well illustrated in this company's latest report. For the previous half year the net profit reached the huge total of £211,967, but a rapid decline to £114,238 resulted during the period under review. The latter sum seems small only in comparison; considered by itself it is still satisfactory. The dividend distribution during the two periods does not show such marked variation, being £170,000 and £160,000 respectively. But whereas formerly £41,967 was earned in excess of the distribution, the earning of this period was £45,762 less than the dividend. The twelve months just ended are easily the best in this company's history, but high though the profits have been the dividends total £3,795 more. The sensational dividend of £100,000 paid in the early portion of the half year under review has not been justified by subsequent happenings; nor, indeed, did it seem justified at the time, savouring, as it did, of a craving for a record.

The causes that brought about the reduction were lower metal prices, a smaller output from the mine, and a higher rate of cost. This is a deadly combination, only needing a reduced grade of ore to be complete. But the ore treated was appreciably higher in grade, and the recoveries in the lead concentrate show a corresponding improvement. Whether the ore treated was higher in grade than the average of the mine is an important matter that cannot be determined in the absence of information regarding the ore reserves. The estimated tonnage of these was given in the previous report, but silence was preserved upon the subject of grade.

The mine itself continued to develop in an excellent manner, and numerous discoveries of importance were made. The policy of exploring the southern portion and of shaft sinking was vigorously carried out. The following are the depths of the shafts at which work was conducted:—

| | | | |
|---|---|---|---|
| No. 1 shaft | Depth | 1302 | ft. |
| No. 2 „ | „ | 1311½ | „ |
| No. 4 „ | „ | 1201½ | „ |
| No. 5 „ | „ | 617 | „ |

At the 1170ft. level a plat was cut in No. 1 shaft, and connected with the main crosscut. In No. 5 shaft a plat was cut at the 425ft. level, and a crosscut extended in a westerly direction. At 25ft. from the shaft a band of ore 4ft. wide was intersected, assaying 21.0 per cent. lead, 3.0 oz. silver, and 6.5 per cent. zinc. The promising developments at the South Blocks mine (Zinc Corporation) augur well for the South. The diamond drill nowadays has an important part to play in the work of exploration, and this branch of operations received due attention. Since the end of the half year a bore (No. 85) was drilled from the end of the crosscut in Section 0 3 g. on a bearing N. 75 degrees W., in order to test the ground between the footwall ore channel and the western boundary. Its length was 688ft.; the core disclosed mostly country, with an occasional patch of low grade ore. But some excellent ore was also disclosed. At 73ft. the bore entered 47½ft. of ore assaying 17.0 per cent. lead, 6.1 oz. silver, and 13.5 per cent. zinc. Again, at 274ft. it passed into 14ft. of ore, assaying 20 per cent. lead, 5.1 oz. silver, and 25.0 per cent. zinc. These discoveries have much significance. The last 362ft. was in schist. A summary of the development work and ore extraction is shown in Table A:—

Table A.—Underground History.

| | | Half-Year Ended | | |
|---|---|---|---|---|
| | | June, 1912. | Dec., 1912. | June, 1913. |
| Ore raised | tons | 165,995 | 178,547 | 151,836 |
| Filling for depleted stopes | tons | 48,664 | 58,571 | 53,726 |
| Ore reserves | tons | — | 3,250,000 | — |
| Footage of development work— | | | | |
| Shaft sinking | | 172½ | 450 | 553½ |
| Winzing and rising | | 1,069½ | 1,027 | 1,159½ |
| Driving and crosscutting | | 1,133 | 2,523½ | 3,025½ |
| Diamond drilling | | 168 | 1,154½ | 685½ |
| Stripping | | 140 | 27½ | 98½ |
| Total footage | | 2,683 | 5,182½ | 5,522½ |

The average grade of ore raised is the same as that shown in Table B. The filling consisted mostly of tailings from the Central mine (36,852 tons). The cost of purchase, handling on the surface, and conveying to the stopes was 1s. 3.2d. per cubic yard of filling, and 1s. 7.5d. per ton of crude ore extracted. The ore reserve would still be huge, even if no ore had been developed during the period. But there is every reason for expecting a substantial addition indicated by the increased amount of development work and the successful results that attended exploration. The miner at the South, and, indeed, at Broken Hill generally, must have enjoyed himself immensely, his average earning on contract development work being 19s. 9.8d., and on stoping 16s. 1.8d. per shift of eight hours.

The metallurgical work was maintained at a high standard, as Table B will testify:—

Table B.—Metallurgical Results at Lead Mill.

| | | Half-Year Ended | | |
|---|---|---|---|---|
| | | June, 1912. | Dec., 1912. | June, 1913. |
| Crude ore treated | tons | 165,532 | 180,080 | 151,742 |
| Lead | per cent. | 14.3 | 13.7 | 14.4 |
| Silver | oz. | 6.5 | 6.4 | 6.5 |
| Zinc | per cent. | 13.6 | 13.8 | 13.7 |
| Lead concentrate produced | tons | 26,630 | 27,238 | 24,417 |
| Proportion to crude ore | per cent. | 16.1 | 15.1 | 16.1 |
| Lead content | tons | 18,652 | 18,755 | 17,141 |
| Silver content | oz. | 617,178 | 617,679 | 554,266 |
| Average assay value— | | | | |
| Lead | per cent. | 70.0 | 68.9 | 70.2 |
| Silver | oz. | 23.2 | 22.7 | 22.7 |
| Zinc | per cent. | 5.9 | 6.2 | 6.7 |
| Percentage of recovery— | | | | |
| Lead | per cent. | 78.8 | 76.0 | 78.3 |
| Silver | oz. | 57.5 | 53.8 | 56.2 |
| Zinc tailing produced (for delivery to Amalgamated Zinc) | tons | 125,294 | 128,446 | 109,098 |
| Lead | per cent. | 2.9 | 3.1 | 2.9 |
| Silver | oz. | 3.0 | 3.1 | 2.9 |
| Zinc | per cent. | 15.4 | 15.8 | 15.5 |
| Quartz tailing produced (sent underground as filling) | tons | 160 | 6,363 | 1,413 |
| Lead | per cent. | 1.9 | 2.5 | 2.0 |
| Silver | oz. | 1.5 | 2.2 | 2.1 |
| Zinc | per cent. | 7.1 | 7.9 | 7.9 |
| Slime produced (stacked for future treatment) | tons | 13,448 | 17,661 | 16,814 |
| Lead | per cent. | 10.1 | 10.7 | 9.3 |
| Silver | oz. | 5.7 | 6.5 | 6.7 |
| Zinc | per cent. | 12.7 | 12.5 | 13.3 |

The reduced tonnage of ore treated was in great part due to the silly strike of the employees of the Silverton Tramway Company, a strike that had its beginning in a most trivial matter, but which nevertheless resulted in serious loss to the mining and treatment companies operating at the Hill. A detailed criticism of the mill work cannot be attempted on the information to be found within the corners of the report. For recoveries and costs go hand-in-glove, and what may appear as improved technical work may be the reverse in point of ultimate economy. But viewed broadly, it is to be noticed that the grade of ore treated is comparatively high, and the recoveries have naturally improved. The grade of concentrate is good. The zinc tailing is slightly lower; this product is not an entire loss to the South, as it is sold to the Amalgamated Zinc (De Bavay's) for 3s. 6d. per ton. This latter company has a first call on the profit derived from the tailing to the extent of 3s. 6d. per ton, and then shares the surplus profit equally with the South. The quartz tailing is useless, except for underground filling, but the metal loss is exceedingly small, being only 0.1 per cent. lead, 0.3 per cent. silver, and 0.5 per cent. zinc. The slime is not yet productive of revenue, but should be a valuable asset if expectations be realised. Satisfactory profits are claimed to have been made with a test plant consisting of a full-sized working unit. The slime dump awaiting treatment is estimated to contain 329,000 tons. The estimated grade is shown in Table C, which gives the approximate tonnage and average assay value of the various accumulated dumps of tailings and slimes:—

Table C.—Products on Hand.

| | | Assay Value. | | |
|---|---|---|---|---|
| | Tons. | Lead, Per cent. | Silver, Oz. | Zinc, Per cent. |
| Tailings— | | | | |
| Old Mill tailings (Zinc Corporation) | 965,925 | 5.7 | 3.6 | 16.4 |
| Zincy tailings (De Bavay Co.) | 30,238 | 3.9 | 2.4 | 18.4 |
| Slimes (old and new) | 329,211 | 11.3 | 5.8 | 14.1 |

The tailings from the old mill are sold to the Zinc Corporation for 3s. 10d. per ton. They are richer than those from the new mill, yet on the whole a much poorer payment is made for them. From the two classes of accumulated tailings the South is reasonably sure of £190,000 yet to come. The value of the slime dumps cannot yet be forecasted. If the lead concentrate be debited with the total of the costs shown in the accounts, the revenue from these tailings dumps and current tailing may be taken to represent net profit. The part played by them in recent periods is as shown in Table D.

The details of the arrangement between the Amalgamated Zinc and the South regarding the divisible profit are not made public. The former company, in its periodical reports, estimates its profits on a basis of spelter £22 per ton; the actual profits are not known till at least six months later. Looking up back records [see "Mining Standard," March 13, 1913] shows that the South received substantial payments above the flat rate of 3s. 6d. per ton, even when spelter was much lower than during the half-year under review. This time it received practically nothing extra. The idea suggests itself that there must have been some extra payment, but that because of the profits of the previous period being overestimated this extra payment was absorbed by the reclamation consequent on a fall in the price of spelter since the previous half-year. The report, of course, omits all reference to this matter. Somehow or other the Broken Hill companies uniformly neglect to throw light on such matters as these.
addition to the reduced output, were responsible

The tailings, then, whatever be the reason, in
for about £46,000 less revenue than previously. But it is the lead concentrate that is the main

Table D.—Delivery of Tailings.

| | Half-Year Ended | | |
|---|---|---|---|
| | June, 1912. Tons. | Dec., 1912. Tons. | June, 1913. Tons. |
| To Amalgamated Zinc— | | | |
| Current production | 125,294 | 128,446 | 109,098 |
| Accumulated | 20,171 | 24,184 | 20,809 |
| Total | 145,465 | 152,630 | 129,907 |
| To Zinc Corporation | 17,585 | 30,203 | 39,270 |
| Tailings Revenue | £53,734 | £76,501 | £30,475 |

It will be seen that the delivery of tailings fell off considerably. The decline in the revenue from this source is remarkable. It would appear as if the tailings to the Amalgamated Zinc realised very little more than the flat rate of 3s. 6d. per ton. Thus:—

| | |
|---|---|
| (Zinc Corporation), 39,270 tons at 3s. 10d. | £7,527 |
| (Amalgamated Zinc), 129,907 tons at 3s. 6d. | 22,733 |
| | £30,260 |

source of revenue to the South, and this, again, shows a sharp fall. There the influence of the metal prices can be more directly traced. The report gives as the average prices for the half-year the figures shown in Table F. As lead concentrate is usually sold on a basis of prices ruling three months after delivery, the published prices probably do not represent the average of those that were actually realised and those that were estimated. The working account is credited by "Mine Production, £268,541," and by "Tailings, £30,475." The former figure represents the net receipts from the lead concentrate, after allowing for the realisation charges. These charges may be assumed to total £4 5s. per ton of concentrate. Then the value of the lead concentrate, on the average prices of the half-year, would be:—

| | |
|---|---|
| 17,141 tons lead at £17 10s. 8d. .. .. | £300,539 |
| 554,266 oz. silver at 2s. 5⅞d. .. .. | 68,994 |
| | £369,533 |
| Deduct £4 5s. on 24,417 tons of concentrate .. .. .. .. .. .. .. | 103,772 |
| | £265,761 |

These figures agree fairly closely with the actual £268,541, but this probably is a coincidence. If the unsold, or unpaid-for, production of each period is estimated at a safe figure there should be a surplus accruing to the next period when metals are above the average prices. In the above calculation there is little room for such surplus. But the calculation is useful nevertheless. It shows that the company needs metal prices well above the average for it to make a half-yearly profit of £100,000 or thereabouts.

The next main department to consider is that dealing with the costs. These have been steadily advancing, as is usual during times of high metal prices. The report publishes a list of working costs. A comparison of these is as follows:—

Table E.—Working Costs per Ton of Ore Treated.

| | Half-year ended | | | | | |
|---|---|---|---|---|---|---|
| | June, 1912. | | Dec., 1912. | | June, 1913. | |
| | s. | d. | s. | d. | s. | d. |
| Mine development | 1 | 7.1 | 2 | 4.8 | 3 | 8.4 |
| Ore extraction . .. | 12 | 10.6 | 12 | 0.6 | 13 | 3.7 |
| Filling depleted stopes .. .. .. | 1 | 5.4 | 1 | 3.5 | 1 | 5.8 |
| Concentrating .. .. | 3 | 9.0 | 3 | 6.3 | 4 | 1.6 |
| | 19 | 8.1 | 19 | 3.2 | 22 | 7.5 |

It will thus be seen that there is an all-round increase, especially pronounced in the underground costs. The working cost this period is equivalent to £7 0s. 7d. per ton of concentrate. There are other costs to be added, such as administration, taxes, depreciation, etc. The total cost shown in the accounts is £186,451. The real cost was £7205 higher, as this amount of income tax was recovered, and shown as a deduction from the costs. The recovery of the tax was a purely fortuitous circumstance. Adding this sum, the total cost was 25s. 6d. per ton of ore treated, and £7 18s. 6d. per ton of concentrate produced. If £4 5s. realisation charge be added the grand total cost was £12 3s. 6d. per ton of concentrate. There is a big difference between this and £7 0s. 7d. A working profit has been aptly described as a mirage of finance.

The balance-sheet calls for little comment. The liquid assets, though reduced, are sound and plentiful, being equal to about 18s. per share. There is a suspense account, £35,000, to provide against reclamations in the event of a severe fall in metal prices. The exact degree of contingency cannot properly be gauged, owing to the insufficient data previously discussed. The main features on the financial side are summed up in Table F. But it must be remembered that the range of comparison extends over an era of prosperity. It is too much to hope that this era will always continue:—

Table F.—Financial History.

| | Half-Year Eended | | |
|---|---|---|---|
| | June, 1912. | Dec., 1912. | June, 1913. |
| Revenue .. .. .. .. | £327,484 | £398,431 | £300,688 |
| Expenditure .. .. | 170,844 | 180,655 | *180,753 |
| Written-off . .. .. | 5,864 | 5,809 | 5,698 |
| Net profit . | 150,956 | 211,967 | 114,238 |
| Dividend .. .. .. | 120,000 | 170,000 | 160,000 |
| Carried forward .. | 114,789 | 156,756 | 110,993 |
| Average metal prices— | | | |
| Lead .. per ton | £16/5/6 | £19/6/3 | £17/10/8 |
| Spelter .. per ton | £25/18/0 | £26/8/7 | £24/11/2 |
| Silver .. per oz. | 2/5 7/16 | 2/7¼ | 2/5¾ |
| Paid capital .. | 163,540 | 163,540 | 163,679 |
| Capital expenditure | 8,177 | 3,590 | 2,961 |
| Liquid assets .. .. | 201,436 | 249,698 | 213,545 |
| Liabilities .. .. .. | 24,996 | 20,968 | 33,261 |
| Surplus of liquid assets .. .. .. .. | 176,440 | 228,730 | 180,284 |

*£7206 income tax recovered, and deducted from expenditure.

## METAL QUOTATIONS.

### By Cable.

(From Our Correspondent.)

London, Tuesday.

There was an all-round improvement in the market values of industrial metals last week, but the most remarkable rise was that in tin. The closing rate of the previous week for that metal was £187 15s., and the highest point touched was £188 for spot, and the highest prices obtainable for many weeks past were £189 15s. for spot and £190 for three months; last week the rates bounded upwards daily until, on Thursday, £197 10s. was reached, followed by a decline to £195 5s. Twelve months ago, however, the prices were £212 for spot and £211 for three months.

COPPER.—The market for spot lines opened with a rise of 15s. to £69 10s., after which the rates were £69 18s. 9d., £70 7s. 6d., and £71 2s. 6d.

For three months' delivery the quotations were £69 10s., again a rise of 15s., £69 17s. 6d., £70 6s. 3d., and £71.

Electrolytic opened the week at £72 15s., then rose to £73, to £73 5s., to £74, and again on Friday to £74 10s. Yesterday's rate was £74 5s.

TIN.—Tuesday's quote for spot-metal was £190, which was followed by £192 10s., £197 10s., and £195 5s.

On Monday three months' parcels brought £187, next day's rate was £189, and then came £191 15s., £197, and £194 15s.

LEAD.—A rise of 2s. 6d. brought Monday's price to £20 7s. 6d., followed on Tuesday by £20 10s.; on Thursday there was a return to £20 7s. 6d., and then back to £20 5s.

SPELTER on Thursday brought £21, as against £20 13s. 9d. in the previous week, and £20 15s. a week earlier.

SILVER.—There was a small average increase, the rates being 27 9/16d., 27 7/16d., and 27½d.

ANTIMONY.—"Star" brand was stationary at £29, and 50 per cent. ore at £6 10s. per ton.

WOLFRAM (70 per cent. ore).—The former price of 33s. 6d. per unit, or £117 5s. per ton, was maintained.

MOLYBDENITE showed no change from 2s. 8d. per lb., equal to £298 14s. per ton.

MANGANESE (50 per cent. ore) was firm at 10d. per unit, or 41s. 8d. per ton.

The British Chamber of Commerce, Paris, the official representative of the Commonwealth in France, reports under date July 28th:—The following are the latest quotations on French markets:—Copper (Havre), £67 16s.; tin (Havre), £196; lead (Havre and Rouen) £23 14s., (Paris) £23 18s.; zinc (Havre) £23, (Paris) £23.

## TASMANIAN MINING.

### Mount Lyell District.

(From Our Correspondent.)

Queenstown, Aug. 29.

The output of ore from the North Lyell mine continues to show a steady increase, and something like 2400 tons a week is now being shipped to the reduction works. Another satisfactory feature in connection with operations is that the average grade of the ore being won is a good deal better than it has been for some time past. On the assumption, therefore, that the present output will be maintained (with a probability of being increased), the North Lyell mine may be regarded as having practically regained its normal production capacity of 10,000 tons of ore per month. As it is also pretty certain that they will be able to keep the grade up to approximately 6 per cent. copper, the treatment of this tonnage, along with between 15,000 and 20,000 tons of Mount Lyell ore, should result in a yield of at least 600 tons of copper a month. A fairly adequate supply of labour is now available, and a large number of men are employed (chiefly on contract) ore-breaking at the 1100, 1000, and 850ft. levels. Close attention is also being paid to the mullocking of the stopes, and with plenty of labour in this respect also obtainable for breaking dirt in the open cut, the filling of the stopes is being kept well up to requirements.

An important piece of necessary development work which has been in hand for a considerable time has also been finished. This is the construction of a new mullock pass through solid country right from the 300ft. to the 850ft. level. The completion of this work will largely facilitate the distribution of filling throughout the lower levels. This pass will also be right outside the area of the workings of the upper levels, and, therefore, it is not likely to be interfered with by any movements of the disturbed country which may occur above the 850ft. level.

Generally speaking, it may be said that, considering the great set-back experienced as a result of the disaster in October last, the management has accomplished remarkably good work in getting the mine back to its original condition in such a short time, and provided an adequate supply of labour can be maintained, the present satisfactory output of ore should continue without any interruption worth mentioning.

At the Mount Lyell mine similar favourable circumstances are prevailing in regard to operations as at the North Lyell mine. An output of not less than 700 tons a day is being kept up, and the increasing of this by another 100 tons should not be difficult. It is only a matter of putting on more men, but in this connection regard has naturally to be paid to the efficiency of the labour offering.

After a campaign of several weeks with only two furnaces running another one was started on Wednesday, and three are now in full blast. With between 9000 and 10,000 tons of North Lyell ore a month coming forward, and from 15,000 to 20,000 tons of pyrites available during the same period from the Mount Lyell mine, they will be able to keep three furnaces in pretty constant blast. Any way, in the interests of shareholders, it is to be hoped that such will be the case, as operations during the past few months, or practically ever since the disaster, cannot have resulted in much of a profit.

The announcement that the Mount Lyell Company had decided to take preliminary steps to ascertain if the low-grade propositions which they have acquired during the past few years can be exploited on a profitable basis has, naturally, excited a good deal of interest locally, as, if the experiments now being conducted in this direction are productive of favourable results, it means a big extension of the life of the Lyell mining field. The Mount Lyell Company now owns practically the whole of the ground along the western fall of the mountain extending from the Glen Lyell at the southern end to the Lyell Comstock at the northern end. This group of properties, upon which millions of tons of low-grade siliceous copper-bearing schist exists, includes the Glen Lyell, Prince Lyell, West Lyell, South Tharsis, Royal Tharsis, Western Tharsis, North Crown Lyell and the western portion of the Lyell Comstock mines. As to the average value of the material comprised within this group it would be difficult to form any accurate estimate, but the results obtained from the working of the South Tharsis and Royal Tharsis may be taken as affording some indication of the value of the metalliferous schists existing within the area in question. These two mines were acquired by the Mount Lyell Company about thirteen years ago, and were worked on a small scale for some years. The material won was smelted as a siliceous flux in conjunction with the company's basic ores, but consequent upon the amalgamation of the Mount Lyell and North Lyell Companies in 1903 all the siliceous material required as a flux for the Mount Lyell ore was furnished by the North Lyell ore, and shortly after the amalgamation took place the mining of South Tharsis and Royal Tharsis was discontinued, and has not since been resumed. During the time those two mines were worked between the amalgamation and the discontinuance of operations some 7000 tons were mined and smelted. Of this about 4000 tons come from the South Tharsis, the average assay value of which was 1.65 per cent. copper, .15 oz. silver, and .017 oz. gold. The balance of nearly 3000 tons was won from the Royal Tharsis, the average assay being 1.66 per cent. copper, .14 oz. silver, and .0088 oz. gold, so that the value of the material from the two mines was practically identical. At the present price of metals this would be worth, roughly, 21s. per ton, and it may be accepted as being fairly indicative of what the average value of the metalliferous schists existing on the Mount Lyell Company's western properties is likely to be. The question therefore to be determined is whether any of the processes of concentration or flotation which are now being carried on at Broken Hill and in other parts of the world can be made commercially successful when applied to the siliceous copper-bearing bodies of the Lyell field, which on a liberal estimate are not likely to bulk more than 25s. per ton, and this apparently is the problem which the Mount Lyell Company has set out to solve.

Three years ago the Government of Canada appointed a Royal Commission to inquire into the systems in vogue in industrial and technical education in the United States, Great Britain, and the continent of Europe. In its report the Commission advises a Federal grant of 3,000,000 dol. yearly for ten years, aggregating 30,000,000 dol., for the purpose of getting a thorough-going industrial educational system well established on a sound basis. It is proposed that 75 per cent. of this vote shall go to the Provinces direct on a per capita basis, and 25 per cent. of the vote be retained for expenditure through a central Dominion board for organisation, the securing of experts, etc. There are recommendations as to effective co-operation between Federal, provincial, and local authorities and boards, so that the best results of joint action may be obtained.

# VICTORIAN MINING ACTIVITIES.

## Bendigo and District.

(From Our Correspondent.)

The gold production for the week, ending August 30, 1913, amounted to 3471 oz. 14 dwt. The principal producers were:—Spring Gully, 472 oz. 8 dwt.; South New Moon, 458 oz. 4 dwt.; Central Red, White, and Blue, 350 oz. 18 dwt.; Ironbarks, 154 oz. 15 dwt.; Golden Pyke, 123 oz. 6 dwt.; Carlisle, 106 oz. 8 dwt. South New Moon declared a 1s. dividend, representing £1600, and increasing the company's total to date to £500,000.

Carlisle are in 225ft. with the 1140ft. south level, the spurs in the end still showing a few colours of gold, though the stone is not as high grade. The indications in driving this level up to the present promise well for the extension of the overhead stoping later, as the formation is rising consistently in this direction. The level is now fully 60ft. under the top fault, assuring a good length of backs along this particular shoot. In side stoping, the spurs are taken for 25ft. to 30ft. from the Victory east back, and carry a little gold throughout. The most advanced stope above the level is 80ft. from the shaft. The workings here extend over a width of 25ft., and the crushing material is of payable quality. Nearer the main crosscut there is more country rock associated with the spurry veins of quartz. The bulk of this finds its way to the mill, and is giving payable results. These stopes are close to the top slide. The most important development of the past few days has been the uncovering of better grade quartz in the 1200ft. north intermediate level. This end is in 236ft., showing a fair width of spurry quartz immediately under the bottom fault; the last couple of firings exposed a better sample of gold. As the top fault is not more than 25ft. overhead and pitching north, while the lower break is rising slightly in the same direction, there is a likelihood of these slides junctioning shortly. Though opened up for a length of about 160ft. at the 1140ft. and 1200ft. levels, there is yet something like 1500ft. of the formation unexplored between the north and south boundaries. At 1264ft. the main north level has exposed a small spur at 38ft. in. containing several colours of gold. Last week's average was below the standard of late, but these fluctuations are inseparable from operations on a spurry formation of this character.

New Golden Fleece appear to have reached the western limits of the 580ft. formation, in crosscutting 60ft. west off the rise above the 650ft. north level. The crosscut is at a depht of about 620ft, and traversed a portion of the stone that pitched under the 580ft. intermediate, a few colours of gold showing at one stage. This crosscut has been discontinued, in order to extend the 650ft. main level, which will again traverse the stone as it pitches north. At 1000ft. rising has been started at 132ft. in the south level, on 3ft. of quartz and spurs, the latter revealing a colour or two of gold. For the last few weeks the company have been pushing on with the opening up of the 500ft. reef at various depths in readiness to start milling with the new battery at the end of the month. Recent crushings have been less favourable, but, as there is a general impression that a fair proportion of the higher grade stone has been conserved till the new battery is available, a fair demand has ruled for scrip.

Catherine Reef reef, at the 2300ft. south level, is not as consolidated as at 173ft. from the shaft. The quartz is spurry in the face, contains a good percentage of minerals, but is not of any value. It will be further tested during the month by breaking across east off the level. The leading stope is close to the timber, operating on 10ft. of fair looking quartz of low value. The next stope is near the No. 1 south winze, taking the reef along the west wall without showing gold. In the third stope south, just below the 2200ft. level, a little gold is visible. North of the main crosscut the upper top stopes are not far under the 2200ft. workings. There is a fair quantity of crushing material still available here, disclosing a few colours of gold. North of the No. 3 winze the spurs fringing the east side of the reef are being extracted while the western stopes are filling. Work is to be resumed in the latter this week. Near the Nos. 4 and 5 winzes a little gold is seen in raising the consolidated portion of the reef. Filling up is also engaging attention in the stopes off the No. 6 winze. From now onward the stone broken from the irregular reef and spurs allied to the band in the open cut will be treated separately. Worked under economical conditions, the management anticipate that this material will prove payable.

Golden Age had two breakings in the top stope over the 858ft. south intermediate during the week. Good gold was seen after the first firing, in 3in. to 6in. of reef. The second breaking also revealing fair gold. This stope is advanced to [illegible] from the Princess Dagmar boundary, and [illegible] the hanging wall that the stone of profitable [illegible] is also following in the top stopes off the main crosscut further north. There is 175ft. of ground between these points, which would seem to assure payable returns for some time. In these back stopes there is 12in. of stone of fair quality. The week's crushing of 80 tons resulted in an improved average, 52 oz. 2 dwt. being obtained. The 655ft. north level off the north shaft shows gold in 4in. to 9in. of stone after each breaking. The level is in 48ft., with the auriferous quartz on the footwall. The hanging wall is exposed without any quartz. A trial crushing from this level will be put through early in October. Southward, the opposite level has been started on 18in. of spurry quartz, which has not revealed anything of value in the first couple of firings. Stoping will be commenced in the course of the next three or four weeks. At the east shaft on the Paddy's Gully line the 1580ft. west crosscut was suspended after passing through the small east back first seen in shaft sinking. As there was very little stone allied to the east back, sinking has been resumed before opening up the corresponding west leg of the cap. This formation appears to be small.

Garden Gully reported payable gold in driving the 1552ft. level south from a crosscut at 300ft. north of the No. 3 shaft in 2ft. to 3ft. of stone. The company formerly had a few good yields from the same stone north of this crosscut, the shoot being limited to the lower portion of the back. A rise of 60ft. to the cap traversed a lot of quartz of very inferior grade. Opposite the No. 3 shaft similar operations led to like results. From the foot of the latter rise, and about 60ft. under the present level, there is a level north to 150ft., the east leg proving of low grade. The enrichment just disclosed is, therefore, also apparently limited. More attention is being paid to the shallow ground. At 494ft. the north level is in 470ft. and within a short distance of the boundary, a few colours of gold showing in 2in. to 6in. of reef. A little gold is also visible in stoping. A crosscut has been started off the east leg of the old 300ft. reef to intersect the east back of an overlying formation; the cap of which is supposed to exist at about the 200ft. level. The matching west leg is 8in. thick, and shows a little gold where exposed in the 332ft. crosscut off the No. 3 shaft. As the original workings are inaccessible, it is not known if the top of the reef was tested in earlier times. The 745ft. south level has been temporarily stopped on 2ft. of quartz along the Victory east back, no gold having been seen. At 485ft. a centre winze is going down to reach the cap of the formation now being stoped above the 494ft. at the No. 1 shaft.

Confidence Extended shallow ground work at 396ft. is attracting some attention, owing to the north level approaching several old shafts that gave phenomenal results about 50 years ago. The level is meeting spurs carrying gold. A trial crushing is to be put through, but these veins do not appear to be payable so far. The spurs are evidently a portion of the system that produced the best returns, and there is likely to be a good extent of virgin ground available. At 1065ft. the company are crosscutting west to prospect the ground in the vicinity of the west backs, faulted by the Collmann crosscourse. A tribute company at one time had fair results from this portion of the lease. Some importance attaches to operations at 1245ft., where a winze is in progress on 4ft. of good looking stone allied to the crosscourse.

Unity uncovered 2ft. of mineralised quartz in the 1145ft. east crosscut on Saturday, without showing gold. The crosscut is going through the eastern beds of the Paddy's Gully line in search of the east leg of the Sea 643ft. reef. The present stone is along a fault and appears to be stronger underfoot. It was reported officially a few weeks ago that the crosscut had passed through centre, but the position of the folding is not yet definitely settled. On the Garden Gully reef channel the 920ft. east crosscut has reached the west leg of the Victory reef, low down. There is 4in. of stone of no value. This crosscut is to work some spurs east of centre and above the system profitably mined in the Carlisle property adjoined. The latter spurs are also being opened north and south from above the 1018ft. crosscut. A fair width of crushing stuff is traversed, which is expected to prove gold bearing as operations advance.

Constellation, in an average width of 15in. of quartz allied to the McDuff back at 1250ft., have recently disclosed better prospects. This east back is connected with some good stone in the next mine north, the Great Northern, and there are evidently greater possibilities in the same channel through the Constellation. The milling from the 525ft. workings resulted in about ½ oz. per ton, which leaves a fair profit on the present output. The machinery at the north shaft will not be available for another fortnight.

Princess Dagmar have made very satisfactory arrangements for continuing operations on the 867ft. intermediate reef, pending the erection of a plant to replace that destroyed by fire. The direct connection with the Johnson's Reef No. 2 shaft has been availed of to conduct the crushing material straight to the mill. This will incur the expense of an extra trucker or two, but, on the whole, the work will be carried out more economically than under the conditions existing previous to the fire. The 867ft. south level is meeting more spurs, containing a little gold. Stoping has been resumed, and a profitable yield is looked for next Saturday. Having a good sum to credit another dividend is expected to be announced early this month.

Johnson's Reef have decided to continue rising on the "Dagmar" reef above the 781ft. crosscut, through the No. 2 shaft. The latest breaking opened up the greater width of 4ft. of stone containing a little gold. In order to work the stone more systematically, a crosscut will be put out from the 680ft. plat, striking a diagonal course with a view to intersecting the stone about midway between the shaft and the north boundary. A connection with the No. 1 stopes on the Paddy's Gully line is anticipated during the month, when the stoping of the reef toward the north boundary from above 1780ft. will be proceeded with. The outlook on the Derby reef channel is still unfavourable.

Great Extended Hustlers, in a crosscut off the old 717ft. level, at 650ft. north of the shaft, have 8in. of bedded quartz showing several colours of gold. The objective is the continuation of the Little reef, which has been a good producer for a length of several hundred feet, further south. It is not yet known if the present quartz is identical with this formation, as several of the parallel eastern backs have auriferous quartz associated where faulting is prevalent. Below 777ft. the Little reef is still furnishing 2ft. of payable stone at a depth of 195ft. The 1053ft. crosscut A favourable development at this depth would greatly enhance prospects. The new reef at 1053ft. is getting close to the lower portion of this back. continues strongly in the winze, and shows gold.

Sea, 2201ft. rise shows 7ft. of spurs of little value near the turnover. It is proposed to break over west through centre, in anticipation of uncovering the cap of another small reef, from which better results are expected, and a connection will also be effected with the south intermediate level below 2124ft., driven on the east leg of what is supposed to be the "inner" formation of the South Garden Co. Both reefs are of profitable quality on the boundary; at 450ft. further south, and as soon as a favourable opportunity presents itself, a matter of about 6 months, it is proposed to work through the adjoining mine. At 1544ft. there is a crosscut north of the shaft opening up 7ft. of stone, but no gold as yet. After reaching an east back, levels will be extended on the reef. Southward at 1[illegible]44ft. the company are rising on the east back of Fiedler's reef, stone that proved fairly remunerative in the northern portion of the lease.

## Castlemaine and District.

(From Our Correspondent.)

Spring Gully had a continuance of recent rich crushings last Saturday, when the usual fortnightly quantity of 234 tons yielded from the battery 472 oz. 8 dwt., nearly 2 oz. per ton. The stone came from the spurs at 200ft., and as much gold as before is still showing. It is certain that the next return, at least, will be highly payable. The mine is being sytematically opened up. These payable spurs are to the east of the old reef that gave the rich gold in the nineties. They are flat, and bear away east from the main formation. At intervals a coarse sample of gold has been got, but prospects lately indicate a more even distribution of the gold. This, of course, is hopeful of a continuity of even yields. The stopes are producing the best gold, and they contain a lot of stone. In order to provide for future working of these spurs a crosscut is being put out at 242ft. If satisfactory developments are met with in the crosscut attention will be turned towards the deeper levels under the spurs.

As is usual when a mine strikes it rich the adjoining mines are beginning to think about resuming operations. It is now a long time since Spring Gully No. 1 has done any work, but the present intention is to resume operations between the 300ft. and 500ft. levels, in order to try and pick up the extension of the spurs producing the good gold in the big mine. The general idea is that the zone of country in which the spurs exist can be reached by crosscutting from the rise connecting the 500ft. and 300ft. levels. The formation, which pitches south, was prospected many years ago, but without success. The exploration for the spurs will be followed with a good deal of interest. There is a fair plant on the lease, and not much expense will be entailed in getting a start again.

There is every chance of the South Spring Gully also getting a fresh start. Mr. W. W. Eskdale paid a visit from Bendigo during the week, and it is pretty certain that at least a third company will operate in the vicinity.

South Wattle Gully seem in no hurry to crush. It is understood that the manager has given his assurance to the directors that it will be a payable proposition to erect a battery. At the 300ft. level the west leg has been driven on for 51ft., the reef being up to 2ft. wide, carrying a little gold and mundic. The No. 2 rise is up nearly 50ft., in good gold stone, averaging from 1ft. to 6ft. thick. Will start stoping to the south. The main level is in 17ft., and fair gold is seen daily in breaking down.

Campbell's Creek bucket dredge nearly doubled its return last week. A full run by the double plant lifted 103 oz. gold, which is 40 oz. more than the previous week.

## MINING IN NEW SOUTH WALES.

### Lithgow District.

(From Our Correspondent.)

Lithgow, Aug. 29.

The limestone quarries near Havilah (near Lithgow) promise to develop into a big and important industry. Messrs. Hoskins Bros., of the Lithgow Ironworks, who are the owners, are pushing along the development of these quarries. At the present time the railway siding at the quarries can only accommodate 16 trucks. Arrangements have been made with the Railway Commissioners for the siding to be extended to the face. This will mean that some 40 chains of railway will have to be constructed. Considered by itself, this big expense speaks well for the abiding faith that Messrs. Hoskins have in the limestone deposits. Mr. W. Williams is in charge. At present 60 tons of stone are being turned out daily, and that output, it is hoped, will be increased shortly. Besides limestone, a splendid deposit of dolomite has been discovered. Some 40 men are now employed at the quarries, and more will be required shortly. Messrs. Hoskins Bros. have two 40-acre leases along the railway line, about two miles on the Mudgee side of Havilah station.

The Turon Company's No. 1 plant obtained 32 oz. for 136 hours during last week.

A correspondent at Pepper's Creek states that the result of the trial crushing at McKennar's new reef is not yet known, but it looks good on the plates. An exceptional return is expected. The reef on the surface is 60 yards long and 6ft. wide; it has been quarried out 6ft. deep. Gold is showing freely in the stone.

Work at the Mabel gold mine will be resumed this week. The machinery has been thoroughly overhauled and put in proper working order.

Consequent on the closing down of the branches of the Commonwealth Oil Corporation at Newnes, Torbane, and Airly, about twenty hands have been paid off at the refinery works.

Gold mining leases are now being opened up by H. E. Brown, Sunny Corner, two areas (leases) of 20 acres in the parish of Coolamigal; F. H. Jennings and another, Oberon, 24 acres 2 roods 34 perches, in the parish of Banshea. The following mining leases of private lands have been approved:—R. Tulloch, Yerranderie, 52 acres 2 roods, in the parish of The Peaks; W. A. Cuneo, Yerranderie, 16 acres 3 roods 10 perches (surface right 3 acres) in the same parish.

Application has been lodged by the Newbold Silica Fire Brick Co. Ltd. with the warden's clerk, Lithgow, for a mining lease on private lands of 1½ acres in the parish of Lidsdale, for the purpose of constructing a tramway for use in connection with mining for silica.

## WESTERN AUSTRALIAN MINING.

(From Our Correspondent.)

Kalgoorlie, August 25.

As rumours are current that the Bullfinch Co. will start paying dividends shortly, the present position of the company is worth inquiry. On December 31st, 1912, the company was indebted to the bank for £26,085, and to sundry creditors for £5988, a total of £32,073. Shares held in reserve numbered 23,850, which can only be issued at, or above, par. The ore in reserve on December 31st was 177,300 short tons, worth 46s. 2d. per ton. Since then 23,411 tons have been treated for a yield of £70,423, or 60s. per ton; costs have been £25,406, or 21s. 8d. per ton, and profit £45,017, or 38s. 4d. per ton. The profit has been earned by treating ore 13s. 10d. per ton above the grade of the ore reserves, and the question is whether with the extra 5 stamps and tube mill running and treating 6000 tons a month of ore of 46s. 2d. per ton grade, or £13,850, the same profit of £9000 a month can be earned. To accomplish this there must be a profit of 30s. per ton on 6000 tons, which will leave only 16s. 2d. per ton to cover costs, against 21s. 8d. per ton hitherto. The costs have been made up as follows:—Mining, 8s. 7d.; milling, 10s. 1d., and development, 3s.; total, 21s. 8d. In March, mining was as low as 6s. 9d., and milling, both in May and July, was only 9s. 6d., the two items combined totalling only 16s. 3d. Adding 3s. for development, this makes 19s. 3d. per ton, or 2s. 5d. below the average for the five months. Even with the full plant going it is hardly likely that any reduction in cost of mining and development will take place, but 9d. may come off milling, and reduce the gross mine cost to 18s. 6d. This would leave a profit of 27s. 8d. per ton, or £8300 a month, equivalent to £100,000 a year. Allowing £12,500 for depreciation and London office expenses, there would remain £87,500, or sufficient to pay 3s. 6d. a share yearly. On this basis the shares at 20s. each would pay 17½ per cent. interest. It remains for the future to decide whether such results will be obtained.

Since abandoning their option on the Great Victoria, the directors of the Great Boulder Co. have turned their attention to Alaska, where they have taken an option on a mine on the Cleveland Penisula, and Mr. Frank Leahy, recently at Marvel Loch, and previously on the Great Boulder, is going to supervise operations. The only gold mines known in Alaska are the Treadwell group, which have for years paid dividends on 8s. ore, and it seems rather foolish to leave the Great Victoria with its 100ft. lode, worth at least double that amount, for snow-clad Alaska. The Great Boulder has cash resources of fully £150,000, is still treating 18,000 tons monthly for a yield of £47,000, and a profit of £25,000, and paying yearly dividends of 3s. a share, or £262,500. On December 31st, 1912, the ore reserves amounted to 731,300 short tons of a recoverable value of 52s. 7d. per ton, and, since then, 124,871 tons have been treated for a return of £328,952, or 52s. 9d. per ton. This shows how carefully Mr. Hamilton's estimates of ore values are made, and if his tonnage figures are as reliable, there were still over three years' supplies ahead of the mill on December 31st.

The Associated directors, who have not the excuse of the Great Boulder directors for leaving their mine in despair, have taken an interest in the Keefey mine, near Cobalt, in Ontario. This mine's only attraction is a 3in. silver vein proved at two levels to be worth 4647 oz., or, say, £600 a ton. A mine with such a narrow vein would not be touched by any English Company, if situated in Australia. However, the directors are hoping it is another La Rose Consols, which holds 360 acres at Cobalt. For the last five years this mine has yielded 6000 tons of ore yearly for a yield of 3,000,000 oz. of silver, all taken from 3 to 4in. veins. In fact, the Cobalt district during the last five years has produced twenty to thirty million ounces of silver yearly from such narrow veins. With regard to the Associated mine, the main shaft has not been sunk one foot since Mr. Duncan McAulay took charge in September, 1911, and is only 2285ft. deep. Since Mr. McAulay's advent development expenditure has been cut down from 4s. 6d. a ton, or £2400 a month, to 3s. a ton, or £1600 a month, and all the money has gone in surface prospecting, such as costeans, potholes, etc. Seeing that the absolutely richest level in the Great Boulder was at 2200ft., where the ore-shoot carried 120s. a ton for a length of 1000ft., and a width of 15ft., Mr. McAulay's policy seems to be a mistaken one. When one further considers that some of the richest ore-shoots ever opened up in the Golden Horseshoe are now being developed at 2480ft., 2630ft., and 2780ft., the moribund condition of the Associated is still more inexplicable. The Associated mine, during 1912, treated 125,169 tons for a yield of £161,000, and paid a dividend of £12,384. The ore reserves on March 31st, 1913, were estimated at 500,000 tons of a recoverable value of 25s. per ton, the same as a year previously. This tonnage is equivalent to 4 years' supply for the mill. Since the year closed the mill has been treating 10,800 tons monthly for a return of £12,800, and a profit of £1240. On March 31st, 1913, the Associated had liquid assets of £130,000, the result of profits earned in W.A. This money, which it is now proposed to squander abroad—the Articles of Association of the company having been altered to give directors that power—has yielded no tax to the Government, as only dividends are taxed in W.A. Already £200,000 to £300,000 of profits have emigrated entirely free of tax, most of which has been lost in wildcat ventures.

The Kalgurli is another shocking example of "stand at ease!" "Stand easy!" In June, 1910, the main shaft was completed to 1900ft., and, at the same time, a new Fraser and Chalmers winding-engine with a capacity of hauling 2 tons from 3000ft. was installed. Not a foot has since been sunk, because the 1750ft. and 1850ft. levels proved disappointing, but ore is ruthlessly being broken out and crushed, and dividends right up to the hilt of profits are being paid so that directors can collect their full fees and commissions on dividends. Ore reserves, which on July 31st, 1910—when sinking stopped—were given as 400,000 tons, were reduced on July 31st, 1912, to 250,000 tons, and what they were on July 31st, 1913, is still a mystery. So far as the new winding engine is concerned, it might as well have never been erected, as the old one was quite serviceable to 1900ft.

At the Yuanmi mine the sulphide mill to work in conjunction with the oxidised mill has just started. The new plant consists of an Edwards duplex roaster of 60 rabbles, a No. 8 Krupp ball mill, rotary drier, etc., of 100 tons daily capacity. After being crushed and roasted the ground sulphide ore joins the oxidised for re-grinding, agitating in cyanide solution, and vacuum filtering. A Crossley gas engine of 100h.p. has been added to the one of 200h.p. to drive the additional plant, and wood-gas is supplied by a down-draught wood-generator, which consumes ordinary 5ft. long firewood. This generator was built at Hoskins foundry, Perth, for B., M. and Co., who claim it to be a "Commonwealth." The Cambridge Co., who have all along had their generators built by Hoskins, say it is a "Cambridge," and a law case is inevitable. According to calculations based on figures issued by B., M. and Co., this Cambridge-Commonwealth generator, consuming wood costing 13s. a ton, effects a saving over a Crossley generator, consuming charcoal at 59s. a ton, of 3.7d. per ton of ore treated, or £15 9s. per 1000 tons treated, the proportion consumed being 171 tons wood, against 100 tons of charcoal.

The cost of transporting Victorious sulphide ore from Ora Banda to the Associated Northern's sulphide mill on the Iron Duke lease, Kalgoorlie, pans out at 25s. a ton. After the test parcel has been treated it is probable that an Edwards roaster and a Krupp ball mill on the lines of the Yuanmi plant will be installed. Mr. G. M. Roberts says that the final decision will probably be arrived at this week. As the foundations of the Huntington mills were specially designed to suit Krupps 8, the substitution of the latter for the former will be an easy matter.

## MINING IN QUEENSLAND.

### Anakie Field.

(From Our Correspondent.)

Sapphire Town, August 23.

Mr. H. Bengtsson, who recently arrived here, is endeavouring to open up a direct trade in gems from this field with the Parisian market, for which the fancy stones—greens, yellows and particolours—obtained here are thought to be suitable. Mr. Bengtsson states that while in London recently he called at the office of the Agent-General for Queensland and endeavoured to see some samples of Queensland sapphires, but was informed that there were none on show. This is surely a matter that needs to be rectified, and it is to be discussed at the next meeting of the local Progress Association.

A miner last week unearthed a fine particoloured (blue and yellow) stone of 11 dwt.

A new washing machine is being erected at Retreat Creek by Messrs. McCrystal and McIntosh. The plants at the township are taxed to their utmost capacity owing to the increased number of surface claims that have been recently taken

## MINERAL RETURNS.

The production of gold from the Rand mines during June was as follows, the figures for June, 1912, being added in parentheses:—Ore milled, 2,234,368 (2,158,722) tons; gold produced, 747,077 (753,936) fine oz., valued at £3,173,382 (£3,202,517), the averages being 6.54 (6.75) dwt. and 27s. 9d. (28s. 8d.) per ton crushed. The working cost amounted to 17s. 9d. (18s. 8d.) per ton, and the working profits are set down at 9s. 11d. (10s. 3d.) per ton. The dividends declared amounted to £3,526,129 (£3,332,465). For the half-year the corresponding figures for this year and last were:—Ore milled, 13,883,192 (12,847,562) tons; gold produced, 4,640,421 (4,542,907) fine oz., valued at £19,711,256 (£19,297,044), the averages being 6.59 (6.95) dwt. and 28s. (29s. 6d.) per ton. Working costs, 17s. 11d. (19s.), and working profit, 9s. 9d. (10s. 1d.) per ton. Dividends paid, £4,164,243 (£3,837,012).

In 1885, when the Witwatersrand reef was discovered, the value of the year's output of gold was just over £6000. Last year the total value was £37,182,795, or, including a few mines outside the Rand area, was £38,757,560! A few of the "outcrop" mines are now nearing the end of their life, but the deep level mines have many years of life before them. Some of these mines are now working more than 4000ft. deep, and the extraordinary regularity of the reef is still maintained.

The following returns of minerals other than gold are recorded in the monthly statement of the Transvaal Chamber of Mines for May, the figures for May, 1912, being given in parentheses:—Coal, 457,063 (422,844) tons; silver, 83,747 (83,676) fine oz.; copper ore, 333 (97) tons; tin ore, 279 (261) tons. The totals for 5 months were:—Coal, 2,115,877 (1,923,662) tons; silver, 423,270 (407,104) fine oz.; copper ore, 1643 (430) tons; tin ore, 1343 (1247) tons.

The value of Queensland's mineral output for 1911-12, according to the Treasurer's Budget statement, was £4,175,355, which, with one exception, was the highest in the annals of mining in Queensland.

## MINING IN NEW ZEALAND.

(From Our Correspondent.)

Very encouraging reports are now being received from the Ross Goldfields mines, Hokitika, the water having been overcome sufficiently to allow of the Cassius workings being continued. Although payable ground had been located in the northern and southern portions of the Cassius workings the management considered, in the interests of all concerned, that before this is lifted and treated further development work is necessary. This will occupy some time, and then it is expected that the precious metal will be extracted from the workings in more than payable quantities. The chairman of the company, Mr. G. Davis, visited the mine in the middle of August, and subsequently stated that he was highly pleased with the prospects before them, though he wished to guard himself against giving a wrong impression. After stating that good payable ground had been located in the mine, Mr. Davis went on to refer to the fact that reports had been circulated to the effect that the present shaft and plant were not adequate to successfully work the mine. This, he declared, was altogether erroneous. The manager estimated that fully 6000 trucks per week will be lifted and treated, providing the areas of ground prove to be extensive. This should allay the feelings of those who are dubious in regard to the handling capacity of the plant, said Mr. Davis, who added that there was no fear of a sudden inrush of water such as had occurred in the past, and active mining operations would therefore not be interfered with. In mining there were always obstacles to be contended against, but at the present juncture there was less likelihood of stoppages than ever before in the history of the mine. Mr. Davis expressed his complete satisfaction at the manner in which the previous difficulties had been surmounted, and referred eulogistically to the able manner in which the company's interests had at all times been conserved. Those closely associated with the company's property are very sanguine as to the payableness of the proposition, the prospects in some instances exceeding anticipations.

During the four weeks ended on August 2nd the Waihi G.M. Co. treated 14,735 tons of ore for a return of bullion worth £25,946, as compared with £25,279 from 14,568 tons in July. The value of the month's yield was higher than that for any previous month this year. The value of the total output from the mine to the date mentioned has been £10,303,241, and dividends and bonuses amounting to £4,532,616.

An important development in the Waihi Grand Junction mine at the low (No. 6) level recently notified to the London office of the company by telegram as follows:—"Empire main lode, No. 6 level east: At a distance of 740ft. passed through the fault line, barely distinguishable. East of the fault have driven upon the lode a distance of 15ft. Width of the reef 4ft. 6in., both walls exposed, value £4 10s. The latest information is that the level has been advanced to 760ft., where the width of the reef is 5ft. 2in. One wall is exposed, value £10 18s." The drive going east on the Empire reef, at No. 6 level is in good grade sulphide ore. This run of values corresponds with the run about 90ft. in length opened up in the level overhead, but in the bottom workings the values have come in some distance west of the point where the ore was payable at No. 5 level.

The Komata Reefs G.M. Co., Hauraki, crushed only 200 tons of ore during July, from which the amalgamating plant produced £285 worth of bullion. Compared with the return for the corresponding period of last year, when 500 tons were crushed and treated for a yield of bullion valued at £1443, this shows a decrease of £1158. The value produced during the seven months has been only £3973, and at the same rate the year's output would be only £6811, as compared with £15,377 in 1912. It should be borne in mind that the mine was not working during May and June, but, making full allowance for that fact, the falling off is notable, and almost ominous in view of the fact that returns have been declining year by year for some time, not only in total value, but also in the tonnage dealt with. In 1908 the ore amounted to 28,270 tons, and the bullion was worth £44,309.

The half-yearly report of the Waihi-Paeroa Gold Extraction Co. states that owing to the unprecedented drought continuing up till the end of May last the operations for the year ended June 30th were so seriously affected that a profit of only £2024 12s. 8d. was made. For the five months to the end of May only 55,500 tons were treated for £14,600 worth of bullion, or an average of only £2920 per month, whereas for June and July, since the river had risen and the new flume had been working, the returns had been £5030 and £4470 from 13,400 and 12,500 tons respectively. At the same time, so much overtime had to be worked in getting sands to keep the works going, that expenses were considerably increased. To prevent a recurrence in a similar dry season, a permanent bridge had been erected across the river in front of the works. The river at this point makes a horseshoe bend, and with 15 chains of flume across the bend, the treated sands were being discharged into the river nearly a mile below the works. For the sum of £50 cash and £12 10s. per annum, the necessary rights were secured from the native owners of the properties through which the flume passes, for 21 years, with a right of renewal. The balance-sheet showed that the bank overdraft of £7970 on June 30th was being rapidly reduced by profit, and by reducing the stocks of cyanide, flints, etc. The number of shareholders on the register was 154.

The New Zealand Crown Mines Co. treated 1468 tons of ore during July for a bullion return of £2367.

---

## THE COAL MINING INDUSTRY.

### New South Wales.

### Northern District.

(From Our Newcastle Correspondent.)

Reference was made last week to the cases against some of the wheelers of Pelaw Main colliery who had stopped work because, as they alleged, the travelling roads were too dusty to work in, and who were proceeded against for throwing the pit idle. Further evidence was taken for the defence, and his Honour, Mr. Justice Heydon, reserved his decision until he had had time to go carefully through the evidence. His decision was delivered on the 26th ult. His Honour said he thought that no case had been made out against two of the six defendants—Seamer and Austin. In the circumstances, he would dismiss the information against them, but without costs, as he thought the two youths had only themselves to blame for having been prosecuted. The defence, in mitigation of the penalty, was that the travelling roads were bad because of the quantity of dust on them. "No employer," said his Honour, "is entitled to the smallest sympathy or assistance who drives his employee to a strike by making the conditions of their work intolerable. In every case, consideration should be shown, and every reasonable pains taken, to make necessary work as little unpleasant as possible. The defence is, therefore, of a quite legitimate character, and is entitled to careful examination. Strikes of protest stand, as between employer and employee, in a different position to strikes of demand. Still, their consequences may be serious, and, as regards the public, there is very little difference." However, after making every allowance that he could for the defendants, he was driven to the conclusion that their action was ill-considered and quite unjustifiable. It showed, on their part, a most unfortunate and aggressive, and, he thought he must say, even an insolent spirit. They would not trust the manager and his promises, and insisted on a new (and, as the manager thought, dangerous) right—that of inspecting the mine for themselves, instead of taking the word of the responsible Government and lodge inspectors. In the circumstances, he must impose a fairly substantial penalty. He would fine each of the defendants, Scott, Davis, Grubb, and Morrison, three guineas, and would allow two guineas costs in each case.

A meeting of the delegate board of the Colliery Employees' Federation was held at Newcastle last week. A report was given of the result of the interview with the Minister for Labour, respecting the desire of the federation to have another tribunal appointed, in addition to the wages board, to deal with disputes at certain of the mines in the Newcastle district. The Government had refused to take the course suggested, and the meeting decided, after discussion, that no attempt would be made to force on these disputes until after the small-coal and afternoon-shift questions have been dealt with by the wages board. At the same time, the speakers at the meeting thought that there should be some power to appoint subsidiary boards to deal with disputes that might crop up while a board was dealing with important matters, and a motion was carried, asking for an amendment of the Industrial Arbitration Act in this respect.

At the same meeting, consideration was given to a notice of motion from the Abermain lodge, as follows:—"That we, the members of the Colliery Employees' Federation, strongly protest against the unwarranted remarks made by Mr. Justice Heydon during the hearing of an application by our general secretary for the constitution of a wages board under the 1912 Act for the miners and other workers in the Northern District collieries, and also during the hearing of an application for the removal of an injunction placed upon certain members of the federation. That the executive officers be instructed to communicate with all the other large unionist bodies in New South Wales, inviting them to join in approaching the Government, and making strong representations to the effect that such an exhibition of bias on the part of Mr. Justice Heydon unfits him for the position of President of the Industrial Court, and, further, that all Members of Parliament representing constituencies in the Northern District be requested to bring the matter before the House." There was long debate upon the motion, during which the speakers expressed strong indignation at the remarks of his Honour. It was said that the remarks reflected unjustifiably upon the Northern miners, and that his Honour's action in thus showing a hostility and violent prejudice against such a body of workmen had aroused feelings of distrust as to what he might do in the event of industrial matters in which the miners were concerned being brought before him. The resolution was carried unanimously.

Two stoppages occurred last week—one at the West Wallsend colliery, and one at the Dudley colliery. In the former case, one of the wheelers went home of his own accord, because he was not satisfied with something in connection with his work, and the other wheelers then stopped. However, the mine was at work again two days after the trouble arose. At the Dudley colliery a dispute arose over wet places, and the men stopped work. The stoppages caused considerable loss and inconvenience to the two mines, and also to the shipping waiting for coal.

An agreement has been entered into between the management and the men at Hebburn colliery, in the Maitland district, with respect to the working of the top seam, and has been ratified by the Colliery Employees' Federation. The company has spent over £13,000 in preparing for the opening out of this seam, and will soon have a big output from it. Local agreements, in spite of the outcry in respect of the Minmi agreement, are in favour with the miners, and in ordinary circumstances the federation agrees to them being framed. However, there were certain features in connection with the Minmi agreement which brought about a rupture between the federation and the lodge.

### Western District.

### The Wait-for-Trucks Question.

(From Our Lithgow Correspondent.)

A conference was held last week between representatives of the miners and the mine managers regarding the time which should be waited by a miner when skips or trucks are not available. After the matter had been discussed in all its bearings, the miners' representatives agreed to submit a proposed agreement to the men. This will be done in the course of a few days.

The shortage of trucks experienced at the local and district collieries is a regular "old man of the sea," and it is now the exception rather than the rule for a full shift to be worked. Practically, few full days were worked at any of the collieries during the past fortnight, while last week the trouble reached its zenith so far. The Invincible colliery, Cullen Bullen, suffered the most, as only six shifts were worked during the fortnight. The Vale of Clwydd management state that "an attempt was made to work ten shifts, but it was a very poor one. There was much broken time, and the fortnight was a very bad one for the men. One day was lost through the accident." The Zigzag worked nine days, though some of these were broken. Thursday, Friday and Saturday were idle owing to the truck scarcity. Oakey Park managed 9½ days of broken time, truck shortage again being a contributing factor. At the Bolden colliery there was a great deal of lost time. At the Lithgow Valley mine about nine days were worked, while about the same number was put in at the Hermitage mine. It is apparent, from the above, that the industry is suffering severely. The Railway Commissioners are asked to note this fact.

Commenting on this shortage some time ago, the Treasurer and Minister for Railways (Mr. Cann) said: "The shortage is largely due to the immense amount of wheat coming to the city. We are doing all we can to decrease the shortage by building. We have 625 waggons building at the Clyde works, and Richie Brothers are under contract to supply 339 waggons for us. The sums to be spent before June next are, respectively, £64,621, £32,569, and £166,510. From these figures it will be seen that we are making all the haste we can to increase the supply." June has long passed, and colliery proprietors and miners alike would like to know whether these contracts were fulfilled, and, if so, where is the additional rolling stock?

### Southern District.

(From Our Wollongong Correspondent.)

If the oil fuel menace develops, this district will suffer more than the others, as the larger part of the southern coal output goes into bunkers. Meantime, trade continues very good.

The coking plant of G. S. Yuill and Co., erected at Corrimal to treat the small of the Corrimal Balgownie Colliery, and which were started at work about this time last year, are giving trouble, owing to the foundations, which were of slag, not standing the heat. Only half a dozen or so of the 30 odd ovens are now workable. As the effluent gases are utilised in generating electricity which drives the plant of the colliery, from 3 to 4 miles distant, the ovens' failure has put the management about somewhat. The Federal Coke Co. have had a short experience with half a dozen ovens, built as additions to their plant; in these the fumes are all carried to one stack instead of to single chimneys. It is notable that less fume is visible from this one stack than from any single chimney; the coking, also, is very satisfactory. At the Mount Pleasant coking plant half a dozen ovens of similar design are being built. The Federal Coke Co. should now be realising how much they have lost by not designing their plant to utilise waste gases in generating electricity. Being within the boundary of a considerable town, which is now inclined for an electric-lighting scheme, this plant could have supplied current at a price which would have defied competition.

Although the fact has not been published as usual, it is known that the delegate board has carried a motion which had been sent on from a lodge, that the district officers be asked to resign. This motion, with the other proceedings of the board, goes the round of the district lodges, and, if carried by a majority, takes effect. In that case, all would be eligible for re-election, and a much vexed question would be decided practically by ballot.

---

# VISIT OF BRITISH ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE.

## Distinguished Visitors.

Great expectations are focussed in the visit to Australia next year of representative members of the British Association for the Advancement of Science and other visitors, and great preparations are being made for their reception and for the holding of the congress. It is expected that the visitors will reach Fremantle on August 4th, Adelaide on August 8th, Melbourne on August 13th, Sydney on August 20th, and Brisbane on August 27th. Mr. A. C. Rivett, lecturer in Chemistry at the Melbourne University, is the organising secretary, and has charge of the arrangements. Each State has appointed a committee, and a federal council, consisting of five members of each State committee, two members of the Federal Parliament from each State, and the chief officers of Federal institutions, Chambers of Commerce, Associated Banks, and other organisations, will look after the administrative work.

The following names were cabled to the Australian press last week as those of men who have signified their intention of joining the party:—

Mr. Henry Edward Armstrong, Ph.D., LL.D., F.R.S., Professor of Chemistry at the City and Guilds College, South Kensington.

Mr. W. J. Ashley, M.A., M. Com., Professor of Commerce since 1901 and since 1902 Dean of the Faculty of Commerce in the University of Birmingham; Professor of Political Economy, Toronto University, 1888-92.

Mr. William Bateson, M.A., F.R.S., Silliman lecturer at Yale University, 1907, and director of the John Innes Horticultural Institution since 1910.

Mr. Alfred Gibbs Bourne, C.I.E., F.R.S., F.L.S., C.M.Z.S., Dirtctor of Public Instruction, Madras; assistant to Professor E. Ray Lankester, 1879-1885.

Mr. Gilbert Charles Bourne, F.R.S., D.Sc., Oxon., F.L.S., Linacre Professor of Comparative Anatomy, Oxford University.

Mr. Frederick Orpen Bower, Sc.D., F.R.S., Regius Professor of Botany, Glasgow University, since 1885.

Mr. William Spiers Bruce, LL.D., F.R.S.E., formerly director of Scottish Oceanographical Laboratory, Edinburgh; leader of the Scottish National Antarctic Expedition 1902-1904, discovered 150 miles of the coast line of Antarctica, naming it Coats Land; Heriot Research Fellow of Edinburgh University.

Mr. Henry D. Conner, K.C., M.A.

Sir Henry Hardinge Cunynghame, vice-president of the Institute of Electrical Engineers; assistant Under-Secretary at the Home Office; secretary of the Parnell Commission, Behring Sea Arbitration, and other Commissions.

Mr Arthur Dendy, D.Sc., F.R.S., F.L.S., F.Z.S., corresponding member of the Royal Societies of Victoria and Tasmania, Professor of Zoology, King's College, London University; demonstrator and assistant lecturer in biology at Melbourne University, 1888-94.

Mr. W. D. Eggar, of Eton College.

Sir Thomas Richard Fraser, Kt., M.D., hon. physician to the King in Scotland; president of the Royal College of Physicians, Edinburgh, 1900-1902; president of the Association of Physicians of Great Britain and Ireland, 1908-9; president of the Indian Plague Commission; laureate of the Institute of France.

Mr. John Walker Gregory, F.R.S., D.Sc., M.I.M.M., Professor of Geology at Glasgow University since 1904; director civilian scientific staff, Antarctic expedition, 1900.

Mr. Alfred Cort Haddon, M.A., Sc.D., F.R.S., University Reader in Ethnology, Cambridge; former president of the Royal Anthropological Institute, Cambridge Antiquarian Society.

Mr. Alfred Daniel Hall, M.A., F.R.S., commissioner under the Development Act, 1909; director of the Rothamsted Experimental Station (Lawes Agricultural Trust), 1902-1912; writer on agricultural subjects.

Sir Walter Noel Hartley, D.Sc., formerly vice-president of the Institute of Chemistry of Great Britain and Ireland; late Professor of Chemistry and Dean of the Faculty of Chemistry, Royal College of Science, Dublin.

Mr. William Abbott Herdman, D.Sc., F.R.S., F.L.S., Professor of Natural History, Liverpool University, since 1881; general secretary British Association, 1903.

Sir Thomas Henry Holland, K.C.I.E., D.Sc., F.R.S., F.G.S., Professor of Geology, Manchester University since 1909.

Mr. Charles William Kimmins, M.A., D.Sc., Chief Inspector of the Education Department of the London County Council since 1904.

Mr. Adam Willis Kirkaldy, M.A., Professor of Finance, Birmingham University.

Mr. George William Lamplugh, F.R.S., District Geologist of the Geological Survey Department of Great Britain.

Sir Oliver Joseph Lodge, F.R.S., D.Sc., Principal of the University of Birmingham since 1900; president of the Mathematical and Physical section of the British Association in 1891; president of the Society for Physical Research, 1901-1904.

Sir Charles Prestwood Lucas, K.C.M.G., assistant Under-Secretary of State and head of Dominions branch Colonial Office, 1897-1911.

Mr. Charles James Martin, M.B., D.Sc., F.R.S., director of the Lister Institute of Preventive Medicine; Professor of Experimental Pathology, London University. .

Mr. John Perry, M.E., D.Sc., LL.D., F.R.S., Professor of Mechanics and Mathematics, Royal College of Science, South Kensington; general treasurer British Association.

Mr. William Jackson Pope, F.R.S., F.I.C., F.C.S., F.C.G.I., Professor of Chemistry, Cambridge University since 1908; discoverer of the optical activity due to asymmetry of nitrogen, sulphur, selenium and tin atoms.

Sir William Henry Preece, F.R.S., LL.D., president of the Institution of Civil Engineers, 1898-99; consulting engineer to the Colonies; author of several works on telegraphy and the telephone.

Sir William Ramsay, LL.D., D.Sc., M.D., Ph.D., F.R.S., F.C.S., Professor of Chemistry, University College, London, 1887-1912; honored by the principal nations for chemical research work; author of numerous scientific works.

Mr. Ernest Rutherford, F.R.S., a native of New Zealand, Langworthy Professor and Director of Physical Laboratories, Manchester University, since 1907; published many works on radio-activity.

Sir Edward Albert Schafer, LL.D., Sc.D., M.D., F.R.S., Professor of Physiology, Edinburgh University, since 1899; president of the British Association, 1912.

Mr. Albert C. Seward, M.A., F.R.S., Professor of Botany, Cambridge, since 1906, joint editor with Mr. Francis Darwin of "More Letters of Charles Darwin."

Mr. Grafton Elliott Smith, Professor of Anatomy, University of Manchester.

Mr. Richard South, Editor of the "Entomologist."

Lieutenant-Colonel Sir Richard Carnac Temple, Indian Army (retired); formerly president of the Bombay Anthropological Society; author of many books on India; editor and proprietor of the "Indian Antiquary" since 1884.

Sir Edward Thorpe, Kt., Ph.D., D.Sc., LL.D., F.R.S., late Professor of General Chemistry and Director of the Chemical Laboratories, Imperial College of Science and Technology, South Kensington.

Sir Everard im Thurn, K.C.M.G., Governor of Fiji and High Commissioner of Western Pacific, 1904-10; explorer in British Guiana.

Mr. Frederick T. Trouton, F.R.S., Quain Professor of Physics, University College, London, since 1902; published "Trouton's Law" on molecular latent heat.

Mr. Arthur Smith Woodward, F.R.S., keeper of Geological department, British Museum; research work in extinct vertebrata, especially fishes; made excavations in Greece for the trustees of the British Museum in 1901.

Mr. Edwin Sharpe Grew, a former Editor of The Illustrated Scientific News, will accompany the party as official reporter of the Congress.

# INDUSTRIAL METALS PRICES.

## Effect on Broken Hill Products.

As chairman at the half-yearly meeting of the Broken Hill Proprietary Co. Ltd. held last Friday, Mr. John Darling made some interesting remarks on the movements of the marekts for lead, spelter and silver, the three metals in which Broken Hill mines are principally interested. Recently, he said, the fluctuations had been of considerable consequence. The average market value for lead in London for the half-year ended November 30, 1912, was £19 4s. 7d., as against £17 5s. 9d. for the half-year ended May 31, 1913, and for spelter, £26 7s. 2d. for half-year ended November 30, 1912, as compared with £25 4s. 9d. for the following half-year. The highest price for lead in London in 1912 was £22 2s. 6d. per ton, and the lowest £15 7s. 6d., while spelter was £27 7s. 6d., against the lowest, £25 per ton. During the six months ended May 31, 1913, the highest market price for lead in London was £19 15s., and the lowest £15 7s. 6d., while the highest quotation for spelter was £26 5s., and the lowest £22 17s. 6d.

It was necessary for them at all times to be largely guided by the opinions of experts in the metal markets. Lead, for instance, had somewhat unexpectedly improved in price, and the experts gave as a reason the lightness of stocks and the consumers buying from hand to mouth, creating a steady demand on a limited production. Another great factor was the unsettled conditions obtaining in Mexico, which was estimated to result in a reduced output from that country at the rate of about 50,000 tons per year. It was difficult to foresee how long this condition of affairs would continue, but while it lasted it was possible for the present (what he considered) high prices to rule. On the other hand, existing prices might cause substitutes to be sought, and, if successful, this would, at no distant date, cause a decreased demand and consequent reduction in values. It must be remembered that present prices were above the average, and they must do their utmost to keep the output at its highest, so that when the decline took place they should a least have realised as much as possible at the full rates.

While lead had advanced, spelter had declined. The present price of £21 2s. 6d. per ton might be considered a reasonable one, but there was no certainty that even that rate would be maintained, some experts expressing an opinion that a decline was more probable than any improvement.

Silver was a smaller factor with them; but it was to be remembered that on their production of 2,700,000 oz. for the six months a decline of 1d. per oz., such as they had experienced, represented a sum of £11,250. As to the future of the silver market, experts are, as usual, fairly cautious, and do not look for any marked fluctuations. They point out that much may depend upon affairs in China being more unsettled and over a wider area, in which case an improvement might be looked for; in addition, the troublous condition of affairs in Mexico is also a factor by diminishing supplies. Generally speaking, however, the opinions expressed appear to favour no early material alteration.

After all, however, Mr. Darling thinks that the outlook for the current six months is, generally, fairly promising.

---

# COMMONWEALTH OIL RECONSTRUCTION.

Our Lithgow (N.S.W.) correspondent supplies the following statement of the Commonwealth Oil Corporation's scheme of reconstruction, to which the Chancery Division of the High Court recently gave its sanction:—

The company was registered in December, 1905, and the original capital was £800,000—£500,000 preferred ordinary and £300,000 deferred ordinary shares—and not more than that had been issued, but there was an increase of capital in March, 1910, to £1,200,000. The new shares were never issued, the actual issued capital was £500,000 preferred and £235,007 deferred shares. The debenture issues were as follows:—On January 3rd, 1908, £150,000 5½ per cent. debentures. They had a floating charge over the whole undertaking assets of the company. In July, 1909, £400,000 6 per cent. second mortgage debenture stock was created, and that gave a floating charge over all assets. The company did not earn sufficient income to pay interests due on its debentures, and in December, 1911, holders of debentures commenced an action against the company and receivers were appointed. A consultative committee, representing all classes of persons interested, was appointed to act in conjunction with the receivers, and a scheme was prepared which, in effect, was that an issue of £350,000 6 per cent. prior lien debentures should be created for the purpose of raising capital. The old £150,000 first mortgage debentures to remain a second charge, but the interest on them to be 6 per cent. instead of $5\frac{1}{2}$ per cent., as previously, and the arrears of interest to be paid in cash. The scheme provides also for a new creation of £290,000 6 per cent. income debenture stock, and for the second mortgage debenture stock, holders getting 60 per cent. of the face value of their debenture stock and foregoing arrears of interest. Creditors of the company for advances upon loans, rather less than £100,000, will get 50 per cent. of their face value in the income debenture stock. The unsecured creditors are to be paid in full; £170,000 is to be issued as preference shares, as a bonus for underwriting commission, to those who took up the prior lien stock. All the existing preferred and deferred ordinary shares, consisting of £1,200,000, are to be written down from £1 to 5s. per share, and the capital is to be reduced to £656,244.

## ROUND HILL (T.).

(Contributed.)

A mine that is attracting a good deal of attention in Tasmania at the present time is the Round Hill silver lead mine. The property is situated in the Kentish district, about 15 miles from the town of Sheffield. At present the ore is carted to Sheffield, and thence to Railton, a distance of 21 miles, before it reaches the railway; and it is fortunate for the proprietors that it is situated in a good agricultural and farming country where cattle are cheap and carting is done at a reasonable rate, as silver-lead ores will not usually bear heavy freights. It costs the company about 23s. to deliver the ore at the port of Devonport, this including railway freight. The building of the Railton-Wilmot line, which is now in progress, will bring the mine within eight miles of a railway station, and thus considerably lessen this charge.

Some account of the mine appeared in the "Mining Standard" about five years ago. Since that time good progress has been made, as the road communication has been improved, the concentration mill erected, all the necessary surface works, such as tramways, smithies, and mine buildings, have been completed, and a considerable amount of development work done, which has proved the deposit to be a large and valuable one. On the eastern workings, where a tribute party is engaged, there are eight stopes of ore averaging about 15ft. in width, one face being over 30ft. wide. The firsts are not hand-picked, the ore being sent direct to the mill, and about one ton of good marketable concentrates is produced from 9 tons of crude ore. Some of this ore has given a very good bulk assay of silver and lead, and it appears as if the silver assay is improving, as the drives get into the solid country, away from the weathered zone. One parcel of 35 tons shipped lately gave a bulk return of 125 oz. of silver and 50 per cent. lead to the ton, and another of 7 tons gave 157 oz. silver and 55 per cent. lead.

The latest survey of the mine made by Mr. Wilkes, C.E., shows 15,000 tons of crude ore in sight. This is worth at present market rates about 20s. per ton at the mine; but there is a much larger amount of possible and probable ore in the various workings of which no account has been taken, as the survey dealt only with the eastern workings. That the deposit is a very extensive and valuable one there can be little doubt.

The Government Geologist's report has not yet been published but in his preliminary report, which was issued some months ago, he seemed to be of the opinion that as depth was attained the galena would be replaced by tin ore.

At present no sinking is being done, as about 100ft. of backs can be obtained by continuing the eastern drive into the Hill, and the western workings can also be proved by tunnels.

Shares in the company are paid up to 1s., and it is claimed that this value is fully represented by the assets, including mine buildings, concentrating mill, water scheme, and proved ore in sight. As calls had to be made in order to equip the property, they have been selling as low as sixpence, and at the time of writing are obtainable at about eightpence. With this mine out of debt and making a profit, they are not likely to continue at this price when the Railton-Wilmot line is completed.

## PUBLICATIONS RECEIVED.

Official Year-Book of the Commonwealth of Australia, 1913. By G. H. Knibbs, C.M.G., F.R.S.S., Government Statistician. (McCarron, Bird and Co., Melbourne). This is the sixth issue of Mr. Knibb's invaluable annual, which has from the first commended itself to appreciative minds as almost an ideal work for statistical reference. Primarily intended to embody each year the actual position of public affairs as then existing, the scope of the work was extended so as to cover the whole period of Australian history; but in the main, the ground covered is the period since the establishment of Federation. It has been necessary, in order to keep the Year-Book within moderate dimensions, to drop out certain items year by year so far as the past was concerned, and it may be necessary, therefore, to refer in some instances to previous issues, but as far as was practicable the figures relating to every topic from 1901 to 1912 have been included in the present volume. Several new features of interest have been incorporated herein, amongst which may be mentioned sections dealing with the Mineral Springs of Australia and with Labour and Industrial statistics. The section on Pastoral Production has been enlarged, and, for the first time, the development of the local wool market and the destination of the clip has been included. When it is mentioned that the general results of the recent Federal elections are given here, it will be recognised that an endeavour has been made to bring the matter as nearly up to date as possible, although the end of 1912 is usually the latest date for which figures were available; the latest available on any subject have been given. The system of presenting statistics graphically by means of diagrams or "graphs," which has hitherto proved so illuminative, has been adhered to, and this volume contains about 40 of such ingenious illustrations, besides a dozen maps. Whatever aspect of the various activities of the Commonwealth may interest an intelligent and thoughtful reasoner, he may with every confidence turn to Mr. Knibb's Year-Book for information, and even if it have appeared in an earlier issue and be excluded from this one, the index on page viii. will show him where to look for it. As usual, the general index is worthy of the volume; thoroughness has been the watchword throughout, and this issue will well sustain the great reputation which the Year-Book has won in the motherland and in foreign countries.

* * *

Victorian Year Book, 1912-13. Part i., Introduction, Constitution and Government; Part ii., Finance; Part iii., Population.

* * *

Coalfields of India. By Prof. V. Ball, C.B., LL.D., F.R.S. Revised and largely re-written by R. R. Simpson, M.Sc., Inspector of Mines. (Memoirs of the Geological Survey of India, Vol. xli.—Geological Survey Office, Calcutta; Kegan Paul, Trench, Trubner and Co., London. 1913. Price 6s. 8d.).

* * *

Records of the Geological Survey of India. Vol. xliii., Part 1. (Geological Survey Office, Calcutta; Kegan Paul, Trench, Trubner and Co., London. 1913.)

* * *

American Institute of Mining Engineers, Transactions, Vol. xliii. (A.I.M.E., New York, 1913).

* * *

Mineral Production of Canada in 1911. By John McLeish, B.A., Chief of the Division of Mineral Resources and Statistics. (Department of Mines, Ottawa, 1913).

* * *

Magnetic Iron Sands of Natashkwan, Province of Quebec. By Geo. C. Mackenzie, B.Sc. (Department of Mines, Ottawa, 1912).

* * *

A very nicely-bound and well-printed pamphlet has reached us from the secretary of the Mine Owners' Association of New South Wales. It gives the names of the officers of that body for 1912-13, and sets forth the objects of the Association. Recent industrial awards in connection with the mining industry are extensively dealt with, and the personnel of the various boards is given. The pamphlet is invaluable to mine managers and others interested in the mining industry.

* * *

A very well designed commercial map of the world on Mercator's projection has been issued by Messrs. John Dewar and Sons. The map is printed on glazed linen, and mounted on rollers, and in addition to the steamship, telegraph, and railway routes, which are clearly shown, there is a considerable amount of useful information as to comparative times, currencies, and populations, etc., embodied in tables printed underneath.

* * *

"Mercury, or 'Quicksilver' in New South Wales," by J. E. Carne, F.G.S., assistant Government Geologist, N.S.W.; Second edition—Mineral Resources, No. 7. (Government Printer, Sydney, 1913.) Mr. Carne's report deals with the occurrence, uses, metallurgy and economics of the metal. Particular attention is devoted to the Australian occurrences, and full information is given as to the cinnabar mines of the State at Cudgegong, Yulgilbar and Pulganbar. The report is illustrated with maps.

* * *

Report on the Cobar Copper and Gold Field (N.S.W.), Part i. By E. C. Andrews, B.A., F.G.S., Geological Surveyor. With folio of folded maps. Government Printer, Sydney, 1913. Price, 7s. 6d.

## SOUTH NEW MOON (V.).

### £500,000 in Dividends.

(From our Bendigo correspondent).

With the announcement of a further disbursement of profits at the rate of 1s. per share, representing £1600, on Thursday next, the 4th inst., the company will claim the distinction of dividing £500,000 amongst shareholders, over a period of about 23 years. It was expected that the round half-million sterling would not be reached until later in the month, but the larger yield of 196 oz. 10 dwt. from the week's milling, augmented by 179 oz. from plates, clinched the matter. The following is the complete list of dividends paid by the company since the 26th of June, 1890:—

| | | | |
|---|---|---|---|
| 26 dividends of 6d. per share .. .. | £0 | 13 | 0 |
| 45 dividends of 1s. per share .. .. | 2 | 5 | 0 |
| 88 dividends of 2s. per share .. .. | 8 | 16 | 0 |
| 13 dividends of 3s. per share .. .. | 1 | 19 | 0 |
| 7 dividends of 4s. per share .. .. | 1 | 8 | 0 |
| 2 dividends of 5s. per share .. .. | 0 | 10 | 0 |
| 1 dividend of 1s. 6d. per share .. | 0 | 1 | 6 |
| 182 Total .. .. .. .. .. .. .. .. | £15 | 12 | 6 |

On 32,000 shares, making £500,000.

The company's record now reads:—

381,324 tons, 223,890 oz. 18 dwt. gold (exclusive of residues).

Calls, 17s. 7d. per share—£28,133 6s. 8d.

Dividends, £15 12s. 6d. per share—£500,000.

Reserve fund, £3753 11s. 11d.

Equipment expenditure, £19,490 8s. 2d.

This remarkably successful career has been due chiefly to the richness of the centre reefs at the shallow levels, the best results coming from between the 820ft. to 1060ft. workings, both north and south of the shaft. Upward from 980ft. in the southern portion of the property, the spurs to eastward of the original rich formation are still yielding very profitably and promising further remunerative returns. There was a time in the history of the company when the management were approached by Mr. G. A. Petrie, on behalf of an English syndicate, with an offer of £192,000 for the property. This was equivalent to £6 per share on the register of 32,000. The wisdom of refusing this tempting bait was subsequently shown by the payment of £13 10s. per share in dividends. The first dividend was payable on June 26th, 1890. and the last call, the 33rd of 6d. per share, was due on October 9, 1895. The present directors are Messrs. William Hunter, Robert Lewers, Henry R. Williams, William Henry Dennis, and Thomas Edward Thomson. Mr. George Green is the legal manager, Mr. William Westhead having full charge of the mining operations for several years.

The first meeting of the registered company was held at the Victoria Hotel, Sandhurst, on June 19th, 1871. Mr. Hyndman (manager of the Oriental Bank) reported that he had received the purchase money from Mr. Mann, on account of Mr. James F. Graham. The first directors were Messrs. James Anderson, Nicholas Jeffrey, Thos. Burrows, Edward Lloyd Marks, and William Winter. The legal manager was Mr. John Raven Mann; auditors, Messrs. Churchill, Davidson and F. Lecar Bolger.

Shareholders named at the half-yearly meeting held 21st June, 1872, were Thomas Burrows, William Smith, W. J. Creeth, Abel John Esler, Robert Gordon, James Penistan, James F. Graham.

On September 1st, 1871, the legal manager reported that the deed of settlement, together with the scrip book, had been destroyed by the fire at the Beehive. The scrip destroyed in the book was in the names of Thomas Bissett, 800 shares; William Gunn, 400 shares; G. V. J. Jacques, 400 shares; and Robert Carr, 400 shares; total, 2000 shares. None of whom had signed the deed.

In 1882 several parties of tributers were working on the lease and did very well by sinking shafts from the surface on various parts of the lease. The most of these shafts are now covered with tailings from the present battery.

At the half-yearly meeting on 24th December, 1884, the manager was instructed to make application for a share of the prospecting vote, with a result that £600 was obtained in instalments after two and a half years' correspondence with the Secretary for Mines, the first instalment being received about May, 1887, of £56 12s. 3d.; 2nd, November 24, 1887, £173 0s. 2d.; 3rd April, 1888, £93 0s. 1d.; 4th, November 22nd, 1888, £132 4s. 8d.; 5th, May 25, 1889, £145 2s. 4d. Total, £599 19s. 6d.; which was paid back to the Government with 6d. exchange added, making £600 on January 14, 1904. On 31st May, 1889, there were 20,627 shares (forfeited) in the hands of the company, on which calls were owing to the amount of £2606 12s. 6d.

In August, 1889, these shares were divided pro rata amongst the shareholders with the exception of 133 shares, which realised £5 1s. 5d., less expenses, leaving a loss on the capital of the company of £2601 11s. 1d.

One shareholder refused to accept the shares she was entitled to, stating that she did not want to increase her liability of calls.

# ENGINEERING AND ELECTRICAL SECTION

Australian
General Electric Co.
217 Clarence Street, Sydney.
Tel.—Central, 3495, 4397; City, 2381.
"Penfold House," Cr. Queen and Little
Collins Sts., Melbourne.
Tel.—Central, 2647.
Representing—
GENERAL ELECTRIC CO., U.S.A.
The
BRITISH THOMSON-HOUSTON
CO. LTD., of Rugby, England.
The GUARANTEE of EXCELLENCE on GOODS ELECTRICAL

## MELBOURNE TRAMWAYS.

At a meeting of the Melbourne Tramways Trust held last Friday, Sir Henry Weedon presiding, Councillor Coulson, in accordance with notice given, moved:—''That in view of the importance of the possible issues between the Melbourne Tramway and Omnibus Company and the trust on behalf of the municipalities, it is essential that the trust should at once obtain the best legal advice obtainable in regard to the responsibilities of the Tramway Company under the covenants of its lease, and that before any further action be taken upon previous resolutions of the trust, a special committee be appointed to confer with the trust's solicitor in regard to the case to be prepared, and the counsel to whom the case shall be submitted, and to submit their recommendations to the trust for approval.'' After discussion, it was agreed to delete the words ''before any further action be taken upon previous resolutions of the trust.'' The motion, thus amended, was unanimously passed; whereupon the chairman and Councillors Coulson and Hickford were appointed to constitute the committee.

The Prahran City Council at its meeting last week received from Mr. W. O. Strangward, secretary of the Prahran-Malvern Tramways Trust, the following resolution passed at a meeting of the Trust on the 21st August:—''That upon the councils of the cities of Prahran and Malvern and the council of the city of Melbourne consenting in manner required by the Prahran and Malvern Tramways Trust Acts, the trust agrees to construct a tramway in Commercial and Malvern roads, from St. Kilda-road to Burke-road, Malvern, as a trust line. The councils of Prahran and Malvern to arrange with the Melbourne Council to obtain the latter's consent to the construction of the line in its territory on the same terms and conditions as the extension in High-street, from Punt-road to St. Kilda-road.'' Councillor Naylor said he was very pleased to inform the council that the construction of the Malvern-road line was now assured. It would be one of the best paying lines in the city. The traffic on the Kew and Hawthorn lines was so large that it could hardly be coped with. These lines were now returning a revenue of 12d. per car mile, which was close upon a paying basis.

While on the one hand several suburbs of Melbourne are advocating the establishment of motor-'bus lines of communication with their neighbours and to connect with existing tramway routes, there is growing feeling on the other that the new conveyances are not an unmixed blessing from a municipal standpoint. In our last issue mention was made of the complaint of the Railways Commissioners of the pounding which the asphalt on the St. Kilda-Brighton tramway track received from heavy motor-vehicles passing over it, sometimes at high rates of speed. It is a far cry from Railways Commissioners to Coburg councillors, nevertheless the council of the northern suburb last week carried a resolution asking the local Parliamentary representative to exert himself towards having a local tax imposed on motor-'buses plying for hire in suburban municipalities. Steps must be taken, it was said, to protect the municipalities against the damage which would be caused to the roads by 'buses, and unless something were done they would have huge companies cutting up the roads and paying nothing for repairs. One of the councillors suggested that private motor cars should also be included.

At the Brunswick town-hall last week a conference of delegates from the Brunswick, Essendon, Fitzroy, and Northcote councils agreed to the following motion:—''That this conference affirms the desirability of establishing and maintaining a motor-'bus service in and between the municipalities concerned.'' A committee of four, one from each of the councils mentioned, was appointed to inquire into and report upon routes and cost.

In reply to a notification received from the Town Clerk of Melbourne to the effect that the Melbourne Motor-'bus Company had applied for a motor-'bus stand in that suburb, the Brunswick council has replied that it has no objection to the request being granted. The proposed line will connect with that already running from Lygon-street to Prince's Bridge.

The scheme formulated by the Williamstown and Port Melbourne councils for instituting motor-'bus inter-communication provides for the laying of a steel track for heavy traffic, which is a good business proposition, as it will save a lot of expense in maintenance.

## ADELAIDE CITY COUNCIL.

### Successful Motor Lorries.

Amongst the findings and recommendations of the special committee appointed by the Adelaide City Council to report on the works department of the corporation was one stating that the work of the City Engineer's department requires the appointment of a properly-trained professional understudy to the engineer, and recommending that such an assistant be appointed at a commencing salary of £270 per annum. Another of the findings reads as follows:—''That from the reports and figures furnished by the City Engineer to the works committee, which were sent on to your special committee for consideration, it finds that the cost of running the four motor lorries purchased last year shows that the average working cost was 8s. per hour after allowing for interest on capital, renewal of tires, depreciation, and insurance. For comparative purposes the costs are:—Motor lorry, 1 hour, 3s.; four drays, 1 hour, at 1s. 6d. each, 6s. That is to say, a given quantity of work which by motor lorry costs 3s., if done by drays costs twice as much. There is a large proportion of the work in the City Engineer's department which appears to be peculiarly suitable for drays, such as the collection of refuse from the yards of houses, street scavenging, and maintenance where the lead is short, but there is also a considerable amount of work in the department which can be advantageously carried out by means of motor lorries, and the employment of motor lorries has been justified.'' It is recommended ''that the Argyll motor lorry be disposed of, and two 4-ton 1913 model Commer motor lorries be purchased, both to be fitted with mechanical self-starter and suitable tipbody.''

## THE TRANS-AUSTRALIAN RAILWAY.

### Progress at Port Augusta.

It is estimated that the permanent survey, now being made, of the route of the railway from Port Augusta to Kalgoorlie will cost over £70,000, or about £60 a mile. This the Government is said to regard as excessive, and it is reported that the question of calling for tenders for the remainder of the survey is being considered. Estimates of the cost of a similar survey for the proposed line from Oodnadatta to Pine Creek are in course of preparation.

When giving evidence on a proposed State railway before the South Australian Railways Standing Committee at Parliament House, Adelaide, on August 22nd, Mr. R. S. Ross, traffic superintendent at Wallaroo, was asked why the 5ft. 3in. gauge was being recommended rather than 4ft. 8½in. The witness said he recognised that the Commonwealth had adopted the narrower gauge for the East-West railway, but the day was not far distant when the line would have to be converted to 5ft. 3in., which would ultimately become the standard Australian gauge. Replying to a question in the House of Assembly last week, the Premier of South Australia, Mr. A. H. Peake, promised to consider the advisability of urging Victoria to make joint representations with the object of getting a 5ft. 3in. gauge adopted by the Commonwealth as the standard instead of 4ft. 8½in. He thought probably it was too late in respect of the east and west railway.

The first two rail-waggons, part of a contract for eight accepted by the Clyde engineering works, Sydney, reached Port Augusta on August 19th. The huge parts are of steel, 9ft. wide by 36ft. long. They will be supported on double bogies, and will carry 40 tons of rails, and will be fitted with automatic couplings. The steamer Mathilda arrived there next day from Bunbury with 22,000 sleepers, and soon after came the Cycle from Newcastle with Australian rails, and the Harold from Adelaide with timber for the cottages in the railway yards. The carriage-shed is rapidly nearing completion, and the roof will be finished next week. Part of the floor is paved with wood blocks, and the remainder will be asphalted. A line of rails is being laid to the shed from the main line. Between the fitting shops and the depot, says the Port Augusta correspondent of the ''Adelaide Chronicle,'' a store-shed is in course of erection to accommodate goods carried from the north-west country by the new railway. The building will be 80ft. in length by 33ft. wide. The engineers' workshops will soon be finished. The heavy turning lathe and other machinery have been fixed to the concrete blocks. The 40 horse-power Dudbridge engine has been installed. The fly-wheel weighs 4 tons. There is a solid foundation of reinforced concrete. The engine was made at Stroud, Gloucestershire, and will drive the dynamo (yet to arrive). and all the rest of the turners' machinery. Just outside the shed a number of moulders are making concrete blocks for the permanent survey. These blocks are 8 x 8 and 2ft. 6in. long. A brass knob is embedded in the top, from which the surveyor takes his alignment. A brass identification plate is affixed to each block, which will register the mileage. The letters denoting this will be burnt in, and the blocks and plates are thus practically indestructible. Since the Marion shovel began its work the Cathedral cutting has made good headway. The cutting is 30ft. wide at the bottom and 71ft. at the top. The navvy has nosed its way through 120ft. of hard sand, averaging between 640 to 650 cubic yards per day. The steelwork of the bridge at Yorkey's is practically complete. As salt water has been used in mixing concrete for the piers the setting takes a little longer. The diversion carries all the traffic, and the piers consequently have a chance of setting solidly. The correspondent adds that ''the boring operations at the Saltia Creek have justified the sinking of a shaft. The water obtained by the bore was of good quality, and amounted to 6000 gallons in 24 hours. This quantity will be further increased by the shaft. Boring will also be conducted at No. 2 base, not far from the depot, and the plant is on the spot. The Mundallia gravel pit, and all the lands affected by the various lines in connection with the East-West railway, have been gazetted. This has a bearing on the recently reported discovery of gold near the gravel pit.''

The Minister for Home Affairs, Mr. Joseph Cook, has accepted the tender of the Victorian Powell Wood Process Ltd. to supply 6000 Victorian mountain ash and messmate sleepers (powellised) for the Port Augusta-Kalgoorlie railway, the price being 7s. 6d. each, less 1s. 5½d. per sleeper, this being allowance for freight to be paid by the department from Melbourne to Port Augusta (equalling 6s. 0¾d. at ship's side, Melbourne). This quantity is accepted in place of 100,000, notification of the acceptance of which was made last May. The total amount involved is £1821 17s. 6d. The following tenders have also been accepted:—Boring for water from Ooldea well, eastward (South Australian section), for about 100 miles, Johnston Bros. Ltd., 1200ft. (minimum), first 50ft. 60s. per foot, 50ft. to 100ft. 50s. per foot, 100ft. to 200ft. 40s. per foot, 200ft. to 500ft. 35s. per foot, £5000 (estimated); car bogies and spares, Forman and Co. Pty. Ltd., 16 delivered Fremantle £1708 12s. 6d., 16 delivered Port Augusta £1708 12s. 6d.; total, £3417 5s.

## BORDER RAILWAY.

### New South Wales and Victoria.

At last week's conference between the Premiers of Victoria and New South Wales the question of Border railways between those States was considered. Altogether, four proposals came under review, three being for the extension of Victorian lines into New South Wales territory at Euston, Wentworth and Moama respectively, and the other the extension of the New South Wales line from Nimitybelle through Bombala and Delegate into Gippsland. An agreement was come to with respect to the extension of the Victorian gauge at Euston and Wentworth into Riverina, Victoria to construct each line to the south bank of the Murray at her own cost, and to pay two-thirds of the cost of the two railway bridges and the connections as far as the New South Wales border towns, including the acquisition of the land required. From Euston a line will be built by New South Wales, almost due north into New South Wales. That line will be operated by Victoria, who will take whatever profit or loss there may be, but she will pay to New South Wales interest at current rates on that State's capital expenditure. The same arrangement applies to the Wentworth line, which is to run for about forty miles to the north-east along a route almost parallel with the River Darling. The preamble to the Bills will include an expression of the intention of the New South Wales Government to throw open for settlement the lands that will be served by these lines. The line from Moama to Moulamein will be built on similar terms, but will involve the purchase of about a couple of miles of the privately owned Moama-Deniliquin railway, towards which Victoria will pay two-thirds and New South Wales one-third of the cost. From some point on this line the New South Wales connection will be carried to Moulamein. With respect to the extension of the New South Wales line from Nimitybelle into Gippsland, while Mr. Watt was willing to co-operate in some such proposal, it was deemed inadvisable to embody this line in the agreement until the area of Victorian country to be served by it could be reported upon by the railway authorities, and it was felt that, as New South Wales had not yet built its proposed line to Bombala, there was no great hurry.

## VICTORIAN RAILWAYS.

The Victorian Railways Commissioners have referred the doubt which has been raised as to the entire satisfactoriness of the selected site at Yarra-side for the central power station of the suburban electrified system, to Mr. C. H. Merz, its supervising engineer, and as Mr. Merz is still in England, it will be some weeks before his reply will be to hand. In any case, a transfer to Fisherman's Bend, or Newport, will make little difference to the general scheme. The scheme provides for the erection of twelve sub-stations in various parts of the suburban area, and it was officially announced last week that these would be erected (subject to Mr. Merz's approval) at Flinders-street, Middle Brighton, Glenroy, North Carlton, Newport, Albion, Macleod, East Camberwell, Mitcham, Caulfield, Springvale, and Chelsea. Substantial brick buildings are to be erected at each place, of a uniform height of 40ft., and a width of 50ft., but their lengths will vary from 212ft. to 74ft., as follows:—Flinders-street, 212ft.; North Carlton, 152ft.; East Camberwell, 152ft.; North Carlton, 152ft.; Glenroy, 110ft.; Middle Brighton, 110ft.; Newport, 110ft.; Mitcham, 92ft.; Springvale, 74ft.; Chelsea, 74ft.; Macleod, 74ft.; Albion, 74ft. It was necessary that these sub-stations should be situated as close as possible to the tracks to be electrified, and in the majority of cases suitable sites are available on railway property, and the buildings will be connected with the main tracks by sidings. Each site is of such a size as to admit of an extension of the sub-station if thought desirable at some future date.

The current will be generated at the power house, and transmitted to the sub-stations by high tension mains as alternating current at 20,000 volts, and after reaching the sub-stations it will be changed by means of rotary converters and transformers to feed the tracks at a voltage of 1500, as direct current. A contract has already been let, amounting to approximately £168,000, for the manufacture of sub-station equipment, and the work is well advanced.

Provision is made in the scheme for the building of a large car repair shed at Jolimont, on portion of the land which was recently resumed by the Commissioners in Flinders Park. This shed will be about [illegible] in length, and probably [illegible] in width, and all repairs to and overhauls of electrical equipment on coaches will be carried out there, as well as such work as light repairs to coaches, car-washing, etc. Preliminary designs for the shed have been received from Mr. Merz, and the Commissioners are now examining them, before the proposals are finally confirmed. Another feature of the scheme is the provision of inspection pits in connection with the sidings which are to be provided for the electrical trains in the Jolimont yard. These pits will be utilised to enable the electrical equipment under the cars to be inspected and tested daily.

In its report on the proposals to connect the district of Duggan, Fumina, Hill End, and Willow Grove with the existing railway system, which was laid on the table of the Legislative Assembly last week, the Railways Standing Committee says it cannot overlook the fact that it recommended the construction of the Moe-Walhalla railway, which at Moondarra passes through a belt of volcanic country quite equal in fertility to any patches of good soil in those districts, in the hope that crops would be grown and despatched over the line on its completion. Yet, from 3rd May, 1910, to 31st March, 1912, five tons only of agricultural produce, including potatoes, were consigned from stations around Moondarra. Such a result does not encourage further railway construction in similar neighbouring country. In the circumstances, the committee is of opinion that it is not expedient to connect the area mentioned by means of a railway with the existing railway system. The district lies between the Latrobe River and the eastern branch of the Tanjil River. To the west of this area is the Warragul-Neerim South railway, with its proposed extension 15 miles northwards to the junction of the Latrobe and Toorongo rivers, and to the east the narrow-gauge line from Moe to Walhalla.

## THE NEWPORT DUST EXHAUSTER.

Hitherto one of the drawbacks attending the calling of operatives in buffing and grinding workshops has been the prejudicial effect on health caused by the metallic and abrasive particles which float about in the atmosphere in such establishments. To obviate this condition at the Newport workshops of the Victorian Railways Commissioners steps have been taken to have manufactured, immediately, a complete exhaust plant. This will consist of a large electrically-driven exhaust fan, capable of dealing with about 22,000 cubic feet of air per minute. This fan will be connected to a large galvanised sheet-iron pipe, having suitable branches leading off to the buffing and grinding machines, each of which will be partly enclosed within a suitable hood connected to one of the branch pipes. A gate, or valve, will be placed in each branch pipe, enabling control to be exercised by each operator over the amount of air entering the hood at which he is engaged. As soon as the exhaust fan draws air along the pipes and branches, air will be drawn in at the hoods, and this will catch the whole of the grindings given off by the buff. This air charged with grindings will be drawn along through the pipes to the exhauster, which will eject the charged air into a separator placed outside the building. The separator consists of a large tank containing some inches of water, and suspended over the water is a filter. The charged air on impinging on the layer of water will be freed of most of its impurities; the remainder will be caught from the air as it escapes through the filter. It will be seen that by this system the air inside the workshops can be maintained as pure as the air outside, and that the air used to convey the impurities to the separator escapes only after it is purified.

## SOUTH AUSTRALIAN RAILWAYS.

While moving the second reading of the Riverton-Spalding Railway Bill in the South Australian House of Assembly last week, the Commissioner of Public Works, Sir Richard Butler, said that the South Australian railways were in a splendid position, and he doubted if any other country in the world where the railways were in the hands of people could show such satisfactory returns. For the 30 years since the State started railway building, the lines up to the present had returned full interest on the capital. During the last eight years, since they had enjoyed such good seasons, approximately £1,500,000, which was the debt of the railways to the general revenue at that time, had been wiped off. That spoke volumes for the foresight of those who had carried out the policy of railway building. During the last few years they had been able to spend a very much larger amount out of the revenue in maintaining the lines as fully equipped as they were when built. He did not believe that in any State in the Commonwealth the railways were better managed than those of South Australia, and he was sure no other railways in Australia returned anything like the handsome profit. The railways did not owe one penny to the general revenue of the country. The Spalding line would be 51¼ miles long on the 5ft. 3in. gauge, and laid with new 50lb. rails, while it would cost £405,000, with rolling stock, or £7434 per mile. The Railways Commissioner estimated the revenue would be £24,000, which, when working expenses and interest had been paid, would fall £9000 short. However, as he expected £13,500 in revenue from the traffic over existing lines, the net result would be a profit from the start of £4500 a year. Sir Richard considered South Australia ought to be very proud of the fact that while it had borrowed 28 million pounds for public works and other purposes, the interest-paying proportion of those works returned more than the total interest on the aggregate sum. The route of the Spalding line would traverse one of the most popular and attractive districts for tourists in the State, and the land would be so productive that he was confident after five years they would be able to remove the guarantee. Sir Richard Butler expressed the hope that the whole of the present narrow gauge lines on the western side of the district would be gradually converted to the broader gauge, as he was sure that the process would be extremely profitable.

## BRITISH AND EUROPEAN DEVELOPMENTS.

(From Our Correspondent.)

London, August 1st.

The Marconi wireless chain contract is still the subject of furious discussion in the Press, and numerous inquiries at St. Stephens. The Postmaster-General has in some measure satisfied some of his critics by announcing new terms respecting the payment of royalty on gross receipts to the Marconi Company. He explained to the House of Commons on Monday last that the company's inventions were not protected by patents in the British Protectorate of East Africa, and it is in East Africa that it is proposed to erect the largest of all the stations capable of communicating to and receiving messages from Egypt, South Africa, and India, the installation having six aerials. The company said that it could not be expected to erect this station for the sum payable and receive no royalty for the use of its invention there, but the Postmaster-General drove what has been called a hard bargain, and agreed to make certain concessions if the company was willing to meet his wishes. The result of this is that a division of the royalties has been agreed to, and if the contract goes through as revised, it will provide that instead of a 10 per cent. royalty being payable in respect of a station as a single unit, 4 per cent. will be payable in respect of the internal transmitting apparatus, 2 per cent. in respect of the internal receiving apparatus, 2 per cent. in respect of the external transmitting apparatus, and 2 per cent. for the external receiving apparatus. Under this arrangement the Government will have full liberty to discard any one part of the Marconi patents in respect to any one part of a station, while retaining it in others, securing a proportionate reduction in the royalty in that way.

It is now expected that the debate on the contract will take place next week, it having been put off owing to this revision of the terms.

There is much discussion proceeding just now respecting the Marylebone municipal electric supply "Sales Department." This department has been attacked by contractors for a long time past because it competed with them. Messrs. Price, Waterhouse and Co., the accountants, have reported on its finances, showing that the turnover of the department last year was £21,629 and the direct cost £16,384, leaving £5245 gross profit—that is, 24½ per cent., or an addition of 32 per cent. to the direct cost of the work done. By adding an amount per share of the general expenses of the department the net profit is brought down to 2½ per cent. on turnover, or 3 per cent. on the capital cost. The report seems to have given rise to trouble in the council meeting, with the result that it was not adopted as presented, and the chairman of the electricity committee resigned. Other developments are anticipated.

Two committees, in which school and library experts, illuminating engineers, and medical authorities have jointly deliberated, have prepared interim reports upon the lighting of schools and libraries. The Illuminating Engineering Society of London have just published brief accounts of the conclusions so far reached by both committees. In the case of the schools, assistance was given by the London Education Authorities, who enabled both gas and electric illumination effects to be studied in some of the class rooms. The question of artificial lighting only has so far been considered. The illumination intensity necessary in a school room depends upon the nature of the work, and whether children or adults are being provided for. Attention is given to the needs of children in the present report, and the following recommendations are made:—

(a) For ordinary clerical work the minimum illumination measured at the desks must not fall below two foot candles, though it may be added that several members of the committee favour 2½ft. candles minimum.

(b) For art classes, drawing offices, workshops, and stitching with dark materials, and such like special work, the desirable minimum is 4ft. candles.

(c) For assembly rooms and for general illumination a minimum of 1ft. candle measured on a horizontal plane 3ft. 3in. from the ground.

In needlework classes only coarse work on white material should be done by artificial light, with the same minimum as in (a) above.

Direct, indirect, and semi-indirect lighting were all considered, with the result that the above standards of illumination are provisionally adopted, irrespective of method.

In regard to blackboard lighting it is stated that, whereas the minimum suggested for reading purposes (2ft. candles) might suffice for small class-rooms where white chalk is largely used, and students are 20ft. or more from the blackboard, a higher value is necessary in larger rooms and on boards for coloured chalk diagrams. An illumination on the blackboard about 60 per cent. in excess of that prevailing in the rest of the room is recommended. Speaking generally, blackboard illumination should be done by special local lighting from lamps fitted with opaque screens, completely concealing them from the eyes. There must be no glare due to reflection from polished surfaces. The committee emphasises the importance of avoiding glare and using proper methods of shading. Too frequently in school rooms bare mantles and filaments are within the range of vision when looking at the blackboard. No lamps ought to come within the solid angle subtended at the eye by the blackboard, and a space two feet above it unless completely screened by a shade impervious to light.

No incandescent surface ought to be visible to students' or teachers' eyes during ordinary work. Glare is also due to direct reflection of light from the polished surfaces of desks or paper. The use of shades which spread the brightness of the source over a considerable area is recommended; also the judicious use of reflection from walls and ceilings. The lights should be so arranged as not to cast shadows on the desks. The foregoing are preliminary suggestions which will be elaborated later.

In regard to the library section of the investigation, the constant development in methods of illumination and the need for fuller information concerning their respective merits, make the committee averse to reporting definitely on many points. A study was made of some London libraries, and the recommendations made are based on observations there, though it is recognised that different conditions prevail in different classes of libraries. It is considered that for table, desk, or newspaper stand lighting, the illumination where the light is being used should never be less than two foot candles—reading ordinary type print on white paper. With small typed books or manuscripts with low reflecting power surfaces, a lower illumination is needed, and a value of not less than 5-foot candles is suggested. For book case and shelf lighting a minimum vertical illumination on the case or shelf of one-half foot candle is proposed; for general illumination a minimum of one-half foot candle. Local illumination should be measured on the desk slope or reading table. Measurements of general illumination should be made on a horizontal surface 3ft. 3in. above the ground. The illumination should always be expressed in foot candles.

Various other points, such as avoidance of shadows and glare in libraries; the advantages attending the combination of local and general lighting; the comparative merits of direct, indirect and semi-indirect lighting; the illumination of racks and shelves, etc., are mentioned, and in some cases these points are still under consideration.

Most large towns are faced with growing demands for electricity and the need for putting their plant capacity on a better basis in order to be prepared in good time. Everything points to a continuously increasing demand, and engineers of stations whose supply margin is running close are anxiously looking to the future, for in view of the busy state of electrical and other plant factories, orders for requirements have to be given out well in advance of the date of actual need. Engineers are not merely placing orders for single sets of extension plant, but as we recently showed in the case of Birmingham, in many places occasion is arising for a careful analysis of the entire position to be made, involving questions relating to scrapping of existing machinery and stations, and putting down larger works designed with more generous regard to the requirements of the future, as far as it is possible to judge them from present day facts and tendencies. One of the latest borough electrical engineers to find it imperative to go fully into the matter along such lines is Mr. Thomas Roles, the city electrical engineer of Bradford. At present at his stations he has under his control 19 separate units having a total full load capacity of 15,800kw. There are 12 high-speed steam generators aggregating 2800kw., four slow-speed steam generators aggregating 4000kw., and three turbo-generators of 9000kw. aggregate; so that 6800kw. is split up amongst 16 sets of various ratings. There is a certainty that electricity will be used for driving a large proportion of the new textile factories which are erecting in Bradford, and that as steam plants become obsolete they will be replaced by electric. Mr. Roles advises that supply to all additional customers, whether coupled to alternating or to direct current mains, will be best effected by means of turbo-generators producing three-phase A.C., which can be converted into energy suitable for supply to D.C. consumers through the medium of rotary machinery installed in substations. The Bradford A.C. generating plant should be immediately added to, but makers of turbo-generators, in reply to Mr. Roles's inquiries, state that it will be impossible to obtain turbines in time for these to assist next winter's load, and unless an order for such plant is placed during the next two or three months it is very doubtful whether such machines can be delivered and erected to assist with the heavy loads expected during October and November, 1914, as most makers are now asking for 15 months for delivery of machines of larger than 3000kw. owing to the difficulty they are experiencing in obtaining raw materials and the large amount of work which they have in their own shops. Two years ago the scrapping of 12 D.C. sets in No. 2 station (having a full load capacity of 2800kw.) was practically decided upon, and if these be now scrapped, as is suggested, it will be necessary to provide A.C. generating plant of 3000kw. capacity to replace them, while, in addition, converting plant of similar capacity must be installed, together with a sufficient margin of spare plant. Visits paid to other stations (Newcastle, Sunderland, Manchester) have shown the Bradford deputation that the larger the scale upon which electricity can be generated the lower the costs of production will be, and the best method is by means of large turbo-generators producing three-phase A.C. "Such being the case, it is only a matter of time before the whole of the reciprocating machinery belonging to the department will become obsolete." The twelve high-speed sets are so already, and when sufficient turbine plant is installed the four slow speed sets will become standby plant. Mr. Roles has considered the question of designing an entirely new station on a new site outside Bradford, but the cost would be about half-a-million sterling, which the department could not stand and which he does not recommend. Considering all the circumstances, he advises that the present site be utilised to the fullest possible advantage for as long a period as is economically possible, and unless the load grows far more rapidly than he contemplates, it will be at least ten years before an entirely new works is found to be an advantageous proposition. The engineer goes on to say that "the steam turbine will not be superseded for very many years as the best means of generating electricity," but he thinks it very probable that the efficiency of this class of machine will be considerably increased by the use of higher steam pressures and superheats, which may have a considerable bearing upon the design of boilers, steam pipes, etc., during the next few years. He also is of opinion that sooner or later gas will be utilised in the generation of electricity, either directly in the turbine or for firing the boilers. By this means the valuable by-products obtained as a result of the manufacture of gas will not be wasted, as is the case at present, when boilers are fired direct by means of coal. "A great deal of experimental work is being carried out on these lines, and it will be readily realised that should success attend any of these experiments the design of the electricity works of the future may be very considerably modified."

Coming now to Mr. Roles's proposals for meeting the present position at Bradford, he would suggest the installation of two additional turbo-generators of a full load capacity of not less than 6000kw., but the important work which is proceeding in connection with the design of large machines leads him to say that by waiting two or three years it will be possible to obtain the result of the experience gained in Europe and America. Therefore he recommends that for the present only one turbo-generator of 3000kw. complete, with condensing plant, be installed. Such a set, aided by a large storage battery, should enable the works to meet all demands during two or three years to come; and he proposes that two 1500kw. rotary converters be installed in place of the 12 D.C. high-speed sets at No. 2 station. A standby plant of 1500kw. capacity is also wanted to replace any one of the converters in case of breakdown or other necessity, but for this Mr. Roles recommends a large storage battery capable of discharging at the rate of 2000kw. for a period of one-hour (this is 25 per cent. smaller than the battery at Manchester). This battery would be of great service to the department in various ways, and it would greatly conduce to economical generation. Mr. Roles adds that he "does not anticipate that the saving effected by the installation of such a battery would more than counterbalance the capital charges; it is even possible that the capital charges would exceed such savings." The total outlay now recommended is £86,250, which includes £10,000 for the 3000kw. turbo-alternator, £14,100 for two 1500kw. converters and switchgear; for storage battery capable of discharging 5000 amp. for one hour, £16,756; switchgear and connections for battery, £5985; battery boosters, £5565; building for battery and extension of switchgear gallery, £7267.

## MISCELLANEOUS.

Our Lithgow (N.S.W.) correspondent writes:—"At the last meeting of the Katoomba Municipal Council, Alderman Kitch moved that an advertisement be inserted in the Sydney, Melbourne, and Tasmanian papers for a thoroughly competent electrical engineer for advice and estimate of probable cost of supplying electricity by water power, both for lighting and tramway purposes, at a fee of about £50. Remembering the coming gas proposition, he thought the Council should have an alternative scheme. Alderman Jenkins seconded the motion, and said he was struck by the statistics appearing in the press, which showed that £140,000 was derived in Melbourne from electric power, and that was about half the revenue of the city. Alderman Lindeman supported, and said he thought the installation of electrical power would be a good investment, and one calculated to lighten the rates. Alderman Goyder said all engineers had agreed that there was not sufficient water available for developing the necessary electric power. The Works Department also reported that the water scheme was impracticable. The Mayor said Government experts were not always to be relied upon. If the Blaxland Shire would share the expense of an engineer's report, it would be possible. Alderman Sands said that any report made at the present time upon the water power available would be misleading if taken as a standard of the yearly supply. In the dry or summer season the streams were of much less volume. The motion was carried, and it was agreed to write to the Shire Council to ascertain what it would do in respect to the engagement of an electrical expert. Alderman Jenkins moved that immediate steps be taken to secure the services of a competent engineer. The Mayor ruled the motion out of order. Alderman James seconded the motion, which was carried."

* * *

Says our Lithgow (N.S.W.) correspondent:—"There is not much to report at the ironworks. The roof of the steel furnace fell in a few days ago, but has been repaired; and efforts are now being made to shift the steel that was in the furnace when the roof fell in and which consequently became cold. It was hoped that rolling rolls at the 27in. mill would be re-commenced this moring. A large number of the new coke ovens near the blast furnace are now under fire, and extension work in other directions is being pushed on."

* * *

The stone-crushing plant at the Government's quarry, Port Kembla (N.S.W.), which is to make road metal of the quarry waste, has been working, but not systematically enough as yet (says our Wollongong correspondent) to show costs. It has been a very long time in process of installation. Its operations make a dust, about which adjoining householders make strong complaint, and threaten legal proceedings. It is understood that this nuisance is to be suppressed by housing the crusher. They say, though, that the atmosphere of the crusher-house will then be a bad one to breathe; the quarry stone is a hard granite.

* * *

The sixth general meeting of the Northern Engineering Institute of New South Wales was held in the Newcastle Council Chambers on August 23. There was a fair attendance, the President, Mr. J. L. C. Rae, occupying the chair. Mr. John Watson, colliery manager, of Adamstown, was duly elected a member of the Institute. The principal business of the evening was the discussion on Mr. A. Gardiner's paper "The Working of Coal Seams in the Newcastle and Maitland Districts," the following members taking part:—Messrs. V. B. Collins, James Campbell, A. W. Edwards, C. F. S. Hood, D. N. Morison, J. L. Grant, H. G. Trenchard, A. W. Tournay-Hinde, and the President. Mr. A. A. Atkinson, Chief Inspector of Coal Mines, sent a written communication on the paper. Mr. Gardiner replied to the various points raised during the discussion.

* * *

The Minister for External Affairs, Mr. Glynn, announced some time ago that the tender of Messrs. Dove Bros., of London, had been accepted for the erection of the Commonwealth buildings in the Strand, London, the amount being £207,000. The report of the High Commissioner, Sir George Reid, on the subject was received last week, which shows that of the 18 tenders sent in, only three firms had based their prices on the preference to unionists clause inserted in the conditions by the Fisher Ministry, but promptly made optional by

**P. & O.** COMPANY'S ROYAL MAIL STEAMERS

FOR MARSEILLES, PLYMOUTH AND LONDON.

Leave Sydney on the subjoined dates, calling at usual ports.

FIRST AND SECOND SALOON ONLY.

| Steamer. | Tons. | Commander. | Noon. | Melb., 3 p.m. |
|---|---|---|---|---|
| MALWA | 11,000 | Thompson | Sept. 6 | Sept. 9 |
| MOOLTAN | 10,000 | Haddock | Sept. 20 | Sept. 23 |
| MOREA | 11,000 | Andrews | Oct. 4 | Oct. 7 |

PASSAGE MONEY TO LONDON—
Single, £41 16s. to £82 10s.
Return, £69 6s. and £123 4s.

Return Tickets between Inter-State Ports are available for return by Orient, Messageries Maritimes, and N.D.L. steamers having room.

SPECIAL HOLIDAY RETURN TICKETS to COLOMBO are now issued, available for two months. Fares from Sydney, £45 2s. first saloon, and £31 18s. second saloon.

A. GORDON WESCHE, Superintendent IN AUSTRALIA, 63 Pitt-street, Sydney.

**The COLONIAL MUTUAL FIRE Insurance Company Limited.**

Principal Office: 60 MARKET-ST., MELBOURNE

Branches in all the States

Transacts Fire, Guarantee, Employers' Liability, Marine, Burglary, and Plate Glass, Accident, Workers' Compensation and Live Stock Insurances

Send for Prospectus

W. TUCKER, General Manager

**Harringtons LTD**

**ANALYTICAL & METALLURGICAL DEPT.**

Lowest fees for all kinds of Assay, Analytical, and Metallurgical work.

Expert Advice on Ore Treatment, Bullion Refining, Smelting, etc., etc. Directed by a qualified Analyst from Messrs. Johnson and Sons, London; Assayers to Bank of England; H.M. Mint, The Council of India, etc.

**HARRINGTONS LTD.**
**386 George Street, Sydney.**

the present Ministry on its accession to office. Of the three "preference" tenders received, the lowest was for £223,000, or £16,000 more than the accepted price. It also appears that Messrs. Dove Bros. stated that if it was to be a condition of the contract that all stone must be dressed in London, instead of at the quarries, they would find it necessary to add £5000 to their quotation. This was originally laid down as an alternative proposal, with the object of favouring the London interests, if possible; but the Cabinet decided that the contractors should have a free hand. Mr. Glynn made it known last Friday that the three firms who had submitted prices on the "preference" basis had been afforded the opportunity of amending their tenders if they desired, but all declined to review the quotations submitted. It is expected that the building will be completed in about two years and a half.

• • •

Messrs. G. B. Lincolne and J. K. Macdougall, Melbourne, have been appointed supervising engineers to the Euroa (V.) Shire Council.

• • •

The proposal to municipalise the Brisbane tramways was advanced a step last week when the City Council generally adopted the Bill by which it is proposed to appoint a commission of three business men, whose functions were to be analogous to those of directors in a company, to formulate a scheme of control. An amendment was passed, however, that the powers of the commission should be restricted, and that the councils should have power to recommend the acceptance or otherwise of its proposals, the matter to be left to the decision of the ratepayers by referendum.

• • •

The Dunedin (N.Z.) Tramway Employees' Union decided last week, on a ballot, by 132 votes to 18, against joining the United Federation of Labour and the Social Democratic party, and by a still larger majority not to join either of these bodies separately. This means that the union is satisfied to remain registered under the Dominion's Industrial Conciliation and Arbitration Act 1908, and will have nothing to do with the bodies which have pledged themselves to repudiate arbitration and to maintain the "right to strike." At the end of last year the workers' unions registered under the Act had a membership of 60,622, as compared with 55,629 at the end of the previous year. It is clear, therefore, that whatever progress is being made by the "red raggers" is not made at the expense of the arbitrationists.

# Invited and Accepted Tenders

It is particularly requested that the information regarding contracts open, and the successful tenderers, be forwarded to The Editor not later than Monday of each week.

The following contractions are used throughout:—S—supply; D—delivery; M—manufacture; C—construction; E—erection; P—purchase; I—installation; R—removal. Where no contractions appear, supply and delivery is understood. The date at the beginning of each paragraph refers to the closing of tenders.

## INVITED.

### Commonwealth.

Specifications, tender-forms, etc., for tenders invited for the Postmaster-General's Department of the various States under this heading may be had as follows:—Victoria—Various State G.P.O.'s. New South Wales—Departmental Stores, Sydney, and various G.P.O.'s in other States. South Australia—Adelaide, Melbourne, Sydney and Brisbane G.P.O.'s. Western Australia—Departmental Stores, Perth, and various G.P.O.'s in other States. Queensland—Various State G.P.O.'s. All States—Various G.P.O.'s. If the specifications, etc., may be had elsewhere, in addition, the places will be given in parentheses.

POSTMASTER-GENERAL'S DEPARTMENT, Melbourne.—9th September.—Steel conduit and fittings, as per schedule No. 973.

9th September.—1000 reinforced concrete poles, as per schedule No. 959.

16th September.—S., D., E. and I. at the Telephone Exchange, Collingwood, Victoria, of a common battery switchboard, as per schedule No. 860, or an automatic, or semi-automatic, switchboard, as per schedule No. 859.

16th September.—Galvanised-iron piping and fittings, as per schedule No. 951.

23rd September.—Sulphate of copper, as per schedule No. 956, in the undermentioned quantities; New South Wales, 140 tons; Victoria, 25 tons; Queensland, 55 tons; South Australia, 20 tons; Western Australia, 60 tons.

23rd September.—500 letter-box fronts, small size, as per schedule No. 957.

23rd September.—General stores, for a period of two years, from the 1st July, 1913, to the 30th June, 1915, as per schedule No. 913.

23rd September.—Waterproof coats and capes, until the 30th June, 1914, as per schedule No. 936.

30th September.—S. and D. of 1,017,000 pattern "A," and 1,768,800 pattern "B" insulators, at Sydney, Melbourne, Brisbane, Adelaide, Perth, and Hobart, during the years 1913-14, 1914-15, and 1915-16, as per schedule No. 974.

7th October.—S. and I. of electrically-driven machinery for operating pneumatic tube services, Central Telegraph Office, Melbourne, as per schedule No. 900.

14th October.—S. and E., at the Telephone Exchange, Melbourne, of a common battery multiple switchboard, as per schedule No. 868.

14th October.—Cable boxes, as per schedule No. 877.

11th November (extended from 4th November).—D. and E. of eight automatic telephone switchboards at the Ascot, Canterbury, Malvern, Cheltenham, Footscray, Oakleigh, Sandringham, and Williamstown Telephone Exchanges, as per schedule No. 953.

5th November.—Galvanised iron piping, as per schedule No. 952.

POSTMASTER-GENERAL'S DEPARTMENT, Sydney.—15th October.—450 fire sheets (asbestos), as per stores schedule N.S.W. No. 326.

15th October.—Measuring instruments, to stores schedule N.S.W. No. 303; telephone parts, to stores schedule N.S.W. No. 314; switchboard parts, to stores schedule N.S.W. No. 315.

15th October.—63,000 insulators (various), as per stores schedule N.S.W. No. 296.

18th March, 1914.—S., D. and E. at the Telephone Exchanges, Epping, Ryde, Hunter's Hill, Drummoyne, Wahroonga, Paddington and Waverley, Sydney, of seven (7) automatic switchboards, with associated equipment, as per schedule No. 179.

POSTMASTER-GENERAL'S DEPARTMENT, Perth.—1st October.—Exterminator—white ant, and plugs.

8th October.—Expansion bolts and shields to schedule No. 297.

8th October.—S. of milliammeters.

8th October.—Telephones, common battery, adjustable bracket sets.

POSTMASTER-GENERAL'S DEPARTMENT, Brisbane.—10th September.—Telephone Exchange, Brisbane, nine sections of a trunk line switchboard, to schedule No. 244, specification No. 461, and the general conditions, drawings, etc., attached thereto.

24th September.—Ironwork, as per stores schedule No. 264; pipes, cast iron, as per stores schedule No. 265; poles, iron, etc., as per stores schedule No. 266; wire, G.I., as per stores schedule No. 269.

19th November.—Bronze wire, as per schedule No. 273.

POSTMASTER-GENERAL'S DEPARTMENT, Adelaide.—12th November.—One lamp signalling trunk line switchboard, of five sections, one cable turning section, and one cable storing section, one two-position recording desk, and one chief operator's desk, as specified in specification No. 431, etc., delivered at the Telephone Exchange, Adelaide, as per schedule No. 296.

POSTMASTER-GENERAL'S DEPARTMENT, Hobart.—15th September.—S. and D. of telephone material, as per schedules Nos. T.72 and T.73.

22nd September.—S. and D. of 3 motor cycles, as per schedule No. T.77.

6th October.—Galvanised iron wire, as per schedule No. T.78.

DEPARTMENT OF HOME AFFAIRS—Federal Capital.—15th September.—S. of sect. 1, main power-house switchgear; sect. 2, switchgear for Diesel engine plant.

24th November.—Water supply pumping plant for Canberra.

DEPARTMENT OF HOME AFFAIRS—Kalgoorlie-Port Augusta Railway.—16th September.—M., S. and D. of fifty 40-ton bogie waggons.

2nd December.—600 pairs of wheels and axles (9in. x 4¼in. journals).

DEPARTMENT OF DEFENCE.—Royal Australian Navy.—8th September.—S. of machinery and accessories for standard 25ft. motor launches, as may be required, for a period of two years from date of contract.

### Victoria.

VICTORIAN RAILWAYS.—4th September.—Rubber motor belts; belt piercers; valve lifters; oil cans; C.I. metallic enamelled bath and screen; I.R. brake hose.

5th September.—Hatchets and electric light cable.

5th September.—Alternator brushes with tails; exciter brushes with tails; screwjacks.

10th September.—Hexigon bright mild steel.

10th September.—Bench friction drilling machine.

10th September.—Mild steel channel and mild steel bevel.

10th September.—Badged chinaware, badged crockeryware, and badged glassware.

10th September.—M.S. and D. of 50,000 sq. ft. of green buffalo trimming leather.

10th September.—S. and D. of one electric driven motor lorry chassis. Fresh tenders.

10th September.—M., S. and D. of 7-8in. steel guard rail stay bolts and nuts for 60lb. rails.

10th September.—M., S. and D. of 1in. steel guard rail stay bolts ad nuts for 80 and 100lb. rails.

10th September.—M., S. and D. of bearing springs.

10th September.—M., S. and D. of pipework, etc., for dust exhauster plant.

**SPECIAL NOTICE !**

**The Mount Morgan Gold Mining Co. Ltd.**

**ARE PREPARED TO PURCHASE Ores, Concentrates and Furnace Products, containing Gold and Copper, at most favourable rates.**

**ALSO TO INSPECT MINING PROPERTIES with a view to Developing, Financing, or Purchasing same.**

**Address:—MR. B. MAGNUS,** GENERAL MANAGER, MOUNT MORGAN, QUEENSLAND.

A. U. S. N. Co. Ltd.

*Fast, Regular, and Comfortable Passenger Steamers*

(also carrying cargo) from and to

MELBOURNE, SYDNEY, ADELAIDE, FREMANTLE, BRISBANE, and all QUEENSLAND PORTS.

Passage Tickets interchangeable, with other Inter-State Companies, on certain conditions.

Full Particulars at

COMPANY'S OFFICES

at all principal Australian Ports.

The Mount Lyell Mining & Railway

CO. LIMITED.

Purchasers of Ores containing Copper, Gold and Silver. Rates obtainable on application to the Secretary

Manufacturers of Coke for Smelting and Foundry Purposes, Acids, Etc.

HEAD OFFICE—

39 QUEEN-STREET, MELBOURNE.

D. G. LUMSDEN,
Secretary.

THE

-PACIFIC CABLE BOARD-

Cablegrams should be Marked

"VIA PACIFIC"

(Not Charged for.)

The quickest and most accurate route for Cablegrams from Australasia to United Kingdom, Canada, United States, Germany, New Zealand, and Pacific Islands.

This route is owned by Great Britain, Australia, New Zealand, and Canada. Australia being the largest part owner (having one-third interest), the public are urged to support the National Cable.

RATES—

| | Ordinary | Deferred. |
|---|---|---|
| UNITED KINGDOM | 3/- | 1/6 |
| GERMANY | 3/- | 1/6 |
| CANADA | 2/4 | 1/2 |
| UNITED STATES | 2/4<br>to 2/8 | 1/2<br>to 2/4 |
| NEW ZEALAND | 4½d. | Nil |
| FIJI | 8d | Nil |

DEFERRED RATES (IN PLAIN LANGUAGE ONLY) have now been arranged to most Countries where ordinary rate exceeds 10d. per word.

Enquiries for further information, pads of cablegram forms, maps and tariff cards, address to—

The Superintendent, SOUTHPORT, QUEENSLAND;
The Officer in Charge, 408 Collins-street, MELBOURNE, telephone 2588;
The Officer in Charge, 42 Hunter-street, SYDNEY; telephones, City 1346, City 3684;
J Milward, Manager in the Pacific, 64 Pitt-street SYDNEY; telephones City 1346, City 3684.

17th September.—M., S. and D. of one hair teasing machine.

17th September.—M., S. and D. of 12 sets copper water tanks and fittings.

17th September.—Pig iron.

17th September.—C. and riveting of mild steel girders, etc., for first section, renewal of Moorabool Viaduct, Geelong to Ballarat line. (Fresh tenders.)

1st October (extended from 10th September).—Neutral track relays.

1st October.—Motor, exhaust fan and accessories.

8th October.—M. (within the Commonwealth of Australia), S. and D. of 80lb. steel rails and fishplates. Contract No. 25,005.

5th November.—Copper rod.

5th November.—Locomotive seamless copper tubes.

5th November.—Best Yorkshire iron angle and tees.

5th November.—Best steel boiler plates.

5th November.—Copper plates.

5th November.—100 tons of good machinery cast-iron scrap.

12th November.—Steel channel bars.

12th November.—20 tons steel ingots.

12th November.—Steel blooms, for crank pins.

12th November.—Locomotive boiler tubes.

12th November.—High-speed tool steel.

12th November.—M., S. and D. of one 15-ton electric crane for Ballarat.

12th November.—Flame arc lamps.

12th November.—Insulated copper cable.

12th November.—M. and D. of one 60h.p. electric motor and accessories.

19th November.—M., S. and D. or cast steel wheel centres for A2 engines and new truck stock.

19th November.—Brass locomotive tubes.

19th November.—150 tons pig iron.

19th November.—10 tons sulphate of copper, best quality, for electrical purposes, battery material.

3rd December.—Steel blooms, for piston rods.

VICTORIAN RAILWAYS COMMISSIONERS—State Coal Mine.—4th September.—Anti-corrosive paint; control apparatus for 7½ h.p. induction motor. (Fresh tender.)

8th September.—S. of cast iron casting.

12th November (extended from 1st October).—S. of rope road haulage engine and electrical equipment for McBride tunnel.

STATE RIVERS AND WATER SUPPLY COMMISSION.—5th September.—M. (in Australia) and S. of a directly coupled motor and pump, with switchboard, of capacity 225 gallons per minute against 110 feet head. (See advertising columns.)

## New South Wales.

PUBLIC WORKS DEPARTMENT.—8th September.—C. of suction and rising mains, receiving tank, and engine house, Experimental Farm, Water Supply, Grafton.

8th September.—S. and E. of pumping machinery, Experimental Farm Water Supply, Grafton.

8th September.—C. and E. of a self-supporting steel chimney at the Power House, State Timber Yard, and Building Workshops, Uhr's Point.

8th September.—S. and D. of hooks, chains, and beef trees for veal, mutton, and pork houses, and alterations to hangers, etc., New Public Abattoirs, Homebush Bay.

7th October.—S. and D. of 500 tons of iron spikes for 60 lb. rails (see advt. cols.).

7th October.—S. of steel pipes and specials for the reticulation of township and supply to the mines, Water Supply, Broken Hill (see advt. cols.).

27th October.—M. of steel bridge for Wilson River, Wauchope to Kempsey section, North Coast railway.

RAILWAY DEPARTMENT.—10th September.—S. of 14,000 buffers.

15th October.—S. of 13 direct-current motors. (See advertising columns.)

26th November.—S. of one 2000lb. storage battery freight truck (see advertising columns).

SYDNEY HARBOUR TRUST.—8th September.—S. and D. of steel roofing and runway brackets for cargo sheds, No. 6 jetty, Woolloomooloo Bay.

WATER CONSERVATION AND IRRIGATION COMMISSION, Public Works Office, Sydney.—10th September.—P. of one pair of cross-compound horizontal, direct-acting reciprocating condensing engines, and two horizontal, double-acting lift and force pumps; also two colonial type tubular boilers, complete with all mountings and furnace fittings, funnel, etc., and feed pumps (see advt. cols.).

## Western Australia.

GOVERNMENT TENDER BOARD.—11th September.—50 tons of charcoal for State Battery, Payne's Find.

18th September.—One improved lever punching, shearing, and angle iron cutting machine for Railway Department.

18th September.—50 tons of charcoal for State battery, Wiluna.

2nd October.—700 brass boiler tubes for Railway Department.

## Queensland.

TREASURY DEPARTMENT.—4th September.—Cutting and lengthening of the bucket dredge "Maryborough," and other work in connection therewith.

29th September.—S. about 1687 tons of cast-iron spigot and faucet water pipes, special castings, and valves, for Maryborough waterworks.

29th October.—C. and E. of central sugar mill at Babinda Creek, North Queensland.

## South Australia.

SUPPLY AND TENDER BOARD.—9th September.—S. and D. at the Public Stores, Port Adelaide, of 4000 porcelain insulators, No. 5, to exhibited sample. Customs duty to be paid by contractor.

9th September.—S. and D. at the Pintsch's gas depot, Adelaide railway station, of about 75,000 galls. of high-test kerosene oil, suitable for manufacture of Pintsch's gas, having a fire test of not under 300 deg. Fah., and a flash point of not less than 245 deg. Fah. closed test, subject to test specified in English Petroleum Act of 1879.

16th September.—S. and D. at the Public Stores, Port Adelaide, or the Sewers Yard, Thebarton, of Portland cement in such quantities and at such times as may be rquired during the periods ending June 30th, 1914, or June 30th, 1915.

14th October.—S. and D. in trucks on wharf, Port Adelaide, of 800 solid drawn, best toughened copper tubes, for locomotive boilers, 10ft. 8¼in. long x 1 7-8in. outside diameter x No. 10 I.W.G. thick at the end, gradually tapering to No. 12 I.W.G. at the other end. Customs duty (if any) to be paid by contractor.

## New Zealand.

RAILWAYS DEPARTMENT.—31st October.—S. and D. of stores for the period from April 1, 1914, to March 31, 1917.

## General.

CITY OF MELBOURNE.—9th September.—S. and D. of No. 6 tar carts, of a capacity of about 600 gallons each.

9th September.—S. and D. of 2000 cubic yards of sand.

9th September.—C. of two pipe culverts and a pipe drain in Carlton.

9th September.—S. and D. of electricity recording meters and maximum demand indicators.

16th September.—S. and D. of (a) insulated copper cables, (b) three-phase transformers.

1st October.—Insulated copper cables.

7th October.—Incandescent electric lamps, and single phase transformers.

8th October.—Insulated copper cables.

CITY OF SOUTH MELBOURNE (V.) (E. C. Crockford, Town Clerk).—10th September.—S. of coal.

CITY OF TOWNSVILLE (Q.).—8th September.—S. of a complete condensing plant, comprising condenser, an Edwards' patent air pump, and circulating pump, the circulating pump to be direct-coupled to a quick, self-lubricating engine, the air pump to be either direct coupled or through gearing to some well-known make of steam engine. Specifications at Town Clerk's offices, Sydney or Brisbane.

CITY OF LAUNCESTON (T.) (C. W. Rocher, Town Clerk).—13th October.—Section i., S. and D. D. of transformers, etc.; section ii., S. and D. of feeder cable, etc.; section iii., S., D. and E. of high tension switchboard, etc.

MUNICIPALITY OF RICHMOND (N.S.W.) (A. V. Grimwood, Town Clerk).—4th September.—S., E. and Maintenance of 40 street lamps.

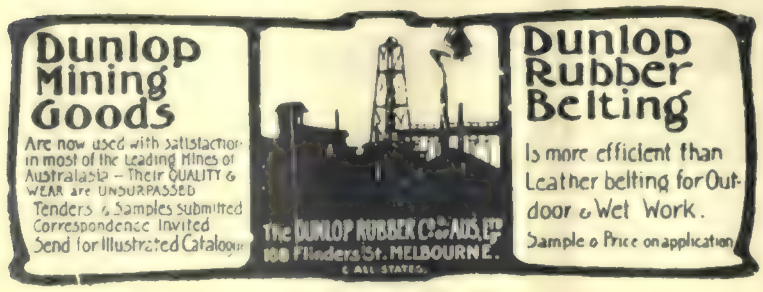
SHIRE OF BRAYBROOK (V.) (W. J. Andrew, Shire Secretary).—5th September.—S. of 8 n.h.p. traction engine and road roller (convertible). (See advertising columns.)

METROPOLITAN GAS COMPANY (V.) (A. E. Bradshaw, Subst. Secretary, Melbourne).—11th September.—P. of a total fixed quantity of 1800 tons of sulphate of ammonia, to be produced by this company during the twelve months ending 31st August, 1914.

THE MELBOURNE AND METROPOLITAN BOARD OF WORKS (V.).—19th September.—M., S. and D. in position at Woori Yallock Creek of girders with hanging straps, bolts, and other fittings, for carrying the main O'Shannassy 34in. pipe over the creek. (See advertising columns.)

MOUNT LYELL MINING AND RAILWAY CO. LTD. (D. G. Lumsden, Secretary, 39 Queen-street, Melbourne).—20th September.—S. of stores (including electrical goods and chemicals) for 12 months ending 31st December, 1914.

STANLEY REWARD TIN MINING COMPANY (L. A. Cleveland, manager, 31 Queen-street, Melbourne).—18th September.—Tributing the lode section of the company's property, Stanley River, West Coast, Tasmania.



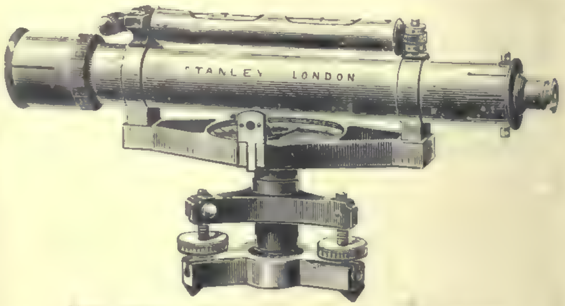
Dunlop Mining Goods
Are now used with satisfaction in most of the Leading Mines of Australasia – Their QUALITY & WEAR are UNSURPASSED
Tenders & Samples submitted
Correspondence Invited
Send for Illustrated Catalogue

The DUNLOP RUBBER Co. of AUS. Ltd
100 Flinders St. MELBOURNE.
& ALL STATES.

Dunlop Rubber Belting
Is more efficient than Leather belting for Outdoor & Wet Work.
Sample & Price on application

Note this on every belt.

Be sure you get
"DICK'S"
We know there are numerous imitations. Dick's maintains its high reputation for strength and efficiency. Every belt guaranteed. Sole agents:
JAMES HARDIE & CO.
Melbourne and Sydney.



**W. F. STANLEY & CO.,**
**SCIENTIFIC INSTRUMENT**
makers, are recognised by all users as being foremost in their craft the world over.
They have appointed us as their N.S.W.
SOLE AGENTS,
and we are selling their manufactures at their English Catalogue Prices, plus only 15 per cent. Customs and importing expenses.
Our stock is now the largest one in **Australia, and embraces all the latest improvements in instruments.**
Write for Catalogues.

**New Pattern Engineers 12-inch level, £9 9/-.**

***Fairfax and Roberts Ltd.,***
Vice-regal Opticians,
Accessories. ***23 & 25 Hunter-st., Sydney.***

GEELONG WATERWORKS AND SEWERAGE TRUST (V.) (J. S. Sharland, secretary).—Contract No. 7.—M., S. and D. and the laying and jointing of about 10,250 lineal feet of oviform reinforced concrete pipes.

MACK LIMITED, 19 Queen-street, Melbourne.—S. and E. at Mack Limited Works, Lake Boga, 10,000-gallon galvanised iron tank on 10ft. platform, with 2in. intake and 3in. discharge pipes.

AUST. GAS RETORT AND FIRE BRICK CO., Tooronga-road, South Yarra (V.).—P. and R. in one line of the following surplus plant:—One 10 h.p. horizontal engine, one 15 h.p. water-tube boiler, one pair clay rollers, one 7ft. grinding pan, one 6ft. grinding pan, two [illegible] brick machines, hoisting gear, shafting and pulleys.

CORPORATION OF ST. PETERS (S.A.) (S. Reeves, Town Clerk).—17th September.—P. of 2 [illegible] scavenger's carts and 1 iron mud barge.

## ACCEPTED.

### Commonwealth.

DEPARTMENT OF HOME AFFAIRS.—Federal Capital.—S. of 1000 [illegible] insulators for power transmission lines, Canberra, Federal Territory, £250.—The Australian General Electric Company, Melbourne.

DEPARTMENT OF HOME AFFAIRS.—Kalgoorlie to Port Augusta Railway.—Boring for water from Ooldea Well, eastward (South Australian section), for about 100 miles, 1200ft. (maximum), [illegible] 100ft. [illegible] per foot, [illegible] 30s. per foot, 100 200ft. [illegible] per foot, 200 300ft. 35s. per foot, £5000 [illegible].—[illegible] Bros. Ltd.

[illegible] engines and spares, 32, 16 delivered Fremantle, £1708 12s. 6d., 16 delivered Port Augusta £1708 12s. 6d., £3417 5s.—[illegible] and Co. Pty. Ltd.

Sleepers (Powellised Victorian mountain ash and messmate), 6000 7s. 6d., less 1s. 5 1-8d. per sleeper, [illegible] allowance for freight to be paid by the Department from Melbourne to Port Augusta, equalling 6s. 0 7-8d. alongside ship, Melbourne, £1821 17s. 6d.—Victorian Powell Wood Process Ltd. This quantity is accepted in lieu of 100,000, notification of the acceptance of which appeared in the "Gazette" of 10th May last, which notification has now to be considered as cancelled.

### Victoria.

VICTORIAN RAILWAYS.—S. and D. of 1 steam pump at £190.—Walsh, Perran and Co.

S. and D. of spring washers (coiled) for 1-inch [illegible] bolts, at £1 [illegible] per 1000, delivered at Spencer-street Railway Station.—Alfred Adams and Co.

S. and D. of hoisting engine and boiler, complete, at £265.—[illegible] Pty. Ltd.

M. [illegible] will be used to the con[illegible]. S. and D. of ¾ inch [illegible] at £13 15s. per ton.—Mephan Ferguson Pty. Ltd.

P. of one only 20 horse-power "Marshall" portable engine and boiler, £710.—Robison Bros. and Co. Pty. Ltd.

P. of rolled steel joists under contract, at rates.—Dorman, Long and Co. Ltd.

PUBLIC WORKS (PORTS AND HARBOURS).—Laying of 4-inch water main at the shipbuilding yard, Williamstown, £100 [illegible] 5s.—Melbourne and Metropolitan Board of Works.

S. of 16 h.p. [illegible] engine [illegible] Gippsland Lakes, £160.—W. [illegible] Wilson.

P. of [illegible] and 3 boiler shell [illegible], £[illegible].—The Agent-General, London.

[illegible] tons [illegible] plates, £172 [illegible]; [illegible] of [illegible] steel tubes, £130 13s.—Stewarts and Lloyds Ltd.

PUBLIC WORKS DEPARTMENT.—500 tons of [illegible] Partridge, £[illegible] 5s. [illegible]

### Western Australia.

WATER SUPPLY DEPARTMENT.—C.I. specials—items 2207 to 2211, £111 5s. G. Kent Ltd.

RAILWAYS DEPARTMENT. Tubular iron poles, items 1018 to 1025, £2254 9s. 11d.—G. Wills and Co.

Steam hammers, item 761, £241 10s. each; item 762, £320 5s. each.—Tomlinson Bros.

### New Zealand.

PUBLIC SERVICE STORES TENDER BOARD.—S. of 9500 castings for iron rails, £149 12s.—Burt, A. and T. Ltd., Wellington.

S. of 25,000 Leclanche No. 2 cells, £1250. Burt, A. and T. Ltd., Wellington. (A quality.)

S. of 20 tons of hard-drawn copper wire, 300 lb. per mile, and 50 tons of hard-drawn copper wire, 200 lb. per mile, £5938 18s. 4d. — Richardson, McCabe and Co. Ltd., Wellington.

S. of 150 tons of galvanised iron wire, £1839 17s. 11d.—Richardson, McCabe and Co. Ltd., Wellington.

S. of 100 miles of V.I.R. twin-twisted wire, £1442 10s. Richardson, McCabe and Co., Wellington.

### General.

MELBOURNE HARBOUR TRUST COMMISSIONERS (V.) (R. Rudd, Secretary).—S. and D. of one direct coupled electric light set, £235. Clayton, Joel and Co.

CITY OF FITZROY (V.) (A. Batson, Town Clerk). S. of one sand spreading machine, £70. Alexander Braid.

MORWELL WATER WORKS TRUST (V.) (A. K. T. Sambell, C.E., Trust Engineer, 421 Collins-street, Melbourne).—Contract No. 7—S. of 12½ tons 5in. C.I. pipes; S. of 2½ tons of 4in. C.I. pipes; S. of 22 tons 3in. C.I. pipes, £331 8s. 9d.—Jos. Nixon and Sons.

Contract No. 8—S. of 3432 lineal feet, 2in. G.W.I. tubing; S. of 9834 lineal feet, 1½in. G.W.I. tubing; S. of 10,428 lineal feet, 1in. G.W.I. tubing; bends, tees, fittings, etc., for same, £404 16s.—Stewarts' and Lloyd's.

GREAT LANGI LOGAN GOLD MINES CO. N.L. (W. Bruce Fox, 123 Queen-street, Melbourne).—S. of 80,000 super. feet of sawn timber, 8s. per 100 super feet, on trucks at Forrest.—W. R. Henry and Son, Geelong and Forrest.

MELBOURNE AND METROPOLITAN BOARD OF WORKS (V.). Repairing and recoating of about 1200ft. of 24 inch wrought iron pipes, £363 13s.—Mephan Ferguson Pty. Ltd.

M., S. and D. of 20,000 lineal feet of cement concrete pipes, 9in. diameter, 9d. per foot. The Reinforced Concrete and Monier Pipe Construction Co. Pty. Ltd.

S. and D. of 2 steel wire plough ropes, £84.—Briscoe and Co. Ltd.

ECHUCA WATER TRUST (V.).—S. of 10-inch, 9-inch, and 8-inch cast iron.—Monteith and Sons.

S. of 12-inch wood pipes.—Australian Wood Pipe Co. Ltd.

CITY OF FOOTSCRAY (V.).—500 five amp. A.C. meters, 21s. each.—Siemens Bros. Dynamo Works Ltd.

## BANK CLEARINGS.

The report of the Melbourne Clearing House for the week ended 1st September was:—

| | | |
|---|---|---|
| Total clearance | | £5,202,136 |
| Balances— | | |
| Settled by certificates | £312,500 | |
| Settled in coin | 233,943 | |
| | | 546,443 |
| Total clearance for the corresponding week, 1912 | | 5,572,785 |

Whilst visiting Castlemaine on their tour of inspection, the Victorian Railways Commissioners paid a visit, by invitation, to the Thompson and Co. (Castlemaine) Propty.'s engineering works.

## PUBLIC WORKS (N.S.W.).

### Big Undertakings.

The four months' supply bill introduced by the Treasurer of New South Wales provides for the expenditure of £3,442,960 out of the general loan account.

The following works are set out in the bill, and are intended to be carried out with the sum proposed to be borrowed:—

Distributing depot and meat market, Pyrmont, £8760. Housing Board: Erection of buildings, and the construction of works, and for other costs and expenses under the Housing Act, 1912, the whole amount to be carried to the housing fund constituted under the said Act, £20,000. Resumed properties branch: Improvement of Observatory Hill resumed area, including re-alignment of streets, erection of shops, dwellings, etc., £25,000. Sydney Harbour Trust: Towards construction of works generally, and for the improvement of the port, further sum, £146,000.

Railways and Tramways.—Railways: Rolling stock to meet additional traffic requirements, and equipment of new lines, £362,000; additions to railway lines, stations, and buildings, and for other purposes, £330,000; duplication of portion of the main trunk lines of railway, and other works in connection therewith, £400,000; towards construction of Flemington to Belmore, and Wardell-road to Glebe Island, and Darling Island railways, £214,000. Tramways: additions to lines, workshops and buildings, duplication of lines, and for other purposes, £280,000; rolling stock to meet expansion of traffic, and equipment of new lines, £91,000; additional power-house to meet expansion of traffic, £71,500.

Minister for Public Works.—Railway construction: North Coast railway (further sum), £130,000; Parkes to Peak Hill (further sum), £28,000; Galong to Burrowa (towards), £35,000; Finley to Tocumwal (towards), £24,000; Dunedoo to Coonabarabran (further sum), £40,000; Wagga to Tumbarumba (further sum), £40,000; Forbes to Stockingbingal (further sum), £32,000; Muswellbrook to Merriwa (further sum), £25,000; Moree to Mungindi, £30,000; Wyalong to Cudgellico, £20,000; Condobolin to Broken Hill, £5000; Glenreagh to Dorrigo, £4000; Coonabarabran to Burren Junction, £5000; Barmedman towards Hillston, £3000; city electric railway, £3000; eastern suburbs electric railway, £900; western suburbs electric railway, £900. Tramway construction: Tramways generally (further sum), £20,000. Sewerage construction: Metropolitan sewerage and stormwater channels (further sum), £1500; country towns sewerage and stormwater channels (further sum), £15,000; Long Bay ocean outfall sewer (further sum), £33,000; Newcastle sewerage (further sum), £8000. Water supplies: Country towns water supplies generally (further sum), £64,200; Hunter District water supply, additional pumping plant at Walka, £2500; metropolitan water supply, improvements, £1000. Harbours and rivers: Newcastle harbour improvements, £19,000; Newcastle harbour, Carrington wharfage, £18,000; Port Kembla, improvements, wharfage, and shipping appliances, £19,000; Coff's Harbour improvements, £4000.

Miscellaneous.—New public abattoir, freezing houses, and other works at Homebush Point, £25,000. Industrial undertakings: Kiama No. 1 State metal quarry, £6200; Kiama No. 2, State metal quarry, £2000; Kiama No. 3, State metal quarry, £3000; State brickworks, Botany, establishment, £3000; new steamer for blue metal trade, £10,000; State quarry, Maroubra, establishment, £5000; Government dockyard and workshops, Newcastle extension, £30,000; new workshops and timber depot, £20,000; building construction, working capital, £20,000.

Metropolitan Board of Water Supply and Sewerage.—Water supply: General reticulation, improvements, land, buildings, canal works, etc., and for other purposes, £110,000; Sydney water supply, amplification, £40,000. Sewerage: Construction and ventilation of sewerage generally, £55,000. Hunter District Water Supply and Sewerage Board: Water supply, extension of reticulation, £7000; improvements and other works, £2000. Sewerage: extension and reticulation, £1500.

Public Instruction.—Miscellaneous: School buildings, teachers' residences, and other buildings, school and residence sites, additions, etc., £80,000.

Minister for Agriculture.—Water conservation: Construction Burrinjuck dam, Murrumbidgee canals, purchase stock, etc., £140,000; land resumptions, Murrumbidgee irrigation areas, £304,000.

## INDUSTRIAL.

The Edwards Pyrites and Ore Reduction Co., of Ballarat, inform us that their agency is held by the following:—America, Stearns, Roger and Co., Denver, Colorado; Great Britain and South Africa, Fraser and Chalmers, London; Western Australia, South Australia and Broken Hill, Forwood, Down and Co. The company retains the control of sales in other parts of Australia.

# REPORTS OF COMPANIES AND CORPORATIONS.

## Chillagoe Co. Ltd. (Q.)

The operations of the Chillagoe Company for the last two four-weekly periods resulted as follows:—

| | | Term Ended | |
|---|---|---|---|
| | | July 18. | Aug. 15 |
| Copper furnace ran | days | 28 | 12 |
| Lead furnace ran | days | 9 | 7 |
| Ore treated | tons | 5,869 | 2,594 |
| Producing:— | | | |
| Copper | tons | 302 | 113 |
| Lead | tons | 169 | 104 |
| Silver | oz. | 22,866 | 11,999 |
| Gold | oz. | 318 | 179 |

## Mount Morgan G.M. Co. (Q.).

The smelting returns of the Mount Morgan Gold Mining Co. for the last two months were as follows:—

| | July | August |
|---|---|---|
| Smelters— | | |
| Copper ore, tons | 19.776 | 20,508 |
| Many Peaks ore, tons | 3,929 | 2,970 |
| Blister copper, tons | 766 | 730 |
| Copper contents, tons | 758 | 723 |
| Gold contents, oz. | 9,384 | 8,942 |
| Proportion Many Peaks ore (approx.)— | | |
| Copper, tons | 48 | 33 |
| Gold, oz. | 28 | 23 |
| Secondary products (approx.)— | | |
| Copper, tons | 9 | 31 |
| Gold, oz. | 142 | 433 |
| Working time, days | 28 | 28 |
| Estimated value, blister (copper at £60) | £<br>84,968 | £<br>81.008 |

## Broken Hill Proprietary Block 10.

The output of the Broken Hill Proprietary Block 10 Co. for the last two four-weekly periods was as follows:—

| | Term ended | |
|---|---|---|
| | Jy 23 | Aug 20 |
| Ore treated, tons | 7,881 | 7.781 |
| Assaying— | | |
| Silver, oz. | 10.1 | 9.5 |
| Lead, per cent. | 12.0 | 12.0 |
| Zinc, per cent. | 14.1 | 14.1 |
| Concentrates, tons | 1,043 | 1,037 |
| Assaying— | | |
| Silver, oz. | 34.3 | 32.8 |
| Lead, per cent. | 64.3 | 64.8 |
| Zinc, per cent. | 7.0 | 7.0 |

## Broken Hill Proprietary (N.S.W.).

The following was the output of the Broken Hill Proprietary Co. for the last two four-weekly periods:—

| | Four weeks ended | |
|---|---|---|
| | July 30 | Aug. 27 |
| Own ores, silver, oz. | 160,978 | 181.954 |
| Do. do., lead, tons | 2,519 | 2,806 |
| Purchased ores, silver, oz. | 191,211 | 197,978 |
| Do., lead, tons | 3.855 | 4,097 |
| Antimonial lead, tons (estimated) | 28 | 66 |
| Zinc concentrates, tons | 7,000 | 6,520 |
| Containing silver, oz. | 90,214 | 82.960 |
| Do. lead, tons | 524 | 472 |
| Do. zinc, tons | 3,227 | 3,014 |

## Iodide (Mineral Hill) Ltd. (N.S.W.).

Iodide (Mineral Hill) Ltd. held its first annual general meeting in Sydney on 28th August. Mr. C. H. Kerry, chairman of directors, presiding. The accounts cover a period of nine months and show a profit of £506 for that term, which amount has been carried forward. A sum of £4469 was spent on development work, off which has been written £1000 as development redemption. Sales of product realised £3877, and the estimated value of ore at refinery, in transit, or at the mine, is £3834. There is a balance due on purchase of mine property of £14,000, payable in November. The sinking of the main shaft has been suspended at 200ft. pending the installation of a pump. The policy of the directors, in view of the prices ruling for metals, is to have all ore, profitable for shipment, broken and despatched, as far as is consistent with good mining. The mine manager estimates the ore in sight, above the 90ft. level, as 3450 tons firsts, averaging 20.6 per cent. lead, 60.31 oz. silver, and 2 dwt. gold, and 5940 tons seconds, averaging 22.8 per cent. lead, 15.49 oz. silver, and 1 dwt. 13 gr. gold. Substantial poppet legs and a compact winding plant have been installed at the main shaft, two tanks of 599,000 and 80,000 gallons capacity respectively have been excavated, and a number of necessary buildings and officials' residences have been erected. In reply to questions, the chairman stated that £7 per ton was a fair average value of the stone being raised, the total charges, including treatment, being £6 12s. per ton. There is at present no defined lode, but work is being carried on on a very large oval lense deposit; so it was impossible to make an estimate of the quantity of ore to be mined. Mr. Kerry stated he did not consider a question asked as to the probabilities of the mine was a fair one, as he would not be bound down to give his personal opinion. The report and balance-sheet were adopted, and Messrs. G. H. Blakemore and G. O. Hyde were re-elected directors.

## Sulphide Corporation (N.S.W.).

The following was the output of the Sulphide Corporation for the four weeks ended with August 23, and for the purpose of comparison the corresponding figures for the previous four weeks are added in parentheses:—16,697 (17,648) tons of crude ore were milled at the Central mine, Broken Hill, producing 3061 (3149) tons of lead concentrates and 5395 (5545) tons of zinc concentrates. During the same period at the Cockle Creek works 3260 (3641) tons of leady concentrates, purchased ores, etc., were smelted, yielding 1289 (1389) tons of lead, containing 2915 (3450) oz. gold and 103,607 (104,954) oz. of silver.

# DIVIDENDS.

The following dividends and bonuses of mining companies in Australia have been declared, and are payable on the dates noted:—

September.

4th.—South New Moon G.M. Co., Bendigo (V.), 1s., £1600.

6th.—Hampden-Cloncurry Copper Mines (Q.), 2s., £35,000.

8th.—Maori Queen Proprietary Co., Bright (V.), 5s., £625.

9th.—Campbell's Creek G.D. Co., Campbell's Creek (V.), 6d., £800.

10th.—William's Fancy G.M. Co., Berringa (V.), 6d. and bonus 6d., £1200.

13th. — Y-Water (Emmaville) Tin Co. (N.S.W.), 1s., £2000.

15th.—Pioneer Tin Dredging Co., Bradshaw's Creek (T.), 6d., £4031.

17th.—Tongkah Compound, Siam, 1s., £2500.

18th.—Mararoa G.M. Co., Norseman (W.A.), 1s., £5000.

24th.—Broken Hill Prop, Block 10 (N.S.W.), 1s., and bonus 1s., £10,000.

25th.—Zinc Corporation (N.S.W.), pref. 2s., less income tax, £24,569.

26th.—Sons of Gwalia Ltd., North Coolgardie (W.A.), 1s., £17,500.

26th.—North Broken Hill Silver-Lead M. Co. (N.S.W.), 2s., £60,000.

26th.—Broken Hill South Silver-Lead M. Co. (N.S.W.), 6s., £60,000.

27th.—Great Boulder Prop. Ltd., Kalgoorlie (W.A.), 9d., £65,625.

30th.—North Mount Farrell S.L.M. Co. (T.), 3d., £1000.

October.

1st.—Broken Hill Water Supply Ltd. (N.S.W.), 1s. 6d., and bonus 1s., £6250.

8th.—South Kalgurli G.M., Kalgoorlie (W.A.), second and final cash return of 8d., £10,000.

# MIXED MEMS.

Mr. E. T. Fisk, the Australian representative of the Marconi Wireless Telegraph Co., commenced his authorised inspection of the Commonwealth wireless plant at the Melbourne station at midnight on August 27th, and concluded it at about 9 o'clock on the following morning. The purpose was to ascertain by a minute examination whether or not the company's patent rights are infringed in the Federal apparatus, with the view of supplying evidence in the action which has been commenced by the company against the Commonwealth Government for infringement. Mr. Balsillie was present during the inspection to represent the Government, and Lieutenant Creswell represented the naval authorities. Simultaneously inspections were made by other representatives of the company at the Hobart and Brisbane stations.

The N.S.W. Mines Department advertises elsewhere in this issue that an examination for Managers' and Under-Managers' Certificates will be held at the Technical College, Newcastle, on the 14th October. Intending candidates' applications must reach the Under-Secretary for Mines by 1st October.

The Edgar rock-drill is the invention of a working miner at Karangahake (N.Z.).

Dr. James Grebin, who has been prospecting for oil in Papua on behalf of the Commonwealth Government, is on his way southwards to Sydney and Melbourne. When in Brisbane he stated that in his prospecting work he had covered an area of about 400 square miles, and had inspected the outcrops between the Vailala River and Purari. Dr. Grebin put down two bores, and struck oil in both. He speaks enthusiastically of the discovery, declaring that, although the quantity of oil secured so far was small, the quality was good. He expressed the opinion that the oil fields could be profitably worked, and that there would be no trouble over traction, as oil could be carried through pipes to the nearest convenient port for export. On reaching Melbourne, Dr. Grebin will present a full report to the Minister of External Affairs.

The Victorian Minister of Mines, Mr. A. A. Billson, was approached last week by a deputation from Eaglehawk with a request that he would take steps to cover in abandoned mining shafts, pointing out that numerous fatalities had occurred through people falling into these unprotected death-traps. It was thought that it was the duty of the Government to either fill up and cover over these shafts for the public safety, or, at least, see that other people did it. The Minister declined to accept the responsibility for the Government. He pointed out that under the Mines' Act lessees were compelled to keep the shafts properly protected, and under the Local Government Act the responsibility rested with the municipalities of taking action against any person who left a shaft in a condition dangerous to the public. The trouble was that, when the lessees protected the shafts with timber, the safeguards were torn away for use as firewood by residents of the locality.

The secretary of the Austral Malay Tin Ltd. reports receipt last week of cabled advices that a preliminary examination has been made of the company's option areas in Renong, a Siamese State north of Tongkah, that the results are promising, and that additional ground adjoining has been secured. Regarding the Kota property, in the Taiping district, the last mail advices stated that the average tin content per cubic yard is 1.01 lb., and cabled advices since to hand are that the final results show the values to be nearly 10 per cent. better. The total area is 170 acres. On the recommendation of Mr. A. W. Freeman, the option held by the company is being exercised immediately. Mr. T. W. Horton is proceeding to make a preliminary examination of the option held at Semenyeh, in the British State of Selangor.

Applications are invited by the Minister for Home Affairs, and will be received until 16th September, for the position of traffic officer at Port Augusta at a commencing salary of £300 per annum. Applicants are required to have general railway experience, to be competent to supervise goods and passenger traffic and station accounts, and to be qualified in the theory and practice of telegraphy, and in the use of the electric train staff system of working.

MINING REFORM AND MILLIONS.

WHY! HOW! WHERE!

ASK YOUR BROKERS FOR A COPY.

CONCENTRATING.

EXPERT FOREMAN WANTED.

Must have Good Past Record and be able to Successfully Manage Men.

Only First Class Man will be considered.

Reply, giving fullest personal information and Salary expected to—

"NECNOC."

OFFICE OF THIS PAPER.

SYDNEY or MELBOURNE

WANTED TO BUY.
CHOICE MINERAL SPECIMENS
From any Part of Australia.
Apply to—V.4394,
(c/o Rudolf Mosse, Berlin, S.W. 19,
Germany.

ARTHUR H. HASELL,

GYPSUM, PHOSPHATE, GUANOS, MAGNESIA, WHITING, DOLOMITE, INFUSORIAL EARTH, TIMBER, HEMP, SULPHUR, Etc

ANALYSES MADE FREE.

HEAD OFFICE Lombard Buildings, 17 Queen-street, Melbourne

Branches 2 Bridge-street, Sydney. 1 Lipson-street, Port Adelaide Factories Pt Adelaide, S.A ; Newport, Vic ; Newcastle, N.S.W Mines Kapunda and Marion Bay, Daly Head, S.A.; Boort, Vic.; Cooma, N.S.W.

## Government Notice (V.).

### STATE RIVERS AND WATER SUPPLY COMMISSION.

TENDERS, addressed to the Secretary, and endorsed, "Tenders for Electrical Pumping Set," will be received at the Commission's Offices, Treasury Gardens, Melbourne, until noon, September 5, 1913, for the Manufacture (in Australia) and Supply of a Directly-coupled Motor and Pump, with Switchboard, of capacity 225 gallons per minute against 110 feet head.

Specifications with the Commission's Mechanical Engineer, Melbourne. Deposit, £7.

M. NALLY,
Secretary.
August 30, 1913.

---

## THE MELBOURNE AND METROPOLITAN BOARD OF WORKS.

SEPARATE TENDERS are invited for the Manufacture, Supply and Delivery in Position, at [illegible] Yallock Creek, of Girders with Hanging Straps, Bolts, and Other Fittings, for carrying the [illegible] O'Shannassy 34in. pipe over the creek. Preliminary and final deposit, £15.

Tenders, accompanied by the necessary preliminary deposit, and endorsed, "Tender for Girders, etc.," must be deposited in the Tender Box, at the offices of the Board, 110 Spencer-street, Melbourne, on or before 11 o'clock a.m. on Friday, September 26, 1913. Full particulars at this office. The lowest or any tender not necessarily accepted.

GEO. A. GIBBS, Secretary.

---

## UNIVERSITY OF DURHAM.

Armstrong College, Newcastle-upon-Tyne.

**Principal: W. H. Hadow, M.A., D. Mus.**

Session of 1913-1914.

MATRICULATION EXAMINATION, SEPTEMBER 23-27.

Particulars of Curricula for University Degrees and College Diplomas in Engineering, Electrical Engineering, Naval Architecture, Mining, Metallurgy, Agriculture, Pure Science, Arts and Commerce, and of Fellowships, Scholarships, and Exhibitions, on application to—

F. H. PRUEN, M.A., Secretary.
Armstrong College, Newcastle-upon-Tyne.

---

## THE PIONEER TIN MINING Co. Ltd.

NOTICE is hereby given that a Dividend (24th) of Sixpence per share has been declared, payable on Monday, September 15, 1913. Transfer books will be closed on Monday, September 8, 1913, for purposes of this dividend. By order of the Board,

JOHN F. WAY, Secretary.
31 Queen-st., Melb., Aug. 28, 1913.

---

## WANDILIGONG GOLD DREDGING CO. NO LIABILITY.

A Dividend (the 57th) of One Shilling per share has been declared, payable at the registered office of the Company, Cavan-street, Bright, on Thursday, September 25, 1913. Transfer books close Thursday, September 18, 1913.

P. J. BREEN, Manager.

---

## BROKEN HILL SOUTH SILVER MINING CO., No Liability.

NOTICE is hereby given that a Dividend (57th) of [illegible] per share has been declared, due and payable on Friday, September 26, 1913. Transfer books will close at the offices of the Company, Collins House, Collins-st., Melbourne, Brookman's Building, Grenfell-st., Adelaide, and 16 O'Connell-st., Sydney, on Friday, September 12, 1913, at 4 o'clock p.m. By order of the Board.

FRANK G. HICKEY, Secretary.

Shareholders are notified that their dividends will be posted direct.

360 Collins-st., Melb., Aug. 29, 1913.

---

## NORTH BROKEN HILL LIMITED.

NOTICE is hereby given that a Dividend (31st) of Two Shillings per share has been declared, due and payable on September 27, 1913. Transfer books will close at the offices of the Company, Collins House, 360 Collins-st., Melbourne, and London, on September 12, 1913, at 4 o'clock in the afternoon.

By order of the Board.
HENRY M. FIEDLER, Secretary.
360 Collins-st., Melb., Aug. 28, 1913.

Shareholders are notified that their dividend will be posted direct.

---

## Government Notices (N.S.W.).

New South Wales Government Railways,
Office of the Chief Commissioner,
Sydney, August 29, 1913.

TENDERS will be received at this Office until 12 o'clock noon on the dates specified for the undermentioned Works, etc., viz.:—

WEDNESDAY, OCTOBER 15, 1913.

The Supply of Thirteen Direct Current Motors, to Specification No. 412, obtainable at the Electrical Engineer's Office, 61 Hunter-street, Sydney (price 2s. 6d. each).

WEDNESDAY, NOVEMBER 26, 1913.

The Supply of One 2000 lb. Storage Freight Truck. Specification No. 426 (price 2s. 6d.), obtainable at the Electrical Engineer's Office, 61 Hunter-street, Sydney.

Tenders are to be endorsed, "Tender for D.C. Motors," or as the case may be.

The Chief Commissioner does not bind himself to accept the lowest or any tender.

By order,
J. S. SPURWAY,
Secretary.

---

COAL MINES REGULATION ACT, 1912.

An Examination of Candidates for Certificates of Competency as Manager and Under-Manager will be held at the Technical College, Newcastle, commencing at 9.30 a.m. on Tuesday, October 14, 1913. Completed applications must reach the Under-Secretary for Mines not later than October 1. Full particulars on application to the Department of Mines.

E. F. PITTMAN,
Under-Secretary.
Department of Mines,
August 27, 1913.
(8a24)

---

Department of Public Works,
Sydney, September 1, 1913.

TENDERS FOR MACHINERY, ETC.

TENDERS, specified below, will be received at this Department until 2 o'clock p.m., on the dates mentioned:—

TUESDAY, OCTOBER 7, 1913.

Supply, etc., of 500 tons Iron Spikes for 60 lb. Rails.

Supply of Steel Pipes and Specials for Reticulation of Township and Supply to Mines, Water Supply, Broken Hill.

MONDAY, OCTOBER 27, 1913.

Manufacture, etc., of Steel Bridge for Wilson River, Wauchope to Kempsey Section, North Coast Railway.

Further particulars may be obtained from N.S.W. "Government Gazette."

(6a58) ARTHUR GRIFFITH.

---

Water Conservation and Irrigation Commission,
Public Works Office,
Sydney, August 25, 1913.

SALE OF OLD PUMPING PLANT, HAY IRRIGATION PUMPING STATION.

The Commissioner invites TENDERS for the Purchase of—

(1) One pair of cross-compound, horizontal, direct-acting, reciprocating, condensing engines, and two horizontal, double-acting lift and force pumps.

(2) Two colonial type tubular boilers, complete, with all mountings, and furnace fittings, funnel, etc., and feed pumps.

Tenders, which should be endorsed "Tender for Purchase of Plant, Hay," and addressed to the undersigned, will be received up to 2 p.m. on Wednesday, September 10, 1913.

Full particulars will be supplied upon application to this office, or to the Superintendent, Irrigation Area, Hay.

By order of the Commissioner,
G. J. EVATT,
Secretary.
(9e12)

---

## THE NORTH MOUNT FARRELL Mining Co., No Liability.

A Dividend the (11th) of Threepence per share has been declared, due and payable at the Company's bankers, the National Bank of Tasmania Limited, Devonport, on Tuesday, September 30, 1913. Transfer books close on Monday, September 22, at 3 o'clock p.m.

W. B. COCKER, Manager.

---

## SHIRE OF BRAYBROOK.

TENDERS are invited, returnable to the undersigned, for 8 N.H.P. TRACTION ENGINE and ROAD ROLLER, convertible, not later than 5th prox.

WALTER J. ANDREW,
Shire Secretary.
Sunshine, 18/8/13.

---

## UMEARI GOLD LIMITED.

### Dredge Master.

Applications will be received by the undersigned for the Position of Dredge Master for Umeari Gold Limited, in the Philippine Islands.

Applicants must hold New South Wales, Victoria or New Zealand Dredge Master's Certificates. Applicants to enclose copies of testimonials, and full particulars of experience, also state age. Salary, £50 per month. Duties to commence on or about December 1 next.

J. E. COCKER, Secretary.
Australasia Chambers, Martin-pl., Sydney.

---

## WILLIAMS FANCY G.M. CO., BERRINGA, No Liability.

A Dividend (the 42nd) of Sixpence a share, with a Bonus of Sixpence a share, has this day been declared, payable at the office of the Company, Lydiard-st., Ballarat, on Wednesday, September 10, 1913. Transfer books close on Saturday, September 6, at 12.30 o'clock p.m.

S. STRETCH, Manager.
Ballarat, August 29, 1913.

---

## WANTED.

YOUNG MAN, with long and good experience, desires Position as Manager of Battery or Cyanide Plant. Has designed and erected complete Treatment Plant. Excellent references. Will go to any part of the world.

Apply:—"GOLDDUST," Office of this Paper, Melbourne.

---

## TRAVELLER,

who visits Automobile Dealers and Machinery Manufacturers, etc., can earn 25 per cent. commission, when he sells a side line—our grinding-in-preparation.

Write for prospectuses, references and samples, and offers, stating branches and provinces covered, to—

F.O.W. 307,
c/o Rudolf Mosse, Frankfurt a/M.,
Germany.

---

COMPANIES ACT, 1890.

TWELFTH SCHEDULE.

## BRONCO HORSESHOE PROPRIETARY Mining Co., No Liability.

I, the undersigned, do hereby make APPLICATION to REGISTER the Bronco Horseshoe Proprietary Company as a No-liability Company under the provisions of Part II. of the "Companies Act 1890."

1. The name of the Company is to be the "Broncho Horseshoe Proprietary Mining Co., No Liability." 2. The place of operations is at Yilgarn, West Australia. 3. The registered office of the Company will be situated at 150 Queen-street, Melbourne. 4. The value of the Company's property, including claim and machinery, is £19,000. 5. The number of shares in the Company is 3000 at £10 each. 6. The number of shares subscribed for is 2000. 7. The name of the manager is Bernard Bradley. 8. The names and addresses and occupations of the shareholders and the number of shares held by each at this date are as below:—

| Name, address, occupation. | No. of shares |
|---|---|
| C. B. Webb, Southern Cross, West Australia, mine manager | 1 |
| W. H. Roberts, Leederville, West Australia, contractor | 1 |
| J. Ryan, Perth, West Australia, licensed victualler | 1 |
| W. Dixon, Hawthorn, investor | 1 |
| F. M. Walsh, Kew, salesman | 1 |
| W. H. Linkson, Perth, West Australia, gentleman | 1 |
| Bernard Bradley, 150 Queen-st., Melbourne, manager of companies (in trust for shareholders) | 1994 |
| Bernard Bradley, 150 Queen-st., Melbourne, manager of companies (in trust for the company) | 1000 |
| Total | 3000 |

BERNARD BRADLEY, Manager.
Dated this second day of September, 1913.
Witness to signature—A. J. Morris.

I, Bernard Bradley, do solemnly and sincerely declare that:—(1) I am the manager of the said intended company. (2) The above statement is, to the best of my belief and knowledge, true in every particular; and I make this solemn declaration, conscientiously believing the same to be true, and by virtue of the provisions of an Act of the Parliament of Victoria rendering persons making a false declaration punishable for wilful and corrupt perjury. BERNARD BRADLEY.

Taken before me, at Melbourne, this second day of September, 1913—Walter Madden, J.P.

PROFESSIONAL CARDS.

**G. H. BLAKEMORE,**
CONSULTING METALLURGIST
For Copper and Lead.
MINING ENGINEER.
CASTLEREAGH CHAMBERS, 10 CASTLEREAGH ST
Telegraph Codes Bedford McNeill 1908 Edition
Moreing & Neal
A B C 5th Edition.
Cable Address Radgarn Telephone 7124 City

**MATTHEW C. COATES, A.M.I.E.E.**
CONSULTING MECHANICAL and ELECTRICAL ENGINEER Expert Reports given for Power Generating Plants, Factory Installations, Steam, Gas and Electric.
99 QUEEN STREET, MELBOURNE.

**VALENTINE J. CROWLEY,**
CONSULTING ELECTRICAL ENGINEER.
Hydro-Electric Plants and Transmission Lines Designed and Supervised.
Austral Chambers, Telephone 7736
97-99 QUEEN STREET, MELBOURNE.

**GOYDER & HALLETT,**
ASSAYERS AND ANALYSTS.
110 Gawler Place, Adelaide.
Telephone 169.
Metallurgical and Chemical Processes Investigated.
Ores Sampled and Assayed.

**T. J. GREENWAY, M.I.M.M., F.I.C.**
MINING AND METALLURGICAL ENGINEER.
60 QUEEN STREET, MELBOURNE.

**KAY, MACNICOL & CO.,**
Mechanical, Mining & Electrical Engineers.
BROKEN HILL CHAMBERS.
31 QUEEN STREET, MELBOURNE.
Cable Address: "Engineer," Melbourne.
Telephone, No. 4883.

**McCARTY, UNDERWOOD & CO.,**
CONSULTING ELECTRICAL AND MECHANICAL ENGINEERS.
31 QUEEN STREET, MELBOURNE
Telephone, 7096

**J. D. AUDLEY SMITH,**
MINING ENGINEER,
9 Bridge-street, Sydney
Telegraphic Address—
Audley Smith,
Mining Engineer,
Sydney
Telephone No.—
City 2677.

**WALTER F. SMITH,**
MANAGER FLOATER G.M.
Ravensthorpe, W.A.
Mines Sampled, Valued, and Reported on.
ASSAYS MADE.
Code: Bedford McNeil.
Reliable Information Furnished on the Phillips River Gold and Copper Field.

**E. A. WEINBERG,**
MINING AND METALLURGICAL ENGINEER,
19 QUEEN STREET, MELBOURNE.

**FRANKLIN WHITE,**
MINING ENGINEER.
CITY MUTUAL CHAMBERS,
62 HUNTER ST., SYDNEY.
G.P.O., Box 1498
Code: Broomhall Imperial Combination.

The wireless station at Awanui (N.Z.) has been completed for some time, and the plant is in readiness for use, but the station has not yet been taken over by the Postmaster-General's Department. This is expected to be done about the end of September. In the meantime the Auckland and Wellington stations are fulfilling the necessary purposes.

**Commonwealth Bank of Australia**
HEAD OFFICE SYDNEY

**Branches** are open for the transaction of **GENERAL BANKING BUSINESS** at **New South Wales**—Sydney. **Federal Capital**—Canberra. **Victoria**—Melbourne. **Queensland**—Brisbane, Rockhampton, and Townsville. **South Australia**—Adelaide. **Western Australia**—Perth **Tasmania**—Hobart And at 36-38 NEW BROAD STREET, **London.** Cable remittances made to, and drafts drawn on foreign places direct. Foreign bills negotiated and collected. Letters of credit and circular notes issued to any part of the world. Bills negotiated or forwarded for collection. Banking and Exchange Business of every description transacted within the Commonwealth, United Kingdom and abroad. Interest paid on fixed deposits.

SAVINGS BANK DEPARTMENT

**Branches** are open at 3 Moore Street, **Sydney;** 317 Collins Street, **Melbourne;** Queen Street, **Brisbane;** Royal Exchange, 96 King William Street, **Adelaide;** St. George's Terrace, **Perth;** Elizabeth Street, **Hobart;** and **Canberra** (Federal Capital); and **1900 Agencies** at **Post Offices** which issue Money Orders in the **Australian Commonwealth and Papua,** from 9 a.m. to 5 p.m. daily, and noon Saturday.
All Branch Offices are open for **deposits** and **withdrawals** on Friday 7 to 9 p.m.
**Withdrawals on demand** may be effected at any office within the Commonwealth.
**1/- Minimum Deposit. 3% Rate of Interest on all Deposits up to £300**
JAMES KELL, DEPUTY GOVERNOR. AUGUST, 1912 DENISON MILLER, GOVERNOR.

**SOUTH**
THE AUSTRALIAN GAS RETORT & FIRE BRICK MANUFACTURING CO., TOORAK ROAD, SOUTH YARRA—
For Fire Clay goods for all purposes.
Send for Catalogue.
**YARRA**

***SHAW'S Steel Wire Ropes***
***FOR ALL MINING PURPOSES.***
Large Stocks always on hand at HEAD AUSTRALASIAN DEPOT
**JOHN SHAW Australia, Limited,**
**445 KENT STREET, SYDNEY.**
*Victorian Agents: Welch, Perrin and Co., and Inglis, Smith and Co.*
*Brisbane: Engineering Supply Co. of Australia Ltd.*

**"INGREY"**
**PATENT WEIGHING & RECORDING MACHINES**
ARE
**Installed in H.M. Dockyards.**
**Certified by the Board of Trade.**
**Accurate and Reliable.**
**Automatic in action and**
**Pay for themselves in a year!**
**H. A. HARVEY & CO. LIMITED, LONDON.**
Australian Representative — LASCELLES PARRINGTON & BRACHE.
London House, 97 Elizabeth Street, Melbourne.
New Zealand Buildings, Pitt Street, Sydney.

**BALLARAT School of Mines**
DEPARTMENTS:
CHEMISTRY and METALLURGY,
ENGINEERING and SURVEYING
ELECTRICAL ENGINEERING,
GEOLOGY and MINING
MATHEMATICS and PHYSICS.
Prospectus on Application.
F. J. MARTELL, Director.

The revenue of the Queensland railways for the last financial year showed an increase of £285,823 upon those for 1911-12, but the return on capital was only £3 8s. 6d. per cent. as compared with £3 9s. 11d. in that year, the cost of running the lines having increased considerably.

* * *

As was notified in an advertisement last week, examinations for enginedrivers and boiler attendants' certificates will be held in the country districts of Victoria (Gippsland excepted) during October and the early part of November. A board will sit in certain country places as advertised if necessary. Applications must be sent in by the 12th inst. (to-morrow week).

*OBTAINABLE FROM ALL BOOKSELLERS.*
**HIGH EXPLOSIVES**
By W. R. QUINAN.
224 PAGES, ROYAL OCTAVO. PRICE—£1-1-0
AUSTRALIAN MINING STANDARD, Melbourne and Sydney.

## CONTENTS

### THURSDAY, SEPTEMBER 11.

EDITORIAL—

The Melbourne City Council Trouble 207

The Hansel Mundy Case . . . . . . . . 207

Leaderettes . . . . . . . . . . . . . . . . . . 208

Personal . . . . . . . . . . . . . . . . . . . . 209

Brief Comment . . . . . . . . . . . . . . . 209

The Investor's Column—

Ironbark (V.) . . . . . . . . . . . . . . . 210

Mount Jasper (T.) . . . . . . . . . . . 210

Metal Quotations . . . . . . . . . . . . . . 210

Mining in New South Wales . . . . . . 211

Victorian Mining Activities . . . . . . 211

Tasmanian Mining . . . . . . . . . . . . 213

Western Australian Mining . . . . . . 213

Mining in New Zealand . . . . . . . . 214

Mines Development Aid (V.) . . . . . 214

The Coal Mining Industry . . . . . . . 214

Ironbark Co. (V.) . . . . . . . . . . . . . 215

The Osmiridium Find . . . . . . . . . . 215

Royal Mint Returns . . . . . . . . . . . 215

Melbourne Suburban Tramways . . . 216

Kalgoorlie Electric Supply . . . . . . 216

Architecture and Engineering . . . . 216

University of Melbourne . . . . . . . . 217

Electricity with Irrigation . . . . . . . 217

A Remarkable Coincidence . . . . . . 217

Correspondence . . . . . . . . . . . . . . 217

British and European Developments . . 218

Thermit Welding . . . . . . . . . . . . . . 218

Miscellaneous . . . . . . . . . . . . . . . 219

Invited and Accepted Tenders . . . . . 221

Melb. C.C. Electric Light Supply . . . . 223

News and Notes . . . . . . . . . . . . . . 224

"Mineral Separation" Process . . . . . 226

Dividends . . . . . . . . . . . . . . . . . . . 226

Reports of Companies . . . . . . . . . . 226

Postal Electricians' Wages . . . . . . . 226

Geology of Petroleum . . . . . . . . . . XII.

---

HENLEY'S

Electric Wires and Cables

AND INSULATING TAPES

ARE THE BEST.

W. T. HENLEY'S Telegraph Works Co. Ltd.

546 COLLINS ST., MELBOURNE.

61 YORK ST., SYDNEY.

---

BELTING!

Largest stock of all kinds of Machine Belting in the Commonwealth.

Conveyor and Elevator Belting for all purposes.

HOPKINS BROS. & ODLUM PY. LTD.

LEICESTER ST., CARLTON, MELBOURNE.

'Phone, Central 754 and 5202. Box 377 G.P.O.

---

COKE!

NORTH BULLI COLLIERY Limited

Supplies best quality hard SOUTHERN SMELTING COKE.

(Weekly output 1250 tons.)

H. G. Hyde, Secretary

Royal Insurance Building, 16 Spring-street, SYDNEY.

---

AUSTRALIAN MINING STANDARD.

PUBLISHED EVERY THURSDAY.

Forwarded Post Free to any Address.

| | Per annum. |
|---|---|
| Australasia . . . . . . . . . . . . . . | 26/- |
| British Possessions . . . . . . . . . . | 32/6 |
| Foreign . . . . . . . . . . . . . . . . . | 34/8 |

Payable half-yearly or yearly, in advance.

All amounts should be made payable to order of "CRITCHLEY PARKER, Bank of Australasia."

12 O'Connell-street,
Sydney.
Tel. Central 2703.
P.O. Box 331.

376 Flinders-lane,
Melbourne.
Central 7931 & 1838.
P.O. Box 253.

**BACK NUMBERS OF THE "MINING STANDARD."**

The following is the rate for back copies more than a month old. Applications by post must be accompanied with cash and postage added. In no case can we guarantee to supply copies, as our storage accommodation is limited.

A postcard will be sent if the number required is out of print.

For copies three months old, ninepence; six months, one shilling; and beyond that period, one penny per month per copy.

As there is a regular demand for back copies of the "Mining Standard," newsagents are requested to send back all returns uncut and in good condition, otherwise they will not be accepted.

All Returns from Newsagents must reach us by the end of each month (the whole paper must be sent). No credit will be allowed beyond this term.

Postage British, 1d.; Foreign, 1½d.; Australasia, ½d. per copy.

Stamps will be accepted as pre-payment.

Address communications: Publishing Department "Mining Standard."

**CASUAL ADVERTISEMENTS.**

The rate for this class of advertisement is governed by the position it occupies.

If it appears on leader page or amongst or next to reading matter, the rate is 15s. per inch (nonpareil) per insertion.

Towards end of reading section—
Brevier, 16 ems width, 6s. per inch per insertion.
Nonpareil, 8s. per inch per insertion.

For the convenience of advertisers, we might state that—Brevier has approximately 7 words to a line, and 8 lines to the inch—6s. Nonpareil has approximately 8 words to the line, and 11 lines to the inch—8s.

**ALTERATION TO ADVERTISEMENTS.**

As our publishing arrangements necessitate the "Mining Standard" being issued simultaneously in Sydney, Melbourne and Adelaide on the same day each week, advertisers wishing to change their advertising matter must supply same ten days in advance of publication.

**ADVERTISEMENT PROOFS.**

Proofs are submitted to advertisers in order to give them an opportunity of going over the advertisements before printing.

Advertising Copy must be typed and so arranged as to clearly indicate the display required for the more important features of the advertisement.

Any departure from the original copy will be charged for. Advertisers are specially requested to instruct their publicity departments to give us clear and definite instructions respecting changes of matter or new copy in order to avoid incurring unnecessary charges.

---

AUSTRALIAN MINING STANDARD.

PUBLISHED EVERY THURSDAY.

ESTABLISHED 1888

It is requested that all business communications be Addressed to Critchley Parker.

THURSDAY, SEPTEMBER 11, 1913.

---

## THE MELBOURNE CITY COUNCIL TROUBLE.

If one may judge by appearances, the Melbourne City Council has only the faintest conception where it stands at the present moment. Its members are in the position of having to judge on the merits of the matter in dispute without possessing the very slightest qualifications for the task. At their meeting on Monday the report of the City Electrical Engineer came before the Council in committee, and the Council deferred until Wednesday taking a vote upon a subject on which it is utterly incompetent to express an opinion. There can be no doubt that, looked at from the strictly technical point of view, the views of Mr. Harper, as expressed in his report, are thoroughly sound; but whether they are also thoroughly sound from a commercial standpoint is a matter on which neither the keenest business man nor the most accomplished engineer can express any definite opinion without having access to the secret records of the Council. The view of the City Electrical Engineer may be remarkably sound on the one side, and the views of the Town Clerk may be equally sound in an entirely contrary direction. The one may be able to prove conclusively that a certain course is the correct course to be pursued from an engineering point of view, and the other may be able to show that, economically, that course is out of the question, owing to the peculiar circumstances of the City Council—circumstances to which probably no one but himself holds the key. The City Council is not the body to decide between the two in such a case; firstly, because its members have not the necessary qualifications; and, secondly, because the Electric Supply Committee is practically on its trial and does not vote as a disinterested party. The most sensible thing for the City Council to do, and therefore the thing which we may be quite certain it will not do (we are writing before the meeting of the Council on Wednesday) is to appoint a committee of absolutely unprejudiced persons (a competent engineer who is something more than a doctrinaire, and a sound commercial man who has some knowledge of engineering) and put before them all the most confidential records of the Council—everything, in fact, that may weigh for or against the views of either the Town Clerk or the City Electrical Engineer—and leave it to them to decide.

---

## THE HANSEL MUNDY CASE.

The need for looking at both sides of the case urged above is shown very clearly in the matter which is at present agitating mining circles in Bendigo (V.). In order to promote the development of the long-neglected "side" or "parallel" lines of reef which traverse the field, the Mine Managers' Association some months ago went to the trouble of inspecting the existing shafts and determining which were the best from which prospecting work could be carried on, and, the officers of the Mines Department having agreed that a good choice had been made, the Minster of Mines was asked for financial assistance under the Mining Development Act, 1908. The grant was made, but it was accompanied by such conditions that only one of the companies concerned, the Hansel Mundy, was able to comply with them. The company, believing that the department was willing to advance £ for £ for prospecting work done in accordance with the Act, a large sum was expended before progress payments were asked for at the department. When the demand was made, the unsatisfactory answer was given that the company could not be assisted, because it was a foreign one. Fourteen or fifteen years ago the company might indeed have been considered foreign (in a sense), inasmuch as it is registered in South Australia; but in these days of Federation it is a bit strange at first sight to see a South Australian company regarded as foreign. Here, surely, then is a first-class subject for vituperation. Imagine the scorn which can be flung at the head of the Victorian Mines Department for its lack of Federal instinct; and yet the matter is capable of a simple explanation, which entirely removes from the department all the odium attaching towards a State that acts towards another State of the same Federation in an unbrotherly way. The refusal of the subsidy is entirely on the quite reasonable ground that the Hansel Mundy Co., not being registered under the No Liability provisions of the Victorian Companies Act, cannot comply with the requirements of the Victorian Mining Development Act. One of the conditions under which an advance for development work is made is that the books of the company to which it is made should be open to the inspection of the department; but in the case of the Hansel Mundy the department would have no power to inspect its books, and therefore no real control over the expenditure of the money. At the meeting of the Mine Managers' Association in Bendigo, it was stated that the company was given an undertaking that a subsidy would be forthcoming; but we fancy this statement was made under a misapprehension. If it was not, we shall be very glad to ventilate the facts and to publish any proof that may be forwarded to us of the correstness of the statement to which we have referred; but, setting aside that feature of the case, it is obvious that the fact to which we have drawn attention constitutes a very real stumbling-block in the way of any subsidising of the Hansel Mundy Company.

---

Although the Victorian Workers' Compensation Bill is at time of writing still before the Legislative Assembly, the most critical provision was passed last week by a majority of only three votes in a House of fifty-three members. The progress of the measure had up to the Tuesday of last week been very steady; there was no hastiness in pushing the numerous clauses through committee, numerous amendments were proposed and were disposed of, but there was no great debate or loss of time. When clause 33, which in the Bill provided that it should be optional with employers to insure themselves against hardship through the operation of the Act, was reached, an amendment was immediately proposed by Mr. Mackey to precisely the opposite effect; the marginal title in the Bill was "Insurance not obligatory"; Mr. Mackey's amendment made it compulsory. The Chief Secretary confessed that compulsory insurance had always appealed to him as necessary if workers were to get full protection, and this sentiment was evidently shared by most members, for the amendment was speedily adopted. A fear was expressed that small employers would be inconvenienced by the necessity for insuring perhaps a casual hand; but, as the small employer is to be, under the Act, liable for compensation should his servant be injured while engaged in the employer's business, it is surely better for him as well as for the servant that the case should be covered by a policy which will cost but a few shillings. The critical point was reached in clause 34, which provides that employees should pay a share of the insurance premimum, and that their proportions are to be deducted weekly from their wages. The Government announced that the clause was considered a vital one, but it was strongly resented by many members. Yet its justice should commend it to everyone. An accident is accidental if it is anything; there is nothing criminal about it, and no reason on the face of things why one man should bear the whole brunt. There may be contributory negligence on the part of someone, not necessarily the employer; probably in a majority of cases it is on the part of a fellow-employee, and in a very large number of cases, of the sufferer himself. The advocates of "the industry bearing the cost" overlooks the fact that there are two parties in an industry, that the employee is as much a part of it as is the man who pays the wages. The employer's profits come out of the industry; so also the employee's wages, and both are alike interested in its prosperity. As the Chief Secretary reminded them, they were careful about a possible injustice to the one party, but cared nothing for an injustice to the other. Further significance attaches to the opposition to the contributory clause, when the small proportion asked for is borne in mind. Supposing the insurance to be effected with the Government department which the Act creates, the Government will pay one-sixth of the premium, the employer three-sixths, and the employee two-sixths. If the insurance be with a company the employer pays two-thirds and the employee one-third. Surely this is a very trifling consideration in view of the benefits derivable, yet it is curious to note the shifts to which the opponents of the proviso put themselves to appear reasonable. For example, all the complaints that have been made for months past that increased wages are "passed on" to consumers, thus raising the cost of living, were flung to the winds, and the same voices now advocated that employers should be liable for the whole burden, but could "pass it on." Almost the whole afternoon and evening sittings were devoted to this clause, and it was not until half-past nine that the division was taken and progress was reported.

* * *

The deputation which waited upon the Attorney General of Tasmania in connection with amendments to the Tasmanian Companies Acts, met with a very sympathetic reception by that gentleman. In response to arguments the Attorney General said that when Mr. Rattle had first approached him upon the matter he had assured Mr. Rattle of his sympathy and accord in the movement. The proposal for a uniform company law had been considered by a Premiers' Conference, and there was a possibility of the Victorian Act of 1910 being adopted by the other States of the Commonwealth. He and his colleagues had thought for some time that the company law should be consolidated and brought up to date, but in these matters great care had to be exercised in order that no portion of the commercial community suffered by reason of the changes made. He would, however, have a draft Bill on the lines of the Victorian Companies Act, 1910, circulated amongst the bodies most likely to be interested, and after due consideration would be brought before Parliament. The Attorney General thanked Mr. Cummins for his compilation of the article on "The Deficiencies of Tasmanian Company Law." This is a tribute to the excellence of the Victorian Companies Act, and if, as suggested, that Act becomes universally adopted by all the States, the benefits it will broadly confer will more than compensate for any isolated cases where hardship may be imposed by the change.

* * *

The Prime Minister of New Zealand was urged lately by a deputation of over forty members of the House of Representatives to consider a scheme for providing pensions for members of Parliament, and annuities for their widows. The case was mentioned of an ex-member who had a record of over 25 years' service to the Dominion, and it was claimed that there were many, not now in Parliament, whose lives had been given to the service of the country and who certainly were worthy of equal consideration with old messengers for whom provision had been made. The Prime Minister said that he agreed heartily that something should be done. After discussion a committee was appointed to draft a Bill, which the Prime Minister said he would place before the Cabinet with his own strong recommendation. It is understood that the Bill will be something on the lines of providing for a pension of about £150 a year for members who have served at least nine years, and in the event of death an annual allowance of about £75 for the widow. Perhaps a request of the kind would have come with more grace from outsiders than from members themselves, even though those who proffered it suggested that they were prompted by consideration for men already out of the political arena. But there might be some difficulty in finding an influential body outside of Parliament sufficiently interested in politicians as a class to speak on their behalf. As a rule, the electors are as ungrateful for services rendered, with more or less fidelity but adequately and promptly paid for, as the chosen ones are (after the election) for the distinction conferred upon them after much handshaking and palaver (while the issue is pending). That being so, if anything is to be done, honourable members must help themselves. They had warrant certainly, had they required it, in the coup d'etat by which the Commonwealth House of Representatives coolly appropriated a large increase of wages without consulting the electors. While seeming to plead for others the deputation did not pretend that they only were to benefit by the pension scheme; on further consideraton the cases of ex-members mentioned were used merely as shocking examples of what it is desired to avoid in future, when the electors have decided to have no more to do with those whom they once trusted. For the proposal put before the Prime Minister suggests that they shall be financed by contributions from members of something like 5 per cent. of their honorarium. New Zealand is fond of experimenting in legislation, but it is doubtful whether even there the people, if consulted, will agree to find a pension for a man who has been "turned down" by those who know him best, namely, his own former constituents.

* * *

One of the subjects dealt with at last Monday's meeting of the Melbourne City Council was that of the proposal to construct a subway at the intersection of Swanston and Flinders streets. As seems to be inevitable in the case of all matters of moment to be decided by the Council, discussion on the matter was deferred by referring it back to committee. A member of the Council, in supporting the proposal to construct a subway at the point named, to relieve the congestion which occurs there at certain periods of the day, supposed that, as usual, nothing would be done in the direction indicated until a Lord Mayor or some other important person had been killed. This just about expresses the usual reasons for anything of consequence to the public being done. Cr. D. V. Hennessy (Lord Mayor) explained that the number of vehicles crossing Prince's Bridge every day approximates 3000, including about 1700 motor-driven. As about a quarter of a million persons per day also crossed this intersection, and it was obvious that, as time went on, the traffic would increase rather than decrease, the Lord Mayor was emphatic on the necessity for the subway being constructed. He pointed out that the rent from the premises it would be necessary to purchase in order to complete the scheme would pay interest and maintain sinking fund for the outlay, and would constitute an excellent financial transaction for the Council. A suggestion made in the Council that the Railway Department should construct stations at other points in the city did not meet with general approval. In connection with the amount of passenger traffic catered for, the Central Station is an object lesson to the rest of the world; but it is notoriously badly situated, and the congestion which occurs in leading up to it is appalling. That something should be done to relieve it goes without saying, and it is incumbent upon the M.C.C. to move in the matter in some direction.

* * *

The Bill to be submitted to the New South Wales Parliament for authority to raise the sum of £3,000,000 for railway construction has, according to the State Treasurer, no relation to any other proposal already before the people for obtaining funds for that purpose. It would seem by this that the taxpayer is to receive his physic in instalments. The State Treasurer also remarked that the Railway Commissioner could spend twice the amount asked for if the money were available. No doubt! In this connection it may be asked that the remarks of Sir Joseph Walton, a member of the British Parliamentary Party, rather add point to the present movement for railway expansion. Although he has been in Australia for a little over a week, Sir Joseph has learned two things of great consequence to Australia: that it is a vast continent (he wonders if we realise the size of it ourselves), the populating of which is something of an undertaking; and that it is sadly lacking in railway facilities as a means to that end. The visit of this Party will unquestionably do good in the direction of making it easier for the supplicant for financial aid to make his voice heard, and with greater hope of success. But the policy of making a dozen or more bites at the cherry is rather questionable under the present circumstances. It would afford the taxpayer some relief to know exactly what expenditure he may be called on to face during the next year or two in connection with the development of the State and the Federation. As it is, the frequency of loan bills is rather trying, and if a wholesale estimate of the country's requirements were made, the taxpayer would at least feel that he understood the position better than he does at present.

• • •

Proofs are abundant that the British Admiralty is not blind to the necessity for conserving to the Imperial Government the sources of supply of petroleum which exist within the Empire, and of securing similar supplies from other countries. It was recently announced that the Admiralty had made contracts with the Mexican Eagle Petroleum Company for oil for the navy, and not long ago an agreement of the same nature was made with the United British West Indies Petroleum Syndicate, which will operate in Trinidad. It is credibly stated that, "apart from Burmah and Egypt, the most promising Imperial sources for this valuable product are the almost untouched oilfields of Trinidad." Yet the agreement just referred to gave the contracting company practically "a pipe-line monopoly and an option of prospecting and taking over 100,000 acres of the best land," much against the will of the people of Trinidad, and although a motion in the Legislative Council of the island for a committee of inquiry was defeated, it seems that the Chamber of Commerce is determined not to let the matter rest, and it is more than likely that more will be heard of the scheme in the Imperial House of Commons. Last week, again, the news was cabled to Australia that the Master of Elibank, Lord Murray, had obtained gratuitously from the Government of Ecuador the right to utilise any public petroleum lands which may be discovered in Ecuador during the next forty years. The concession merely required an undertaking by Lord Murray to expend the sum of £100,000 upon the discovery and exploitation of oil fields within ten years. Lord Murray has also secured the right to expropriate private lands, upon terms stipulated by an engineer approved by the Government. It is not surprising that, as was the case in Trinidad, the people should, in spite of their own age-long neglect of their wealth, be strongly opposed to the granting of these valuable and "monstrous" concessions upon such terms, whether, as in the one case, to the Imperial Government, or, as in the other, to a foreign private individual. Whether Lord Murray is acting on his own behalf, on behalf of a company similar to the Mexican one, with which he is associated, or covertly on behalf of the British Government, his position is such that he stands a remarkably good chance of securing a ready market with the Admiralty for the vast quantity of oil which, by all accounts, only awaits his enterprise to become a living force in the world.

## BRIEF COMMENT.

The news of the registration of the Mount Oxide Mines Ltd. (Q.), in London, with a nominal capital of £500,000, leaves room for much speculation as to the status of the company. It is not clear what the £15,000 deposit was for, since it is not known that any cash is to change hands, unless it is part of the amount required to wipe off the debentures of the old company. Although it is understood that £80,000 is to be made available for development of the mine and an additional £400,000 for the railway, if necessary, it is not intimated how the money will be secured, as all the figures so far available do not fit, it being stated that the shareholders in the old company are to receive a share in the new for every share held in the old, representing two-fifths of the nominal capital of the company just registered.

No authentic information is yet available as to the precise cause of the loss of gold which is occurring in the Adelong Gold Estates' (N.S.W.) dredges. The trouble seems to be chiefly confined to the No. 2 dredge, although the recovery made by it is said to be 75 per cent. or more. Also, most of the gold is very fine, which may account for some of the difficulty experienced in recovering it if sufficient care be not exercised. In the preliminary stages it is only to be expected that some adjustments are necessary in a plant before it will work in sympathy with its peculiar conditions, which is alright so long as the difficulties do not indefinitely remain insurmountable.

The British-Australian Oil Co. is faced with a rather gloomy prospect. According to the managing director (Mr. Robertson Lawson), the mine is incapable of yielding shale of the quality desired to produce oil in profitable quantities. The necessity for a reconstruction is a very fair indication of the predicament the company is in. Mr. Lawson, who apparently cannot see that a spade is anything but a spade, said he would not oppose Mr. Bibby's scheme to reconstruct the company, on the basis of the latter gentleman finding the £75,000 necessary therefor. The statement of Mr. Johnstone (consulting engineer for the company) that there were 2,500,000 tons of shale available does not make the situation any better if the company is unable to produce oil from it at a profit. If, as he says, the average gallonage per ton of shale had so far been 62.5, and it was estimated that 35 gallons per ton would pay, it is hard for anyone not familiar with the actual results to understand why there should be any necessity for a reconstruction. Seeing that the necessity exists, however, it must be quite obvious that upon its ability or inability to show a profit an enterprise must stand or fall, the statements of consulting engineers notwithstanding, and it would not improve the position of the company if it had ten times 2,500,000 tons of shale which it could not convert into oil or anything else at a profit.

The first general meeting of the Carpathia Tin Mining Co., Ardlethan, was responsible for certain disclosures which show the present position of the company to be clear and its policy perfectly justified. The future of the mine, of course, must always remain more or less speculative, and Dr. Jack's report, when it is available, cannot go beyond certain surmises as the result of his examination. This much must be said for the property, however. In his original report, Dr. Jack estimated the gross value of the ore then in sight to be £93,750, made on the most conservative possible basis under the circumstances, and the results to date unquestionably show this estimate to have been reliable. Moreover, it has been proved over and over again that going beyond what can be seen in a mine in its development stages is a grave mistake for mine officials or directors to make, whatever its shareholders may choose to do; and on this score the reticence of the directors, if conscientious, is to be commended.

We have received a call from Mr. Gordon Fenton, the prospector of a new find of osmiridium about 2 miles south-west of the Bald Hills osmiridium mine, on the west coast of Tasmania. According to Mr. Fenton, the osmiridium is carried in a lode which can be traced over the full length of three ten-acre blocks, and outcrops boldly for about three chains, and has a width of about 11ft. The average dish prospects from the whole of the sampling exceeded 1 oz. per ton, but no assay or analysis has yet been made of the lode matter to determine its actual mineral contents. An osmiridium lode is something new, as hitherto that metal has been found only in placers; also, it is usually associated with platinum. The syndicate which has been formed in Melbourne to develop the find would do well to determine the actual contents of the lode. The find is said to be easily accessible, being about a mile and a half from the Coorina-road, and is 13 miles from Waratah, the nearest point at which there is a railway. According to description it would seem that the property is fairly well situated for working facilities, it being possible to send all ore to a plant by gravitation, and the volume of water flowing in a creek in the vicinity of the leases promises to provide adequate power for a small plant.

The additional parcel of 5 tons of Hercules (T.) ore now being tested is to determine the commercial practicability of its treatment by the flotation process. The Hercules ore, in the opinion of the chairman of directors (Mr. T. Bowes Kelly), is practically identical with that at Broken Hill, in which case the assumption is that the same treatment will apply. It is to be hoped that it will not also be assumed that the treatment of five tons will satisfactorily determine this point, although a laboratory test of five tons previously yielded a concentrate carrying 50 per cent. zinc. No doubt the chairman is quite alive to the advisability of making very sure that a costly treatment plant is well justified before he recommends it.

## PERSONAL.

Mr. A. E. Wadsworth, A.R.S.I., chief sanitary inspector in the Department of Public Health, Tasmania, has been Inspector of Health and Food in the Federal capital territory.

Mr. Percy Hunter, Director of Immigration for New South Wales and Victoria, has returned from his inquiries on immigration matters.

Mr. Henry Noyes, of Noyes Bros. (Melb.) Proprietary Ltd., is on his way back from England.

Mr. L. Wrathall, of the Royal School of Mines, London, is prospecting in Papua for petroleum.

Messrs. H. H. Fanstone and J. M. Reid were last week elected members of the Victorian Institute of Engineers.

A press cablegram received in Melbourne last week reported that it was understood that the Congress of the British Association for the Advancement of Science, which will be held in Australia next year, will be presided over by Mr. William Bateson, the director of the John Innes Horticultural Institution, Merton Park, Surrey.

Mr. W. H. Link has been appointed general manager of the Sloane's and Scotchman's United Quartz mines, Berringa (V.).

Mr. W. Davidson, ex-Inspector-General of Public Works in Victoria, has been elected an honorary fellow of the Royal Victorian Institute of Architects.

Mr. W. B. Griffin, designer of the accepted design for the Federal capital, has been invited to accept the position of head of the school of architecture in the University of Illinois (U.S.A.).

Mr. W. H. Gavin, engineer in charge of the Cass-Otira section of the New Zealand Midland Railway, has accepted the position of inspecting engineer for New Zealand. Mr. H. Vickerman, of Wellington, has been appointed to the former position.

Mr. John Gibb Dunlop, who was responsible for the introduction of triple-expansion engines on steamers engaged in the Australian service, died in England last week. For some years the deceased was superintendent engineer to the Orient Steam Navigation Co., and subsequently went into the ship-building trade.

Mr. Edward Dyason will leave shortly for West Australia on professional business.

---

At the last clean-up (report on 2nd inst.) of the Tingha Consolidated Tin Mines (N.S.W.), the return was 13 tons 19 cwt. of tin ore for 644 hours' dredging, as compared with the last previous yield of 20 tons 3 cwt. for 1326 hours' work.

Discussing the Mines Regulation Bill in the West Australian Parliament last week, Mr. Wilson, leader of the opposition, strongly condemned the hampering and harassing of the most important industry of the State by clauses abolishing night shifts and contract work, reducing the week's work to 44 hours, limiting stopes to 10ft. in height, and appointing workmen's inspectors by the trades unions. Increasing the cost of production meant a reduction of work. He could not understand the objection to contract work. Every contractor received at least the arbitration pay of 13s. 4d. a day, and as much more as he could earn. The system was a bonus system. He strongly condemned the proposals for barring alien workers. Not a mining accident recorded in the State had been due to the aliens' imperfect English. He read statements made by mine employees showing that where foreigners were employed exceedingly few were worked as miners, nearly all being engaged in simple shovelling and trucking. A too drastic application of the language test was unnecessary.

# THE INVESTOR'S COLUMN.

## Some Companies Attracting Attention To-day.

(By Our Exchange Reporter.)

### Ironbark (V.).

Although this company has been a consistent reporter for the last eighteen months or two years of more or less payable weekly returns, it has practically ceased to be a medium for speculation, and, therefore, has gone out of fashion. Most of the shareholders appear to be quite satisfied with their investment, and content to take the shilling dividend when it comes along. They probably feel that a long period of dead work has been rendered necessary by the peculiar working conditions, and now that this has largely been completed, they may reasonably expect more profitable times. The majority of people have, however, a great objection to a stock which is not readily marketable, and such a disability has certainly attached to Ironbark. Very few of the dealers gave them attention, and there has not been any inducement to buy them, for the reason that the chances of a rise in price were small, that is while the shaft was being sunk. The market inactivity may, however, seem a little remarkable when it is remembered that this concern is now about the second best dividend paying public company working on the Sheepshead line of reef. It can hardly be called a good second, for the first is the Central Red, White and Blue, with its remarkable record of success. Nevertheless, the Ironbark, since it struck the saddle reef which it is now working, has put up a very creditable record in the form of dividend payments to the amount of 10s. or 11s. per share, together with the sinking and equipment of a new shaft to a depth of about 600 feet, all this work having accomplished without any calls upon the shareholders.

This reef has been described as a small one, and this is true when it is compared with the massive formation of the Central Red, White and Blue at 318 feet, nevertheless it seems to provide a respectable amount of milling material, the monthly crushings running into over 1200 tons, which is nearly up to the average of some of the leading and well opened up Daylesford mines. This output has been attained since the shaft on the Sheepshead line has been sunk to its present depth and connection made with the workings at and in the vicinity of 480 feet, but prior to then substantial supplies of stone were treated monthly, despite the serious disabilities under which the operations were carried on. These can be comprehended when it is remembered that the old main shaft is on the New Chum line of reef, and that it was by means of a long crosscut from here—some 600ft. in length—that the reef on the Sheepshead line was first discovered and subsequently worked. Looking back on the occurrence, it is obvious how very lucky the company was in making the discovery, especially as the reef where first located was of its very best quality, the first small crushings going up to about 4 oz. to the ton. Since then the formation has been worked pretty extensively; and out of a length of approximately 900 feet traversing the company's lease 150 to 200 feet remains to be taken out going southward towards the Victoria Consols boundary, and 350 feet northward towards that of the Hercules and Energetic. (These figures are approximate.) As the reef dips northward to the extent of 16 feet in the 100 it will be necessary in order to take out the northern portion of the reef to sink the shaft another 100 feet to 685 feet. This work should be completed by the end of the year if taken in hand without delay. As the Hercules and Energetic are now following up from their new shaft a small run of stone which is believed to be the northern extension of the same reef, their operations may have the effect of establishing the value of the 350 feet of northern ground in the Ironbark lease. This work will not, however, be accomplished for a considerable time to come, for the reason that the Hercules and Energetic shaft is some 400 feet from the boundary between the two companies, but should payable stone be struck there will be a big jump in the price of Hercules and Energetic. When shaft sinking, the Ironbark Company passed through a small make of stone apparently part of a saddle reef, and it was recently stated that before resuming sinking a crosscut would be put out at 450 feet in order to discover something more about it. The Hercules and Energetic are working with fairly encouraging prospects a reef which is at a shallower depth than the Ironbark formation, and it is probably the southward extension of this reef that the latter company will prospect. As far as can be judged there does not seem to be much reason for hoping that it will prove to be anything remarkable, but in mining it is often the unexpected that happens, and it never does to neglect any chances. The company is also prospecting at 330 feet a small reef on the New Chum line; this was worked in the Hercules and Energetic ground with payable results, but coming southward the stone deteriorated in quality. The Central Red, White and Blue reef is at 318 feet a lower formation than that of the Ironbark at 480 feet, owing to its dip northward, and the latter company will probably strike it at a lower depth. But this reef, although so remarkably payable where worked by the "Central Blue" company, has not so far where opened up disclosed anything of value in the Victoria Consols lease, and until it does do so the Ironbark company cannot count with much certainty on getting a continuation of the run of gold. All the same, after the completion of the next lift of 100 feet, shaft sinking will be resumed, probably to a depth of 1000 feet, in order to strike the northward extension of this great formation, and also another run of stone which seems to exist about 200 feet above it. What these reefs will be worth when opened up is a question which time will answer—the gamble is a big one. For the present it will be safer to base an estimate of the value of Ironbark shares on the quality and size of the reef which is now being worked. In this respect it is satisfactory to know that the manager has just reported that the stone going both north and south is now showing nice gold. This announcement caused a slight flutter "On 'Change," sales of small lots of shares taking place up to 12s., and an improvement of 2s. on previous transactions. As there was a similar better enquiry in Bendigo, although at a lower price, it may be assumed that the prospects are regarded locally as better than for some time.

Taking the facts generally into consideration, Ironbarks do not seem a bad speculation at present quotations.

### Mount Jasper (T.).

The authorised capital of this concern is £48,000 in 2400 shares of £20 each, of which 300 are held in reserve and the remainder are paid up to £13, the paid-up capital thus being £27,300. With so small a share register a rise of £4 or £5 per share is not so important a matter as might at first be supposed, although it is no doubt a matter for much congratulation among the shareholders. Such a rise has taken place during the last month or six weeks in the price of these shares, the higher range of values having been gained after numerous transactions in small lots of shares—five being quite a moderate sized parcel. It is evident, therefore, that the prospects of the company are regarded as improving, and, as the half-yearly report is to be submitted to the shareholders on September 10, it may be regarded as the basis for such a belief.

From this resume of the operations, it will be gathered that the directors are satisfied that the prospecting work has established the value and permanency of the Mount Stewart property; the development stage is, therefore, practically passed, and the producing period is about to begin. The commencement will, however, be made at the Mt. Jasper mine, and on the copper ore which is there opened up. For this purpose a concentrating plant is being erected (and approaching completion) on the main Waratah-Corrinna road, good transport facilities being assured by the selection of this site. Some 20,000 tons of ore are proved or in sight at the mine, and these can be economically extracted by means of an open cut. From the profits derived from the milling and concentrating operations, it is hoped there will be sufficient money to erect another treatment plant at the Whyte River to deal with the ore from the Mount Stewart silver lodes; also to provide funds for prospecting promising lodes which are known to exist on other leases owned by the company.

One of the most promising of these subsidiary "shows" is situated in the neighbourhood of the old Jasper workings, and is known as Jasper's New Find. During the half year a considerable amount of attention was given to this lode, and it has been proved to be 30ft. wide with copper and iron pyrites scattered throughout. Some driving has been carried on, mainly northward from the tunnel and on the hanging wall, a total distance of 104ft. Small seams of rich ore have been met, in addition to 100 tons of concentrating material which has been won. Ninety tons of high-grade from here realised about £5 per ton net.

Such veins of payable ore in a large formation appear to be a characteristic of the lodes in the company's leases, but they are apparently not large or rich enough to make it a profitable proceeding to mine and treat the whole face of the formation. Such veins are, of course, very often sorted and shipped by different companies, and the proceeds make a welcome addition to the revenue, but the returns do not make a mine. The question to be answered is whether the lode will pay when treated in a comprehensive manner? It is plain, therefore, that, on the result of the concentration process on the Mount Jasper copper ore, that an opinion on the value of these shares as a mining speculation will be largely decided, for, although the company has several irons in the fire, this appears to be the most important one. The fact that the shares have lately doubled in price is an indication that a hopeful view of the prospects of the company is held by some investors.

In many ways, Mount Jasper's make an attractive proposition: the small share register, the valuable assets in the form of earlier expenditure on tramline and mine development, the numerous lodes carrying small but very rich veins of ore. These assets and natural advantages tempt a speculator into having just one or two shares on the chance of their being a big thing some day."

---

# METAL QUOTATIONS.

## By Cable.

(From Our Correspondent.)

### London, Tuesday.

Very favourable markets occurred again last week, the rates for all metals showing an advance, with the exception of a passing weakening in tin on Monday. Copper opened with a rise of 6s. 3d. and closed 48s. 9d., still higher for spot delivery. Tin was weaker by 25s. on Monday, but went as high as £199 5s. on Thursday. Lead opened 2s. 6d. better and rose a further 15s. by the middle of the week. Spelter also shared in the improvement.

COPER.—Spot began the week at £71 8s. 9d., and rose on successive days to £71 15s., £72 12s. 6d., £73 and £73 17s. 6d.

For three months delivery the rates were £71 8s. 9d. (a rise of 8s. 9d.), £71 11s. 3d., £72 7s. 6d., £72 12s. 6d. and £73 2s. 6d.

Electrolytic opened the week at £74 5s., went to £75 on Wednesday, £75 10s. on Thursday, and £76 on Friday. Yesterday's rate was £76 15s.

The total supplies of copper for August were 49,302 tons. Total deliveries (including Chilian and North American for all Europe) 50,884 tons. Stocks in England and France and afloat (including quantity advised from Chili and Australia) 26,506 tons. Quantity advised from Australia by mail and cable, 4,200 tons. The total European visible supply is 34,945.

TIN.—Monday's rate for spot was £194, showing a fall of 25s. since Friday; the price then rose to £195, £197 15s. and £199 5s., and fell back to £195 10s.

For three months lots the prices were £193 10s., £194 10s., £197, £198 and £194 10s.

The August supplies of tin (including stocks in America and quantity afloat) amount to 12,841 tons. The quantity of Straits and Australian on spot and landing is 1470 tons, and the quantity afloat 4694 tons. Deliveries in London and Holland during August were 3375 tons.

LEAD.—The market opened at £20 7s. 6d., rose to £20 12s. 6d., £21 2s. 6d., then dropped to £21 and £20 15s.

SPELTER.—Thursday's quotation was £21 10s., as against £21 a week earlier.

SILVER.—Practically no change from the previous week, quotations again being 27 7-16d. and 27½d.

ANTIMONY.—"Star" brand rose to £29 10s., but 50 per cent. ore fell from £6 10s. to £6 5s. per ton.

WOLFRAM (70 per cent. ore).—There was a fall of 1s. per unit, viz., to 32s. 6d., the rate per ton being £113 15s. instead of £117 5s.

MOLYBDENITE showed no change from 2s. 8d. per lb., equal to £298 14s. per ton.

MANGANESE (50 per cent. ore) was firm at 10d. per unit, or 41s. 8d. per ton.

---

The British Chamber of Commerce, Paris, official representative of the Commonwealth in France, reports the following latest prices quoted on the French markets:—Antimony, £40; copper, £71 4s.; tin (Havre), £197 4s.; lead (Rouen and Havre) £24 10s., (Paris) £24 14s.; zinc (Havre) £23 6s., (Paris) &23 6s.

---

It was announced last week that an agreement had been nearly completed in London under which the Gitsham Gold Extraction Co., of Melbourne, will, subject to the formation of an English company, receive £15,000 cash, and 33,000 shares in a 100,000 share company, with a £20,000 working capital. It is added that 10,000 shares are to be reserved under option of purchase to the promoters at par. The capital will, it is stated, be made available fourteen days after approved demonstrations of the process have been held. The projected London company will organise all reflotations in other countries.

# MINING IN NEW SOUTH WALES.

## Broken Hill.

(From Our Correspondent.)

Broken Hill, September 5.

Into Broken Hill, as into Australian mining generally, a new interest is being introduced. The Broken Hill mining companies, "knowing things" as regards costs, would not attempt some of the "outside shows" until they were "proved." A number of Bendigo (Vic.) investors have taken up some of these shows, and there is every chance of them "making good." They will, of course, have to spend money, and for this reason are developing companies, to take over syndicate interests. The concerns on the market are the **Silver City Blocks, Rupee, and Diamond Jubilee—a lead-zinc, a zinc, and a gold proposition.** Every working company, or the directors of that company, are content now about the ore bodies being low, both north and south, but the astuteness of managements declares "let the other man do the preliminary work."

Of the Silver City Blocks, the "Australian Mining Standard" has already said things. The South Blocks (Zinc Corporation) has proved itself, the South Extended ditto (there is a mystery about this mine which the public cannot grasp), and the Silver City is end on. Of the Rupee I personally cannot speak in too laudatory terms. There is ore in the upper levels, but the value of lower levels is still a problem for solution. A special company ran the show for quite a time, two of the big Broken Hill companies tried it, and I personally held an interest in the concern for years. I once thought the mine a good one, but my experience and the tests of other folk make me chary of recommending anything but a very big company taking the prospect over. I call it a "prospect," but it is better than that. But the money to be spent to prove the "show" will be much. Of the Diamond Jubilee, all I can say, and speculators can believe me, is that on my only two inspections of the property I took samples, tested them personally, and found payable quantities of free gold. I think, however, big gold is in the vicinity, but not in the block which the Diamond Jubilee regards as its main area.

The actual line of lode has disclosed nothing new of late, except in the case of the South, where diamond drilling going southward of the 1070ft. level showed 120ft. of ore, averaging 16s. 6d per cent lead, 8 oz. silver, and 15s. 6d. per cent. zinc. In addition, 11 ft. of 25 per cent. lead ore was struck further on, with 5 oz. silver and 12 per cent. zinc in addition. This ore is all southward. The South Blocks (Zinc Corporation) is in that direction.

A deal of interest centres around the slimes treatment processes now being experimented with in Broken Hill. There is the Owen (Mr. Owen dislocated a collarbone playing polo the other day), the Lister, and other. But, and wisely, the different ideas are to be amalgamated. The M.S. combine has secured the rights of the various ideas—and the results will be known later on.

Elsewhere, in the official columns, will be found the mill returns of mines. They are worthy of analysis. A steady improvement in recoveries is being made everywhere. The Central (Sulphide Corporation) attains to a nearly perfect recovery, easily over 90 per cent., other companies are running to an 80 per cent. grip; and the new treatments improve and improve.

A man said yesterday: "Broken Hill is certainly the centre of strikes. But it is also the centre of metallurgical improvement. I must laugh at your industrial troubles, they are so silly; but of your mining and milling work no praise can be too high. Broken Hill is watched closely in America and on the Continent. Only, don't have so many strikes."

## Bathurst District.

(From Our Correspondent.)

Bathurst, Sept. 5.

At Scabben Flat, about 5 miles north of Trunkey Creek, the reef being opened up by McKellar and party is looking very well, and another big crushing is about to be put through the battery. The prospectors, being poor men, were able to secure only small blocks of one, two and five acres, which is insufficient for company purposes; but Bathurst people have applied for two ten-acre leases adjoining on the north and south, through which ground the reef can be traced, in places up to 20ft. wide, and outcropping high above the ground. It is strange that this area has remained unprospected so long, as the stone is of a kindly character, with mineral seams running through it. If the quartz were picked, exceedingly high values could be obtained; but McKellar's party consider the best way to work it is to take the whole thing at a face, and if their last bulk crushing, which went over 2 oz. per ton, can be maintained, they undoubtedly have a very valuable property. It is understood that Melbourne speculators are likely to handle the proposition. Trunkey has been such a dead-alive field for years past, that little prospecting has been going on around the district, and this discovery is likely to bring this famous old township into prominence once more.

The Bathurst Centenary Celebrations, to be held in November, to commemorate the discovery of the Bathurst Plains by Surveyor-General Evans, promises to be a most successful function, and will last a full week. Amongst the many displays to be made is that of a big representative collection of the mineral wealth won at and west of Bathurst. All the mines in the district are being asked to co-operate by sending exhibits of the ores they are handling, and this feature of the celebrations will undoubtedly be of great interest to all those connected with the mining industry.

Buyers have inspected the Golden Gully hydraulic sluicing plant at Tambaroora, and, if the sale be completed, it is understood it will be transferred to the Tingha tinfield. The failure of this company has undoubtedly had a deterrent effect at Hill End, but, after all, it is the reefs that must be considered the main standby. At Hargraves the Consolidated mine is busily engaged erecting the battery, which is expected to be completed at an early date. What is known as Bason Point on the Upper Turon River, has been prospected with a view of determining whether it would warrant the erection of a hydraulic sluicing plant. This is a portion of the ancient river bed, the bottom of which is some 50ft. above the present river. There is an overburden of 100ft., consisting of river sand and gravel, etc., but unfortunately this contains no values worth speaking of. As the only way to work it would be to take the whole face of it, and as the bottom wash would need to be exceptionally rich to render it a payable venture, the project has had to be turned down.

## Lithgow and District.

(From Our Correspondent.)

Lithgow, September 5.

Mount Costigan copper mine has been sold to a syndicate, and one of the late shareholders has been retained as manager.

The want of railway trucks is again causing inconvenience to the lime and cement trade at Portland. The number of trucks coming forward is not sufficient to send out the quantities of products under order, and the consequence is that a large stock is now lying on hand waiting transhipment.

During his rambling about the country between Blackheath and Medlow Baths, Mr. Foy has discovered a seam of chert for road-making, 30ft. deep. He has also surveyed a proposed tramline, which he intends to have made to his coal mine in the valley.

At the Lithgow Mining Warden's Court on Friday, before Mr. A. B. C. Burke, the Sunnyside Gold Mining Syndicate applied for suspension of labour conditions on their Sunny Corner mineral leases for a period of three months. It was stated, on behalf of the applicants, that a company had only recently been formed, and had not yet started work. The money which would be available for the leases would not be less than £10,000. The leases had been held by the syndicate for about four months. The name of the new company was the Zinc Corporation No. 1. Six months would be required by the new company to get ready for work. The Warden, in summing up, said there seemed to be three or four parties concerned in the leases. There had been no definite information put before him as to the future plans of the company. His duty was to consider first the interests of the mining industry, and then those of the lessees, and finally those of the general public. He granted a partial suspension for a period of one month from date (August 30th), ten men to be employed during that period. In granting this exemption, the Warden did not wish it to be inferred that he was at all satisfied with the way the leases had been held. There was no evidence to show that the applicants had spent one penny on them.

---

Several lots of quartz have lately been sent to Cockle Creek by parties working at Wolumla, in the Far South Coast district, writes our Wollongong correspondent. The New Venture Syndicate had a return of 16 oz. 16 dwt. gold and 16 oz. silver from two tons. C. Momsen (Murphy's lease) received 2 oz. 8 dwt. gold and 7 oz. of silver per ton, and F. Westaway's yield from the Monte Christo lease was nearly the same. Chegwidden and party are working a small vein in very hard country on the Meaker lease, and are raising ore which looks fairly good.

# VICTORIAN MINING ACTIVITIES.

## Ballarat and District.

(From Our Correspondent.)

The Birthday Tunnel have more stone making on the bend of the rise on the Express reef at the No. 3 level. In about 30 or 40ft. this rise will connect with the old 100ft. shaft. The stone appears to be pitching southerly, and they will drive in this direction on holing through to the shaft. In the course of a few days the No. 3 east crosscut should be in stone. The rise at the No. 4 level has reached the slide which is carrying a large body of quartz of indifferent grade, but they have not yet exposed the footwall, which is likely to carry the best stone. The stone in the No. 4 south drive is hardly payable, but the appearances are healthy.

The Scarsdale have opened out from the shaft in very promising country at a depth of 200ft. The stone just cut on the plat is said to be a vertical make, and it shows gold and galena. It is expected that the main body of reef will be intersected any day, as a big leader was cut a few feet above in the shaft. The metropolitan interest in this venture is said to be strong.

The Central Plateau have not yet located the shoot of gold in the 700ft. level, and are now following the reef where it is of payable quality in the 600ft. level by winzing to determine if there has been any displacement. They are down about 14 or 15ft. without any change of note occurring, there being a full sink of stone showing gold in the solid at the depth indicated. The water is light. The face of the 700ft. north drive is a little beyond this point, and is discharging a fair stream of water. An interesting change in country has been met by cutting into the western portion of the formation, very favourable-looking slate and quartz, with 6in. of laminated stone, being found under the hanging wall. The drive will very likely be turned a little westerly to pick up the continuation of this run.

The New Normanby shaft will reach the required depth of 1600ft. in about a fortnight, and this will be the deepest point reached on the Eastern line. As the shaft is now in veiny country, the prospects are promising. The other sections are turning out stone of moderate value.

The position at the New Specimen Hill is healthier. The amalgam is understood to indicate a better yield. The shaft has been sunk another lift (including well), and they are now opening out. Fair bodies of payable ore exist in the western stopes at the 430ft. level and on the north faces at the 350ft. level.

## Bendigo and District.

(From Our Correspondent.)

The gold production for the week ending September 6th, 1913, amounted to 4379 oz. 11 dwt., including 1015 oz. 4 dwt. from the mines of the Lansell Proprietary. The principal producers were Lansell's Little No. 180, with 657 oz. 10 dwt.; Golden Pyke, 438 oz. 17 dwt.; Central Red, White and Blue, 355 oz.; Spring Gully, 309 oz. 9 dwt.; Lansell's North Red, White and Blue, 187 oz. 13 dwt.; Catherine Reef, 108 oz. 13 dwt.; Garden Gully, 108 oz. 5 dwt.; South New Moon, 106 oz. 8 dwt.; Ironbark, 99 oz. 2 dwt.; Carlisle, 99 oz. 1 dwt.; Lansell's South Red, White and Blue, 96 oz. 17 dwt. Three dividends were announced, totalling £5322 10s., viz.:—Central Red, White and Blue, 2s., £3200, total to date, £131,200; Golden Pyke, 1s., £1372 10s., total to date, £79,430 7s.; Great Northern, 6d., £750, total to date, £169,450.

Johnson's Reef reported a more favourable development on the Paddy's Gully line at 1730ft., payable gold showing in 18in. of quartz associated with the upper portion of the west leg of the Collmann reef. The company are driving south off a crosscut at about 310ft. south of the No. 2 shaft, the objective being a connection with the workings from the No. 1 shaft, which were suspended some time ago. These stopes are something like 300ft. south of the 1730ft. crosscut. The present level started low down on the west back, but in driving 280ft. the south pitch of the reef channel has brought the cap of the reef closer, the leg stone gradually enlarging. No gold was seen till late last month, and the first payable prospects last week. Another 30ft. of driving will connect the former stopes, and, with the improvement in ventilation, the reef may be extracted along the intervening section more economically. In the latter stages of stoping off the No. 1 shaft, the outlook was unsatisfactory, but there is ample room for better grade stone to exist over the length of more than 300ft. north to the 1730ft. crosscut. Above the latter a rise was put up on the east leg, and an intermediate level driven north along the cap and west leg to about 100ft. The east leg and cap were of no value, but the west leg showed one or two payable enrichments. These shoots were not at all permanent, however, and the formation does not promise to be as productive in this direction as in the Collmann and Tacchi companies' lease. From the old stopes off the No. 1 shaft to the Princess Dagmar boundary, the Johnson's Reef have a length of nearly 1000ft. of the reef intact. The Princess Dagmar hold about 600ft. along the line, but have no shaft. Next north the Golden Age shaft has been going down to reach the same reef, and should uncover the backs during the next few months. In the rise on the Princess Dagmar reef, along the "Pyke" fold, the Johnson's Reef passed through the increased width of 4ft. of crushing material without seeing much gold. The stone subsequently narrowed to 9in., revealing better prospects. It is intended to gain south with the rise, in order to effect a connection as soon as possible with the crosscut in course of extension from the 680ft. plat at the No. 2 shaft. This crosscut is expected to gain a good distance north before reaching the reef channel. The slightly better return of 61 oz. 10 dwt. from 235 tons was sent in from the No. 3 shaft on the Derby line.

Golden Pyke showed a substantial improvement with an average of over 1 oz. 3 dwt. from 310 tons. The balance of the return was from residues. The richer stone last week was drawn from the second stope over the 543ft. level. This stope is operating north, from the rise at 200ft. from the shaft. There is 2ft. to 3ft. of quartz available of very good quality. As the stope is entering the rich shoot of stone traversed in rising through to 447ft., it is anticipated that excellent results will be forthcoming for some time. The leading stope is 50ft. from the Constellation boundary, also taking 12in. of good quartz. The third stope in operation above 543ft. is over the south level, extracting 4ft. to 5ft. of well mineralised crushing material, showing a few colours of gold. At 643ft. the reef is smaller at present and showing less gold. The stope gaining north from the rise at 150ft. south of the shaft will eventually reach the other shoot of rich stone, existing between 543ft. and 643ft. The important crosscut at 743ft. has been resumed to tap the same formation, which is fairly strong underfoot at 643ft. The end is 170ft. from the plat, and should reach the reef in another 80ft. In advancing the 447ft. main level to 400ft. north there is 8in. of quartz and a little gold. The outlook in these stopes has not materially changed. On the outer reef at this depth the indications are favourable, a few colours of gold showing in 15in. to 18in. of stone.

Garden Gully prospects brightened in driving and stoping south toward the No. 3 shaft at 1552ft., the first milling producing the very satisfactory return of 52 oz. 12 dwt. from 45 tons. The reef has recently contained more galena, which is considered to favour the chance of greater permanency in the gold shoot. The formation previously disclosed good prospects north, but a few crushings sufficed to extract the payable stone. At 300ft. south of where last week's milling was broken the same portion of the reef has been prospected without result. There is also a level north to about half-way from the 1552ft. level at 40ft. lower on the back, only a little gold showing. The shoot of good stone therefore appears rather limited. A somewhat better average than of late was also shown in the milling from 494ft. at the main shaft. This reef is being sought at the south shaft, and should be reached next month.

Great Extended Hustlers, in crosscutting at a considerable distance beyond the 1053ft. workings on the new reef, have found the continuation of the stone gold bearing at 1326ft. There is 9in. to 2ft. 6in. of quartz here, on which the company have started driving south to connect with 1053ft. From the latter level the reef is being followed underfoot by a winze. At 12ft. down there is 2ft. 6in. of stone, showing a fair sample of gold. Stopes operating above 1053ft. are taking up to 12in. of reef, but the quality is inferior. The 1053ft. main crosscut is out 385ft., and should shortly reach the downward extension of the Little reef seen in the winze workings below 777ft. The stone has been followed for a depth of about 200ft. in the winze measuring along the dip, and still shows a little gold in a width of 6in. to 2ft. At 717ft. there is a level going north from about 650ft. north of the shaft, on what is believed to be the continuation of the Little formation.

Central Red, White and Blue continue to produce stone of excellent quality from a few feet under the 318ft. north level. The high grade character of this portion of the reef is primarily responsible for the fine standard of recent returns. This quartz is being conserved as much as possible in order to reserve the other rich shoot near the No. 5 winze till the stopes reach it more systematically above the 400ft. main level. The latter level is opening up a full width of quartz in approaching the Little No. 180 boundary, a few colours of gold showing last term. In stoping here a little gold is also visible. A slight improvement occurred in stoping over the 318ft. south level, a few colours of gold having been disclosed near the hanging wall. In back stoping the new reef toward the shaft at 720ft. there is less gold. The best prospects appear to be northward on this formation, as indeed on all the quartz deposits yet opened up, and a good deal of interest attaches to the extension of the 800ft. north level on the completion of sinking. This level will start in the cap of the 720ft. reef, and eventually pick up the 650ft. formation now being back stoped at 720ft. Shaft sinking has progressed to 144ft. below the last named depth, and will be continued with the object of also opening out at 880ft., to command the north pitch of the 720ft. cap. During the week a small east back was passed through in the shaft. The indications point to the upper limits of this back being represented by a miniature centre reef, as the fold cannot be far west of the shaft at this depth. The customary 2s. dividend was made available for next Thursday, and another similar distribution is likely to be announced on the occasion of the half-yearly meeting, about the middle of next month.

Bird's Reef have started to de-water the shaft from the 100ft. plat. The depth is 77ft. below the 420ft. plat. On clearing the shaft, sinking will be resumed, to enable a crosscut being extended at 520ft. It is proposed to crosscut west for the system of auriferous spurs worked with promising results for a time at 77ft. from the 420ft. plat. These veins occupied fissures in the sandstone beds at a good distance east of the reef channel proper. They carried a coarse sample of gold and were well mineralised, but failed to extend far overhead.

Golden Age hardly expected the milling of 110 tons last week to produce 67 oz. 13 dwt., as less gold had been seen. Towards the close of the term the outlook was more favourable in the 853ft. south stopes, where the whole of the milling came from. The third stope off the south end of the lease has been carried forward about 30ft., and still discloses fair gold. Another stope will be gained during the month, which will extend almost the same height as the Princess Dagmar original stopes on the boundary. In driving north at 655ft. in the north shaft, the auriferous portion of the footwall stone has risen overhead with a small fault. There is another small break appearing underfoot in the end, which is expected to precede the occurrence of more gold-bearing stone. Early next month stoping will be commenced. Meanwhile the quartz broken in driving is being milled, and a trial lot will be cleaned off this week. The south level has been restarted, and has shown a couple of colours of fine gold.

Constellation general crushing of 124 tons yielded 42 oz. 6 dwt., which is payable. The 525ft. overhead stopes show fair gold at intervals. In understoping north and south of the 623ft. rise there is 10in. of reef of fair quality. The 622ft. south level is in about 100ft., opening up 6in. of stone and a little gold. Better results will be shown at this depth in stoping south later on. The north level is advanced to 35ft., with a colour or two of gold visible now and then in 10in. of stone. Some important work is in progress at 1250ft., where the stopes along the McDuff east back are opening up 3ft. of payable quartz. Operations have been resumed in the north shaft. It is proposed to drive north and south on the Golden Pyke reef at 420ft., from this base.

Goldfields South commenced to unwater the shaft from the 880ft. plat, despite the appeal pending against the decision of the Warden for refusing to recommend the company's lease for forfeiture. It is expected that the lower workings will be cleared by the time this is published, and in the event of the appeal to the Minister of Mines being disallowed, the extension of the 1365ft. crosscut will be proceeded with. It is calculated that this crosscut will need to go another 120ft. to reach the reef the tributers are working successfully in the Victoria Proprietary mine, at 200ft. from the boundary. These tributers had another clean-up on Saturday last, 35 tons producing the very remunerative return of 35 oz. 18 dwt.

Goldfields Consolidated leading stope in the tribute block from the south boundary has uncovered a new make of stone, of a very promising appearance, but no gold was seen in the first breaking. A little fine gold is seen in the higher stopes, but the payable shoot of stone is probably a little higher up. The first crushing from the tribute block will be cleared off this week. At 510ft. the level on the east leg of the same reef is exposing 8in. to 12in. of quartz, containing a colour or two of gold. The 730ft. rise is up 70ft. and in about the middle of the cap of the small reef. The formation is spurry and shows a little gold.

North Bendigo came forward with the larger yield of 61 oz. 10 dwt. from 200 tons, which leaves a good profit. The stopes over the 1000ft. north level continue to show gold along the east and west legs and close to the turnover. In deepening the winze on the east back at 240ft. north of the 913ft. plat, a little gold is seen in 1ft. of reef. The main north stopes are still showing a little gold throughout, in the eastern portion of the formation.

## Maldon.

(From Our Correspondent.)

The Derby United crushed 180 tons for 28 oz. gold (battery only). The rise in the end of the 680ft. level is up 36ft., where the reef has opened out to 18in. in width, carrying nice metal and a little gold dish trials. The 550ft. level has been driven to 55ft., showing a reef 5ft. wide, heavily mineralised. The stopes south of Cymru shaft are varying 5ft. to 8ft. wide.

E. Hibbert and party, who have been tributers at the Nuggety Extended, crushed 12 tons for 4 oz. 11 dwt., excluding residues.

The South British Syndicate has put down a winze 17ft. in the 210ft. level north in the new shaft, and saving the stone for crushing. The south drive in the same level is out 9ft. Dirt is now being broken out for crushing from the old shaft.

The New Day Dawn is getting on well with its preliminary work, prior to vigorous prospecting. The air compressor and rock-drilling plant have been completed, and are working well; four faces will be treated almost at once. The 90ft. level north drive is showing a reef 3ft. wide, which is nicely mineralised, and carrying payable gold.

South German has struck another call, the 81st, of 3d. per share. This is a great and disappointing change for the previous fortnight, when the shares were going up toward £1 in value. No material change is reported in the intermediate level north. The stone is wider than the drive, and is of nice appearance. Tenders have been called for driving a crosscut at the 2000ft. level, with the intention of picking up the stone being worked at 1900ft. Grigg and party, tributers crushed 123 tons for 33 oz. 4 dwt.

Oswald's Gold Mine had a good month. From 380 tons crushed 177 oz. 11 dwt. were returned; cyanide, 840 tons, 116 oz. 12 dwt.; total, 294 oz. 3 dwt. At the 400ft. level the rise is up 22ft., with a reef 3ft. wide in the hanging back, carrying a few prospects of gold. The drive north has been extended to 109ft. from the crosscut, and is worth an ounce to the ton. At 600ft. the stopes are being broken out for a width of 8ft., and range in value up to 15 dwt. per ton. The north stope has been proved payable for a distance of 30ft. At Tabletop stone is being broken from a massive formation of low value. At 1100ft. a stope is being taken from the back of the level for a width of 5ft., worth up to 15 dwt. in parts.

Various other mines in the district have made calls. Derby United made its 147th (2d.); Pioneer Otago, 47th (1d.); New Day Dawn, 2nd (2d.).

## Castlemaine and District.

(From Our Correspondent.)

The remarkable developments in the Spring Gully mine have caused the Castlemaine field to take rather an exceptional place in the front rank of mining districts. The richness of the stone crushed during the past two fortnights brought the directors up against the problem of weekly crushings. At first it was not deemed necessary, but the weight of opinion favoured such a course, and last week it was adopted. The quantity crushed was 140 tons, and the net return 309 oz. Although the management did not intend to declare a dividend on the 30th August, it was eventually decided to make a distribution of 1/- dividend. As this absorbed £1157 10s., and left £520 in hand, besides a reserve fund of £200, the high yield of last week provides the wherewithal for another 1/- dividend. The outlook of the mine is such that good yields will be assured for several weeks at least. The 240ft. main level is in about 120ft., and gold has been seen in a spur along the western side for about 70ft. It will have to go at least 100ft. to pick up the pitch of the richer veins. As there is about 500ft. south of the shaft, and as it is possible that the spurs may be opened up from the 318ft. main level, the outlook is also encouraging to that extent. Although it is doubtful whether the present streaks of gold will be found to extend far, this eastern system of spurs should be extensive, because of the resemblance they bear to the faulting of the Spring Gully slide. At the same depth (240ft.) the north level has been driven 100ft. on the western portion of the system, with specks of gold showing. The main crosscut is out 100ft., and has got under the winze sunk from 200ft. level. Three spurs passed through have each shown gold. It has reached the eastern beds, which contain the rich veins in the higher reaches. There are large areas of stopes in the 200ft. level north; and also in the 170ft. level, neither of which have been drawn on for some months, but the whole of which are reckoned to be payable, as gold has been seen almost all through.

The history and possibilities of the three lesser mines of the group have been diligently searched during the week, and the shareholders are not slow to revive interest in them. Last week an inspection was made of the No. 1 mine. Beyond the fault flat spurs are showing to the east, in the same direction as the main mine's spurs. To the west of them there are also possible makes of payable stone. When the mine was working previously this part was largely neglected in favour of the larger formations in shallower levels. Work is to be resumed. That it turned out good stone is shown by the fact that in 1905 dividends were paid to the value of £1777.

The South Spring Gully has a shaft sunk to 310ft. The Spring Gully system does not show any sign of existence in the territory of this mine, being a considerable distance to the east. A centre reef is said to have been found in the bottom crosscut, of an average value of 6 dwt., but it has not been adequately tested.

To the north of the big mine Spring Gully Junction holds the lease. As the beds and faults have a rising tendency, the eastern spurs should easily be reached from the present shaft. In 1905 this mine returned its shareholders £825.

Those who are conversant with the revelations in the South Wattle Gully mine through their more recent activities are satisfied that there is a payable future before it. The 300ft. level, in the drive on the west leg, has been extended to 57ft., where the reef is 1ft. thick, carrying a little gold, nice galena and pyrites. The drive off the No. 2 rise has been extended to 23ft. No more work will be done at that point till the battery has been completed. The reef covers the whole of the drive, and shows fair gold in breaking as well as in the face. Further south a rise is being put up to open up the reef, and it is intended to go up 30ft. before cutting stone. The saddle has been driven across for 7ft., and the west leg cut. It is 2ft. through, showing gold. When the No. 3 rise is up a crosscut will be put out to the west leg. The No. 2 rise is being extended to the top of the saddle where the reef is 4ft. thick and in the opinion of the manager payable.

Campbell's Creek bucket dredge had a big fall in average last week. The double plant had a full run for 48 oz. 12 dwt. compared with 103 oz. the previous week.

## Daylesford.

(From Our Correspondent.)

Though things are seemingly on the quiet side here of late the gold returns from the mines' milling dirt are, in the aggregate, very fair. The clean-up for the month from the Nuggety Ajax group amounts to the respectable total of some 2177 oz., from a tonnage of 4000 tons of ore. The Central Ajax shows up pretty well with its first return from a 20-head mill, resulting in 1300 oz. from 1400 tons, and another dividend of 1s. 6d. per share, leaving still between £3000 and £4000 to credit. Matters below the surface are encouraging, and the whole of the stopes are producing ample payable stone to keep the battery at work. The output for the current month is expected to be quite 1500 tons. The Ajax shows a reduced milling, but the average quality of the previous month is about maintained. The drive travelling southward at No. 7 is responsible for keeping up the average. At this point there is a full face of fairly good value stone, and a rise is on the way up from this level, in which a couple of feet of similar quality stone is disclosed.

The North Nuggety Ajax dropped nearly a hundred ounces on its previous yield, with about the same tonnage—412 oz. from 1313 tons crushed. It was rumored during the week that driving on the Welcome at No. 4 had disclosed good results, but this is not confirmed, though the country looks encouraging for an early development in this quarter. The Nuggety Ajax is not able to show anything in the way of an improvement, the month's crushing of 275 tons returning but 59 oz., a return of about last month's average.

The Frenchman's Reef gold return, which averaged about 12 dwt., is a good indication of the value of the stone operated upon at the present time. The New Specimen Hill have finished sinking to 610ft., and a new level will be at once opened up. The stone broken from the 350ft. and 430ft. level stopes is classed as of payable value. It is anticipated that the gold for the month will be somewhere in the vicinity of 300 oz. The Lord Roberts are ready for crosscutting east and west at the new level. This company will, it is expected, take the erection of a battery in hand, probably in a few weeks. The North Lord Roberts have started to sink their shaft on what is known as the western lode. It is down over 16ft., and through payable reef. The North Ajax have resumed shaft sinking from the 700ft. level. The lode followed north at this level has been cut off by a dyke. It has frequently happened on this line that a make has improved in quality after the dyke has been passed.

---

## TASMANIAN MINING.

### Mount Lyell District.

(From Our Correspondent.)

Queenstown, Sept. 5.

Operations generally in connection with the various departments of the Mount Lyell Co. continue to proceed satisfactorily and without interruption, except so far as may apply to surface work at the mines, due to the atrocious weather prevailing for some time past. During the last two months the climatic conditions have been simply vile, even from a West Coast point of view, and the men who are employed at surface work have had to earn their money under extremely hard conditions. What these conditions are will be better understood when it is known that out of the last 67 days 56 have been wet, and during the period the rainfall has been something like 30 inches, or 2½ feet. And when a rainfall like this is accompanied by hail, snow and hurricane gales, it makes those who have to work in it inclined to think that there are more congenial places in Australia.

At the North Lyell mine they are maintaining an output of 400 tons a day to the smelters. The bulk of this output continues to be drawn from the 1100, 1000 and 850ft. levels, with a small quantity from the 400ft. level, along with a limited tonnage from the substopes and No. 15 stopes at the 700ft. level, a good deal of the ore from the latter level being of excellent grade.

The output of pyrites from the Mount Lyell mine keeps at a minimum of about 700 tons a day, and under existing conditions (weather and otherwise) this tonnage seems to be the limit capacity of the mine. Pretty well all of the material is being won from the three underground levels, with the balance coming from the three lowest benches of the open cut. Operations at the South Lyell mine are practically confined to cutting the main and cross drives through the ore body at No. 8 level, which is identical with No. 8, the deepest level of the Mount Lyell mine workings. This work is being vigorously pushed ahead, and the South Lyell mine is now well on the way to becoming regularly productive, and to an appreciable extent.

At the Comstock mine work is restricted to making necessary development connection between No. 4 and No. 3, and No. 3 and No. 2 levels, and to the extension of No. 5 tunnel. Since the Mount Lyell company started operations this tunnel has been driven about 180ft., and there is still some 300ft. to drive before the objective point is reached.

At the reduction works three furnaces are in continuous operation, and have been so for the past week. The four-weekly period closed on Wednesday, Sept. 3, and, although during that time only two furnaces were in blast for three weeks out of four, the metal production for the month will be the best for any similar period since the disaster. The ore from the North Lyell mine has been of good grade right through the period, and this being so, and taking into consideration the increased tonnage treated, the production of copper for the four weeks is pretty certain to reach close on 450 tons, or over 70 tons more than for the previous period. This is a very gratifying increase, and, providing that the present output of North Lyell ore is maintained (which is almost certain), the metal production for the current month, with three furnaces running, should reach at least 600 tons.

Mr. E. James, who has been on the mining staff of the Mount Lyell Co. for over eight years, first as surveyor, and then as assistant engineer, has left the company's service, and it is reported that Mr. G. F. Jakins, mines surveyor, who has been supervising operations at the Lyell Comstock mine since work was first started there, will take Mr. James' place.

At Lyell Blocks sinking the main shaft below the 1100ft. level is in progress. The work, which has hitherto been carried out by day labour, is now being done on contract, the price, it is understood, being £10 10s. per foot. The water is becoming a bit troublesome; but this is only to be expected, as the Blocks shaft is now about 20ft. below the workings of the 1100ft. level of the North Lyell mine, and very probably is receiving the benefit of a least a portion of the soakage from that locality. And if anything like a heavy quantity of water is encountered in sinking the Blocks shaft below its present depth, it will be a serious matter for the company, as far as expense is concerned.

---

## WESTERN AUSTRALIAN MINING.

(From Our Correspondent.)

Kalgoorlie, Sept. 1.

The new leases pegged by the manager of the Mararoa Co. have lain idle for years, together with a dozen other leases held by the Norseman Gold Mines Ltd., in the early days. These leases are traversed by various north and south lodes, which pass through numerous quartz porphyry dykes. The underlie of the lodes is 45 degrees to the east, and the ore shoots have a slight dip to the south. The Norseman Gold Mines Ltd., from 1896 to 1904, locked up an area of 227 acres, comprised of 18 leases. The mines produced 79,300 tons, which returned £178,500 in gold, and £42,500 in silver. The two deepest shafts are on the Viking and Mildura, the former being 574ft. and the latter 550ft. on the underlie. In 1901 Government granted a £1 for £1 subsidy to sink the Viking shaft from its then depth of 440ft. to a depth of 700ft., but the company ceased operations when the shaft reached 574ft., and, for the next three years, all the leases were thrown open to tributers, who merely worked in the shallow levels. Six years ago a syndicate pegged the Viking lease, and have since then treated 11,640 tons for £85,300, all broken from the upper levels. In May the sinking of the shaft was resumed, from 574ft., where it was stopped in 1901, and, after sinking 26ft., very rich ore was struck at a depth of 600ft., which yielded some exceedingly rich specimens, and about which very misleading reports were published. However, the result was the re-pegging, by Rawlings, Bullen and Rumble, of the Mildura and Hardy Norseman immediately adjoining the Viking on the north, and this has been followed by the Mararoa taking up the Cachuanca and Sydney Norseman still further north. An adit was driven into the hill on the Sydney 60ft. below the surface, and followed the reef 550ft. on its strike, the average width being 66in. On the Cachuanca, an adit is driven at a depth of 90ft., and followed the reef 300ft. on the strike, the width varying from 36in. to 84in. A parcel of 676 tons was treated from these workings for a return of £1115, or 33s. per ton. This line of reef is one of the longest known in the State, but, after its abandonment by the Norseman Gold Mines Ltd., of which A. E. Thomas was attorney, and John Morgan underground manager, the ground has lain idle.

Very slow progress is being made with the sinking of the second diamond drill bore hole on Fraser's mine, at Southern Cross. It took some six months to sink the first bore-hole to a depth of 1190ft., and the second bore, started in June, is only down 500ft. At a depth of 480ft. a quartz vein, 18in. wide, was encountered, but no assay values have been published so far by Government. An area of 180 acres was acquired on option by W. J. Loring, of Bewick, Moreing and Co., on his recent visit to the State, and the flotation of the property in London depends entirely on the result of the Government boring.

The position of the Victorious mine, at Ora Banda, is not at all satisfactory, as the walls of the open cut, which has been taken out some 60ft. wide, have collapsed, and caused "a creep." All the passes have been filled, and, as a consequence, it may be some time before the pay ore in the mine can be readily got at. The despatch of sulphide ore to the company's treatment plant at Kalgoorlie has been very slow, but, in any case, seems to be rather premature. There are practically no backs, and, until developments are pushed ahead, there seems little hope of the yield being appreciably increased. Mr. G. M. Roberts, the manager, has decided on the installation of a sulphide plant, but this seems hardly justified in the present uncertain position of the sulphide zone. Telluride is still showing at No. 5 level, but the tonnage of sulpho-telluride ore opened up is not material.

Developments in Chaffers hardly warrant the market optimism created thereby. At No. 16 level the west crosscut—319ft. north of the shaft—only cut No. 4 lode at 567ft. from the shaft, and this has been driven on 300ft. south in ore assaying 29s. per ton, or 26s. recoverable. This No. 4 lode is the Horseshoe 1, which is a negligible quantity in the latter property. No development worth mentioning has been done on the Horseshoe Nos. 2 and 3 lodes, known in Chaffers as Nos. 3 and 2 respectively, although the former accounts for 40 per cent. and the latter 53 per cent. of the Horseshoe's ore reserves on December 31, 1912. At No. 16 level, in the Chaffers property at a distance of 427ft. west of the shaft, the main west crosscut penetrated a branch of No. 3 lode (Horseshoe No. 2), which has been driven on 85ft. in ore assaying 127s. 6d. per ton for the full width of the drive. Nothing is said of the Horseshoe No. 4 lode, known as the Boulder main lode, which should be much nearer the Chaffers shaft. There is no doubt that the way the ore shoots in the Horseshoe are pitching south that Chaffers should eventually become a great mine, but it seems strange why the crosscuts in Chaffers have missed the values, and that development is being pushed ahead on apparently poorer ore bodies.

## MINING IN NEW ZEALAND.

The Lake Hochstetter Goldfields Company, which lately let a contract for the long tunnel on the line of the company's water race for over £2000, has now let additional contracts, including several other tunnels. The price is stated to be over £10,000. The contractors are a party of about a dozen first-class working men. It is expected that the work will take about 10 months to complete. The mine manager, Mr. Henry Linklater, continues to obtain splendid prospects in several of the faces which it is to open out on. About half of the company's shares are held in Greymouth, Ahaura, Reefton, and Hokitika; the balance are held in Sydney, where the head office of the management is situated.

For the period ended August 9, the Waihi Grand Junction Gold Mining Company, with 39 stamps running 24 days, crushed and treated 8800 tons of ore for a return of bullion valued at £15,200. No comparison can be made for the same period last year owing to the strike. The total value of the bullion won from the mine to date is £717,324, and the dividends paid to date have amounted to £40,000.

The manager of the New Sylvia gold mine (Thames) recently reported that a crushing of 875 tons of ore had realised bullion valued at £1008, and concentrates valued at £175, making a total return of £1183.

A member of the House of Representatives having urged that more attention should be given to such an important industry than it was now receiving from the Minister of Mines, Mr. Fraser, in reply, asked in what direction was encouragement to be given to mining without wasting money. Some requests were reasonable and some were not. He did not think it correct to say that the industry had been neglected by either the present or the late Government. He, as Minister, had given very considerable help in the North Island. He had given £10,000 to the deep levels at the Thames, and had granted another large sum to a prospecting party in the same district. Wherever people were willing to put their hands in their pockets themselves in connection with the organisation of prospecting parties, and showed that they were prepared to carry out the work in a proper systematic manner, the Government would grant assistance. After all, mining was a great gamble; sometimes it was successful and sometimes it was not. When people thought that they had found something good they usually desired that a Government officer should be sent to report on their finds, in order, very probably, if the report was a favourable one, that they could put it in the prospectus, and thus induce people to take shares in a company when it was formed. Then, if the thing turned out contrary to expectations, the shareholders would say, "We entered into this thing because we saw that a Government officer, who should know something about it, had reported favourably upon it." "I recognise that the mining industry is an important one," the Minister added, "but I am not going to lend money on every wild-cat scheme that is brought under my notice."

## MINES DEVELOPMENT AID (V.)

### Two Important Applications.

When the Cassilis G.M. Co. N.L. asked for a loan of £3000 under the Victorian Mines Development Act the Minister of Mines requested Mr. Herman, the Director of Geological Survey, to furnish a report upon the mine and its prospects, and to make a recommendation respecting the application. Mr. Herman has now reported that a sum of £20,000, or more, has been directly spent on plant in evolving a satisfactory metallurgical process, and about £30,000 in steam and hydro-electric power plant. Further capital expenditure on plant is not likely to be heavy. The only requirement at present involving material expenditure is a storage dam at the power supply at Cobungra. The development required is the sinking of the main shaft 400ft. (to 1250ft.), crosscutting to 1050 and 1250ft., and opening up intermediate levels at 950ft. (in progress) in 1158ft., opening up the Ceresa lode at deeper levels, and crosscutting from the upper tunnel eastward to cut several lines of lode worked profitably near the surface by former owners. He recommends that £4000 be advanced at the rate of pound for pound, of the underground cost, subject to the following special conditions:—The capital of the company to be increased, and monthly calls made of threepence per share on 60,000 shares, or equivalent calls on a greater or lesser number of shares. The money derived from these calls to be paid to a special fund, to be used for the special development programme only. All faces of this programme, as opened up, to be advanced simultaneously. The financial arrangements stipulated would, he considers, permit of this.

Some months ago the Gippsland Copper, Platinum and Gold Mining and Smelting Co., N.L., of Cooper's Creek (V.), applied for a loan under the same Act, but the request was not favourably looked at by the Minister of Mines, According to the directors' report for the term ended on July 31, a fresh application has been made, and the result of the appeal is expected to be known in time for the general meeting on September 19. Nothing has transpired to alter the board's view of the future policy of working. According to the report of the legal manager, it is estimated that they have now 18,000 tons of ore of an average grade of 3 per cent. copper ready to be broken out, which it is intended to classify by rejecting about 25 per cent., making 13,500 tons of 4 per cent. ore. It is considered that, with the additions to the smelter and surface equipment (previously estimated to cost about £4500), this ore could be treated at a sufficient profit to pay for further exploration of the lode at depth. The big lode is stated to have been intercepted at the No. 2 level, showing by bulk 2.45 per cent. copper, of which 8ft. bulked 3.47 per cent. If the policy of work outlined is carried out, it is expected to result in an expenditure of over £20,000 in actual wages, while the smelting of the ore is being carried out, and probably £10,000 in development work, while over £3500 would be paid to the Government in railway freights on coke, fluxes, etc., during the smelting period. During the half-year £1900 was obtained from the sale of matte, and £309 from gold and pyrites. On July 31 the company had a bank balance of £426; stores and supplies are stated to be worth £295, while bills receivable and sundry debtors amount to £353. Sundry creditors total £898, and there is a further debit of £300. The reserve capital is stated in the balance-sheet at £8750, and the uncalled capital at £4375. Not much work was done during the half-year, on account of the Government aid being withheld.

## THE COAL MINING INDUSTRY.

### New South Wales.

### Northern District.

(From Our Newcastle Correspondent.)

Newcastle, Sept. 5.

The colliery proprietors had the opportunity this week of putting before the Miners' Wages Board their views on the men's demand for payment for small coal. Their contentions are that payment for small coal is included in the payment for large, that the industry cannot carry any further burden such as this would impose, and that payment for small would make miners careless, so that they would turn out a much larger percentage of small than they do at present, which would be a further handicap to the mine owner. Chief interest centred in the evidence of Mr. John Brown, head of the great coal and shipping firm of J. and A. Brown. In reply to a question, he said that it appeared to him that the miners wanted the whole of the profits, and that they did not want to leave anything for the owners of the mines. By their demands they were making trouble for themselves as well as for all concerned in the coal trade of Newcastle; for the opening of the Panama Canal, which would take place in October, would bring the United States coals into direct competition with New South Wales coal on the west coast of America, and probably the whole of that market would be lost. Even as things were, the sudden rise in freights had left no margin of profit to the exporter during the last three years, and in some cases there had been an actual loss on the coal shipped away. During one year his firm had lost no less than £27,000 in this way; and the conditions of trade were such that one of two pits where the men were now on strike had lost £4000 last year in its colliery business. In conclusion, Mr. Brown said that the miners wanted to have the wages of all other colliery employees besides themselves fixed, but for themselves they insisted upon conditions that would enable them to earn up to £2 per day. The miners frequently worked only 6½ to 7 hours per day, and every day that the pits worked in the Maitland field there were 20 per cent. of the men absent, the high wages earned making them careless as to when they turned up to work.

### Southern District.

(From Our Wollongong Correspondent.)

Wollongong, Sept. 5.

The coal loading jetty at Port Kembla, which is to be the most efficiently equipped in Australia, and the construction of which was begun a very long time ago, is not even now within a year of being ready. The contractors for the loading appliances have a great portion of their £40,000 job to do yet. There is no doubt that the building of the structure was delayed by the failure of the contractors for the supply of timber to keep up their agreement. But when it is completed, as the local progress association points out, there will be no means of getting the coal to it, because of the single line being incapable of carrying any substantial increase of traffic; hence the association is urging that the duplicating of the line from Clifton should be commenced immediately.

The Illawarra Coke Co., recently formed to treat the small coal from Coalcliff, is now inviting tenders for building the ovens.

### Victoria.

### Powlett River District.

(From Our Wonthaggi Correspondent.)

The coming into force of the new agreement between the Railways Commissioners and the miners and wheelers, governing the rates to be paid for all classes of work in the State mine for the ensuing two and a half years, is already being attended with excellent results. From the opening of the mine up to July last, a period of over three and a half years, the miners were continually uneasy and dissatisfied, with the result that stoppages were frequent. It was hard to say what was going to happen from day to day, and this state of affairs acted with detrimental effect, not only on the mine, but also on the town of Wonthaggi and on business people. The output was restricted, owing to the fact that prices in sections of the mine varied, and as new places were opened up there was an inducement for the men to restrict their output until such time as the rates were settled for a lengthy period. Quite a different state of affairs has ruled under the new agreement, and, instead of the previous unsettled state of affairs, the miners and wheelers appear to be satisfied that they have secured good rates, and intend making the most of them. The natural consequence is that the output per day of two shifts has rapidly increased from between 1600 and 1700 tons to as high as 2300 tons. For the past month it has averaged aver 2100 tons per day. When the mine was working three shifts per day, the highest output was 2500 tons for a day's work. If the mine was then giving a profit, a much larger one must be made now. The number of employees has been decreased considerably, especially on the surface. Then, again, the bulk of the coal is now being cut by machines, which not only saves a considerable sum on the hewing rate, as compared with coal cut by hand, but also has reduced the percentage of slack to a very large extent. The slack was in the past one of the great drawbacks to the success of the mine, but now the quantity available is not sufficient to meet the demand. The last fortnight's pay was the best for over 12 months. The miners made the splendid average of a fraction over 14s. 10d. per shift. The wheelers, whose first pay it was since the contract system was introduced, averaged over 10s. per shift, and have thus secured their increase of 1/- per shift. They are, however, doing more work, and the increased output more than compensates for the increased earnings. The financial year has started well, so far as the State mine is concerned, and there is every likelihood of the present state of affairs continuing.

The August returns of the Commodore G.M. Co., Meekatharra (W.A.) show that 730 tons of ore milled yielded bullion worth £1215, while 390 tons of material cyanided gave £210, making a total of £1425. The slimes produced amounted to 340 tons of an assay value of 16s. per ton. Expenditure on revenue account (mining, milling, etc.) amounted to £775, on development account to £280, and on main shaft timber £50, making a total of £1105. The profit on ore treatment was £650.

# IRONBARK CO. (V.).

## The Sheepshead Reef Channel.

(From Our Bendigo Correspondent).

An interesting development occurred in the company's north workings on the 480ft. reef last week, which appears to indicate better results from the opening up of the formation northward than have attended operations in this direction for the last 80ft. This north level is at 551ft. and 25ft. from the new shaft, with which it is connected by a crosscut west. Driving is between the hanging walls of the "necky" reef, close to the cap. There is 7ft. of crushing material associated with one of the lavas, and the last couple of firings have shown several nice colours of gold. The best prospects are in the smaller vein of bedded quartz on the east wall. Allied to the west wall is 1ft. to 2ft. of less regular quartz of a well mineralised character. The intervening spurs make up the balance of crushing stuff, and the whole appears payable. A stope has been carried in immediately over the level for the last 70ft., leaving a good width of neck stone still extending overhead. The east and west legs have pitched underfoot. From the end of the level to the north boundary there is 350ft. of solid ground. As the quartz has been extracted only in driving for the last 70ft. or 80ft., the reef may be said to be intact in this direction for a length of over 400ft. As the legs are still pitching north in the end, a lower level will need to be extended at a greater depth to follow the stone to the Hercules and Energetic boundary. The latter company will crosscut for the same stone early in October, and a payable development at that point would materially enhance the value of both properties. At 80ft. from the face of the 551ft. north level the Ironbark have a winze down 20ft. on the west leg, but nothing of value has been found so far. Operations are now below an important fault, where the outlook is likely to improve northward. This fault occasioned a freer deposition of gold in its vicinity further south, and similar conditions are likely to prevail again. The break is a double one where exposed in the crosscut connecting the new shaft, and carries a few inches of laminated quartz. Indications point to the faulting becoming more pronounced toward the adjoining lease north. Above 551ft. there is a small block of ground to beat out, running back to the original winze on the reef from the old shaft. A fair width of crushing material is available, containing a little gold. Southward the main level is along the west back and probably within 60ft. of the Victoria Consols boundary. It is taking a small vein of quartz adhering to the wall, carrying a little gold, the footwall spurs showing minerals very freely. The first two stopes are 10ft. to 15ft. under the saddle, where the reef is small along the hanging wall and of low grade. At 65ft. from the face of the level the stope is operating across the cap, on 13ft. to 15ft. of highly mineralised stone, of a spurry character, showing fair gold at intervals. The gold is chiefly found not far from the hanging walls and the lavas. The two remaining stopes cover a length of 80ft., and extend to about 5ft. above the rails of the 466ft. south level at 210ft. from the No. 1 winze. In these stopes there is 8ft. to 14ft. of stone, the reef being the more consolidated in the back stope. The conditions otherwise are similar to those in the third stope, with the difference that the back stope has shown more gold lately. This is an important improvement, auguring well for the beating up of the forward stopes later. Estimating the length of stoping at over 140ft., and the 60ft. of solid ground to the south boundary ahead of the level, the reef may be said to be standing over a length of 175ft. in this direction, as the east leg has not been followed beyond the back stope. Here there is 2ft. 6in. to 6ft. of stone running down to 15ft. below the eastern turnover, showing payable gold. At 40ft. nearer the shaft, a rise to 20ft. produced a very low grade milling from the upper portion of the neck. There is 5ft. of spurry quartz here, and better returns are confidently expected from further exploration. Over all the reef is probably intact for a length of more than 600ft., providing crushing material for an extended period. Overlying it is another formation, of which nothing has been ascertained apart from the fact that the east and west backs carry very little stone in the 480ft. crosscut. It is intended to tap this reef with a shallower crosscut off the new shaft during the next few weeks. This shaft is down nearly 590ft., and from it the present productive stone may be reached lower down with a short east crosscut. Sinking is likely to be persevered with for some time, as the backs of the Central Red, White and Blue 316ft. reef are due to come through at a depth of between 750ft. and 800ft.

Though principal interest attaches to the work on this parallel reef channel, the last has not been heard of the resources of the New Chum line at shallow levels. The company have a rise going up on the east back of reef from the 320ft. north level. This formation was very rich along the west back in the Hercules and Energetic, but deteriorated in quality nearing the boundary. There is plenty of scope for another enrichment in the Ironbark lease.

---

# THE OSMIRIDIUM FIND.

The discovery of what the prospector claims to be distinctly a lode carrying osmiridium, in the vicinity of Bald Hill on the west coast of Tasmania, is of sufficient consequence to warrant some further information as to the importance of the find being supplied. As to its importance as an industry for the profitable investment of capital, the sources of information as to the present and probable future demand for the metal are so meagre that what can be said on this score at the present juncture must be treated as chiefly conjecture.

In an article published in our issue of May 8th last (when the discovery of osmiridium at Bald Hill attracted some notice), we dealt with the commercial possibilities of the find, the general conclusion being that the use of the metal seemed hardly extensive enough to induce the hope that any material increase in its production would find a ready market. It seems perfectly clear that Tasmania is now practically the sole producer in the world of this metal, as the Russian output has steadily declined during the past 10 years from about 150 oz. per annum to nil, the average per year for the whole of that period not exceeding 80 oz. During that period Tasmania's quota to the world's supply was comparatively insignificant, until 1911, when it produced over 270 oz., and in 1912 nearly 800 oz.

In his report on the Bald Hills field, Mr. Twelvetrees, the Tasmanian Government Geologist, directs attention to the fact that the available iridium in the world depends largely upon the output of iridium-bearing platinum ores, and that it accordingly follows that the osmiridium now being produced by Tasmania has to compete with the prospectively increasing output of platinum from Russia and the United States (there being a movement on foot to effect this) with which would occur a corresponding increase in the supply of osmiridium. This would undoubtedly affect the output of the latter metal from Tasmania, or at least the price of it, assuming the market to be limited, but if the demand for platinum goods, especially hard platinum, be on the increase, and available supplies have not yet overtaken the demand, this must reflect beneficially on Tasmania's prospects.

The proof of the pudding is in the eating. The price (a reliable barometer usually) of osmiridium has been steadily increasing until it now exceeds £10 per oz. It follows as a fairly logical sequence that the supply has never been sufficient, or the price would not have risen to the extent it has done. It also follows that, having a definite use, the extent of that use is not necessarily limited to what we know to have been the available annual supplies. The difficulty is to determine how far the supply may go; but the producers of osmiridium may rest assured of this, that the price will speedily reflect the position if they overstep the mark. It then becomes a question of the profit there is in producing the metal. £10 per oz. should leave a good margin over cost of production, and unless the bottom be knocked clean out of the market (which seems hardly likely, seeing that the metal is exceedingly rare and the supply is not likely to increase beyond bounds), the industry will stand a pound or two reduction in the price and still survive.

Another point which may have some bearing on the cost of production and the extent of supply in the case of the present find is that it is questionable if the osmiridium actually occurs in a lode. Mr. Twelvetrees, in referring to "a line of rock" which one prospector claims to have followed and to be distinct, states that this presents none of the structural features of a lode. As a matter of fact, Mr. Twelvetrees persistently refers to the metal occurring "in the rock," although he gives certain geological reasons for a distinct line or trend in the case above referred to.

Upon just how far the limits of the occurrence of osmiridium, both in width and length, and whether it is or is not a lode, can be determined will depend upon profitable production. The very high percentage of the metal, which has in some instances been proved to exist, goes nowhere as an indication of what quantity of it may be recovered at a profit. Thorough and exhaustive sampling alone will determine this, and the law of averages will then apply with equal force in this as in other classes of mining.

The profitable mining of the metal will also depend largely upon what natural facilities exist on the field. In the case of the find to the south of Bald Hill it is stated that a creek in the vicinity will supply a volume of water equivalent to about 5 sluice heads. This should provide the power necessary to drive all the plant it would be wise to instal to work any individual proposition on the field. To be able to confine the cost of production to mining alone is a big advantage to any mining company, and one to be seized even if it entail a considerably higher first cost; because there the cost ceases and becomes the last, with the exception of that involved in reasonable wear and tear. The most important thing to do at the present time, however, is to determine the extent of the find, and only development will do that.

The secrecy which shrouds the extent of the platinum market (in which may be included iridium and osmiridium) is due to the fact that it is "under control" (a fact which may be otherwise expressed). Seeing that Tasmania is now practically the sole producer of osmiridium, the circle or group which controls this market is bound to be interested if the output is likely to become extensive enough to affect them. Whether it will be in the direction of squeezing or absorbing it it is not possible to say. It would be well for those interested in the field to watch for either possibility and hope for the latter.

---

# ROYAL MINT RETURNS.

## Sydney Branch.

| | August. Fine oz. | Since the 1st January. Fine oz. |
|---|---|---|
| Gold received for coinage— | | |
| New South Wales .. | 7,430.92 | 68,006.36 |
| Queensland .. .. .. | 31,975.02 | 168.508.44 |
| New Zealand .. .. | 1,713.63 | 120,226.93 |
| Victoria .. .. .. | 50.17 | 166.12 |
| Northern Territory | — | 140.47 |
| Tasmania .. .. .. | — | 138.20 |
| Western Australia . | — | 158.49 |
| Papua .. .. .. .. | 549.17 | 9.065.68 |
| Other Countries .. | 53.99 | 181.01 |
| Coin .. .. .. .. .. | — | 329.10 |
| Total .. .. | 41,772.90 | 366,920.80 |
| Gross value of above .. | £177,439 | £1,558,579 |

## Melbourne Branch.

| | August. Fine oz. | Since the 1st January. Fine oz. |
|---|---|---|
| Gold received for coinage— | | |
| Victoria .. .. .. | 39,194.51 | 309,971.19 |
| New South Wales .. | 433.71 | 3,575.56 |
| New Zealand .. .. | 2,654.50 | 41.479.18 |
| Queensland .. .. .. | 158.71 | 1,528.68 |
| South Australia (including Nth. Territory) .. .. .. .. | 117.27 | 5,952.26 |
| Tasmania .. .. .. | 2,166.75 | 14.842.91 |
| Western Australia.. | 715.43 | 3,613.39 |
| Other Countries .. | — | 7.34 |
| Light Gold Coin .. | — | 1,141.32 |
| Unknown .. .. .. | 270.66 | 2,321:32 |
| Total .. .. | 45,711.54 | 384,433.15 |
| Gross value of above .. | £194,170 | £1,632,967 |

## Perth Branch.

| | August. Gross oz. | Since the 1st January. Gross oz. |
|---|---|---|
| Western Australia .. | 125,005.90 | 966,093.72 |
| Other Australian States | — | 14.73 |
| Unknown Origin .. .. | — | 467.53 |
| Total .. .. | 125.005.90 | 966,575.98 |
| Value of gold, calculated at an average of £3 9s. 7d. per gross ounce .. .. .. .. .. .. | £434.916 | £3,392,700 |

---

Mr. Otto Beit, brother of the late Mr. Alfred Beit, who is also a director of the British South Africa Company, has expressed his intention to found three science research scholarships of £150 a year each, tenable at the Imperial College of Science and Technology, and open to graduates of recognised universities in the United Kingdom, the Dominions, and the colonies.

# ENGINEERING AND ELECTRICAL SECTION

THE FAMOUS
"Brimsdown"
"Wirum"
BRITISH MADE Lamps.

The most popular, reliable and economic lamp on the market.

Sole Agents—
THE
LAWRENCE & HANSON
Electrical Co. Ltd.

405 LONSDALE ST., MELBOURNE.
33 YORK ST., SYDNEY.
and at WELLINGTON, N.Z.

## MELBOURNE SUBURBAN TRAMWAYS.

### The Middle Park Scheme.

Acting upon the suggestion of the Premier, Mr. Watt, with a view to overcoming the opposition of the Melbourne Tramway and Omnibus Co. to the proposed electric tramway from Princes Bridge to Fraser-street, Middle Park, the Tramway Committee of the South Melbourne Council last week passed the following recommendations:—

‘‘That in reply to the proposal of the Premier to incorporate in the proposed Tramway Bill a clause that the council should compensate the Melbourne Tramway and Omnibus Co. for any proved losses they may sustain in the construction of the electric tram, this council is of opinion, in view of the fact that other electric tramways constructed within the districts mentioned in clause 3 of the Tramways Act 1890, have contributed traffic to the Melbourne Tramway and Omnibus Co.'s lines, it would be inequitable to provide that South Melbourne council should compensate the Melbourne Tramway and Omnibus Co. for loss of traffic, should the proposed tramway from Princes Bridge to Fraser-street be constructed.

‘‘That in the event of Parliament being of a contrary opinion, the Act should provide that the amount of compensation (if any) payable to the said company should be fixed by the Minister of Public Works prior to the construction of the line after hearing such evidence as he may think fit.

‘‘That the council submits the expert report prepared by Messrs. M'Carty, Underwood and Co., which favours the construction of the proposed line. It is recommended that additional copies of the report be obtained.’’

The Camberwell Council desired to have embodied in its Order-in-Council respecting the extension of the electric tramway along White Horse-road towards Balwyn, a clause permitting the issue of through tickets to serve on the electric, horse, and cable tramways; but this was opposed by the Railways Commissioners as likely to interfere with their business interests. Last week, however, in view of the early expiration of the cable tramway lease, they withdrew that objection, and agreed to alter the wording of the clause relating to the regrading of the railway so as to make it clear that the department desired that the tramway authority should contribute towards the cost of regrading only to the extent to which it would benefit by the abolition of the level crossing at White Horse-road; that the tramway authority would pay a sum equal to the capital value of the annual saving which it would derive by the removal of the level crossing. The Commissioners have also intimated that they are prepared to defray half, instead of one-third, the cost of any interlocking arrangements which may be necessary at the crossing to ensure the safety of train and tram traffic, and to bear half the cost of any subsequent alterations which may be necessary in consequence of electrification.

In spite of some opposition, the Coburg Council's tramway committee acquiesced last week in the application made by a motor 'bus company to the Melbourne City Council, and forwarded for consideration by the local body, for a stand for motor 'buses to connect the Coburg tramways with the local cemetery.

The receipts of the Melbourne Tramway and Omnibus Co. for August amounted to £58,247, as compared with £58,929 for August, 1912. The passengers carried numbered 6,993,349, showing a decrease of 47,466 as compared with the same month last year, and the tram-miles run were 1,014,787, a decrease of 14,292. The receipts for the first two months of the current financial year amount to £117,150, against £116,590 for the corresponding period last year, or an increase of £560. The total number of passengers for the two months is 14,076,976, against 13,952,852, or an increase of 124,124; and the mileage is 2,040,998 miles, against 1,995,242 miles, or an increase of 45,756 miles. The average fare for the two months is 1.9973d., against 2.0054d. for the corresponding period last year.

The receipts of the Prahran-Malvern (V.) Tramways Trust for August amounted to £6365 14s. 8d., as against £3398 13s. 4d. for August, 1912, the increase being £2967 1s. 4d. The passengers carried numbered 952,611, as against 532,772, and the car-miles run were 115,285, as against 61,629.

---

## KALGOORLIE ELECTRIC SUPPLY.

### The Charge to Picture Shows.

The Kalgoorlie (W.A.) Council had before it recently applications from Mr. Madorsky, of Radio Pictures, and Mr. Jonathan Morris, for the supply of electric current for their motors at power rates. The electrical engineer reported as follows on the matter:—‘‘When the prices for power and light were fixed it was never contemplated that a motor would be introduced into a lighting circuit, merely to change the voltage, and, therefore, no specific tariff was arranged for such a case. The advent of picture shows, however, has brought this about, and the above applications make it important that it should be dealt with not merely for these cases, but on broad lines to even all similar cases. At present it may be argued, with a fair show of reason, that since the council's wires are connected to a motor, therefore the motor rate should be charged. On the other hand, if that rule be conceded, it is desirable to trace the effect of such a concession to its logical conclusion. The rate must, of course, apply to all consumers whose light is obtained under the same conditions, and, therefore, every large consumer would begin to ask himself if it would pay him to introduce a motor generator into his circuit in order to obtain the lower rate, and the probable result would be that every man whose bill exceeded £5 per month would instal the necessary apparatus, and thereby save nearly half his annual cost for light. But consumers who pay £5 a month or over contribute about half the total revenue, and, therefore, the possible effect of granting this concession would be the ultimate loss of revenue of about £4000 a year. That being so, it is quite obvious that, if electric lighting is to be carried on on business lines, the applications cannot be granted, and I recommend accordingly. In order to leave no doubt about the matter in case of future applicants, I would suggest that a resolution be carried by the council to the effect that the current for all motors connected to the council's wires which are merely used to change the voltage will be charged for at the usual lighting rates.’’ The matter was referred to the full committee for consideration.

An unusual incident occurred in connection with the discussion. Another letter from Mr. Madorsky was read, stating that he had seen the report of the engineer and asking that the matter might be postponed until he could make it convenient to lay a further statement before the council. The question was asked how Mr. Madorsky had come to see the report, and Councillor Morris acknowledged that he had showed his copy of it, and did not think he had done wrong. The Mayor replied that the councillor had been guilty of a breach of faith. He was well aware that the reports were not available even to the press till they came before the council, yet he had divulged information contained in a report to a private individual. But Councillor Morris still maintained that he had done nothing wrong, and the mayor left the question to a vote of the councillors, who thereupon unanimously supported his remarks. It was decided to defer the question as Mr. Madorsky had requested.

---

## ARCHITECTURE AND ENGINEERING.

Mr. Walter Burley Griffin, the creator of the design which gained the first prize in the competition invited by the Commonwealth Government for the planning of the Federal capital, was present last week at the ordinary meeting of the Royal Victorian Institute of Architects, held in Melbourne, and gave a short address on architecture in the United States.

Mr. Griffin said that in some respects the United States was below England and Australia in the standard of architecture. A greater amount of study was evidently given to the facades of buildings than was customary in America. They had not in America office work training as a requirement of the profession. Engineering was the basis of architecture in their system, and, until very recently, had been the dominating influence. The great advance made had not been, with them, in decorative architecture, but in engineering feats, which had not been accompanied by adequate artistic expression. During the last few years, however, there had been a general change in the attitude towards education, and he thought that in education they were at the parting of the ways. Democracy had been recognised as an essential of life in politics, and they must also have it in thought; but present education brought convention in as authority. He would advocate the individualistic instead of the conventional method of training. His idea was an assumption that every child born into the world was a genius, either a scientist, discovering things for the benefit of the people; an inventor, experimenting with mechanical processes, or an artist, who gave form to utilitarian things. A few years in the schools, however, was sufficient to kill any originality that he might have. Architects should learn to adapt materials and structure to use. The Americans to-day were building bigger and finer buildings than any other people, yet it was realised that they had not got as far as the ancient Greeks, or the builders of the Mediaeval ages. Materials, he said, had changed in the last ten years. In the last twenty-five years they had changed so completely that they could hardly find ways of adapting preceding architecture to modern conditions. But the greatest activity of architects was just in that direction, and the results were usually incongruous. The idea, when he was at school, was to set the pupil thinking out the greatest problems of architecture before going into business, and building warehouses and railway sidings. His first problem in practice had been a poultry house representing an investment of £12, and that was what he would give to every student to start on, and then he could pass on to a stable, as the speaker had done. In that way he did not have to borrow anything, and started with the necessities alone.

Mr. H. J. Hadden said that not many would echo the visitor's sentiments. Unfortunately, many of the men practising in Australia and the students were children of convention, and in that they lacked the broad liberty which was the heritage of the artist. The ‘‘jerry builder,’’ and not the architect, was the man who pleased the public taste. In the suburbs, where 500 houses were built, 400 of them were built by speculative builders, and not by the architect.

Mr. Griffin said that the ‘‘jerry builder’’ was a natural product of architecture, as it was taught. The architect did not stoop to get the absolute maximum of result from the minimum of money as the ‘‘jerry builder’’ did. He had personally studied the problem of the worker's cottage at £400, and he would make it cheaper than the ‘‘jerry builder,’’ and get more results for the same money. They found in the garden villages of England that the ‘‘jerry builder's’’ sale board did not bring results, and that people were going to those villages that had been architecturally planned, until the designers were unable to keep up with the waiting list. Architecture was a cult into which the man in the street had not been initiated. But among savage people and animals they could not find a sample of the monstrosities that cities were responsible for.

Their buildings were such an essential part of their lives that every man took an interest in them, and that accounted for the beauty of the Polynesian village as compared with the colonial city.

## UNIVERSITY OF MELBOURNE.

### Proposed Chair of Architecture.

At the meeting of the Council of the University of Melbourne, on the 1st. inst., Dr. Macfarland submitted the report of the joint committee, consisting of representatives of the council, the faculty of engineering, the Royal Victorian Institute of Architects and the Working Men's College, on the memorial laid before the University Council by some 87 members of the Victorian Architectural Students' Society at the beginning of August. The committee had under its consideration the present University diploma of architecture; the work done by the Working Men's College and the Department of Education; the limitation as to time available for articled pupils to attend the University; the necessity for preserving the condition as to articles for the purpose of entering the profession; and the development by the University of the architectural side of the work. The committee reported that the University, with the assistance of the technical schools of Victoria, should be able to satisfy the demands of the architectural students for a thorough training. It would be essential for a Professor of Architecture to be appointed, and if those representing architectural interests in the community take the initiative in obtaining the necessary funds, the University should heartily co-operate. The creation of a new faculty of architecture would ultimately become necessary. To grant the request of the memorial it is necessary that temporary regulations should be passed, and the committee suggests that the University Council should request the faculty of engineering to draft these regulations.

The report was adopted, and was referred to the faculty of engineering to report upon its feasibility and to draft a scheme.

## ELECTRICITY WITH IRRIGATION.

Regulations for the transmission and supply and sale of electrical power have been isued by the Commissioner for Water Conservation and Irrigation (N.S.W.) under the Irrigation Act 1912. The charges for lighting will be divided into a fixed charge based upon the number of lamps connected at any one premises, or upon the number in use at any time as measured by a maximum demand indicator, together with a charge per unit as measured by meter. The 25 c.p. metallic filament lamp using 30 watts will be taken as a standard, and the charge for each such lamp or its equivalent fixed or in use at any one time shall be at the rate of 5s. per annum, payable quarterly. The charge for electricity will be at the rate of 1d. per unit. Consumers are to effect their own wiring, but the work must be approved of by the Commissioner before connection to supply mains. The charges for power will be divided into a fixed charge based upon the total horse-power laid down or in use at any one time as measured by a maximum demand indicator, together with a charge per unit as measured by meter. The charge per horse-power laid down or in use at any one time will be at the rate of £5 per horse-power per annum, payable quarterly. The price for electricity will be 1d. per unit. Motors and the incidental wiring will be supplied, provided the buildings are reasonably substantial. Payment may be made either in cash or on the hire-purchase system, or an annual rental basis. An estimate of the cost of the work, guaranteed within a margin of 10 per cent., will be supplied, and the user must deposit half this amount before the work is commenced, and the balance on completion, under the cash-purchase system. Annual rentals will be 15 per cent. for the motor and 10 per cent. for the wiring. Under the hire-purchase system, the instalments are spread over a term not exceeding ten years, interest being charged on deferred payments at the rate of 10 per cent. Meters will be supplied free of charge, but will remain the property of the Commissioners. Maximum demand indicators will only be supplied at the special request of the user, and will be charged for at the rate of 5s. per annum each, payable quarterly; while tested metallic filament lamps of 16, 25, and 50 c.p. will be supplied at cost price.

Parramatta (N.S.W.) is at last illuminated by electric light. The company is a local one, and within a very short period of the necessity for the city being lighted by electricity having suggested itself, was formed, and justified its existence by the speedy installation of the necessary plant. The supply was officially switched on for the first time on Saturday night last.

## A REMARKABLE COINCIDENCE.

"The Salon," a monthly magazine, published in Sydney, is described on its front cover as "the Journal of the Institute of Architects of New South Wales the Queensland Institute of Architects," and on the title page also it is described as "the Journal of the Institute of Architects of New South Wales." That being so, what it publishes may be regarded as official from the Institute. If we be right in these premises, the extraordinary coincidence, to which we draw attention below, reflects no credit on that body. In parallel columns we give, firstly, an extract from an editorial from the January issue of "The Town Planning Review," which is the Journal of the Department of Civic Design, School of Architecture, University of Liverpool, and, secondly, an extract from an article in the May-June issue of the "Salon." We make no comment upon the extraordinary likeness of these two articles, which both deal with the Departmental Board's design for the lay-out of Canberra; but we may add that "The Town Planning Review" also published a caricature by an "anonymous contributor," which it described as "by no means too severe a censure on this improbable scheme." The "Salon" also reproduced a caricature, which it described as "by no means too severe a censure on this most improbable scheme"; and this caricature, though it is described as by "our artist," is, except in some minor details, identical with the one published in "The Town Planning Review." It may also be mentioned that "The Salon" article begins thus:—"We have carefully examined the design for the lay-out of Canberra, as projected by the Departmental Board, and, as the official journal of the Institute of Architects of New South Wales, Queensland, South Australia and Western Australia, we must, even at this late hour, enter our protest against such being carried out, even although it is officially announced that this plan has been finally decided upon." The extent to which the result of this "careful examination" coincides with that of "The Town Planning Review" may be seen from a comparison of the following passages, which will be perused with interest by our readers, and doubtless with surprise by many of the architects of New South Wales:—

"The Town Planning Review," January, 1913.

We have all along objected to the conduct of this competition, and have severely criticised the selected design; but, disregarding what might have been, had the competition been more fortunately inaugurated, we have no doubt but that a qualified assessor would have discovered, amongst the wealth of material submitted, a man whose appreciation for essential requirements, whose grasp of the difficulties of this particular problem, and whose ability for composing architectural groupings would have justified the Board in commissioning him to prepare a final design. If the assessors considered that Mr. Griffin most nearly fulfilled these conditions, the least they could have done would have been to have placed him in this responsible position.

Turning to this so-called final plan, which we reproduce, we see embodied all the errors of Mr. Griffin's plan exaggerated, without any of its many redeeming qualities. The new plan is evidently the product of a Department whose personnel is utterly untrained in the elements of architectural composition, whose mind is a turmoil of confusion as regards the association of different buildings, and whose ideas on the simple logic of street planning have resulted in a road scheme which is simply a *reductio ad absurdum*. Indeed, the whole lay-out is so entirely outside the pale of serious criticism, that we feel that it cannot be put into execution. The perspective sketch, which acompanies the plan, with its innumerable kiosks, and its irregular distribution of everything that is architecturally undesirable, reminds us of a third-rate Luna Park, or the Christmas production of a toy factory. When compared with Mr. Griffin's plan, the defects of which are, after all, æsthetic rather than functional and technical, it is obvious at once that the "final plan" is the work of an amateur, who has yet to learn the elementary principles of laying-out a town.

"The Salon," May-June, 1913.

We have all along objected to the conduct of this competition, and have severely criticised the selected design; but, disregarding what might have been, had the competition been more fortunately inaugurated, we have no doubt but that a qualified assessor would have discovered, amongst the wealth of material submitted, a man whose appreciation for essential requirements, whose grasp of the difficulties of this particular problem, and whose ability for composing architectural groupings would have justified the Board in commissioning him to prepare a final design. If the assessors considered that Mr. Griffin most nearly fulfilled these conditions, the least they could have done would have been to have placed him in this responsible position. We reproduce Mr. Griffin's plan, along with the Departmental plan, in the latter of which we see embodied all the errors of Mr. Griffin's plan exaggerated, without any of its many redeeming qualities. The new plan is evidently the product of a Department whose personnel is utterly untrained in the elements of architectural composition, whose mind is a turmoil of confusion as regards the association of different buildings, and whose ideas on the simple logic of street planning have resulted in a road scheme which is simply a *reductio ad absurdum*.

When compared with Mr. Griffin's plan, the defects of which are, after all, æsthetic rather than functional and technical, it is obvious at once that the "final plan" is the work of an amateur, who has yet to learn the elementary principles of laying-out a town.

## CORRESPONDENCE.

### MR. IRVINE, K.C., AND THE MARCONI COMPANY.

To the Editor of "The Australian Mining Standard."

Sir,—As there has been so much discussion, both in Parliament and elsewhere, as to the relations of Mr. W. H. Irvine, K.C., with the Marconi Company, we think it only right to make public the following facts:—Nearly two years ago Mr. Irvine was given a general retainer by the Marconi Company, similar retainers being also given to three other leading counsel. The effect of such a retainer is merely to give a client (in return for a trifling annual fee) a first call upon the services of the counsel in question, should he desire to avail himself of the same.

Immediately after Mr. Irvine's acceptance of office as Attorney-General we received, through his clerk, a message that he desired to see us. A member of our firm accordingly saw him, and he then intimated to us that, in view of his present position, he could no longer act for the Marconi Company, and that he had arranged with one of his colleagues (we think Mr. Glynn) to deal with any official maters that might arise in connection with the pending action between the Marconi Company and the Commonwealth. Mr. Irvine further intimated to us that he must return the brief that had been delivered to him to represent the Brisbane Tramways Company upon the pending application to the High Court for a prohibition order in connection with the award made by Mr. Justice Higgins in the Arbitration Court. We of course at once recognised that Mr. Irvine must sever his connection with the Marconi Company's case, but as regards the tramways case we urged him to reconsider his decision, seeing that, except that it had been given leave to intervene to argue certain technical constitutional points, the Commonwealth was no party to those proceedings.

Mr. Irvine, however, firmly insisted that, on account of these constitutional points having arisen, he could not appear in that or any other branch of the case, and that this decision must apply to all other cases in which any constitutional point could arise. Though it does not, of course, affect the question of principle involved, we might say that, apart altogether from the Marconi case, Mr. Irvine's refusal to act in the tramways case will involve a very great monetary sacrifice on his part, since the case is likely to be one of great magnitude. We may also add that when we saw Mr. Irvine was being attacked about his Marconi retainer, we communicated with him, and suggested we should publish the facts, and he said he would rather we did not do anything. We are writing this of our own accord, in what we consider our duty in a public matter, to prevent any misapprehension.—Yours, etc.,

BLAKE and RIGGALL,
Solicitors for Marconi Company.
Melbourne, September 4.

The South Australian House of Assembly last week passed a resolution authorising the construction of the first lock on the River Murray, near Blanchtown, at a cost of £120,000.

## BRITISH AND EUROPEAN DEVELOPMENTS.

(From Our Correspondent.)

London, August 8th.

Several months ago the Aberdeen Corporation Tramways Department fitted out ten cars on the "Pay as you Enter" principle, six of them being entirely new cars, and the remainder old cars altered. In his report just issued, the manager, Mr. R. S. Pilcher, refers to the experience so far obtained with these cars. He says that the public have now become accustomed to them, and there is no congestion or delay through the prepayment of fares. The passengers have accommodated themselves to the system, and have their fares ready. There have been no rear-platform accidents. It is found that the receipts have steadily risen, and although there is a natural increase taking place on the route served with Paye cars, a large part of the increase in receipts it attributed to the prepayment of fares. Under the usual fare collecting methods a considerable leakage is always occurring owing to the inability of the conductor to attend to his numerous other duties and collect the fares as well.

The City Engineer of London (Mr. F. Sumner), in the course of his anual report to the City Corporation, devotes a good deal of attention to street lighting affairs. In the city area there are still 329 of the original type "open" electric lamps in service at £26 per lamp per annum, and there are also 73 Oliver flame arcs (partly experimental) costing £17 10s. per lamp per annum; 21 "Excello" flame arcs, and 45 metallic filament lamps bring up the total to 468. Where electric arc lamps are being experimented with in Cheapside and Watling-street, they are of 3000 c.p., and hung 27.6ft. above the roadway, 90ft. apart, unless assisted with metallic filament lamps, where they are 200ft. apart. In Farringdom-road they are 4000 c.p., placed 25.6ft. above the roadway, and 175ft. apart. In Paternoster Row, and in courts and lanes south of Cheapside, they are on brackets 12ft. 6in. above the roadway; they give 75 c.p., and are about 86ft. apart in most cases. As stated in these pages a short time ago large contracts have been placed with both the gas and electricity companies for high pressure gas and modern electric lighting in a number of important thoroughfares. Another point mentioned in Mr. Sumner's report is the time system, or want of system, prevailing in the city. Discussion occurs periodically on the absurd disagreement that exists between the numerous clocks shown by private and public parties. Quite recently the subject has been receiving much attention in the press. Mr. Sumner shows that there are 106 clocks fixed above the public ways by private parties, and of these only 42, and none of the 29 church clocks, are synchronised. He also refers, as usual, in his annual statement to the position of overhead wires. The Corporation Engineers' Department still exercises its authority in getting derelict or disused wires and attachments taken down. All owners of overhead wires are required to identify them by attaching an approved perforated zinc label to each, and this system, together with registration, has proved advantageous. It is pointed out that one of the results of roof inspections is to discover that large numbers of wires have been erected without any notice having been given. It is only by very careful supervision that the department is able to detect new lines.

The depressed state of business at Kalgoorlie and the decrease in the number of men employed at the mines, also the demands for higher wages by the tramway employees, were mentioned by Mr. A. H. P. Stoneham, at the meeting of the Kalgoorlie Electric Tramways Ltd., as the causes of the report and accounts being unsatisfactory. The stated causes naturally decreased income and increased expenses. Complimentary references were made to the work done by Mr. Stanley, the manager, both in his efforts to decrease expenses and in his fight on behalf of the shareholders during the long time that he had to devote to the proceedings before the Arbitration Court. Mr. Stoneham added, however, that the real trouble was slackness of business at Kalgoorlie. It seemed that today, instead of Europeans or native Australians being at work on the mines, there was a large number of unmarried foreigners, and a reduction of 4000 or 5000 men employed there—men having no families—seriously affected their traffic. Whether the trans-continental railway—the construction of which had been begun in a half-hearted fashion—or the agricultural prosperity of Southwest Australia, would benefit Kalgoorlie, was hard to say. When they were started the Kalgoorlie tramways were regarded as a far better proposition than those of Perth, but in experience exactly the reverse had proved to be the case. The directors had hopes that the idea of nationalisation would extend to Kalgoorlie, and the Government would propose tramways purchase. So far there had only been pourparlers on the subject, and they had not amounted to much. If there was a chance of getting a decent price they would certainly consider it. The statement which the shareholders had before them included a comparative report, prepared by the company's attorney, showing the decrease in the output of gold from the mines, the decrease in men employed, and in profits per ton. The results stated by the engineer and the directors may be shown for the two years as below:—

| | 1911. | 1912. | Inc. or Dec. |
|---|---|---|---|
| Car miles run .. .. | 621,086 | 619,170 | — |
| Passengers carried | 2,694,936 | 2,489,833 | — |
| Earnings per car mile .. .. .. .. | 15.98d. | 14.65d. | — |
| Expenses per car mile .. .. .. .. | 9.97d. | 10.07d. | + |
| Expenses per cent.. | 62.39 | 68.74 | + |
| Power supply units charged by Power Co. .. .. .. .. | 642,292 | 703,189 | + |
| Amount for do. do. | £7,153 | £8,058 | + |
| Gross receipts.. .. | £41,472 | £37,917 | — |
| Net Profits.. .. .. | £14,250 | £10,099 | — |

In regard to the supply of power to the tramways, Mr. Stoneham made an interesting reference to the effect upon the meters of the big storm in Kalgoorlie early in the present year. Prior to this occurrence the two meters on which they had measured and checked the consumption had been in agreement, but they had since failed to agree, and they were acting against this company's interest by registering "alarmingly more" than formerly. With the aid of experts they had overhauled and calibrated the meters, and they now agreed within a little. The company considered that the wrong reading for some months had led to a bill for electricity much bigger than it should have been. Their dispute with the Power Company concerning £300 or £400 under this head had been submitted to arbitration.

Two municipal corporations have just resolved to send deputations abroad to collect information preparatory to the settlement of plant details in connection with big electrical extension schemes. I refer to Glasgow and Bradford. Reference to the big doings that Glasgow has in contemplation has frequently been made here, and before deciding upon the equipment of the power station for which plans have been prepared, it has authorised Mr. Lackie, the city electrical engineer, and the convener of the electricity committee, to proceed to Chicago, New York, and other places in North America, to investigate the working and results of the biggest sets of generating plant with a view to reporting thereon. It is said that Dr. Ferranti is in some measure responsible for this decision. Glasgow is proud of its existing stations, and it is in the belief that there is nothing in the United Kingdom to beat them that the proposal to see the best stations in America has been adopted. The figures just issued for the past twelve months show that the units sold by the Glasgow Department totalled 60,133,955, with 27,848 consumers. For private lighting the consumption was about 18½ millions, and for power getting on for 42 millions. The number of motors on circuit is 8805, aggregating 59,144 h.p. Lighting revenue was £186,018, and power £136,058. After paying working expenses, and before meeting financial and depreciation charges, the surplus is £175,109, about £6000 less than for last year. After deducting £50,307 for depreciation as compared to £55,315 last year, and meeting interest, etc., charges, the net surplus is £7520, as compared with £10,751 a year ago. As showing the growth of the undertaking, it may be stated that the revenue from all sources increased by £25,817 during the year, but the working expenses advanced by £32,125. The larger output, increased coal charges, and higher rates and taxes, account for this latter item.

In the case of Bradford, the report of Mr. Roles, to which extended reference was made here a week ago, revealed the uncertain state of mind of some engineers in the midst of present day supersession tendencies. Probably as the result of the report mentioned, the corporation has now deputed Mr. Roles, as city electrical engineer, together with the chairman and deputy-chairman, for a tour of power stations in Berlin and other Continental cities where turbo-generating plant such as will be needed for extensions at Bradford can be seen at work.

The Bradford Corporation has resolved to launch out further in respect to street lighting. Special consideration has been given to the subject jointly by the gas and electrical engineers, and the result is a decision to light a number of streets where electric mains are already laid, by means of 84 electric lamps at £4 per annum per 200 watt lantern, and to proceed to convert a number of side street gas lamps into electric lamps, the cost in this case being £2 12s. 6d. per lamp per annum. The Glasgow Corporation has almost completed the substitution of flame arcs for old type arcs in the old Glasgow area, and the satisfactory result has led to orders for further flame arcs for other thoroughfares.

## THERMIT WELDING.

By Alfred J. Higgin, F.I.C., Lecturer in Metallurgy, University of Melbourne.

The metal aluminium, if heated to a sufficiently high temperature in oxygen gas, burns with formation of aluminium oxide.

The heat generated by the combustion of aluminium in oxygen is very great, and it is owing to this fact that welding by the Thermit process is possible. Not only will aluminium combine with free oxygen; it will, when heated with metallic oxides, combine with the oxygen they contain, with formation of the metal and aluminium oxide.

The reactions between aluminium and metallic oxides generate a very great amount of heat, sufficient indeed to raise the temperature of the mass to a white heat. This fact was discovered by Vautin, but it was first made use of in a practical manner by Goldschmidt, of Essen, who utilised the reaction between aluminium and ferric oxide for welding purposes. If aluminium in the form of powder be mixed with granulated ferric oxide, and the mixture be ignited, intense combustion occurs. The aluminium combines with the oxygen of the ferric oxide, while the iron is reduced to the metallic state.

The heat generated by the reaction is so great that both the aluminium oxide and the iron are obtained in the molten condition at a white heat, and unless the crucible in which the operation is carried out is of special make it will be melted in carrying out the process.

This mixture of aluminium and oxide of iron, according to Richards, generates enough heat to raise the temperature of the mass to 2694 deg. C.

Either ferric oxide or magnetic oxide of iron may be used.

A mixture of magnetic oxide of iron and aluminium is sold under the name of Thermit, and is largely used for welding purposes.

Defective castings, broken main-shafts and stern posts of steamers, and broken cog-wheels have all been successfully repaired by means of Thermit.

Perhaps the largest use to which Thermit is put is for jointing tramway rails for electrical purposes, and it is in this connection that I am bringing the subject of Thermit welding before you. The welded joint is much superior to the mechanical joint in every particular. Its only disadvantage is its high initial cost, but it is by far cheaper in the end.

It has been found that the use of welded joints very often entails an extra five or more years' lease of "life" for the permanent way, over and above what would have been possible if mechanical joints had been adopted. It is practically impossible to prevent a mechanical joint from becoming loose owing to vibration; and as the maintenance up-keep is costly, and looseness is detrimental to the paving sets, the disadvantages of mechanical joints are sufficiently obvious. Besides this, the electrical conductivity of the rails is not much diminished by the presence of welded joints. On the other hand mechanically-jointed rails must be bonded if they are to be used as part of the supply circuit, and even the best bonds diminish the conductivity of the system. Of course, the welded joint can only be adopted when the rails are embedded in the roadway, so that their temperature is not affected by atmospheric conditions, and expansions and contractions due to changes of temperature are eliminated.

Before making a joint it is necessary to file up the two surfaces of the rails which are to be welded together. The rails are then securely clamped together so that the two clean surfaces are in close contact. A mould is then fixed round the two ends of the rails. The mould consists of an iron frame-work which holds together the refractory material into which the molten Thermit runs. This mould completely surrounds the ends of the rails, and projects about two inches above their surface. It is open at the top, so that the charge of molten Thermit can be poured in at one side. It is poured in at the tongue side of the rail, then runs down round the web and foot and rises up on the head side. The metallic iron resulting from the reaction is sufficient to fill the mould about half full.

The foot of the rail is thus completely surrounded with metallic iron, and it extends about half way up the web. The Thermit mixture is placed in a conical sheet iron crucible, which is thickly lined with refractory material. There is a small hole at the bottom of the crucible, into which a small iron rod, split and bent over at the top, is placed. This forms a support for a disc of asbestos which is placed over it. On the top of the asbestos disc a small quantity of coarse sand is sprinkled. The Thermit mixture is then placed in the crucible, and is prevented from running out of the hole at the bottom by the arrangements just described. A litle ferromanganese is put on the top.

The crucible is supported just above the mould on the tongue side of the rail, so that no heat may be lost in the transfer of the molten metal.

It is necesary to produce a local elevation of temperature to initiate the reaction. This is accomplished by means of a mixture of fine aluminium powder and barium peroxide which is placed in a small heap on the surface of the Thermit mixture. This mixture is then ignited with an ordinary wax match. The reaction begins immediately and propagates itself very rapidly through the mass, so that in a few moments the contents of the crucible are in a molten condition and at a white heat. As the reaction takes place with what may be described as volcanic violence the top of the crucible is covered over with a conical cover as soon as the mixture has been ignited, in order to prevent spattering. The cover serves also to prevent loss of heat.

As soon as the whole of the mixture has been melted the iron rod at the bottom of the crucible is raised up by means of an iron bar. This opens the tap hole at the bottom of the crucible and the molten mixture of iron and alumina flows into the mould. As before mentioned, the iron is sufficient in quantity to reach about half-way up the web of the rail. The molten alumina fills up the rest of the mould and covers the top of the rail to a depth of about two inches.

Shortly after the mould has been filled the clamps which are used for holding the ends of the rails together are tightened up so as to press the plastic surfaces against one another. The mass of iron and slag surrounding the ends of the rails is at a very high temperature when first poured out of the crucible. It must be very considerably over 2000 deg. C. Even after having remained for some time in the mould and after a solid skin has formed on the surface, the interior is still hot enough to melt the end of a steel file. A copper coin placed on the solid surface some time after pouring melts in a few moments.

It is thought by most people who are not well acquainted with the subject that a large portion of the rail is actually melted up by the intense heat of the Thermit mixture. This is not, however, true. A comparatively small amount of the rails undergo fusion and the rest is simply welded together by the pressure applied to the hot and plastic surfaces by means of the clamps.

In order to ascertain as nearly as possible what portions of the rail were actually welded together and what portions underwent fusion I obtained, through the kind offices of Mr. Brown, the lecturer in Electrical Engineering at the Melbourne University, some specimens of Thermit welds.

These were kindly supplied by Mr. Dix, the manager of the Malvern Tramways Trust, to whom I am also indebted for much valuable information regarding this process of welding.

There was also another point of interest, namely, what alteration does the internal structure of the steel undergo after having been exposed to the intense heat of the Thermit mixture?

In order to ascertain whether the two surfaces at top of rail which had been surrounded by hot slag were actually welded together, test pieces were cut from both the head and the tongue of the rails. These were cut in such a manner that the weld was situated at about the middle of the bars. The bars were then fixed in the testing machine and submitted to tensile stress. They all broke at the weld without having undergone much elongation. The surfaces of the fractures were then examined and the original file marks made in cleaning the surfaces were plainly discernible. (Illustration No. 1).

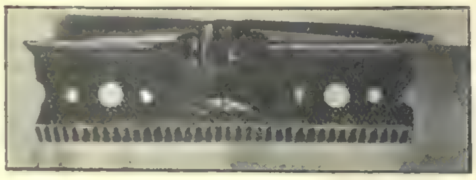
I must now draw your attention to the table giving the results of the tensile tests. I have added some tests on welds made at the Adelaide University and kindly supplied to me by Professor Chapman.

| | Diameter of Specimen | Area of Cross Section | Ultimate Load | Ultimate Load per Sq. Inch | Elongation and Length of Specimen. | Remarks. |
|---|---|---|---|---|---|---|
| | Inches | Sq in. | lbs. | tons. | | |
| 1. | .509 | .2035 | 17,910 | 39.4 | 18.7 per cent. on a length of 6in. | This specimen was cut from the solid rail, not at the weld. |
| 2 | 498 | 1948 | 12,580 | 28.6 | 5/32in. on a length of 4in. | This specimen was cut from the head of a pair of welded rails. Broke at weld. Strained beyond elastic limt. |
| 3 | 507 | 2019 | 12,560 | 27.7 | 3/16in. on a length of 4in. | This specimen was cut from the head of a pair of welded rails. Broke at weld. Strained beyond elastic limit. |
| 4 | 497 | 1940 | 9,350 | 21.5 | | Bar cut from foot of pair of rails welded by Thermit. Broke at weld. |
| 5 | 332 | 0865 | 8,800 | 45.4 | 17 per cent. on a length of 2.75in. | This specimen was cut from solid rail, not at weld. |
| 6 | 8345 | 5482 | 33,500 | 27.3 | .008 per cent on a length of 12in. | This specimen was cut from the head of a pair of welded rails. Broke at weld. |
| 7 | 8365 | 5946 | 36,500 | 29.6 | 003 per cent. on length of 8in. | This specimen was cut from the head of a pair of welded rails. Broke at weld. |
| 8 | | 5000 | 21,600 | 19.2 | 0025 per cent on length of 9in. | This specimen was cut from the tongue of the rail. Broke at weld. Oxidised about 30 per cent. of area. |

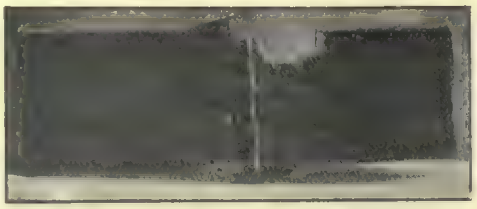
Tests 1-4 were made at the University of Adelaide, and tests 5-8 at the University of Melbourne.

These tests disclose the fact that a true weld has been made at the top of the rail, which, though not as strong as the rail itself, is quite satisfactory.

The next step was to find out whether any fusion had taken place in that portion of the rail which has been surrounded by the molten iron. In order to do this sections of the weld were cut out with a saw.



No. 1. Showing welded rails with head cut off, and sections cut out of foot.



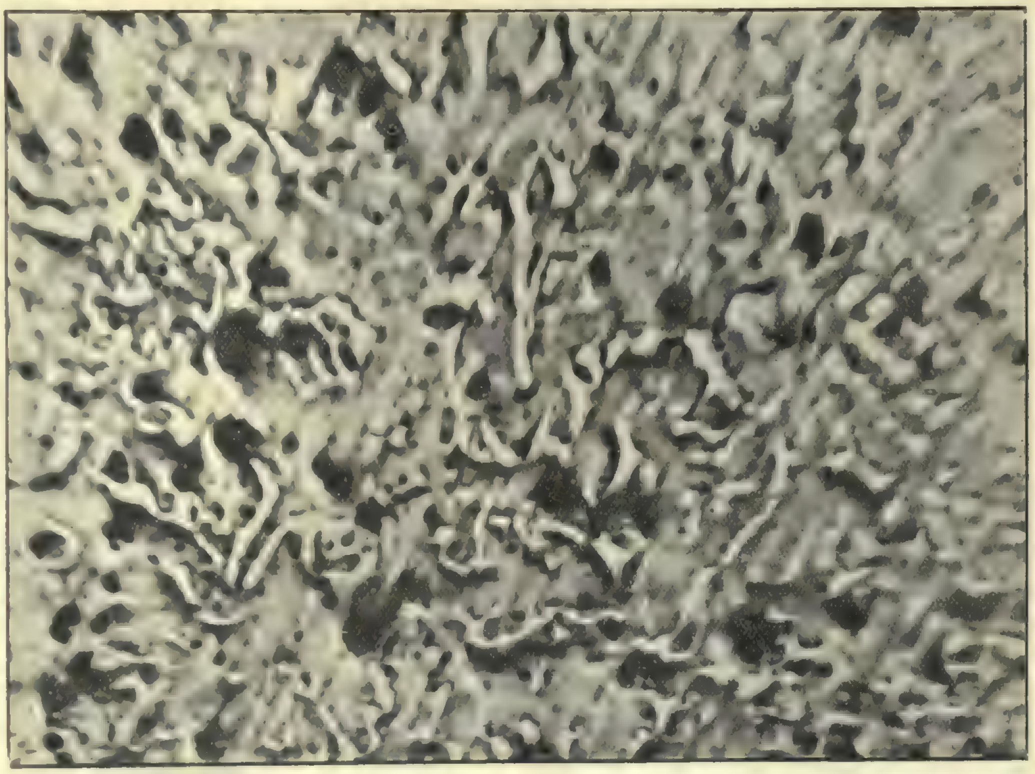
No. 2. Showing the foot of the welded rail. The specimen shown in Nos. 4 and 5 was taken at the left-hand side of the chalk line, which shows the position of the weld.

These sections were cut in a longitudinal direction, from the foot of the rail. (Illustration No. 2.)

At a depth of about 1½ inches the foot of the rail is plainly discernible, embedded in the iron resulting from the Thermit reaction, so that it is quite plain that no fusion has taken place at that depth.

Cross sections of the piece which had been cut out were then made. The sections disclosed the fact that at the edge, the foot of the rail had undergone fusion. The sections were polished and examined under the microscope. The metal out of which the sections were cut was full of blowholes of considerable size. The polished section was also full of minute holes and was harder in some parts than others. It was found impossible to polish the sections smoothly, as the harder portions stood out in relief. (Illustration No. 3.)

(To be continued.)



No. 3.—Microscopic structure of the polished surface of the section. Shows that the metal is full of minute cavities.

## MISCELLANEOUS.

A Bill has been drafted and approved by the Victorian Cabinet, providing for the acquisition of Metropolitan Gas Company's business by the municipalities on more favourable terms than are at present possible, and also for the limitation of the price to be charged for gas. The Bill is to be introduced this Session. It is said that, in general, the dividends of the company will be limited to 10 per cent., and the maximum charge for gas to be 4s. per 1000 cubic feet, but that rates may be automatically altered inversely as business permits, dividends being increased only as the price of gas has previously been diminished. The dividend will have to be reduced below 10 per cent. by 5s. per £100 of capital, for every penny or fraction of a penny that the price has been raised above 4s.; similarly, for every penny taken off the charge to the public the company will be allowed to pay an increase of 5s. in each £100 in dividends. There will also be provision for the purchase of the company's undertaking by the municipalities, or the proposed Greater Melbourne Council, after six months' notice. It is probable that the amount to be paid for the purchase will be limited to the combined total of:—(1) The sum by which the value of the assets exceeds the liabilities of the company; (2) a sum equal to a dividend of 10 per cent. per annum on the paid-up capital of the company for the three years preceding the date of notice of intention to purchase; and (3) the sums set aside within those three years to reserve and special purposes funds.

* * *

The improvements to the port of Warrnambool, which form part of the Victorian Government's outer ports and decentralisation proposals, will include an extension of the existing pier by 300ft., the addition being constructed of concrete blocks on a foundation of bags of cement concrete weighing 9 tons each. Tenders close on October 23, and tenderers are requested to add £2500 to the amount of their tenders to cover extra work which may require doing during the currency of the contract, Acting on the advice of Messrs. Merz and McLellan, the West Australian Railway Commissioner has placed orders in London for plant for the Government's electric power house, amounting in all to £188,251. This having been done without calling for competitive tenders is regarded with some suspicion by the Opposition, which has recollections of the former persistency with which the Labour party insisted on tenders being called, in order to avoid the possibility of favouritism degenerating into a practical monopoly, as well as on the ''settled policy'' of buying as far as possible in Australia. Mr. Scaddan, however, is content to say that the order was placed with the concurrence of the Agent-General and himself.

* * *

The Treasurer of New South Wales, Mr. Cann, has taken the first formal step towards obtaining the assent of Parliament to raising a loan of £3,000,000 for railway purposes, namely, duplication, deviations, and rolling-stock. It is proposed to obtain the money on 4 per cent. debentures.

* * *

Messrs. McCarty, Underwood and Company, of Melbourne, have been appointed consulting engineers to the municipality of Rushworth (V.).

* * *

According to a statement made in the Queensland Legislative Assembly last week by the Minister of Railways, 1190 accidents occurred on the railways of that State during 1912-13; 1207 persons were killed or injured, and the amount of compensation paid was £12,877. Six accidents resulted in damage to rolling stock to the extent of £4138, and during the same period six fires caused damage to railway property and rolling stock to the extent of £8886.

* * *

By an arrangement between the Queensland Mines Department and the Hydraulic Engineer's Department of that State, the services of Mr. E. S. Saint-Smith, of the Geological Survey branch, will be transferred to the latter department for 12 months in order to carry out an investigation into the general character of the intake beds of the large area of artesian water-bearing country in western Queensland. Mr. Saint-Smith, as Mr. Appel informed the Legislative Assembly last week, would work with Mr. Thom, of the Hydraulic Engineer's Department, and would examine the country near the Dividing Range, between Roma and Hughenden, with a view to defining, if possible, the area of the gathering ground of the artesian basin. The work has been commenced at Wallumbilla, near Roma.

* * *

The official report of the West Australian Government railways for the last financial year gives the capital cost of the lines as £14,913,128. The miles worked numbered 2,783; the earnings were £2,037,853; working expenses, £1,506,600; interest debited, £505,925; train miles run, 5,623,132; surplus of earnings over working expenses and interest, £25,328. These returns, as compared with the previous year, show the following increases:—Capital cost, £1,680,035; miles worked, 312; earnings, £153,249; working expenses, £162,623; interest, £66,772. A decrease of £76,146 is shown in the net surplus of earnings over working expenses and interest.

* * *

The terrible railway disaster at Aisgill, Yorkshire, caused by a collision between two Scotch express trains, has revived the suggestions that steel should be substituted for wood in the construction of railway carriages, and that electric light should replace all other lights in use, especially gas. New interest is also given to methods of line control and signalling.

* * *

An arrangement has been come to between the Launceston (T.) City Council and its employees, without the intervention of a wages board, under which a working week shall consist of 48 hours, not earlier than 5 a.m. nor later than 10 p.m. on ordinary week days, and not later than noon on Saturdays. All work done outside of those hours to be paid for at time and a half, between 10 p.m. and midnight, and from midnight until 5 a.m. double time. Sundays, double time. At present all over 48 hours per week are paid for at time and a half. The following are the rates for the electric light and power station:—Power house attendants, 10s. per shift, with not more than 12½ per cent. deducted for quarters, with seven days' annual leave on full pay. Present rate, 8s. 6d. Switchboard attendants, 10s., deduction 16 2-3 per cent. for rent, light, etc. Greasers, power house, 8s. 6d. per shift, with seven days' annual leave on full pay. Present rate—No greasers employed.

* * *

The annual report of the Pacific Cable Board shows that the receipts amounted to £167,900 and expenditure to £121,625, leaving £32,269 to be provided by the Imperial and Dominion Parliaments, compared with £47,519 for the preceding year. As the Commonwealth has to pay one-third of the annual loss, its proportion this year will amount to £10,756, as against £15,839 in the previous year, £16,070 in 1911, and £19,863 in 1910. In 1903, the first year of the Board's control, the Commonwealth's share of the loss was £30,172. In order to appreciate how entirely the Board has justified its creation it must be remembered that prior to its appointment Australia was paying a subsidy of £32,000 a year to the Eastern Extension company, and that the rate was then 4s. 9d. per word, as compared with 3s. now. It is also of great importance to remember that the so-called deficit is only an apparent one. The cost of the cable was approximately £2,000,000, and this is gradually being paid, with interest at the rate of 3 per cent., by means of an annuity of £77,545, running for 50 years; besides which, £30,000 is annually put to a renewal and depreciation account, and these heavy sums are both deducted, as expenditure, before the apparent deficit is arrived at. The deficiency only exists at all because the capital liability is being annually reduced, and will be entirely paid off in another forty years.

* * *

Our Lithgow (N.S.W.) correspondent writes:—''Work in connection with the great railway deviation on the Blue Mountains is being pushed on. It is expected that the double line will be completed around the ''Bluff'' as far as Blaxland Junction, and opened for traffic in about three weeks. It is understood that the old road, via the Eastern tunnel, is to remain. All the excavation work, in cutting out the heavy grades between Blaxland and Valley Heights, has been finished. A new idea in the matter of rail-laying has been introduced—steel sleepers instead of the ordinary wood sleepers, having been used. At Valley Heights mountain (the new marshalling depot), the engine sheds, etc., are being erected; but it will be some weeks yet before everything is ready at the place.''

* * *

Our Lithgow (N.S.W.) correspondent writes:—''Mr. Wright, manager of the small arms factory, stated to-day that another batch of rifles was well forward to completion. Over 300 men are now employed at the factory, and operations are proceeding smoothly. Owing to the motion of censure in the House of Representatives, no pay was distributed at the factory last week-end, as supplies had not been passed by Parliament. It was stated that the money would be available this afternoon—about £1500 for the fornight. The grounds about the factory are being laid out to advantage. A carriage-way has been formed right through the rifle range, and along it have been planted rows of pine and other trees. In other directions roads have been formed, and rows of trees planted along them—985 being set out. The ironworks and blast furnace wages board sat again on Tuesday morning, when it is understood the main portions of the award were decided upon. The sittings have now concluded, and the chairman (Mr. W. A. Newbury) states that the award will be gazetted on Wednesday, September 24.''

* * *

The Victorian Minister of Railways, Mr. A. A. Billson, was asked last week by a deputation from the Chamber of Agriculture to extend the concessions at present granted to travellers living within the suburban radius to people living outside that radius. Mr. Billson promised to consult with the Railways Commissioners and to discuss with them as to whether the matter was one of policy or administration.

* * *

A progress report on work done at the two ends of the Trans-Australian railway was made public on Saturday by Mr. W. H. Kelly, the Hon. Minister in charge of the Department for Home Affairs. At the Kalgoorlie end the permanent route has been pegged and levelled to 80½ miles, clearing has been completed up to 58½ miles, and the earthworks are being built up at the 61½-mile mark. The railhead is now over eight miles out. In all 246 men are at work on the section. At Port Augusta the temporary locomotive workshop has been finished, and machinery is being installed. The surveyors are encamped 65 miles out, and the route is marked for 60 miles. The foundations and abutments for the bridge at Yorkey's Crossing (Spencer Gulf) are in position, and the steel work is being laid down. In the meantime, a deviation has been made across the gulf, and the rails are down to the 9½-mile point. The number of men at work is 470.

* * *

After spending £207,417 on the Fremantle dock the West Australian Government abandoned the project.

* * *

The Wallongong (N.S.W.) council continues to discuss the question of a change in the lighting system (writes our Wollongong correspondent) without having decided whether to employ electricity or gas. The Wollongong Gaslight Company has supplied the town for many years with not unqualified satisfaction, and a firm, styling itself the Wollongong Electric Power Supply Company, having got into the thick of the customers, has popularised the electric light, although producing it at a maximum of cost. A majority of the council appear to favour municipal ownership, whether of a gas or an electric plant. The North Illawarra council, whose municipality is between Wollongong and Bulli shire, has a notion of continuing the lighting of the main South Coast road from its boundary right through the municipality, and has appointed a committee to report as to the cost. One or other of the collieries would be looked to for the supply of electrical current.

* * *

Under the Shale Oil Bounties Act, during the last financial year, £803 14s. 6d. was paid to the Commonwealth Oil Corporation, of Hartley Vale, and Newnes (N.S.W.), for the manufacture of kerosene, and £881 13s. 9d. for the manufacture of refined paraffin wax; while £1988 1s. went to the British Australian Oil Company, of Hamilton (N.S.W.), for kerosene, and £85 14s. 8d. for refined paraffin wax, the total distribution being £3759 3s. 1d.

* * *

A return laid on the table of the House of Representatives last week showed that under the Manufacturers Encouragement Act the firm of G. and C. Hoskins Ltd., of Lithgow (N.S.W.) received in bounty during the last financial year £38 7s. 3d. for puddled bar iron made from Australian pig iron, while for pig iron manufactured from Australian ore they were paid £16,949 2s. 2d. Under the same Act, Lysaght Bros. and Co. Ltd. received £1110 7s. 5d. for wire-netting made from British wire, the total amount of bounty distributed under the Act being £18,097 16s. 10d.

* * *

The expenditure on West Australian railways to the end of June amounted to £14,913,000, the increase for the year having been £1,680,000. The mileage in use was 2783, showing an increase of 312 miles for the year. The train miles run totalled 5,623,132, an increase of 495,000. The gross earnings were £2,037,853, an increase of £153,249. Working expenses totalled £1,506,600, an increase of £162,000. The interest debited was £505,925, an increase of £66,772. The surplus of earnings over the working expenses and interest debit was £25,328, against £101,474 in the previous year. The working expenses per train mile were 64.3d., an increase of 2½d. The net surplus per train mile was 1d., a decrease of 3½d. per mile. The earnings are credited with £311,549 freight on departmental goods not paid for.

* * *

Mr. Arthur Sawyer, who since the erection of the wireless station on the Macquarie Islands at the end of 1911 has been in charge there, went back to New Zealand on board the cable steamer ''Tutanekai,'' which had been lent by the New Zealand Government to carry provisions to the island when the ''Rachel Cohen'' had been driven past the station by bad weather. In the course of an interview, Mr. Sawyer said:—''The Telefunken wireless set has done really wonderful work. On several occasions I have spoken to the Suva station, 2400 miles away. By 'spoken' I mean completed messages, both sent and received. On three occasions I have held conversation with Port Moresby (Papua), 2800 miles away, which is, I think, a record for Australasia for a 1½ kilowatt set. I was generally able to keep in touch with Dr. Mawson, except during the time when the ice party's poles were blown down. Here is a whole pocket-book full of notes from the Mawson party, some of them valuable ones, which, of course, I cannot divulge. The record night, as far as messages from Adelie Land were concerned, was about 1200 words.''

* * *

The electric lighting of Port Melbourne is now an accomplished fact, the formal inauguration having taken place on the 2nd inst. The reticulations within the city boundary were carried out under the supervision of Mr. W. H. Ashman, the council's electrical expert. The current is supplied by the Melbourne City Council, delivered at the city boundary at a pressure of 6600 volts., three-phase 50 cycles. The lighting of the streets is provided for three sections at three substations, whence also current is available for private consumers. Previously to the official opening, several inquiries had been made by factory proprietors as to cost of supply for light and power, and it is expected that the new departure will stimulate trade there, owing to the facilities offered for transport of manufactured goods.

* * *

It is promised that soon after the return of Mr. Fitzpatrick, Victoria's Chief Railway Commissioner, a system of parcels delivery by motor vans will be inaugurated in Melbourne and in large provincial centres, in connection with the parcel-carrying business of the department. This will be a great public convenience, and it will do away with the present necessity for calling or sending for goods forwarded by rail. It will also assuredly tend to increased business, provided only that the service is operated on business lines and with business promptitude.

# Invited and Accepted Tenders

**It is particularly requested that the information regarding contracts open, and the successful tenderers, be forwarded to The Editor not later than Monday of each week.**

The following contractions are used throughout:—S—supply; D—delivery; M—manufacture; C—construction; E—erection; P—purchase; I—installation; R—removal. Where no contractions appear, supply and delivery is understood. The date at the beginning of each paragraph refers to the closing of tenders.

## INVITED.

### Commonwealth.

**Specifications, tender-forms, etc., for tenders invited for the Postmaster-General's Department of the various States under this heading may be had as follows:—Victoria—Various State G.P.O.'s. New South Wales—Departmental Stores, Sydney, and various G.P.O.'s in other States. South Australia—Adelaide, Melbourne, Sydney and Brisbane G.P.O.'s. Western Australia—Departmental Stores, Perth, and various G.P.O.'s in other States. Queensland—Various State G.P.O.'s. All States—Various G.P.O.'s. If the specifications, etc., may be had elsewhere, in addition, the places will be given in parentheses.**

POSTMASTER-GENERAL'S DEPARTMENT. Melbourne.—16th September.—S., D., E. and I. at the Telephone Exchange, Collingwood, Victoria, of a common battery switchboard, as per schedule No. 860, or an automatic, or semi-automatic, switchboard, as per schedule No. 859.

16th September.—Galvanised-iron piping and fittings, as per schedule No. 951.

23rd September.—Sulphate of copper, as per schedule No. 956, in the undermentioned quantities; New South Wales, 140 tons; Victoria, 25 tons; Queensland, 55 tons; South Australia, 20 tons; Western Australia, 60 tons.

23rd September.—500 letter-box fronts, small size, as per schedule No. 957.

23rd September.—General stores, for a period of two years, from the 1st July, 1913, to the 30th June, 1915, as per schedule No. 913.

23rd September.—Waterproof coats and capes, until the 30th June, 1914, as per schedule No. 936.

30th September.—S. and D. of 1,017,000 pattern "A," and 1,768,800 pattern "B" insulators, at Sydney, Melbourne, Brisbane, Adelaide, Perth, and Hobart, during the years 1913-14, 1914-15, and 1915-16, as per schedule No. 974.

30th September.—S. and D. of 2000 pairs of brass lightning guard brackets, as per schedule No. 978. (See advertising columns.)

7th October.—S. and I. of electrically-driven machinery for operating pneumatic tube services, Central Telegraph Office, Melbourne, as per schedule No. 900.

14th October.—S. and E., at the Telephone Exchange, Melbourne, of a common battery multiple switchboard, as per schedule No. 868.

14th October.—Cable boxes, as per schedule No. 877.

11th November (extended from 4th November).—D. and E. of eight automatic telephone switchboards at the Ascot, Canterbury, Malvern, Cheltenham, Footscray, Oakleigh, Sandringham, and Williamstown Telephone Exchanges, as per schedule No. 953. (See advertising columns.)

5th November.—Galvanised iron piping, as per schedule No. 952.

16th December.—S. and D. of one common battery multiple switchboard at the Telephone Exchange, Wills-street, Melbourne, as per schedule No. 968. (See advertising columns.)

POSTMASTER-GENERAL'S DEPARTMENT, Sydney.—8th October.—S. and D. at the Telephone Exchange, Watson's Bay, Sydney, of 1 automatic switchboard, with all associated equipment as per schedule No. 234.

15th October.—450 fire sheets (asbestos), as per stores schedule N.S.W. No. 326.

15th October.—Measuring instruments, to stores schedule N.S.W. No. 303; telephone parts, to stores schedule N.S.W. No. 314; switchboard parts, to stores schedule N.S.W. No. 315.

15th October.—63,000 insulators (various), as per stores schedule N.S.W. No. 296.

18th March, 1914.—S., D. and E. at the Telephone Exchanges, Epping, Ryde, Hunter's Hill, Drummoyne, Wahroonga, Paddington and Waverley, Sydney, of seven (7) automatic switchboards, with associated equipment, as per schedule No. 179.

POSTMASTER-GENERAL'S DEPARTMENT, Perth.—1st October.—Exterminator white ant, and plugs.

8th October.—Expansion bolts and shields to schedule No. 297.

8th October.—S. of milliammeters.

8th October.—Telephones, common battery, adjustable bracket sets.

10th December.—S. and D. of 60 tons wire (galvanised iron).

POSTMASTER-GENERAL'S DEPARTMENT, Brisbane.—24th September.—Ironwork, as per stores schedule No. 264; pipes, cast iron, as per stores schedule No. 265; poles, iron, etc., as per stores schedule No. 266; wire, G.I., as per stores schedule No. 269.

15th October.—Steel date stamps, as per stores schedule No. 279.

19th November.—Bronze wire, as per schedule No. 273.

POSTMASTER-GENERAL'S DEPARTMENT, Adelaide.—12th November.—One lamp signalling trunk line switchboard, of five sections, one cable turning section, and one cable storing section, one two-position recording desk, and one chief operator's desk, as specified in specification No. 431, etc., delivered at the Telephone Exchange, Adelaide, as per schedule No. 296.

POSTMASTER-GENERAL'S DEPARTMENT, Hobart.—15th September.—S. and D. of telephone material, as per schedules Nos. T.72 and T.73.

22nd September.—S. and D. of 3 motor cycles, as per schedule No. T.77.

6th October.—Galvanised iron wire, as per schedule No. T.78.

1st December.—S. and D. of dry cells, as per schedule No. T. 84.

DEPARTMENT OF HOME AFFAIRS—Federal Capital.—15th September.—S. of sect. 1, main power-house switchgear; sect. 2, switchgear for Diesel engine plant.

24th November.—Water supply pumping plant for Canberra.

DEPARTMENT OF HOME AFFAIRS—Kalgoorlie-Port Augusta Railway.—16th September.—M., S. and D. of fifty 40-ton bogie waggons.

2nd December.—600 pairs of wheels and axles (9in. x 4½in. journals).

### Victoria.

VICTORIAN RAILWAYS.—11th September.—Covered wire; special mantles and overmantles; malthoid coating.

11th September.—Parts for pneumatic hammer and drills.

12th September.—Polished plate glass (ground); self-lubricating trolley wheels, brass pillar cocks.

12th September.—10 tons of block tin.

12th September.—C.I. pipes and bends; blow-off valve and pulley; adjustable ball and socket post hangers; shafting and steel pulleys.

17th September.—Machine bits.

17th September.—M. and S. of one grab bucket.

17th September.—M., S. and D. of one hair teasing machine.

17th September.—M., S. and D. of 12 sets copper water tanks and fittings.

17th September.—Pig iron.

17th September.—C. and riveting of mild steel girders, etc., for first section, renewal of Moorabool Viaduct, Geelong to Ballarat line. (Fresh tenders.)

17th September.—S. and D. of galvanised telegraph wire, No. 12.

1st October (extended from 10th September).—Neutral track relays.

1st October.—Motor, exhaust fan and accessories.

8th October.—M. (within the Commonwealth of Australia), S. and D. of 80lb. steel rails and fishplates. Contract No. 25,005.

8th October (extended from 17th September).—Pig iron.

8th October.—P. and R. of about 720 tons of 80 lb. double headed steel rails.

5th November.—Copper rod.

5th November.—Locomotive seamless copper tubes.

5th November.—Best Yorkshire iron angle and tees.

5th November.—Best steel boiler plates.

5th November.—Copper plates.

5th November.—100 tons of good machinery cast-iron scrap.

12th November.—Steel channel bars.

12th November.—20 tons steel ingots.

12th November.—Steel blooms, for crank pins.

12th November.—Locomotive boiler tubes.

12th November.—High-speed tool steel.

12th November.—M., S. and D. of one 15-ton electric crane for Ballarat.

12th November.—Flame arc lamps.

12th November.—Insulated copper cable.

12th November.—M. and D. of one 60h.p. electric motor and accessories.

19th November.—M., S. and D. or cast steel wheel centres for A2 engines and new truck stock.

19th November.—Brass locomotive tubes.

19th November.—150 tons pig iron.

19th November.—10 tons sulphate of copper, best quality, for electrical purposes, battery material.

3rd December.—Steel blooms, for piston rods.

VICTORIAN RAILWAYS COMMISSIONERS—State Coal Mine.—12th November (extended from 1st October).—S of rope road haulage engine and electrical equipment for McBride tunnel,

STATE RIVERS AND WATER SUPPLY COMMISSION.—12th September.—S. of about 121 tons C.I. pipes.

PUBLIC WORKS DEPARTMENT.—18th September.—100 tons of zinc spelter. (See advertising columns.)

### New South Wales.

PUBLIC WORKS DEPARTMENT.—7th October.—S. and D. of 500 tons of iron spikes for 60 lb. rails. (See advertising columns.)

7th October.—S. of steel pipes and specials for the reticulation of township and supply to the mines, Water Supply, Broken Hill (see advt. cols.).

7th October.—M., S. and D. of 15 jib water cranes.

27th October.—M. of steel bridge for Wilson River, Wauchope to Kempsey section, North Coast railway.

RAILWAY DEPARTMENT.—15th October.—S. of 13 direct-current motors.

26th November.—S. of one 2000 lb. storage battery freight truck.

SYDNEY HARBOUR TRUST.—15th September. — S. and D. of 70 tons (approximately) of steel and ironwork, to form floor joist trussing, etc., for double-decked cargo sheds at Berths Nos. 1, 2 and 3, Wooloomooloo Bay. (See advertising columns.)

**P. & O.** COMPANY'S ROYAL MAIL STEAMERS

FOR MARSEILLES, PLYMOUTH AND LONDON.

Leave Sydney on the subjoined dates, calling at usual ports.

FIRST AND SECOND SALOON ONLY.

| Steamer, | Tons. | Commander. | Noon. | Melb., 3 p.m. |
|---|---|---|---|---|
| MOOLTAN | 10,000 | Haddock | Sept. 20 | Sept. 23 |
| MOREA | 11,000 | Andrews | Oct. 4 | Oct. 7 |
| MARMORA | 10,500 | Lockyer | Oct. 18 | Oct. 21 |

PASSAGE MONEY TO LONDON—
Single, £41 16s. to £82 10s.
Return, £69 6s. and £123 4s.

Return Tickets between Inter-State Ports are available for return by Orient, Messageries Maritimes, and N.D.L. steamers having room.

SPECIAL HOLIDAY RETURN TICKETS to COLOMBO are now issued, available for two months. Fares from Sydney, £45 2s. first saloon, and £31 18s. second saloon.

A. GORDON WESCHE, Superintendent IN AUSTRALIA, 63 Pitt-street, Sydney.

**The COLONIAL MUTUAL FIRE Insurance Company Limited.**

Principal Office: 60 MARKET-ST., MELBOURNE.

Branches in all the States.
Transacts Fire, Guarantee, Employers' Liability, Marine, Burglary, and Plate Glass, Accident, Workers' Compensation and Live Stock Insurances.
Send for Prospectus.
W. TUCKER, General Manager.

**Harringtons Ltd**

**ANALYTICAL & METALLURGICAL DEPT.**

Lowest fees for all kinds of Assay, Analytical, and Metallurgical work.

Expert Advice on Ore Treatment, Bullion Refining, Smelting, etc., etc., Directed by a qualified Analyst from Messrs. Johnson and Sons, London: Assayers to Bank of England; H.M. Mint, The Council of India, etc.

**HARRINGTONS LTD.**
**386 George Street, Sydney.**

**A. U. S. N. Co. Ltd.**

*Fast, Regular, and Comfortable Passenger Steamers*
(also carrying cargo) from and to
MELBOURNE, SYDNEY, ADELAIDE, FREMANTLE, BRISBANE, and all QUEENSLAND PORTS.

Passage Tickets interchangeable, with other Inter-State Companies, on certain conditions.

Full Particulars at
**COMPANY'S OFFICES**
**at all principal Australian Ports.**

**The Mount Lyell Mining & Railway**
**CO. LIMITED.**

Purchasers of **Ores containing Copper, Gold and Silver.** Rates obtainable on application to the Secretary

Manufacturers of **Coke for Smelting and Foundry Purposes, Acids, Etc.**

**HEAD OFFICE—**
**39 QUEEN-STREET, MELBOURNE.**
**D. G. LUMSDEN,**
Secretary.

**THIS POWER FOR MOST PROFIT!**

Here is the Engine for you, Mr. Mine Manager—the right power for the Mine, operating with the cheapest fuel obtainable.

No waste power, and no useless wear and tear and vibration. These are some of the prominent features of the

**ATLAS DIESEL OIL ENGINE.**

Test your present Engine, see if it consumes more than 0.55 lbs. of fuel per B.H.P. per hour. If it does, you are losing money which the Atlas Diesel would save for you. Power waste is a serious thing, and one that is often overlooked. You probably use a considerable amount, then you owe it to yourself to see that there is no leakage.

"Atlas Diesel" Engines are the only true Internal Combustion Engines, as they require no devices for ignition.

Easy to run, always reliable, and made from 15 H.P. upwards.

Send for full particulars or call and see the Engine working.

**STAWN LTD.,**
Engineers, **343 KENT STREET, SYDNEY.**

METROPOLITAN BOARD OF WATER SUPPLY AND SEWERAGE (341 Pitt-street, Sydney).—15th September.—Purchase and removal of one mechanical stoker 4ft. x 8ft., lying at Electric Light Station, Turner-street, Redfern.

15th December.—M. and D. of one turbine centrifugal pumping plant for Crown-street Pumping Station. (See advertising columns).

## Western Australia.

GOVERNMENT TENDER BOARD.—11th September.—50 tons of charcoal for State Battery, Payne's Find.

18th September.—One improved lever punching, shearing, and angle iron cutting machine for Railway Department.

18th September.—50 tons of charcoal for State battery, Wiluna.

2nd October.—700 brass boiler tubes for Railway Department.

9th October.—25,000 gallon C.I. tanks, for Railway Department.

## Queensland.

TREASURY DEPARTMENT. 29th September.—S. about 1687 tons of cast-iron spigot and faucet water pipes, special castings, and valves, for Maryborough waterworks.

29th October.—C. and E. of central sugar mill at Babinda Creek, North Queensland.

## South Australia.

SUPPLY AND TENDER BOARD. — 16th September. — S. and D. at the Public Stores, Port Adelaide, or the Sewers Yard, Thebarton, of Portland cement in such quantities and at such times as may be rquired during the periods ending June 30th, 1914, or June 30th, 1915.

14th October.—S. and D. in trucks on wharf, Port Adelaide, of 800 solid drawn, best toughened copper tubes, for locomotive boilers, 10ft. 8¼in. long x 1 7-8in. outside diameter x No. 10 I.W.G. thick at the end, gradually tapering to No. 12 I.W.G. at the other end. Customs duty (if any) to be paid by contractor.

## New Zealand.

RAILWAYS DEPARTMENT.—31st October.—S. and D. of stores for the period from April 1, 1914, to March 31, 1917.

## General.

CITY OF MELBOURNE.—12th September.—S. and D. of 9 C.I. switch pillars.

16th September.—S. and D. of (a) insulated copper cables, (b) three-phase transformers.

1st October.—Insulated copper cables.

7th October.—Incandescent electric lamps, and single phase transformers.

8th October.—Insulated copper cables.

CITY OF SYDNEY.—15th September.—S. and D. of arc lamp winches. (See advertising columns.)

16th September.—S. and D. of cast iron street orderly bins. (See advertising columns.)

CITY OF HAWTHORN (V.) (W. Broad Hall, Town Clerk).—12th September.—Engine coal, Portland cement and lime; general stores, etc.

CITY OF PRAHRAN (V.) (John Romanis, Town Clerk).—15th September.—Ironmongery and stores, etc.

CITY OF LAUNCESTON (T.) (C. W. Rocher, Town Clerk).—24th November (extended from 13th October).—Section i., S. and D. of transformers, etc.; section ii., S. and D. of feeder cable, etc.; section iii., S., D. and E. of high tension switchboard, etc.

CORPORATION OF ST. PETERS (S.A.) (S. Reeves, Town Clerk).—17th September.—P. of 2 iron scavenger's carts and 1 iron mud barge.

METROPOLITAN GAS COMPANY (V.) (A. E. Bradshaw, Subst. Secretary, Melbourne).—11th September.—P. of a total fixed quantity of 1800 tons of sulphate of ammonia, to be produced by this company during the twelve months ending 31st August, 1914.

THE MELBOURNE AND METROPOLITAN BOARD OF WORKS (V.).—19th September.—M., S. and D. in position at Woori Yallock Creek of girders with hanging straps, bolts, and other fittings, for carrying the main O'Shannassy 34in. pipe over the creek. (See advertising columns.)

MOUNT LYELL MINING AND RAILWAY CO. LTD. (D. G. Lumsden, Secretary, 39 Queen-street, Melbourne).—20th September.—S. of stores (including electrical goods and chemicals) for 12 months ending 31st December, 1914.

STANLEY REWARD TIN MINING COMPANY (L. A. Cleveland, manager, 31 Queen-street, Melbourne).—18th September.—Tributing the lode section of the company's property, Stanley River, West Coast, Tasmania.

GEELONG WATERWORKS AND SEWERAGE TRUST (V.) (J. S. Sharland, secretary).—25th September.—Contract No. 7—M., S. and D. and the laying and jointing of about 10,250 lineal feet of oviform reinforced concrete pipes.

WANGARATTA WATERWORKS TRUST (V.) (T. C. Muntz, secretary).—22nd September.—S. of secondhand pumps, 20,000 galls. or more (Worthington preferred).

SHIRE OF NUNAWADING (V.) (J. R. Kefford, secretary, Box Hill).—20th September.—Wires and cable and wood poles.

18th October.—Electrical equipment. (See advertising columns.)

# ACCEPTED.

## Commonwealth.

POSTMASTER-GENERAL'S DEPARTMENT, Queensland.—1000 letter box fronts, with locks and 3 keys for each, complete, medium size, 5s. 3d. each; 600 key blanks, 5d. each.—Edward Duckett and Sons, Melbourne.

12,000 leads for Meidinger main battery with connecting wire, 2½d. each.—British Insulated and Helsby Cables Ltd., Melbourne.

20,000 zincs, Lechlanche. 6½in. x ½in., 1.97d. each.—India Rubber, Gutta Percha and Telegraph Works Co. Ltd., Melbourne.

DEPARTMENT OF HOME AFFAIRS.—Mechanical equipment of new steam laundry at Royal Naval College, Jervis Bay, £1491 10s.—James O'Grady, South Melbourne.

## Victoria.

VICTORIAN RAILWAYS.—S. and D. of a portable petrol-driven concrete (Batch) mixer, with Batch hopper—Item No. 1, 1 portable petrol-driven concrete (Batch) mixer with Batch hopper (size 0), at £228; item No. 1a, Batch hopper, at £13—Australian Metal Co. Ltd.

C. and E. of verandahs over platforms at Malvern (Caulfield line duplication), £360 9s. 5d.—A. Challingsworth Pty. Ltd.

P. of a quantity of Bamber zinc rods, £130—Eyre Smelting Co.

P. of certain spare parts for McKeen motor cars, £42 A. Adams and Co.

P. of a quantity of speed recorders, £696—Mons. Flaman.

M. (from iron which will be sold to the contractor by the Corporation), S. and D. of ¾in. dogspikes, at £13 19s. 6d. per ton—Victoria Iron Rolling Co. Pty. Ltd.

M. (from iron which will be sold to the contractor by the Corporation), S. and D. of ¾in. dogspikes, at £13 19s. per ton—McPherson's Pty. Ltd.

M., S. and D. of 2 10h.p. portable oil engines, with tools and spares, at £200 each—Ronaldson Bros. and Tippett.

M., S. and D. of totally enclosed direct-current motors and equipment for underground haulage winches—Item No. 1, 75h.p. motor, at £300 each; item No. 2, control panels, at £12 10s. each; item No. 3, controllers, with resistances, at £55 15s. each; item No. 4, spares, viz., brushes, at 1s. 6d. each; resistance grids, at 2s. each; spare bearing shell, at £13 each; spare contact fingers, at 1s. 6d. each—Australian General Electric Co.

M., S. and D. of 1 140h.p. induction motor—Item No. 1, 140h.p. 415-volt 3-phase induction motor, with control, as specified, at £278 8s.; item No. 2, spare bearing shell, at £7 10s. each—Australian General Electric Co.

PUBLIC WORKS (PORTS AND HARBOURS)—100 cases gelignite, at £2 2s. per case, £210—Dalgety and Co.

100 cases gelignite, at £2 2s. per case, £210—McMicking and Co.

100 cases gelignite, at £2 2s. per case, £210—Kynoch Ltd.

Plates and angles, for use in constructing grab hopper dredge and large suction hopper dredge for Outer Ports Scheme, £3706—Agent-General in London.

50 cases explosives, £105—Kynoch Ltd.

2 automatic "Day" time registers, fitted with duplex ribbon attachment, for 200 persons, each £119 4s.—Jas. A. Munro and Co.

42 bars steel, in various sizes, £155 2s. 7d.—B. K. Morton Pty. Ltd.

1 motor F.E.P. 18, fitted with flexible coupling for electric installation, £122 12s.—India Rubber, Gutta Percha and Telegraph Works Co. Ltd.

MINES DEPARTMENT.—Repairing No. 1 Calyx drill, £42 15s.—Goldfields Diamond Drilling Co.

## Western Australia.

List of material purchased outside contracts by Railway and Tramway Stores:—

One 3-phase generator and exciter panel, 40 yards 39/16-600M. cable, 165 yards, 14/12 cable, all forming part of item 1 of tender, dated 15th December, 1911, £335 2s. 6d.—Chas. Atkins and Co. Ltd.

Dunlop Mining Goods
Are now used with satisfaction in most of the Leading Mines of Australasia – Their QUALITY & WEAR are UNSURPASSED
Tenders & Samples submitted
Correspondence invited
Send for Illustrated Catalogue

The DUNLOP RUBBER Co. of AUS. Ltd
108 Flinders St. MELBOURNE.
& ALL STATES

Dunlop Rubber Belting
Is more efficient than Leather belting for Outdoor & Wet Work.
Sample & Price on application

**"FIBRO-CEMENT" Fireproofing**

Everyone about to build should obtain full particulars of this cool, acid-proof, ant-proof and fire-resisting material. The slates for roofs and the sheets for walls and ceilings are specially suited for the Australian climate. Used by the Federal and State Governments and by all the leading Architects and Builders.

**ECONOMICAL AND EVERLASTING.**

Full particulars, etc., from Sole Agents and Importers—
**JAMES HARDIE & CO.** Melbourne & Sydney

**WRISTLET WATCHES**

They have come to stay. Why?
Fashion's decree of "no" pocket calls for some safe way to carry a watch.
They have a very handsome appearance.
They are distinguished looking.
We make the bracelets.
We set them with diamonds, with pearls, with turquoise, and stock them in plain gold.
We sell only reliable watches at bedrock prices.
See our large stock of watches.
Write for watch pamphlet.

Good, Reliable Lever Watches, fully jewelled, from £5/5/-; set with pearls, from £11/11/- upwards; with diamonds, £25, are the rage.

**FAIRFAX and ROBERTS LTD.,**
**The Oldest Jewellery House in Sydney, 23 and 25 HUNTER STREET.**
Plain figures—Cash.

36 gallons S.Mms. Russia jacket enamel, 14s. per gallon; 6 gallons, clear insulating varnish, less 10 per cent. discount, 16s. 9d. per gallon—Couche, Calder and Co.

60 only, 1 keg soda carb. (3 tons), £9 per ton—Felton, Grimwade and Bickford.

100 gross galvanised iron thimbles, 1½ x ⅜, 9s. per gross—Levi Green.

13 bars mild steel, 2 x ⅜ (7 cwt. 2 qr. 12 lb.), £11 10s. per ton; 20 bars angle steel, 1¾ x 1¾ x ¼ ([illegible] cwt. 2 qr. 18 lb.), £11 10s. per ton; 54 bars B.H. crown iron, 2 x ¾ (2 tons 1 cwt. 0 qr. 19 lb.), £23 13s. 5d.—G. P. Harris, Scarfe and Co.

One 21in. stationary head drilling machine, back gear, positive feed and cut-off, £37 10s.—Leslie and Co.

One case ripple iron, 10ft. x 26 gauge (10 cwt. 0 qr. 0 lb.), £21 15s. per ton; one case ripple iron, 7ft. x 26 gauge (10 cwt. 0 qr. 9 lb.), £20 5s. 6d. per ton; one case ripple iron, 6ft. x 26 gauge (10 cwt. 0 qr. 6 lb.), £20 5s. 6d. per ton—McLean Bros. and Rigg.

20 ingots pig lead (1 ton 0 cwt. 0 qr. 16 lb.), £25 per ton—W. Sandover and Co.

One bolt screwing machine, Whitworth thread to take up to 1½in. bolts, Winns patent, 6197B. No. 2, £68—Saunders and Stuart.

Mild steel, 4 flats, 12 x ½ x 20ft. (14 cwt. 2 qr. 8 lb.), £11 14s. per ton; mild steel, 5 flats, 15 x ½ x 25ft. (1 ton 8 cwt. 1 qr. 24 lb.), £11 14s. per ton; mild steel, 11 flats, 8 x ½ x 10/30ft., 1/20ft. (1 ton 18 cwt. 3 qr. 12 lb.), £11 14s. per ton, 2 joists (16 cwt. 2 qr. 0 lb.), £12 per ton; 2 joists (5 cwt. 0 qr. 21 lb.), £11 14s. per ton; 2 joists (1 ton 11 cwt. 0 qr. 0 lb.), £12 2s. 6d. per ton; 2 cuts, 7s. 6d. per ton; 2 cuts, 8s. 6d. per ton—Frodingham Iron and Steel Co.

110 C.I. main pipes, 4in. x 9ft., 13s. 8d. per length; 300 A.E.G. metallic filament lamps, 25 c.p. x 220 volts, 1s. 10d. each—Imperial Electric and Engineering Co.

400 positive plates for 9-plate high type "Tonum" cell, 4s. 0½d. each—Noyes Bros.

24 bars mild steel tees (3 tons 3 cwt. 0 qr. 3 lb.), £9 10s. per ton—W. Padbury.

PUBLIC WORKS DEPARTMENT.—Pumps and boilers, item 1086, £57 10s. each—Saunders and Stuart. Item 1087, £27 10s. each—G. Kent Ltd. Item 1088, £1 17s. each—General Electric Engineering Co.

RAILWAYS DEPARTMENT.—Iron and steel, rates obtainable on application—Elder, Shenton and Co. Ltd., H. T. Wright, and G. Wills and Co.

### New South Wales.

PUBLIC WORKS DEPARTMENT.—S., D., E. and maintenance of hydraulic presses, pumps and cages at the new abattoirs, Homebush Bay, £2800—Stamp and Powell, Melbourne.

M., S. and D. of twenty 5-ton steel gantry cranes for railway station yards, £1788 10s.—Structural Engineering Co., Erskineville.

METROPOLITAN BOARD OF WATER SUPPLY AND SEWERAGE.—S. and D. of centrifugal pumps and electric motors, £1900—Zollner Ltd., Sydney.

S. and D. of two 81in. C.I. penstocks, £224—H. Vale and Sons, Auburn.

### South Australia.

SUPPLY AND TENDER BOARD.—5000 tons Lithgow pig iron, at £4 7s. 6d. per ton; 2500 tons Lithgow pig iron, at £4 6s. 6d. per ton—G. and C. Hoskins Ltd.

4050 tons Cleveland No. 3 iron, at £4 3s. 1½d. per ton; 1600 tons [illegible] "[illegible] West," at £3 2s. 5d. per ton—Geo. Wills and Co. Ltd.

7 windmills and appliances, for £789 16s. 7d.—Metters Ltd.

3 windmills and appliances, for £312 3s. 7d.—H. C. Richards.

1500 plain I.R. washers, at [illegible] each—Barnet Glass Rubber Co. Ltd.

1050 I.R. hosepipes, for £281 17s. 6d.—Dunlop Rubber Co. of Australasia.

Steel wheels and axles for platelayers' trollies—Item 1, at 42s. 6d. each; item 2, at 5s. each; item 3, at 21s. each; item 4, at 17s. 6d. each; item 5, at 21s. 6d. each; and additional 160 wheels, at 42s. 6d. each—John Coumbe and Sons.

20 cwt. ingot tin, not under 99 per cent. pure, for £217—Geo. P. Harris, Scarfe, and Co. Ltd.

360 tons limestone flux, at 9s. 11d. per ton—R. Fricker.

12 2in. turbine water meters, at £4 19s. 6d. each; 12 3in. turbine water meters, at £5 10s. each—A. W. Dobbie and Co. Ltd.

2000 drawhooks, at 8s. 4d. each—Jas. Martin and Co.

2000 drawhook pins, at 4s. 3d. each; 2000 drawhook bridles, at 2s. 3d. each—Gawler Implement Manufacturing Co. Ltd.

Westinghouse brake material, for £6425 17s. 6d.—Elder, Smith and Co. Ltd.

250 Wallis' patent buffer springs, at £6 16s. per set of 4—J. B. Wallis and Co.

4 30 ton weighbridges, 5ft. 3in. gauge, for £596—Geo. P. Harris, Scarfe and Co. Ltd.

350 S.D. copper tubes, at 10⅝d. per lb., less 2½ per cent.—Geo. Wills and Co. Ltd.

500 bars bright drawn hex. steel, at £10 9s. per ton—Steele and Baker.

224 bars mild steel for making motion pins, at £10 2s. 5d. per ton—Geo. P. Harris, Scarfe and Co. Ltd.

673 cold reeled mild steel bars, squares, £9 15s. 10d. per ton; under 1in., £11 5s. 9d. per ton; 1in. and over, £10 5s. 9d. per ton—Elder, Smith and Co. Ltd.

2350 bars best chain iron, at £19 13s. 2d. per ton—Geo. P. Harris, Scarfe and Co. Ltd.

---

## MELBOURNE C.C. ELECTRIC LIGHT SUPPLY.

On Monday last, the 8th inst., the M.C.C. was to go into committee for the purpose of finally coming to a decision on the matter of the supply of current in bulk to the Footscray City Council. That no finality was reached is only in keeping with the procedure which has hitherto characterised the investigation of the position by the M.C.C., and the matter was further adjourned until Wednesday afternoon. Unfortunately, we will have gone to press before the adjourned meeting is held, but in the proceedings of Monday's meeting sufficient was disclosed to enable us to review the situation. In the first place it is difficult to determine the why and wherefore of the inquiry, for the City Councillors don't know themselves. Generally, however, it may be assumed that the application of the Williamstown C.C. for the supply of electric energy, and the price they were to be charged, led to the fact being disclosed that Footscray was obtaining its supply at a price of about 1¾d. per unit, whereas the city consumers were being charged almost 3d. The City Electrical Engineer was then charged to make a report, which was not understood, and the Council deferred dealing with the matter until Monday last, when Mr. Harper was called upon to personally explain his report.

It was certainly "in the air" that the consequences of the inquiry were to be more serious than has since proved to be the case. In the council chamber itself important issues were raised, which ended lamely, and lost point. One of these, "Was the concern paying as a whole?" went no further; and another, as to the wisdom of allowing the affairs of such a large enterprise to be guided by the City Engineer without technical check, died of sheer inanition. One thing is quite certain, the Melb. C.C. is quite incapable of deciding these issues for itself, which is no reflection on the personal ability of the councillors, but rather an argument that the cobbler is better occupied in making boots than bonnets. There may be a great deal to justify the impression held by some of the councillors that things in this department are not as they should be. But in that case a specific charge should have been made and adhered to. As it is, we don't know, the councillors don't know, and nobody else knows, what the real point at issue was; but, having heard Mr. Harper's explanation, the position boils down to this: Is the price at which current is charged to the Footscray Council a fair and profitable one to the corporation? If there be any other issue, we should be glad to know it.

A diagram showing the position of mains, or feeders, was produced in the council chamber as an easy means of illustration. We attach a hypothetical diagram on the same basis, which is a simple one, and the following is a description of it.

The lines shown radiating from the power house are mains leading to South Yarra, East Melbourne, Carlton, Melbourne, North Melbourne and Footscrya. Each arrow head indicates substations at which the high-tension current as delivered from the power house is transformed into low-tension current for distribution among consumers. There are certain losses which occur in the transmission of the high-cum-low tension current to consumers. To show these losses, the mains to Carlton and Footscray are taken as comparisons. In both cases the current which travels along the mains is high-tension. In the case of Carlton there is a loss of 3 per cent. in its transmission to the substation. At this substation there is a further loss of 3 per cent. in transforming it from high to low tension. There is then a further loss of 7 per cent. in distributing the low-tension current to consumers. All this loss (13 per cent.) is borne by the City Council, and made up by direct charges to the consumer, as it (the Council) undertakes the job of transmitting, transforming, and distributing the current. In the case of Footscray, the Melbourne C.C. merely transmits high-tension current to the Footscray boundary, where its responsibility ceases. In other words, the Footscray Council has to bear the loss of transforming the high into low tension, and the loss incidental to the distribution of the latter to its consumers. The loss of 1 per cent. only along the Footscray main as compared with 3 per cent. along that leading to Carlton is due to the latter being a small main and fully loaded, and the former a large main and carrying a small load.

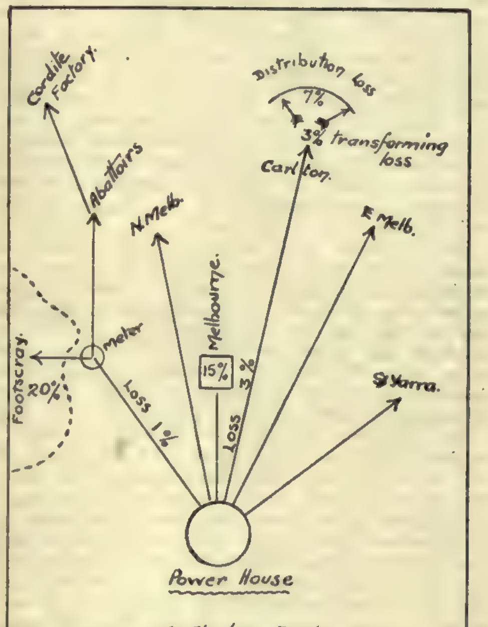


Diagram of Electric Feeder Mains.

The 20 per cent. loss in Footscray is supposition on the part of Mr. Harper, as this has nothing to do with him. The hard fact is that the M.C.C. sells to the Footscray Council high-tension current in bulk at an average price of 1¾d. per unit, on which it makes a profit of slightly less than ½d. per unit. "In bulk" means the total supply of current, irrespective of whether it is used for power or lighting purposes. The loss of 15 per cent. in Melbourne is merely that of distributing low-tension current to consumers, as the current is transformed from high to low in the power house, and distributed direct.

This is Mr. Harper's explanation. If there be any other reason why the point was raised, it should be made known and specifically charged. If there be any real discrepancy submerged in what some councillors are pleased to term an "elaborate mass of technicalities" it is their business to find it out. As to the point of the undertaking being a profitable one, the Council, in pursuit of its obligations to the taxpayer, no doubt scans a "balance-sheet" occasionally. It is to be hoped it is able to display more astuteness in "ferreting" a statement of accounts than it has shown in following the vagaries of high tension current, and, incidentally, its transformation into low.

## NEWS AND NOTES.

In giving his decision in the case wherein the N.S.W. Chief Railway Commissioner was summoned by the Minister for Labour and Industry for a breach of Section 69 of the Act, Mr. Justice Heydon remarked that it would be absurd if it were incumbent upon the Commissioner to give 21 days' notice of intent to cease employing casual or supernumerary hands if they could be classified as such. As, however, the work at Darling Island had been previously performed exclusively by casuals it seemed that a system had become established in which the casual labour was recognised, if not exactly as a permanent employee in that interpretation of the term, as at least having an exclusive right to the job. It would therefore seem that the dispensing of the casuals as a whole and their replacement by permanent hands was primarily a change of system which directly involved a difference in the rates of wages due to each class, in which case there was a breach of the section. The Commissioner therefore ought to have given the notice provided for. On the question of penalty, Mr. Justice Heydon remarked, "Now, as to the penalty, which may be as much as £50, no information has been given to me to enlighten me as to the seriousness of the offence. In the statement of facts nothing is said as to the number of casual men, or the difference in the rates of pay. Nor was anything whatever said in argument about anything but the bare legal aspect of the case. I infer that a decision on that is all that was sought, the section being one which has never before been discussed. Accordingly, I fix the penalty at £5, and I allow costs 10 guineas.

The Victorian gold received at the Melbourne branch of the Royal Mint during August amounted to 41,707.31 oz. gross, or 39,194.51 oz. fine, the value being £166,488. Comparing this with the receipts for August, 1912, which amounted to 54,389.26 oz. gross, or 50,842.06 oz. fine, the value being £215,963, the shortage last month is shown to be 12,682 oz. gross, or 71,647½ oz. fine, the value of which would be £49,475.

The Mararoa G.M. Co., of Norseman (W.A.), crushed 15,804 short tons of stone during the half-year ended on June 30th, the average value being 35s. 10.3d. per ton, besides treating 11,262 short tons of sands, 3841 tons of slimes, 1648 tons of Waihi slimes and 173 tons of concentrates, the gold yield from the whole being valued at £30,593, representing 6963 fine oz. The mining, milling and realisation costs averaged 17s. 6.72d. per ton, and the whole expenditure was £13,828. Two dividends of 1s. each were paid, amounting to £10,000. The amount spent on mine development was £3888, but no improvement was disclosed; the stone raised, however, maintained the usual average grade. The manager now reports that during August the battery crushed 2715 short tons for 1011 oz. 5 dwt. of bullion, worth 64s. 1½d. per oz.; 1980 tons were cyanided for bullion worth £1180, 700 tons of slimes produced £525 worth, and 12 tons of current concentrates yielded £50, making the total value of bullion for the month £4997.

The half-yearly report of the Mount Jasper Copper Mines (T.), says the directors, are confident that the profits from the concentrating plant at Mount Jasper will provide funds for the erection of another plant to treat the Mount Stewart ore, and for the development of four other lodes in the company's leases. The Mount Jasper concentrating plant is nearly completed, and is being connected by tramway with the old Jasper workings, from which, it is asserted, 20,000 tons of ore can be taken by open-cutting. It is also stated that only £200 remains to be paid on account of the purchase of Mount Stewart leases, and that that mine has a shaft 200ft. deep, with winding and pumping plant, and a tramway 5½ miles long.

The Minister of External Affairs, Mr. Glynn, received a telegram last Thursday from Dr. Gilruth, administrator of the Northern Territory, which stated that two prospectors, Messrs. Sharber and Richardson, had discovered an extensive deposit of tin, apparently of good quality, at Beswick Creek, about 70 miles from Horseshoe Creek, and 100 miles from the Pine Creek railway station. Some selected specimens of the ore were sent to the battery at Horseshoe Creek, and gave 45 per cent. of tin. The Government Geologist of the Territory was despatched to the scene immediately news of the find was received, says Dr. Gilruth, and as a result of his examination he expressed the opinion that the lode is a permanent one, and that it probably extends for about 10 square miles.

The following important announcement was telegraphed late last week by the manager of the Hercules mine, Mount Read (T.):—"No. 2 diamond drill has bored diagonally undertoot from No. 4 level towards No. 5B crosscut, and has penetrated 59 feet. The whole core assays high in zinc contents. The core is now below the point at which Mr. Blakemore made his estimate of ore reserves."

The Mount Bischoff Company shipped 100 tons of tin oxide during August, and 20,211 tons of crude ore were treated in the milling and concentrating plant for the same period.

The establishment of uniform company law in the States of the Commonwealth will be listed for considerationat the next conference of Premiers.

In Western Australia the present law governing trade unions restricts them to matters concerning industrial relations between themselves and employers, and no union can register if it uses its funds for any purpose other than that specified in the definition of trade union. But it is proposed to alter all that and the Government is considering a Bill for introduction this session, under which the field for trades union activities will be greatly enlarged. If the bill as drafted becomes law a trade union will not only be empowered to use its funds for the purpose of assisting political delegates, but will become a body corporate, and have the status of an ordinary company, with full powers as to investment of money in property and so forth.

Before the vendors parted with the Bullfinch (W.A.) group of leases (says the "Southern Cross Times") they milled 1027½ tons of ore for a yield of 10,958.88 fine oz. After the flotation 653½ tons were sent away for treatment, and returned 5,544.42 oz. fine gold; or, to put it another way, before the plant started 1681 tons gave a return of over £70,000 worth of gold. Since the mill started 24,159 tons have been treated for a return of bullion valued at £96,060. If an allowance of £10,000 is made for the gold that was stolen, and for that which is locked up in the treatment appliances, the figures to date are roughly 25,840 tons for gold valued at £176,000. Now that the extra five stamps, etc., are running, it is safe to anticipate a good increase in the monthly yield.

The Frenchman's Reef Gold Mines, Daylesford (V.) has purchased the balance of the assets, including leases, of the Frenchman's Reef South Company (in liquidation).

Prospecting operations at the North Lord Roberts mine are proving very satisfactory. The lode, which is well defined and solid, is 12ft. wide, carrying payable values for a distance of 600 or 700ft. The latest report states that a prospecting shaft which is being sunk, is down 16ft. in payable values. The lease adjoins the Lord Roberts Co. on the north.

Incidentally, after replying to requests for financial assistance made by deputations last week, the Victorian Minister of Mines, Mr. A. A. Billson, said that he wished to dissipate the idea that the Government was not prepared to advance money for the assistance of small mining ventures. That was quite incorrect, and was a misconception on the part of the paper that published it. It was recognised that out of some of the small ventures big ventures might arise with financial assistance. What the Government required was sound evidence that a company would not suspend operations when a grant was exhausted. That sort of thing would damage a mining district. A Government grant should inspire confidence on the part of investors.

Of a total of 125,005 oz. of gold received during August by the West Australian branch of the Royal Mint, 73,364 oz. came from Kalgoorlie, 7558 oz. from Meekatharra, 7076 oz. from Mt. Malcolm, 6977 oz. from Black Range, 3914 oz. from Coolgardie, 3793 oz. from the Dundas field, 3638 oz. from Yilgarn Field, 3310 oz. from Menzies, and 2919 oz. from Day Dawn.

The following extract from the "Bendigo Advertiser" of August 28th affords a good testimonial for Bryne's ambulance stretchers, for which Messrs. McMicking and Co. of Melbourne, are agents;—A miner named James Collis, a married man with three children, residing in High-street, Golden-square, met with a serious accident yesterday. He was working in a rise above the 300ft. level in the Goldfields Consolidated mine, Diamond Hill, in a tribute block from the Goldfields North Co., when a piece of stone became dislodged, and in its descent struck Collis a severe blow on the back, fracturing the spine. Dr. Ffrost was sent for, and the injured man was made as comfortable as possible until the arrival of the St. Andrew ambulance car, when he was conveyed to the Bendigo Hospital for treatment. Dr. Ffrost speaks in the highest terms of the utility of Bayne's stretcher, which was used on the occasion, the unfortunate man being lowered down the rise 60ft., carried along the level a distance of 500ft., and raised to the surface without the least discomfort or injury.

Recent New Zealand exchanges show that since the ending of the strike at Waihi things have greatly improved there, are indeed better than they ever have been. Mr. Butler, president of the Ohinemuri Mines and Batteries Employees' Union, says that "the conditions of work are better, and the wages are also better, and since the strike the class of man employed in Waihi might safely be said to be equal of any in New Zealand. There has been work completed in the Waihi mine of late that had never previously been approached, that is, with regard to the breaking out of ore. There are fewer men employed now, but the tonnage worked per man has been largely increased. Three years ago there was always dissatisfaction, but there never has been before such harmony as exists now." How long will this contentment be permitted?

Speaking at Moturoa (N.Z.), recently, on the occasion of the opening of the refinery for the Taranaki Oil Wells Co., Mr. J. D. Henry, oil expert, said that it was reasonable to suppose that here they would have a colossal industry. As for the future of the industry, it was very difficult and exceedingly dangerous for a man in his position to try and forecast the future of an industry of this kind, but if they could rely on the outcrops near the breakwater, the wells on the Moturoa field, the indications inland, the indications at German Hill, and at Inglewood, and other places, and on top of that the enterprising character of the people, they must have not only a genuine oil-field, but an oil-field of tremendous possibilities. They had undeniably established New Plymouth on the oil map of the world, and the only way to keep it there and make New Plymouth famous was for them to be loyal. Passing on to what he termed the "surrounding developments," Mr. Henry said these were highly gratifying, and that nothing had given him greater pleasure than to see the Galician type of derricks rising close to their own field. Referring to Mr. Morgan (the Government Geologist) and his evidence given before the Empire Trade Commission, Mr. Henry said: "Either this refinery will be a monument for me, a gravestone for the professor, or a gravestone for me and a monument to Mr. Morgan."

## AMALGAMATED ZINC (DE BAVAY'S) Limited.

Notice is hereby given that the Half Yearly Ordinary General MEETING of Amalgamated Zinc (De Bavay's) Limited will be held at the registered office of the company, No. 360-366 Collins-street, Melbourne, on Thursday, the 18th day of September, 1913, at 11 o'clock in the forenoon.

Business:

1. To receive and consider the balance-sheet and profit and loss account for period ended 30th June, 1913, and the reports of the directors and auditors.
2. To transact any other business that may be legally brought forward.

By order of the Board,
HAROLD L. SHACKELL,
Assistant Secretary.

360-366 Collins-street, Melbourne,
5th September, 1913.

## COPE'S CREEK DREDGING CO., No Liability.

NOTICE is hereby given that the Directors have this day declared a Dividend (35th) of 6d. per share on all shares in the Company, payable at the registered office of the Company, 109 Pitt-street, Sydney, on and after September 18, 1913. The transfer books of the Company will be closed from 15th to 18th inst., both days inclusive. By order of the Board, R. VERNON SADDINGTON,
Sydney, September 5, 1913. Manager.

Metallurgical Experimentalist desires position. Long practical and laboratory experience. Specialities:—"Flotation" and Cyaniding. References from 10 companies.

"METALLURGIST."
Grand Hotel, Mt. Morgan.

## UNIVERSITY OF DURHAM.

Armstrong College, Newcastle-upon-Tyne.

Principal: W. H. Hadow, M.A., D. Mus.
Session of 1913-1914.

MATRICULATION EXAMINATION, SEPTEMBER 23-27.

Particulars of Curricula for University Degrees and College Diplomas in Engineering, Electrical Engineering, Naval Architecture, Mining, Metallurgy, Agriculture, Pure Science, Arts and Commerce, and of Fellowships, Scholarships, and Exhibitions, on application to—

F. H. PRUEN, M.A., Secretary,
Armstrong College, Newcastle-upon-Tyne.

## WANTED.

YOUNG MAN, with long and good experience, desires Position as Manager of Battery or Cyanide Plant. Has designed and erected complete Treatment Plant. Excellent references. Will go to any part of the world.

Apply:—"GOLDDUST," Office of this Paper, Melbourne.

## Commonwealth of Australia.

Postmaster General's Department,
Melbourne, September 5, 1913.

TENDERS will be received at the office of the Deputy Postmaster-General, Melbourne, until 3 p.m., on the undermentioned dates:—

30th September.—Brass Lightning Guard Brackets (Sch. 978). See Commonwealth Gazette, September 6.

11th November (amended date)—Supply, Delivery and Erection of Eight Automatic Telephone Switchboards at the Ascot, Canterbury, Malvern, Cheltenham, Footscray, Oakleigh, Sandringham and Williamstown Telephone Exchanges (Sch. 953). See Commonwealth Gazette, August 30.

16th December.—One Common Battery Multiple Switchboard at the Telephone Exchange, Wills-street, Melbourne (Sch. 968). See **Commonwealth Gazette, September 6.**

AGAR WYNNE,
(1250) Postmaster-General.

## Government Notices (N.S.W.).

Sydney Harbour Trust Office,
Circular Quay, September 5, 1913.

TENDERS FOR STEEL AND IRONWORK.

**TENDERS will be received at this office up to** 2 p.m. on Monday, the 15th instant, for the Supply and Delivery of seventy (70) tons (approximately) of Steel and Ironwork to form floor joist, trussing, etc., for double-decked cargo sheds **at Berths Nos. 1, 2 and 3, Woolloomooloo Bay.**

Forms of tender and full particulars may be obtained on application to the Engineer-in-chief of the Trust.

HAROLD F. NORRIE,
(7a15) Secretary.

Metropolitan Board of Water Supply and Sewerage,
341 Pitt-street, Sydney, N.S.W.,
September 5, 1913.

TENDERS will be received up to 2 p.m. on December 15, 1913, for the Manufacture and Delivery of One Turbine Centrifugal Pumping Plant for Crown-street Pumping Station.

For further particulars see Government Gazette.

WILLIAM HOLMES,
Secretary.

## MUNICIPAL COUNCIL OF SYDNEY.

TO CONTRACTORS.

SEALED and ENDORSED TENDERS will be received by **the undersigned until 3 o'clock p.m.** on Tuesday, September 16, for the Supply and **Delivery of Cast-iron Street Orderly Bins.**

Specification, etc., **may be seen upon application** at the office of the City Surveyor, Town Hall, Sydney.

The lowest or any tender not necessarily accepted.

Tenderers please note that they must pay their CASH DEPOSITS direct into the City Treasury, and not enclose same with their tenders, otherwise their tenders will be rejected as INFORMAL.

THOMAS H. NESBITT,
Town Hall, Sydney, Town Clerk.
September 5, 1913.

## MUNICIPAL COUNCIL OF SYDNEY.

TO CONTRACTORS.

SEALED and ENDORSED TENDERS will be received by the undersigned for the Supply and Delivery of Arc Lamp Winches, until 3 o'clock p.m. on Monday, September 15th, 1913.

Copies of Specifications, etc., may be seen or obtained upon application at the office of the City Electrical Engineer, Town Hall, Sydney, upon payment of the sum of 10s. 6d.

The lowest or any tender not necessarily accepted.

Tenderers please note that they must pay their CASH DEPOSITS direct into the City Treasury, and not enclose same with their tenders, otherwise their tenders will be rejected as INFORMAL.

THOMAS H. NESBITT,
Town Hall, Sydney, Town Clerk.
September 5, 1913.

## Government Notice (V.).

Department of Public Works,
Melbourne, September 5, 1913.

TENDERS will be received until twelve o'clock on Thursday, September 18, for Supply and Delivery at Wire Netting Factory, Penal Establishment, Pentridge, Coburg, of 100 tons Zinc Spelter. Deposit, £50.

Particulars and conditions may be learnt at this office. The lowest or any tender not necessarily accepted.

W. A. ADAMSON,
Acting Commissioner of Public Works.

## SHIRE OF NUNAWADING.

TENDERS are hereby invited for the undermentioned works:—

(a) Supply and Delivery of Electrical Equipment.

(b) Supply and Delivery of Wires and Cable.

(c) Supply and Delivery of Wood Poles.

Specifications on view at the office of the Consulting Engineers, G. B. Lincolne and J. K. Macdougall, 430 Little Collins-street, Melbourne, from whom copies may be obtained on payment of 10s. 6d. per set, returnable on receipt of a bona fide tender.

Specifications also on view at the office of the undersigned, to whom tenders are returnable not later than—(a) October 18, (b) and (c) September 20, 1913.

J. R. KEFFORD,
Shire Hall, Box Hill, Shire Secretary.
September 5, 1913.

## PIONEER TIN MINING CO. LTD.

NOTICE is hereby given that the Sixth Annual General Meeting of shareholders will be held at the office of the Company, No. 34 Queen-street, Melbourne, on Friday, September 19, 1913, at 3.30 p.m., for the following purposes:—To receive directors' report and statement of accounts for the period ended June 30, 1913; to elect two directors in the place of Messrs. Harvey Patterson and Reginald Bright, who retire from office, but, being eligible, offer themselves for re-election; to appoint an auditor; to transact any other business of an ordinary general meeting. By order of the Board,

JOHN F. WAY, Secretary.
Melbourne, Sept. 3, 1913.

## CHILLAGOE LIMITED.

NOTICE is hereby given that the second CALL of 6d. per share (making the shares paid up to 9s.) has been made by the Directors upon the members in respect of the shares held by them respectively, and that the same is payable to the Secretary, at the office of the Company, 39 Queen-street, Melbourne, on or before September 22, 1913. Dated at 39 Queen-street, Melbourne, September 2, 1913,

By order of the Board,
C. L. HEWITT, Secretary.

## THE UNION TRUSTEE COMPANY OF AUSTRALIA LIMITED.

NOTICE is hereby given that the 57th Ordinary General Meeting (being the half-yearly meeting) of the above Company will be held at the office of the Company, Union Trustee Buildings, 333 Collins-st., Melbourne, on Wednesday, September 24, 1913, at 11.30 a.m. Business:—To receive chairman's report for half-year and to declare interim dividend: to appoint an additional director: to fix remuneration of directors. By order,

SAML. COOKE, Manager.
Union Trustee Bldgs., 333 Collins-st., Melb.

## AMALGAMATED PICTURES LTD.

A Dividend of 10 per cent. on preference shares for the six months ending August 31, 1913, and 1s. per share interim dividend on ordinary shares in the above Company, has been declared, due and payable at the registered office of the Company, 60 Queen-st., Melbourne, on Tuesday, September 16, 1913. Transfer books close on Saturday, September 13, 1913, at noon. By order of the Board,

GEO. E. DICKENSON, Secretary.
60 Queen-street, Melbourne.

FURTHER NOTICE IS HEREBY GIVEN that the Patentee of Australian Letters Patent No. 18844/10 dated the 4th August, 1910, for "ore concentrator" is prepared to satisfy any demands and all requirements of the public respecting said invention. Further information and particulars obtainable from EDWARD WATERS & SONS, Patent Attorneys, of 414-418 Collins-street, Melbourne, and 7 Moore-street, Sydney.

## CITY OF MELBOURNE.

APPLICATIONS, accompanied by copies of testimonials, stating age and experience, will be received at this office until 10 a.m., Thursday, 18th inst., for APPOINTMENT OF OVERHEAD SUPERINTENDENT, in connection with the Council's electric supply system, at a minimum salary of £286 per annum.

Technical and practical knowledge, and experience in the erection, supervision, and maintenance of overhead electric supply wires, is absolutely essential.

Further information as to the conditions of appointment and nature of duties may be obtained on personal application at this office.

Applications to be addressed to the Chairman, Electric Supply Committee, and endorsed "Application for Appointment of Overhead Superintendent."

JOHN CLAYTON,
Town Clerk's Office, Town Clerk.
Town Hall, Melbourne,
September 9, 1913.

## MELBURNIAN BUCKET DREDGING Co., No Liability.

NOTICE is hereby given that a Dividend (10th) of 6d. per share has been declared, due and payable at the registered office of the Company, third floor, Broken Hill Chambers, 31 Queen-street, Melbourne, on Thursday, September 11, 1913. Transfer books close from September 8 to September 11, both days inclusive.

A. F. SHOWERS, Manager.

## JUNCTION NORTH BROKEN HILL MINE, No Liability.

NOTICE is hereby given that the OFFICE of the Junction North Broken Hill Mine No Liability has been REMOVED to 19 Queen-street, Melbourne, and that Frank Howard Reynolds has been appointed manager of the said Company.

Scrip for transfer at the Melbourne register must be lodged at the above address.

Dated this fifth day of September, one thousand nine hundred and thirteen.

By order of the Board,
F. H. REYNOLDS, Manager.

## "COMPANIES ACT 1890."

### Twelfth Schedule.

I, the undersigned, hereby make application to REGISTER THE NORTH LORD ROBERTS GOLD MINING COMPANY NO LIABILITY as a No Liability Company, under the provisions of Part II. of the "Companies Act 1890." 1. The name of the company is to be The North Lord Roberts Gold Mining Company No Liability. 2. The place of intended operations is at Sailor's Falls, near Daylesford. 3. The registered office of the company will be situated at No. 60 Queen-street, Melbourne. 4. The value of the company's property, including claim, is £1800. 5. The number of shares in the intended company is 40,000 of 5s. each. 6. The number of shares subscribed for is 40,000. 7. The name of the manager is Thomas Morres. 8. The names and addresses and occupations of the shareholders and the number of shares held by each at this date are as below:—

| Name. | Address. | Occupation. | Number of Shares. |
|---|---|---|---|
| Robert William Hinkson, | Daylesford, | investor | 500 |
| John Urquhart, | Stock Exchange, Bendigo, | sharebroker | 300 |
| George Alexander Miller, | Stock Exchange, Bendigo, | sharebroker | 2,000 |
| Alfred Riley, | Yarra Park, East Melbourne, | school teacher | 500 |
| George Joseph Keogh, | 69 Queen-street, Melbourne, | legal manager | 500 |
| Thomas Morres, | 60 Queen-street, Melbourne, | accountant (in trust for vendors) | 8,000 |
| Thomas Morres, | 60 Queen-street, Melbourne, | accountant (in trust for shareholders) | 28,200 |
| | | | 40,000 |

Dated this fourth day of September, 1913.

T. MORRES, Manager.

Witness to Signature:—Eustace M. Flannagan, solicitor, Melbourne. I, Thomas Morres, of 60 Queen-street, Melbourne, in the State of Victoria, accountant, do solemnly and sincerely declare that —1. I am the manager of the said intended company. 2. The above statement is, to be best of my belief and knowledge, true in every particular; and I make this solemn declaration, conscientiously believing the same to be true, and by virtue of the provisions of an Act of Parliament of Victoria rendering persons making a false declaration punishable for wilful and corrupt perjury—T. MORRES. Taken before me, this 4th day of September, one thousand nine hundred and thirteen, at Melbourne, in the state of Victoria—WM. H. WADDELL, J.P. PAVEY, WILSON and COHEN, Collins House, 360 Collins-street, Melbourne, Solicitors.

## "MINERALS SEPARATION" PROCESS.

### Patent Rights Vindicated.

The action brought by Minerals Separation Ltd. against Mr. James H. Hyde, as the representative of several large firms in the United States, to vindicate its patent rights, has resulted completely in the plaintiff company's favour. The suit was heard in the Federal Court at Butte, Montana. Mr. Hyde's contention was that the plaintiffs "were not the original true inventors of the alleged invention in ore concentration which letters patent No. 835,120 purport to embrace," and that the letters patent of other inventors, such as Messrs. H. Bradford, F. E. and A. S. Elmore, C. V. Potter, G. D. Delprat and A. E. Cattermole, clearly described and claimed "the alleged invention" of Messrs. Sulman, Pickard and John Ballot. In a circular issued to shareholders by Mr. John Ballot, chairman of Minerals Separation and the Minerals Separation American Syndicate Ltd., he states that the judgment of the Court "is a complete victory for Minerals Separation Ltd., and the American syndicate, who have thereby obtained a perpetual injunction against the defendant, his associates, agents, clerks, and workmen from infringing, and from encouraging others to infringe, their patents, and an order for damages and costs in respect of the infringement. Moreover, the Minerals Separation 'agitation froth flotation' process patent has been declared valid, and is, therefore, indefeasible." The judgment, it is stated, sharply contrasted the company's patent in the suit with patents cited against it by the defendant, and held that the latter were radically different, and that defendant's contentions of "lack of novelty" and "anticipation" had failed. Further, it was announced, the judge held that the Minerals Separation invention was a joint and legal patent granted to the inventors, H. L. Sulman, H. F. K. Pickard, and John Ballot, and that it was valid in respect to all claims in issue; expresses confidence that the decision will be maintained, even if an appeal be lodged. This action has special interest in Australia, as, since the amalgamation of interests which cut short similar litigation here a couple of years ago, the patent rights to this process in the Commonwealth are the property of Minerals Separation and De Bavay's Process Limited—55 per cent. of the shares in which are held by the Minerals Separation Company of London and 45 per cent. by the Amalgamated Zinc (De Bavay's) Company.

## DIVIDENDS.

The following dividends and bonuses of mining companies in Australia have been declared, and are payable on the dates noted:—

September.

13th. — Y-Water (Emmaville) Tin Co. (N.S.W.), 1s., £2000.

15th.—Pioneer Tin Dredging Co., Bradshaw's Creek (T.), 6d., £4031.

16th.—Cope's Creek Central T.D. Co., Tingha (N.S.W.), 1/-, £1500.

17th.—Tongkah Compound, Siam, 1s., £2500.

18th.—Mararoa G.M. Co., Norseman (W.A.), 1s., £5000.

24th.—Broken Hill Prop, Block 10 (N.S.W.), 1s., and bonus 1s., £10,000.

25th.—Zinc Corporation (N.S.W.), pref. 2s., less income tax, £24,569.

25th.—Ajax Central G.M. Co., Daylesford (V.), 1/6, £2250.

25th.—Wandiligong G.D. Co. (V.), 1/-, £300.

26th.—Sons of Gwalia Ltd., North Coolgardie (W.A.), 1s., £17,500.

26th.—North Broken Hill Silver-Lead M. Co. (N.S.W.), 2s., £60,000.

26th.—Broken Hill South Silver-Lead M. Co. (N.S.W.), 6s., £60,000.

27th.—Great Boulder Prop. Ltd., Kalgoorlie (W.A.), 9d., £65,625.

30th.—North Mount Farrell S.L.M. Co. (T.), 3d., £1000.

October.

1st.—Broken Hill Water Supply Ltd. (N.S.W.), 1s. 6d., and bonus 1s., £6250.

4th.—Kalgurli Gold Mines, Kalgoorlie (W.A.), 4/-, £24,000.

8th.—South Kalgurli G.M., Kalgoorlie (W.A.), second and final cash return of 8d., £10,000.

## BANK CLEARINGS.

The report of the Melbourne Clearing House for the week ended 8th September was:—

| | | |
|---|---|---|
| Total clearance | | £5,838,823 |
| Balances— | | |
| Settled by certificates | £544,500 | |
| Settled in coin | 170,007 | |
| | | 714,507 |
| Total clearance for the corresponding week, 1912 (five days) | | 5,257,611 |

## POSTAL ELECTRICIANS' WAGES.

### Award Not Retrospective.

In the House of Representatives last Friday, replying to a question by Mr. Mathews, the Postmaster-General, Mr. Wynne, read the following statement by the Public Service Commissioner, Mr. D. C. McLachlan, relative to the recent award of Mr. Justice Higgins in the case of the postal electricians: — "The award is not retrospective, either as a whole or in part. The law (sec. 14 of the Arbitration (Public Service) Act) directs that no award shall come into operation ealier than after the expiration of thirty days after the award has been laid before Parliament. Further, the award itself expressly states that it shall not come into force until the expiration of such thirty days. Prior thereto the rates of pay are governed by the Public Service Act and Regulations, and up to the date the award comes into force the officers concerned in the award cannot lawfully be paid any wages other than as prescribed by the regulations. If the award in the present case is departed from as regards the date on which its principal feature shall come into operation, a dangerous precedent will be established for all future cases. The court has now before it claims by several public service associations, lodged at various dates back to the 11th September, 1912, and, if the present request be acceded to, each of these associations will no doubt ask to have the awards in their cases also made retrospective, in disregard of the provisions of the law. The present award will swell the salary bill of the department by an amount of £30,000 per annum, and if it were made retrospective the Commonwealth Treasury would be required to immediately provide an additional sum for arrears of payment estimated at least at £20,000."

## REPORTS OF COMPANIES AND CORPORATIONS.

### Great Cobar Ltd. (N.S.W.)

The output of the Great Cobar Ltd. for the last two months was:—

| | July. | Aug. |
|---|---|---|
| Blister copper produced, tons | 681 | 546 |
| Contents (estimated)— | | |
| Gold, oz. | 3,377 | 2,746 |
| Silver, oz. | 11,653 | 10,143 |
| Estimate, contents of concentrates on hand— | | |
| Copper, tons | 78 | 76 |
| Gold, oz. | 67 | 53 |
| Silver, oz. | 603 | 485 |

### Amalgamated Zinc (De Bavay's).

The return showing production, revenue, working costs, and estimated profits of the Amalgamated Zinc (De Bavay's) Ltd. (N.S.W.) for the last two four-weekly periods is as follows:—

| | Four weeks ended | |
|---|---|---|
| | July 26. | Aug.23. |
| Tailings treated, tons | 43,780 | 44,454 |
| Zinc concentrates produced, tons | 12,192 | 12,248 |
| Assaying— | | |
| Zinc, per cent. | 49.4 | 49.4 |
| Silver, oz. | 8.6 | 8.5 |
| Lead, per cent. | 5.9 | 6.0 |
| Lead concentrates, tons | 133 | 135 |
| Assaying— | | |
| Lead, per cent. | 51.8 | 52.1 |
| Silver, oz. | 34.3 | 34.6 |
| Zinc, per cent. | 18.1 | 18.9 |
| Estimated income (spelter at £22 per ton) | £35,474 | £35,585 |
| Total working expenditure (including cost tailings treated) | £17,234 | £17,368 |
| Estimated profit on working account (spelter at £22) after deducting amount due to Broken Hill South Co., under partnership agreement | £12,498 | £12,506 |

### Hampden-Cloncurry Copper Mine.

The smelting returns of the Hampden-Cloncurry Copper mines Ltd. (Q.) for June and August are given below, the works having been closed during part of June and throughout July owing to a strike:—

| | June. | Aug. |
|---|---|---|
| Ore treated, tons | 1,418 | 6,126 |
| Blister copper, tons | 171 | 575 |
| Fine copper, tons | 169 | 568 |
| Gold, oz. | 49 | 155 |
| Silver, oz. | 1,543 | 4,988 |

### Mount Elliott Ltd. (Q.).

The smelting returns of Mount Elliott Ltd. for the last two periods in which operations were carried on were:—

| | *Mar. 19. | †August. |
|---|---|---|
| Ore treated, tons | 2,307 | 3,596 |
| Blister copper produced, tons | 246 4-5 | 386 |
| Contents— | | |
| Copper, tons | 244 7-10 | 382 3-5 |
| Gold, oz. | 432 1-5 | 649 |
| Silver, oz. | 452 3-10 | 1,006 |

*Smelting suspended. †25 days.

### Great Fitzroy Mines Ltd. (Q.)

The smelting and milling returns, revenue and expenditure, of the Great Fitzroy Mines Ltd. for the past two months were as follows:—

| | July. | Aug. |
|---|---|---|
| Furnace, hours | 714 | 743 |
| Ore treated, tons | 2,997 | 2,756 |
| Copper, per cent. | 2.80 | 2.82 |
| Gold, dwt | 4.25 | 3.27 |
| Sintered concentrates, tons | 1,290 | 1,406 |
| Copper, per cent. | 11.30 | 11.43 |
| Gold, dwt. | 9.72 | 8.89 |
| Copper, in blister, tons | 203.18 | 205.52 |
| Gold, in blister, oz. | 1,171 | 923 |
| Silver, in blister, oz. | 2,516 | 2,771 |
| Mill, hours | 403 | 393 |
| Ore treated, tons | 6,411 | 6,612 |
| Copper, per cent. | 2.59 | 2.59 |
| Gold, dwt. | 2.61 | 2.30 |
| Concentrates, tons | 1,250 | 1,347 |
| Copper, per cent. | 11.54 | 11.22 |
| Gold, dwt. | 10.09 | 8.66 |
| | £ | £ |
| Revenue | 17,061 | 17,156 |
| Price electrolytic copper | 67/0/6 | 71/15/3 |
| Working expenditure | 15,504 | 15,156 |

The Launceston (T.) City Council, at its meeting on the 1st inst., received a report from its electric lighting committee which stated that, owing to the increasing demand for electricity, additional transformer capacity and a new high tension switchboard are required at the sub-station, and a new feeder to the eastern portion of the city. The committee also point out that the location of transformers at the Albert Hall is not considered desirable, and that, with increased transformer capacity at the sub-station, it will be possible to dispense with those at the hall by connecting the district served by them direct to the sub-station. The committee, therefore, advise the purchase of two 500 K.V.A. transformers for the sub-station, also a modern high tension switchboard, and the laying of two underground feeder cables from the sub-station to the area now supplied from the Albert Hall. It was also recommended that tenders be called for this new equipment, which is estimated to cost about £5000. The report and recommendations were adopted.

The following were last week appointed by the Queensland Government as a board to inquire into the scheme proposed by Mr. Thomas Mills to equip and sink a vertical shaft at Charters Towers to a depth of 4000ft.:—Messrs. J. Linedale, Charters Towers; C. Jackson, chief inspector of mines; and W. Rands, consulting Government geologist. The scheme was outlined and commented upon in our issue of August 28.

Telephone—5866 Central. Cable Address—"PORPHYRY."

**Edward Dyason and Co.**

*MINING ENGINEERS AND METALLURGISTS,*

Examine, Report on, and Value Mining and Metallurgical Properties.

Consulting Engineers.

**60 QUEEN STREET - - - MELBOURNE,**

Codes A.B.C. 5th Edition. Moreing and Neal. Bedford McNeill.

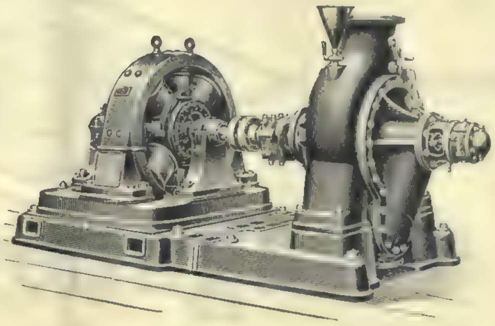
EFFICIENCY 70-80%

WEISE & MONSKI
CENTRIFUGAL PUMPS
ARE THE
SPECIALISED PRODUCT OF THE MOST UP-TO-DATE FACTORY IN EUROPE.
Low and High Lifts — Single and Multi-Stage — Belt Driven or Direct Coupled.

STOCKS IN SYDNEY AND PERTH.

FRANK R. PERROT, Sole Representative,
204 CLARENCE STREET, SYDNEY. 883 HAY STREET, PERTH.

Sales Agents—
L. Bannister, 39 Queen St., Melbourne. E. Barton Hack, Blende St. N., Broken Hill. Evans, Deakin & Co., 172 Edward St., Brisbane.



THE BROKEN HILL PROPRIETARY COMPANY LTD.

Smelters and Refiners.

TARIFF ON APPLICATION.

MANUFACTURERS OF:
SOFT PIG LEAD, FINE SILVER, ANTIMONIAL LEAD, COKE, SPELTER, BLUEPOWDER (ZINC DUST), and SULPHURIC ACID.

Branch Offices—
LONDON, 3 Great Winchester-st., E.C.; ADELAIDE, Alfred Chbrs., Currie-st.; SYDNEY, Imperial Chbrs., O'Connell-st.

HEAD OFFICE.
Equitable Building, Collins Street, MELBOURNE.

*Flotation Processes.*

Minerals Separation and De Bavay's Processes, Australia Pty. Ltd.

Own and Control all processes for the concentration of ores by flotation methods covered by Patents granted to—

MINERALS SEPARATION LTD.
DE BAVAY.
POTTER.
DELPRAT, ETC.

These processes are specially applicable to the Concentration of Ores containing Silver, Lead, Zinc, Copper, Molybdenum, etc., etc.

Plants for the treatment of Ores by our processes have been erected and are in operation at the following mines:—

CENTRAL (SULPHIDE CORP.).
AMALGAMATED ZINC (De Bavay's)
ZINC CORPORATION.
JUNCTION NORTH.
BROKEN HILL PINNACLES.
GREAT COBAR.
WALLAROO AND MOONTA.
GREAT FITZROY MINES.
KYLOE COPPER MINES.
SILVER PEAK MINES.
ETHERIDGE GOLD MINES, ETC.

And plants are also in course of erection at British Broken Hill Proprietary Ltd. and "Lloyd's" Copper Mines Ltd.

*For Full Particulars as to Terms, etc., apply—*

*MINERALS SEPARATION & DE BAVAY'S PROCESSES, Australia Pty. Ltd.,*
*COLLINS HOUSE, COLLINS STREET, MELBOURNE.*

"Allen's"

IMPERIAL

Manganese Steel

FOR

Dredging Pins and Bushes, and all Wearing Parts of
Rock-Crushing Machinery, Points, Crossings, Etc.

SOLE MAKERS OF

THE "STAG" TUBE MILL

For Grinding Grit, or Tailings, and Granular Materials,
to any degree of Fineness.

THE "STAG" BRAND OCTAGON
MINING DRILL STEEL

EDGAR ALLEN & CO., LTD.,
Imperial Steel Works, SHEFFIELD.

Stocks on Hand
of
Mining and High Class Tool Steels.

AUSTRALIAN REPRESENTATIVES:
P. T. Taylor Ltd., 141 York Street, Sydney.

## GEOLOGY OF PETROLEUM.

In the Echo des Mines M. Henry Neuburger states that, in his opinion, there is no acceptable geology of pertoleum, although he considers that the oil owes its formation to the decomposition of organic matter. In a subsequent article M. Fernand Peters endeavours to controvert these impressions by the following arguments: If it be admitted that pertoleum originates from buried organisms (molluscs, fish, etc.) which accumulate in beds the age can be determined. It is true that the oil tends under pressure to rise through fissures and diffuse itself through permeable strata of more recent date, but the group of beds from whence it flowed should be regarded as the geological date. The fact that the age of petroliferous deposits is, as yet, undeterminable would seem to suggest that a theory other than the organic might be capable of explaining their presence. For the occurrence of bituminous schists an organic origin may be admitted, but for true deposits or "spouters" such an origin is extremely improbable.

When one stands in front of the gushing wells in the oil region of the Caucasus and contemplates the enormous quantity of raw naphtha that has overflowed from a comparatively limited district, it seems extravagant to imagine that sufficiently vast masses of dead organisms could have been accumulated. The organic theory is applicable to merely special cases. The decay of shell and other fish can give existence to only a relatively small quantity of hydrocarbons that impregnate contemporaneous strata, of which the geological age can be ascertained; such aggregations are inconsiderable when compared with veritable petroleum springs. The mineral theory of its origin is more probable, and the objections which have been opposed to it have less value than those raised against the organic derivation of petroleum. Hydrocarbons have been found in almost every formation, from the Cambrian to the Recent, and have even been noticed oozing from eruptives; they must, therefore, come from a great depth. It is known that the reaction of water on carbides at low pressure and at ordinary temperatures may produce hydrocarbons, equally so that carbides and water exist in depth under pressure and great heat.

It is, consequently, logical to accept the mineral theory, as it appears more reasonable and accounts for the different occurrences of petroleum in a more intelligent manner than does the organic theory. This view of the profound derivation of mineral oil would be analogous to the hydrothermal formation of epigenetic deposits of metallic ores in the fissures of stratified rocks. It follows, from this argument, that in prospecting for petroliferous deposits it is unnecessary to consider the geological period of the formation or to pay any attention to the impressions of molluscs or fish. The circumstances to investigate are the anticlinals of the strata, the deep fractures which have permitted the ascent of the oil, and the beds of sandstone, sand, porous limestone, etc., which have become impregnated with petroleum after their formation.

---

The permanent way of the Tasmanian Timber and Tramway Co. Ltd., built on a 2ft. 6in. gauge, has been completed, the sawmill erected, and the power plant installed. The shipping service is very poor at present, and before pushing business very hard, a jetty 1050ft. long is being erected, and is well on towards completion. Consideration is being given to the method to be adopted for seasoning the timber.

GREAT COBAR LIMITED,
COBAR, N.S.W.

MINE OWNERS, SMELTERS, COLLIERY PROPRIETORS, PURCHASERS
OF COPPER ORES AND MATTES.

VACANCIES FOR COMPETENT MACHINE MINERS.

SYDNEY: Australasia Chambers, Martin Place, And at Lithgow and Singleton. LONDON: 65 New Broad Street, E.C.

## CONTENTS

### THURSDAY, SEPTEMBER 18.

EDITORIAL—

Mineral Outputs 1912 . . . . . . . . 227
Commonwealth Electoral Bill . . . . 227
Leaderettes . . . . . . . . . . . . . . . 228
News and Notes . . . . . . . . . . . . 229
Brief Comment . . . . . . . . . . . . 230
Personal . . . . . . . . . . . . . . . . . 230
Metal Quotations . . . . . . . . . . . 230
The Investor's Column—
Ajax North (V.) . . . . . . . . . . . 231
New Langi Logan (V.) . . . . . . . 231
Mining in Western Australia . . . . . 231
Big Mines . . . . . . . . . . . . . . . . 232
New South Wales Mining . . . . . . . 232
Victorian Mining Activities . . . . . . 232
Publications Received . . . . . . . . 234
Mining in Queensland . . . . . . . . . 234
Correspondence . . . . . . . . . . . . 234
The Coal Mining Industry . . . . . . 235
Amalgamated Zinc (De Bavay's) Ltd. 236
Draining Zeehan Mines (T.) . . . . . 236
Tasmanian Smelting Co. . . . . . . . 236
Mineral Returns . . . . . . . . . . . . 236
Reports of Companies, etc. . . . . . 236
Wanted: Electrical Mechanics . . . . 237
Hydro-electric and Metallurgical Co.. . 237
Trans-Australian Railway . . . . . . 237
New South Wales Railways . . . . . 237
Wollongong Electrical Scheme . . . . 238
Railway Electrification . . . . . . . . 238
Visit of British Association for the Advancement of Science . . . . . . . . 238
British and European Developments . . 239
N.S.W. Railway Construction . . . . . 239
Miscellaneous . . . . . . . . . . . . . 240
Tenders Invited and Accepted . . . . 241
Dividends . . . . . . . . . . . . . . . . 245
Mixed Mems . . . . . . . . . . . . . . 245

**FIRE. . BRICK**

**Our Products have proved their superiority.**

**FIRE CLAY GOODS** For Every Purpose.

Darley Fire Bricks will withstand the most intense heat, and will not shrink. Our bricks are made near Bacchus Marsh, Victoria, and we supply all the States.

Specialities
**High-Grade Firebricks & Retorts.**
*Prompt Delivery. For Prices, etc., write to—*
**DARLEY F. B. Co.,**
**Oliver's Lane, Flinders St. Melbourne**

**COKE!**
**NORTH BULLI COLLIERY Limited**
Supplies best quality hard
SOUTHERN
SMELTING COKE.
(Weekly output 1250 tons.)
H. G. Hyde, Secretary
Royal Insurance Building, 16 Spring-street,
SYDNEY.

**AUSTRALIAN MINING STANDARD.**
PUBLISHED EVERY THURSDAY.
Forwarded Post Free to any Address.

| | Per annum |
|---|---|
| Australasia . . . . . . . . . . . . | 26/- |
| British Possessions . . . . . . . . | 32/6 |
| Foreign . . . . . . . . . . . . . . . | 34/8 |

Payable half-yearly or yearly, in advance.
All amounts should be made payable to order of "CRITCHLEY PARKER, Bank of Australasia."

12 O'Connell-street,
Sydney.
Tel. Central 2703.
P.O. Box 331.

376 Flinders-lane,
Melbourne.
Central 7931 & 1838.
P.O. Box 253.

**CASUAL ADVERTISEMENTS.**

The rate for this class of advertisement is governed by the position it occupies.

If it appears on leader page or amongst or next to reading matter, the rate is 15s. per inch (nonpareil) per insertion.

Towards end of reading section—
Brevier, 16 ems width, 6s. per inch per insertion.
Nonpareil, 8s. per inch per insertion.

For the convenuience of advertisers, we might state that—Brevier has approximately 7 words to a line, and 8 lines to the inch—6s. Nonpareil has approximately 8 words to the line, and 11 lines to the inch—8s.

**ALTERATION TO ADVERTISEMENTS.**

As our publishing arrangements necessitate the "Mining Standard" being issued simultaneously in Sydney, Melbourne and Adelaide on the same day each week, advertisers wishing to change their advertising matter must supply same ten days in advance of publication.

**ADVERTISEMENT PROOFS.**

Proofs are submitted to advertisers in order to give them an opportunity of going over the advertisements before printing.

Advertising Copy must be typed and so arranged as to clearly indicate the display required for the more important features of the advertisement.

Any departure from the original copy will be charged for. Advertisers are specially requested to instruct their publicity departments to give us clear and definite instructions respecting changes of matter or new copy in order to avoid incurring unnecessary charges.

**AUSTRALIAN MINING STANDARD.**
PUBLISHED EVERY THURSDAY.
ESTABLISHED 1888.

It is requested that all business communications be Addressed to Critchley Parker.

THURSDAY, SEPTEMBER 18, 1913.

## MINERAL OUTPUTS, 1912.

The mineral statistics for all the various divisions of the Commonwealth being now available, it behoves the "Standard" to put forth its annual survey of the position. This will, of course, be on the lines laid down in our issues of October 24th and 31st of last year.

It may be briefly stated that those lines have been devised so as to admit of a fair comparison between the various States, the States' own official figures not being acceptable in the main for the reason that in some cases items are excluded which in other cases are included. We therefore omit altogether figures relating to building-stones, brick-clays, sands, gravels, cements, slates, limestone and salt; but, *per contra*, we give the gross instead of the net value of the product of the silver-lead mines of New South Wales. On these bases the value of the mineral output for the year 1912, with the increase in the value of the production for the preceding year, and the percentage of improvement, may be stated as follows:—

| | £ | Increase. £ | Percentage of alteration on totals for 1911. |
|---|---|---|---|
| New South Wales .. | 11,871,614 | 1,337,940 | 12.7 inc. |
| Victoria .. .. .. .. .. | 2,331,294 | — 132,571 | 5.4 dec. |
| Queensland .. .. .. | 4,148,644 | 517,793 | 14.3 inc. |
| West Australia .. | 5,760,207 | — 345,646 | 5.7 dec. |
| Tasmania .. .. .. .. | 1,493,502 | 144,005 | 10.7 inc. |
| South Australia .. | 532,791 | 143,835 | 37.0 inc. |
| Northern Territory | 57,820 | - 1,533 | 2.6 dec. |
| Papua .. .. .. .. .. | 70,309 | - 4,189 | 5.6 dec. |
| Australia .. .. .. .. | 26,195,872 | 1,563,823 | 6.3 inc. |
| Australia and Papua | 26,266,181 | 1,559,634 | 6.3 inc. |

The figures for Papua, it may be remarked, are those for the financial year 1911-12, the Dependency's totals being made up for a different period to those of the Commonwealth itself, and the figures for 1912 not being available. It may be assumed, however, that the total output for the year would be approximately the same as that for the twelve months ended June, 1912.

The chief items making up this total of over 26 millions sterling are shown in the following table, which also gives the increase on the value of the previous year's production and the percentage improvement:—

| | £ | Increase. £ | Percentage of alteration on totals for 1911. |
|---|---|---|---|
| Gold .. .. .. .. | 9,940,556 | — 773,180 | 7.3 dec. |
| Silver-Lead .. | 4,876,769 | 714,496 | 17.2 inc. |
| Zinc .. .. .. .. | 1,766,459 | 351,290 | 24.8 inc. |
| Copper .. .. . | 3,254,231 | 677,567 | 26.3 inc. |
| Tin .. .. .. . | 1,348,992 | 139,019 | 11.6 inc. |
| Coal .. .. .. .. | 4,580,479 | 466,469 | 11.3 inc. |

Of these chief lines the proportions of the various divisions of the Commonwealth and Papua are as follows:—

| | N.S.W. | Vic. | Qld. | W.A. | Tas. | S.A. | N.T, | P. |
|---|---|---|---|---|---|---|---|---|
| Gold .. .. | 7.0 | 20.5 | 14.9 | 54.9 | 1.6 | 0.3 | 0.2 | 0.6 |
| Silver-lead | 90.3 | - | 2.5 | 0.8 | 6.3 | - | - | - |
| Zinc .. .. | 100.0 | — | — | — | — | — | — | — |
| Copper .. | 17.8 | — | 52.2 | 1.8 | 13.5 | 14.2 | 0.1 | 0.3 |
| Tin .. .. .. .. | 25.0 | 0.4 | 27.0 | 5.2 | 40.3 | - | 2.0 | - |
| Coal .. .. | 83.4 | 5.6 | 7.4 | 3.0 | 0.5 | -- | — | — |

Of iron, which provides rather less than 1 per cent. of the total, New South Wales is responsible for 79.4 per cent., South Australia 15.4 per cent., and Queensland 5.3 per cent., the total being £171,642, a considerable decline from the £195,693 of the previous year. Gold, silver-lead, and zinc, in the proportions given, show only fractional differences on the previous year, but there are various changes of importance in regard to the distribution of the copper output, New South Wales' proportion running down from 23 to 17.8, Tasmania's from 15.9 to 13.5, and West Australia's from 3 to 1.8, while Queensland's has improved from 44.9 to 52.2, and South Australia's from 13 to 14.2. In coal New South Wales improved her percentage at the expense of Victoria, while in iron Queensland has fallen away seriously to the advantage of New South Wales and South Australia. As before, New South Wales is the prime producer of coal, silver, lead, zinc and iron, Western Australia of gold, and Queensland of copper, while in tin, which is the most evenly distributed of all the metals, Tasmania holds first place.

Finally we present another table showing the proportions in which the various State totals for last year were made up, nothing below 0.5 per cent. being included:—

| | N.S.W. | Vic. | Qld. | W.A. | Tas. | S.A. | N.T. | Pap. |
|---|---|---|---|---|---|---|---|---|
| Gold .. | 5.9 | 87.5 | 35.6 | 94.6 | 10.8 | 5.3 | 39.2 | 86.2 |
| Silver .. | 14.1 | — | 1.6 | — ) | | | | |
| Lead .. | 23.0 | — | 1.3 | — ) | 20.6 | | 1.4 | |
| Zinc .. | 14.9 | — | — | — | — | — | — | — |
| Copper .. | 4.9 | — | 40.9 | 1.1 | 29.4 | 86.6 | 6.9 | 13.8 |
| Tin .. | 2.8 | | 8.8 | 1.2 | 36.2 | — | 46.7 | — |
| Coal .. | 32.2 | 11.1 | 8.2 | 2.4 | 1.6 | — | — | — |
| Iron .. .. | 1.1 | — | | | | 5.0 | — | — |
| Antimony | — | 0.7 | | | — | — | — | - |
| Tungsten | | | 1.4 | | | | 5.8 | — |
| Gems (inc. opal) .. | | | 1.0 | | | — | — | — |
| Gypsum . | | | - | | | 1.7 | — | — |
| Phosphate | | | | | | 1.1 | — | — |

The total figures are: Gold, 37.9; silver-lead, 18.6; zinc, 6.7; copper, 12.4; tin, 5.1; coal, 17.4,

This table shows Victoria, West Australia, and Papua to be almost entirely gold States, and South Australia to be essentially a copper State, New South Wales, Queensland, Tasmania, and the Northern Territory being the four divisions of the Commonwealth that have a real variety of mineral wealth. In a future issue we propose to deal on similar lines with the total mineral production of the various States to date.

## COMMONWEALTH ELECTORAL BILL.

It is satisfactory to note that a Bill has been introduced in the House of Representatives for the amending of the Commonwealth Electoral Act, even though it is practically certain that the proposals contained in the measure will never be placed upon the Statute Book. The most important clause of all, perhaps, is that which transfers to a High Court or Supreme Court judge the question of electoral redistribution, which is at present entrusted to a separate commission for each State; but this is a matter with which we hope to deal in a later issue. The other main features of the Bill are the restoration of the postal vote, the restriction of the "absent vote" to those actually unable to vote at their own polling booths, provision for the signature of each elector on a ballot paper block which is to be retained by the electoral office, and the repeal of the law which makes it necessary that all newspaper articles dealing with elections during their currency should be signed. To every one of these provisions it is possible to accord a hearty measure of support, but it is quite certain that every one of them will be most vigorously opposed by the Labour Party. That party was responsible for the restriction of the postal vote, and was responsible for the extension of the absent vote, its motive in each case being the advantage of its own party. It is, of course, open to the opponents of the present Government to say that the desire to repeal these two provisions is likewise due to the partisan spirit; but, though no doubt to say so is correct so far as it goes, it does not cover all the ground. Most men looking at the matter without prejudice would be willing to restore the postal vote, because it is a reasonable privilege to accord and is practically unattended with danger of fraud; but the same people would object to the absent voting provisions of the present Act, on the score that, although convenient to the public, they are undesirable, as laying the way open to a great deal of dishonesty. In other words, whether these proposals of the Government be or be not put forward solely in the Government's own interest, they are fair and reasonable, and are not likely to be opposed save on selfish grounds by those who stand to lose by their adoption. The proposal that a ballot paper should be signed for is on quite another footing; but it is sure to be bitterly opposed on the ground that it will destroy the secrecy of the ballot. In reality it will do nothing of the sort; but it will go far to insure the dishonest man being deprived of his present privilege to cast two or more votes for every one cast by the honest one. Amongst the minor provisions of the Bill is one repealing the existing law that elections shall be held on a Saturday. The existing provision is another that was passed for purely partisan reasons, and it is unquestionably similarly partisan reasons that are suggesting its repeal. There is something to be said on each side of this case. There are many men who find it difficult to vote on any day but a Saturday, but it must also be remembered that there are many others who find Saturday the most awkward day of all for them to go to a polling booth. If election day were a public holiday it would not matter very much on which day of the week an election fell.

---

The Dredging Inquiry Board appointed by the Victorian Government to receive evidence and report upon the effects of this method of recovering gold and other metals in working prejudicially to agricultural and pastoral interests, only recently concluded its investigations and has not yet had time to make its report. As is usual in such appointments, the members were selected as being intelligent, reliable, and unprejudiced men, who could be relied upon to look facts squarely in the face and to form a just opinion upon the subject committed to them. It would, therefore, appear to be the duty of interested parties on both sides to await their report without attempting by other means than debate at the proper time and place to secure votes for their own view of the matter. When, therefore, Mr. Bowser, M.L.A., last week invited members of both Houses of the State Parliament to join a party which he would conduct over the district in the Ovens Valley which the Board had recently visited, the question suggested itself: Is he afraid that the Board's report will be adverse to his views as a "farmer's friend"? Or, possibly, Mr. Bowser was afraid that the report would not, even with his eloquent support, prove sufficiently convincing to move the Legislative Assembly to insist upon further and more drastic legislation for the hampering of the mining industry. It is not so very long since the dredging companies of the State were compelled at great expense to equip their plants with re-soiling attachments; if it should be sought to go further, and in some way put further burdens upon the shareholders, or further obstacles in the way of dredging operations, it may soon prove wiser to abandon the industry altogether. The closing sentence of the Sludge Abatement Board's report for 1912, however, suggests that even the farmers do not desire that. "There has been much less ill-feeling than formerly" (says that report) "between farmers and miners, the former mostly realising that, in a State which owes so much to mining, this important industry cannot be wiped out except for very strong and valid reasons." Of course, Mr. Bowser's explanation, that his object was to enable members to see for themselves the damage which is being done, can be easily appreciated; but that a flying visit such as the Parliamentary party paid to the district should be pitted against the exhaustive inquiries of the Board, is not complimentary to either the Board or the Minister who appointed it. If a week-end trip was all that the case called for, why incur the expense of a long and exhaustive inquiry?

* * *

Mr. Justice Higgins recently made a statement regarding certain remarks he had made during the hearing of the engine-drivers and firemen's plaint, which, as reported by the press, he considered might be regarded as a reflection upon the Industrial Court of New South Wales and the wages boards in different States. He said that he would not let the awards of the Federal Arbitration Court depend upon the findings of any other tribunals, not because the other tribunals were not doing good work, but because they might change their minds. If rates awarded were found to be right—as they generally were—he could see to it that the parties were bound by the Federal law. He then quoted what he described as a curious experience. He had been asked to make an order for preference against a company which preferred to employ non-unionist workmen. He did not want to make this order, and asked the company to give him an undertaking that they would not discriminate, which they declined to do. The State legislature just then passed a law forbidding discrimination, which, it was argued, would obviate the need for the order for preference. Mr. Justice Higgins' reply to this was that the legislature had changed its mind, which it might do again, and in that case he was going to make an order for preference—the only case in which he had made it yet—unless the company would give the Court an undertaking that it would not discriminate. It is quite clear from this that the Federal Arbitration Court, in the opinion of its President, is saddled with the terrible responsibility of being consistent: it may not change its mind whatever other tribunals may do. It also shows how absurd is the situation in which one tribunal stands as, in some cases, a corrective, and in others a monument to the folly of legislation which, in a supposedly united country, brings two sets of laws into conflict and disrepute.

* * *

With the air of one who blames another for a threatened calamity, and was personally willing to give up much to ward it off, Mr. T. M. Jude, General Secretary of the Federated Mining Employees' Association, wrote last week to the secretary of the Bendigo (V.) Mine Owners' Association asking for a further conference on the non-union question. He and his committee were afraid that the trouble might extend to a number of other mines, and, of course, they did not want that—provided they could get all they wanted without. The mine-owners had expressed their determination, and that of shareholders in most, if not all, of their companies, that the open mine must be maintained at all costs. The battle had already extended over 10 weeks at Bendigo, and things were no nearer a settlement than on the day the men went out at the behest of the union executive; the men had lost 10 weeks' wages, had grown weary of waiting about for the dole which the association could afford to allow them, had seen an increasing number of free labourers taken on to swell the total of non-unionists below ground, and were getting restive, chafing not so much against having to work with non-unionists as against not being allowed to work at all. The conference was granted, however, and was conducted in an admirable spirit. Mr. T. Howes, President of the F.M.E.A., wanted the matter settled "in the interests of the miners, the mine-owners, and the whole community"—always providing that the settlement must come about as they wished. The representatives of the mine-owners were, no doubt, touched by the tender regard for their interests which the Federation had developed during those ten weeks, but it failed to move them. Mr. Jude appealed to figures. There were 2100 members in the union, and only from 50 to 70 outsiders in the mines. "Why should four non-unionists have disrupted operations at the Virginia mine, where previously 90 men had been employed?" No one knew better than Mr. Jude that the Virginia non-unionists had had nothing to do with "disrupting" the mine, but had simply kept on with their work and told the union bosses that they had "no time" for them and their meddling. It was not even their unionist fellow-workers who had wrought the mischief. Mr. Jude and his colleagues were the authors of the disruption; and this fact was being brought home to them by the spectacle of impoverished families and men weary, not with labour, but with loafing. Mr. S. H. McGowan turned some of Mr. Jude's figures against himself. He had asked why should 70 men hold up 2100? Mr. McGowan wanted to know why 2100 men should be afraid of 70. The mine-owners, he said, were not at all disposed to sacrifice those 70 men for the sake of any union. Mr. Rankin put the essence of the employers' contentions clearly when he said that the question of non-unionism should never have been brought before the mine-owners; they had nothing to do with it, and that fact should be a sufficient reply. The offer was made to take back as many unionists as there was then room for up to last Thursday; after that day they would hold out no hope. The secretary then kindly consented to allow the present non-unionists to remain in the mines, if only the owners would see that all others who were taken on joined the union. But the owners were obdurate, and the officials left the conference without scoring a single point, but with the knowledge that the number of non-unionists in the mines is constantly increasing.

* * *

There is nothing half-hearted in the New Zealand Government's proposals for doing away with strikes and lock-outs, to judge by the proposals of the new Arbitration Act Amendment Bill, but with what success it will pass the ordeal of Parliament has yet to be seen. Certainly some of its provisions will be hotly opposed, namely, those which attach penalties to those offences. Should the Bill become law, every worker or every employer who, being bound by an award of a court, shall take part in a strike (or a lock-out, as the case may be) will be liable to a penalty up to £10, and a union which promotes it to a penalty of £1000, and those who aid and abet a strike, even by contributing to strike funds, are also penalised. If ten or more workers intend to strike, they must notify the Minister for Labour, setting out the grounds of such intention. On receipt of such notice, the Minister will direct the holding of a conference between the parties, or refer the matter to the Labour Disputes Committee for investigation. This committee will consist of at least three, and at most seven, members, and will represent employers and employees in equal numbers, and it will report the result of its mediation to the Minister of Labour, and make such recommendations as it may think fit, which will be made public through the press. Failing a settlement, a secret ballot of the men will be ordered, at which a bare majority will suffice to decide the issue submitted. If ten or more workers to whom this part of the Act applies strike without giving the necessary notice, each will be deemed to be a party to an unlawful strike, and will be liable to a maximum penalty of £10. The same provisions will apply to the employers who take part in a lock-out, but the maximum penalty in such case is fixed at £600. Another proviso of the Bill which will prove very unpalatable, particularly to the extremists who delight in pushing things as far as they will go and rely upon a form of "reconstruction" to save them from the consequences of their conduct, is that if a union has voluntarily or penally had its registration cancelled, and a new union has been formed, the new union may not include in its membership any who have taken part in an unlawful strike. As soon as a new union is registered, it will be bound by any award or agreement which concerned the cancelled union. These last provisions are a new departure in industrial legislation, and their fate in Parliament, and, should they be agreed to, in actual operation, will be watched with interest.

---

## NEWS AND NOTES.

The Automatic Gold Recovery (Jones Process) Ltd.—This is to be the name of a company now forming in New South Wales, to more fully deal with a process for gold extraction, which is the invention of Mr. S. N. Jones. The principal feature is that the ore is broken into a hopper, and by a succession of rollers reduced to a fine powder, which automatically sifts down into a calcining furnace, through which it is carried on a reverberatory tray, and at length deposited in a water sump. From here it is elevated to the amalgamator to receive a special patented process, and the recovery is complete. If laboratory tests go for anything the matter is an assured success. The capital asked for from the mining interests of the Commonwealth for the testing of the efficiency of a process for which great potentialities are claimed is £1250. Investors and others interested are referred to our advertising columns for fuller particulars of this venture, which, if successful, should mean life and vigour for many a languishing and abandoned field.

In connection with the report of the first annual meeting of shareholders in Iodide (Mineral Hill) Ltd. (N.S.W.), published in our issue of September 4th, our attention has been directed by the secretary to the reported statement of the chairman (Mr. C. H. Kerry), that £7 per ton was a fair average value of the stone being raised. He says that what the chairman really said was that £7 was the fair average profit per ton, after all charges amounting to £6 12s., had been paid.

Mr. F. W. Holst, chairman of the Central Plateau Co., informs us that the statement of our Ballarat (V.) correspondent, that the face of the 700ft. north drive is a little beyond the winze from 660ft., is incorrect, as this drive has to go about 100ft. before it will be under the winze.

The gold received at the Melbourne branch of the Royal Mint during the week ended on the 12th inst. amounted to 26,149.15 oz.

The full amount divided amongst shareholders by the Tongkah Harbour Tin Dredging Co., Siam, including the dividend payable on October 22nd, will then amount to £174,000.

Mr. Hartwell Conder, Tasmanian State Mining Engineer, who visited the Beaconsfield district with a view to the Department aiding in the restoration of active mining operations there, has advised the expenditure of £800 at the Blue Tier, and £200 on the North Tasmania mine. Arrangements have now been completed with the owners of the property. Messrs. Dally and Best and party, who represent the North Tasmania, have commenced active operations, and expect to be on payable stone in a short time. At the Blue Tier arrangements have been made with Dr. L. Gray Thompson, of Launceston, who holds the old Gladstone section, to sink on this old line of reef, and work has been started under the supervision of Mr. Birkett. Great interest is taken in the work to be carried out on this old field, as many are under the impression that this lode only needs to be sunk on, when something good will be revealed.

A find of copper is reported from Hillgrove. The outcrop, situated at Chandler Falls, is said to be from 40 to 50ft. wide, containing numerous segregations of copper ore which extend along the line of lode for a distance of from 600 to 700ft. Samples of the ore are said to present to expert examination a probable value of 30 to 60 per cent. copper.

During the half-year ended on August 31st, the South Madame Berry G.M. Co., of Allendale (V.), treated 1787 fathoms of wash for a return of 1698 oz. of gold, and at the close there was a credit bank balance of £694, while stores represented £175. Against these assets was £455 due to sundry creditors.

The recovery of stream tin by the Pioneer Tin Mining Co., Bradshaw's Creek (T.), during the year ended with June 30th amounted to 429¾ tons from 621,200 cubic yards of sluicing material, as compared with 475 tons from 667,300 cubic yards in the previous year. The manager, Mr. C. G. Ryan, attributes the diminished quantity of dirt treated, largely to "the driest autumn experienced for 18 years"; but that the ground worked was of somewhat lower value than usual is shown by the fact that the average per cubic yard was 1.547 lb. as compared with 1.593 lb. in 1911-12, and with 1.904 lb. the average for the years 1910-13. Fortunately the price of tin ruled unusually high, so that the financial results of the year's work were less seriously affected than they otherwise would have been, the value of tin sold and that still on hand being £67,140, and, deducting the tin on hand at the end of the previous year (£9112), the year's production was worth £58,029. Working expenses and other charges took £21,970, leaving a profit of £45,170, from which dividends, amounting to 4s. 3d. per share, absorbed £34,264 and taxes £2199, while £10,000 has been written off for depreciation, and a balance of £17,257 is carried forward. Tin on hand stands at £9474, and stores are represented at £2428.

A new contract has been entered into between the Mungana (Chillagoe) Mining Co. and the Chillagoe Company (Q.), under which the former will supply, and the latter will treat a largely-increased tonnage of ore. It is desired to make immediate efforts at the mine to increase the shipments, and more men are required, especially machine men, miners and truckers.

Tributers in the Victoria Proprietary mine, Bendigo (V.), obtained, last week, 62 oz. of gold from 35 loads of stone taken from the direction of the Goldfields South boundary.

A new company has been formed, the Cowell Consolidated Silver and Copper Mining Co., amalgamating the Cowell Proprietary and the Cowell Blocks companies (S. Aus.), the capital being £75,000 in £1 shares. The Proprietary shareholders will receive 11,000 shares, and the Blocks Syndicate 16,500, while 22,500 are offered to the public and 25,000 are held in reserve. A trial parcel of 100 tons of copper ore is being taken out of the promising lode discovered about a mile from the parent mine, which assayed from 30 to 40 per cent. copper, and this will be sent to the Wallaroo smelters.

Chas. Ruwolt Pty. Ltd., Victoria-street, Richmond, Melbourne, have recently constructed, to the order of the Philippine Dredges Ltd., some very powerful machinery for a bucket dredger. This machinery has been designed to meet all modern requirements, and noteworthy examples are the top and bottom tumblers. The top tumbler is of somewhat unusual design, being 5-sided in place of 4-sided, but this design of tumbler has given excellent results in actual practice, and, to minimise wear, the face of tumbler is lined with hard steel slabs. This tumbler, as well as the bottom tumbler, which is 6-sided, weighs about 7 tons. The ladder is also of special design and strength, being of the trussed girder type, 80ft. long and 6ft. deep at centre, the weight being about 24 tons. To complete this section of dredging machinery the builders are now making a full band of 8 cubic feet close-connected buckets of massive proportions. The first shipment of machinery left Melbourne last month, and it is anticipated that the balance will be completed in from 8 to 10 weeks. When erected the dredge should have a capacity of at least 25,000 yards per week, making it one of the largest-capacity plants in this part of the world.

For the half-year ended on April 14th, the Bank of Australia has declared a dividend at the rate of 14 per cent. per annum, and a bonus of 12s. per share, making about 17 per cent. per annum and absorbing £170,000; a further £50,000 was added to reserves, bringing them up to £2,660,000; £20,000 was written off banking premises; a bonus of 10 per cent. was allotted to the staffs, and a balance of £29,192 is carried forward.

The Political Labour League of Broken Hill (N.S.W.) decided last week to request the Parliamentary representatives of the district to endeavour to insert a clause in the State's Mines Act Amendment Bill, making it compulsory for miners to carry chalk and mark the holes when firing, so that they may be easily detected when they miss fire.

The Minerals Separation flotation plant of the Wallaroo and Moonta Mining and Smelting Co. (S. Aus.) is giving the magnificent return of 95 per cent. of the copper contents of the crudes.

The output of the Edna May G.M. Co., Westons (W.A.), for the period ended on the 6th inst., was 995 oz., of the value of £4005, from 1116 tons of stone.

The Broken Hill Proprietary during the four weeks ended with August 27th, raised 24,304 tons of crude ore. At the ore-dressing mills 22,204 tons of crude ore were treated, and 19,266 tons of dump tailings re-ground, for a joint production of 5253 tons of lead concentrates and 5200 tons of slimes. At the re-grinding plant twin-screw feeders have been provided for feeding each of the tube mills, effecting a substantial economy. In the zinc flotation plant 6520 tons of zinc concentrates were produced during the term, assaying 46.22 per cent. zinc, 7.24 per cent. lead, and 12.72 oz. silver per ton. The sulphuric acid plant made 496 tons of sulphuric acid (strong), 182 tons of which was obtained from the roasting of zinc concentrates. From Iron Knob 4414 tons of ironstone were sent to Port Pirie for use as flux. A temporary electric-light station having been completed at the site of the iron and steel works at Newcastle, three shifts are now being worked daily at construction work.

A notable blasting operation was accomplished at the Harcourt (V.) granite quarries on the 4th inst., which separated a massive block containing between 90,000 and 100,000 cubic feet and weighing approximately 8000 tons. Preparatory work had been going on for a long time. Two men, with an Ingersoll jack-hammer, driven by compressed air, were employed for about eight months in taking out a gullet 60ft. long and 30ft. deep along one side of the block, and a large quantity of explosives was used in the process. The way was thus cleared on one side. On the other side, running parallel with the gullet, but 54ft. away, a natural joint ran through the stone. The object was to make a break from this joint to the gullet. A hole 4in. in diameter and 20ft. deep was drilled in the solid stone and charged with half a hundredweight of powder. When exploded, the block was broken across 54ft. of solid stone 30ft. deep, and shifted bodily a distance of 4in. from the break. It was hardly hoped that the mass would have been secured in one block, but so skilfully was the operation devised and carried out that the owners may take the credit of having shifted what is probably the largest solid mass of stone ever moved in Australia. Several large dividing cuts will now be put in to enable the cranes to deal with blocks of more convenient sizes according to orders received. It is said that one of the first of these smaller stones to be secured will be those required for the King Edward Memorial to be erected in Melbourne.

It has been decided to double the capital of the Infusorial Earth Co., N.L., by raising the value of its 24,000 shares from 5s. to 10s. each.

Very satisfactory assay results have been obtained respecting the stone in No. 2 bore on the east lode at the Hercules G. and S. Co.'s mine, Mt. Read (T.). As stated last week, the bore is put in diagonally underfoot from No. 4 level towards No. 5 B crosscut. Before the end of last week it was in 100ft., and the manager telegraphed that the assay at 82ft. was:—Gold, 7½ dwt. per ton; silver, 6½ oz.; lead, 4 per cent.; zinc, 41 per cent. At 85ft. the assay was:—Gold, 12 dwt. per ton; silver, 19 oz.; lead, 20½ per cent.; zinc, 40 per cent. At 87ft. the values were:—Gold, 9 dwt.; silver, 10 oz.; lead, 19 per cent.; zinc, 35 per cent.

Bendigo's (V.) share of the proceeds of the Wattle-day carnival promoted by the local branch of the A.N.A. in aid of the Worn-out Miners' Fund, was £91 16s. 1d.

The balance of Mr. A. J. Higgin's paper on Thermit Welding will appear in our next issue. It may be mentioned that, by a printer's error, the first of the blocks in illustrations of the first part of the article, which was published in last issue, appeared upside down.

## BRIEF COMMENT.

The British Australian Oil Co. Ltd. is on its trial, and the new company will have to make an entire reconstruction of the management, as stipulated for by the guarantors (The General Investors and Trustees Ltd.). The shareholders, under the terms of the reconstruction, will receive a share in the new company, credited as paid up to 15s., for every £1 share held in the old company. In other words, they are asked to consider their old shares as worth no more than 15s., and themselves as still liable for another 5s., payable at the rate of 1s. on application, 1s. on allotment, and thereafter in calls of not more than 1s. at intervals of not less than three months. The future of the company is by no means assured by its fresh lease of life, and it can hardly be said that even the board of the company views the outlook too optimistically. The provision for the entire reconstruction of the management indicates that the previous management probably had something to do with the plight of the company. However, the road is clear for the new company, and it is to be hoped it will worry through.

While it is obvious that the promotion of the Mt. Oxide Co. (Q.) in London to the status of a first-class mining company should lead to considerable interest being evinced in the field, it is inconceivable that this should lead to the market valuation which has been made of Oxide Creek Ltd., as the position of that mine is certainly not such as to warrant it. It is quite probable that the bears, knowing that a good many factors were against an ill or well-directed "boost," sought to take advantage of that, and were "hoist with their own petard," so to speak. Many vexatious delays will occur before the field is accessible by a railway; and until this facility is afforded genuine investors would be well advised to hold off.

The statement that the Gippsland copper mine will probably have to close down on account of the failure of the Government to subsidise development work in it to the extent of £1500 is saddling the Government with the responsibility for the mine being subjected to that fate. According to what information can be gathered on the matter the Department's refusal to grant the sum stated is due to the fact that, in the opinion of the Departmental officers, it is totally inadequate to prove the mine. Applicants for State aid should bear in mind that the department is responsible for the justifiable expenditure of the people's money; and if, in the opinion of its officers, any aid sought is likely to be abortively directed, a refusal to grant it is no more than can be expected.

In the provisional directors' report, read by the secretary at the first general meeting of shareholders of the Carpathia Tin Mining Co., Ardlethan (N.S.W.), the cat is rather let out of the bag, by the statement that "the rich streaks of ore (in Dumbrell's Bygoo) have been more or less impoverished, but that there is reason to believe, if time is allowed for more systematic working, that other tin veins may be located." The chairman further gives a forecast of the result of the expert examination now being made of the property (although he says he will not attempt to anticipate those conclusions) by saying: "The outlook, I am sorry to say, is not encouraging, the rich surface wash veins and deposits will soon be depleted, although their recurrence in the deeper ground is almost certain. The field must depend on its big low-grade deposits. If they are found to average under 2 per cent., there is no hope of their paying under existing conditions. What is wanted at Ardlethan is an assured water supply from the Murrumbidgee. That would cost £100,000. Also a complete modern milling and smelting equipment, which would cost another £100,000. There is no prospect of these things being obtained until at least a million tons of 1 per cent. to 2 per cent. metallic tin ore have been developed. That is our aim. Subject to the recommendations of our expert advisers we are ready to spend our capital in establishing tonnage and values, and I shall be ready to go elsewhere, if necessary, for the money to revive Ardlethan. If, on the other hand, we are advised to close down, or, if, after another trial, we fail—well, we must take our gruel."

Attention has recently been directed in the West Australian press to the geological report of Dr. Malcolm Maclaren on the Kalgoorlie field. It is interesting to note that other authorities on the field do not hold with Dr. Maclaren in his opinion that the Ivanhoe east lode will be found below the porphyry dyke, which commences at a depth of 1070ft. in the company's property, and extends to well over 3000ft. It might be pointed out that Dr. Maclaren commenced his examination of the belt known as the "Golden Mile" about five years ago; and, while this has been done chiefly on behalf of a few of the big companies there, the investigation has been carried to every point on the field, and has been of the most microscopic nature. An incident, which proves that expert geological knowledge is worth something, occurred in connection with the famous "Oroya" pipe, which cut out completely after having been the "bank" of the Oroya Brown Hill Co. for years. Rising, sinking, crosscutting and driving in the vicinity revealed nothing, and left all the parties concerned exceedingly mystified. It was left for Dr. Maclaren to point out that a displacement had occurred, and that the continuation (if any) of the pipe would be found some considerable distance from the spot at which it had been lost. This necessitated development work from an adjoining property, but it was carried out, and at the point sought country identical with that in which the pipe had lived in the Oroya Brown Hill was found. The shoot of gold, however, was not in it; but the evidence found in the vicinity that Dr. Maclaren's theory was right was so convincing that all further hope of the pipe "living" was abandoned. That private companies are concerned in the examination, and that certain facts therefore cannot be made public, except by consideration of the parties interested, is to be regretted. That the general result of Dr. Maclaren's researches, which will be made known very shortly, will be of immense value, there can be little doubt, and while local authorities may differ from him in many respects it may be said that none of them knew there was anything to differ about until they were informed of it.

The persistency of Mr. Thrower, the member for Macquarie (N.S.W.), in asking for a State battery for Stuart Town, has been rewarded by the extraordinary admission from the Minister of Mines that "he (the Minister) had begun to think he could see his way clear to establish a battery there." It would be interesting to learn if the Minister has begun to think that State batteries are very questionable enterprises from the financial point of view, and if his proclamation, volunteering to provide 75 per cent. of the cost of batteries if others interested will provide the remaining 25 per cent., is an indication that he has found State batteries to be a financial burden on the treasury. The point is, if there were no State aid of any description, would the resources of the country remain undeveloped? We think not; and the policy of making the units of a country unwilling shareholders in a variety of State enterprises has nothing to recommend it, and less to support it.

The Bald Hill Osmiridium Mines, No Liability, has been registered on the Sydney Stock Exchange. The company has a nominal capital of £12,500, in 1250 shares of £10, the subscribed capital being 650 shares fully paid to £10 (vendors), and 500 shares paid to £2, 100 shares being held in reserve. A Melbourne syndicate has also been formed to exploit the alleged lode two miles to the south of Bald Hill, so the value of the field should be fairly well determined as the result of this activity. Regarding the find, to the south of Bald Hill, it is claimed by the prospectors that the so-called lode exists on each side of a gorge some hundreds of feet in width. The state is misleading. Actually, the "lode" is only definable on one side of the gorge, the continuity of it on the other side being assumed in consequence of the presence of floaters. It is much more probable that the floaters have been shed from the higher ground into the gorge, and, in view of the topographical situation, are of no value as a guide to the continuity of the lode.

## PERSONAL.

Mr. E. F. Pittman, Under-Secretary for Mines in New South Wales, has been in Victoria lately, and last Saturday visited Ballarat in connection with the preparation of the handbook for the use of members of the Science Congress to be held in Australia next year.

Mr. B. Whitington, who, after filling the position of science master at the Ballarat (V.) School of Mines for several years, is leaving to take up the position of director of the Queenstown (T.) School of Mines, was accorded a farewell by the staff at Ballarat last Saturday.

Mr. E. O. Marks, lately assistant Government Geologist of Queensland, resigned in order to take up the study of medicine at the Dublin University. No effort has yet been made to fill the post, but it is to be advertised shortly.

Mr. F. A. Campbell, who recently resigned his position as director of the Working Men's College, Melbourne, on the ground of ill-health, was entertained by the president, who, however, was prevented from attending the gathering. Mr. W. H. Haigh, who occupied the chair, presented Mr. Campbell, on behalf of the council, with an address, and mentioned that it had been found possible with the co-operation of the Government to make a grant of a pension of £250 a year to their director. Mr. Campbell had been connected with the college for 27 years.

Mr. G. H. Knibbs, the Commonwealth Statistician, has been elected a member of the International Statistical Institute, of which the membership is restricted to 200. The Institute, which was founded in 1885 by an assembly in London of statisticians from all parts of the world, has for its main object to compare the work and method of statistical inquiry in different States, and to evolve a uniform method of collecting and classifying statistics.

Mr. John Tamlyn, for many years associated with mining in and around Bendigo (V.), and who, in the early days, in partnership with Mr. W. Maynard, erected the machinery at many of the mines, died there on the 10th inst., at the age of 79 years.

Mr. Bowes Kelly has been appointed vice-chairman of the board of the Mt. Lyell Mining and Railway Co. (T.).

Mr. W. L. Baillieu, M.L.C., and honorary Minister, who has been for many months in London, proposes to sail for Australia by the R.M.S. "Medina" on the 22nd inst. Before leaving Melbourne, Mr. Baillieu held the portfolio of Commissioner of Public Works, and was also Minister of Public Health and a Vice-President of the Board of Land and Works.

Mr. Charles Wood, a member of the Bendigo (V.) Stock Exchange since 1889, and at one time its chairman, died at Bendigo on the 11th inst., at the age of 55 years. Deceased was a native of the town, his parents having been amongst the pioneers of the goldfield. It is exactly 21 years since the formation of the firm of Wood and McNair, of which deceased was the senior partner.

Sir George Reid, High Commissioner for the Commonwealth, left London with his family last Friday for Australia on six months' leave.

Mr. J. C. Ross, at present engineer to the Warrnambool (V.) Town Council, has been appointed city engineer to the Hobart City Council.

Mr. Motoyoshi Yamashita, mining engineer, of Ikuno mine, Japan, has lately been visiting and inspecting the Mount Lyell Company's mine and reduction works, in order to gain a close acquaintance with the methods pursued by the company.

## METAL QUOTATIONS.

### By Cable.

(From Our Correspondent.)

London, Tuesday.

Prices for industrial metals were easier last week than in the previous one, but a fairly high level was maintained. It was hardly expected that the high rate paid a fortnight ago for tin would be maintained, but copper held its ground well, and the week closed with a rising market. Electrolytic copper was in strong demand, and on Wednesday as high as £77 10s. per ton was paid, or £4 10s. more than for ordinary standard metal. The price of lead weakened daily, and spelter eased somewhat.

COPPER.—The opening day's quotation for spot delivery was £74 17s. 6d., showing an advance of £1 on the previous Friday's rate, after which the price eased to £73 12s. 6d., £73, and £72 12s. 6d., but rose on Friday to £73 5s.

Three months' orders were taken at £73 17s. 6d., or 15s. more than on the previous Friday, the subsequent rates being £73 2s. 6d., £73, £72 10s., and £73.

Electrolytic, which opened the week at £76 10s., went to £77 5s. and £77 10s., dropping back on Thursday to £77 5s. Yesterday's quotation was £77 10s.

TIN.—Spot lines on Tuesday fell from the previous Friday's quotation of £195 10s. to £194, the quotes for the three following days being £193 5s., £193 10s., and £193 5s.

For three months' delivery there was also a fall of 30s. per ton on Tuesday, the rates for the week being £193, £192 5s., and £192 15s.

LEAD brought £20 7s. 6d. on Wednesday, as compared with £20 15s. at the previous week end; the price then rose to £20 10s., but fell to £20 2s. 6d. The imports into the United Kingdom during August were 17,189 tons, including 4962 tons Australian. Exports amounted to 4984 tons.

SPELTER was quoted on Thursday at £21 7s. 6d., as against £21 10s. a week earlier, and £21 a fortnight earlier.

SILVER.—Prices were higher, opening with a rise of $\frac{1}{16}$d. to $27\frac{9}{16}$d., and rising to $27\frac{5}{8}$d. and $27\frac{3}{4}$d.

ANTIMONY.—There was no change for either "Star" brand metal or 50 per cent. ore, the quotations being still £29 10s. and £6 5s. per ton respectively.

WOLFRAM (70 per cent. ore).—The market recovered the ground lost last week, the rate being again 33s. 6d. per unit, equal to £117 5s. per ton.

MOLYBDENITE showed no change from 2s. 8d. per lb., equal to £298 14s. per ton.

MANGANESE (50 per cent. ore) was firm at 10d. per unit, or 41s. 8d. per ton.

# THE INVESTOR'S COLUMN.

## Some Companies Attracting Attention To-day.

(By Our Exchange Reporter.)

### Ajax North (V.).

Up to the present it can hardly be said that this stock has made as much progress in public estimation as was confidently anticipated some six or eight months ago, and it may therefore be inferred that the stone met with in sinking the shaft has not proved to be of quite as good value when driven on as was at first expected.

The quotations were at one time in the vicinity of 12s., but since then, despite several moderately-pronounced fluctuations, they have declined to 7s. 6d., with this month's call paid.

This is a matter for regret, as the introduction of another payable mine would be of considerable service to the Daylesford field just at present, for the reason that none of the companies there, with the exception of the Ajax Central, can be regarded as regular dividend payers. The Ajax certainly has for a Victorian gold mine an unusually large reserve fund, and is apparently also getting stone of a more payable quality than has been available for some time. The North Nuggety Ajax is a little more than paying its way, while carrying on a lot of important prospecting work, but it is just a question whether the last dividend should have been paid, and another can hardly be expected until the extension into the mine of one of the Ajax Central reefs has been proved. As for the Nuggety Ajax, it has become almost a dead letter as far as public interest is concerned. Under these circumstances a favourable development would be very acceptable to the market, and it was hoped that this had occurred at the Ajax North about three weeks ago. Recently the main development work has been the continuation of the level at seven hundred feet on the vertical reef southward towards the Ajax boundary. The stone met with here is of a veiny character, and may be classified as just about payable. Going North from the shaft moderately payable stone was met and followed, until cut off by a dyke, the average width being 4ft. over a distance of 180ft. A drive north was also put in at the No. 6 quite recently, and after going twelve or fifteen feet, about a foot of stone was met with carrying payable gold, and this stone is believed to be identical with the reef cut in the shaft at the lower level; this drive is in about 30ft. Payable stone has thus been proved going north at both levels, and fairly payable south. The company's prospects may therefore be considered good, but a more definite opinion on the value of the shares may be formed when the reef is opened up at the next level; it is therefore satisfactory to know that shaft sinking has been resumed, a depth of 722ft. having been attained. This work has already been attended with promising results, three feet of fairly good stone having been passed through, and this believed to be the downward continuation of the reef met with at the level above. But although the management is pushing on with the necessary work for proving the value of the mine, a period of shaft sinking is often associated with declining prices, and the shares of this company are not an exception in this respect, for although the quotations improved to about 10s. on the announcement, three weeks ago, of the development at 600ft., they have since fallen, as already stated, to 7s. 6d. This company should prove to be a successful one, and the shares are a very legitimate mining speculation.

### New Langi Logan (V.).

The accident to the pumping plant of this company, although only one of the setbacks to which mining enterprises are subject, is particularly vexatious in this particular instance, inasmuch as it delays the progress of the draining operations, which constitute at the present moment the main work of the company, and until which is accomplished the producing stage cannot be commenced. So far the progress has been steady and well sustained, the water pressure above the gravel having been reduced to 30 lbs. to the square inch, which is almost sufficiently low to justify putting up a rise into the wash. No risks are, however, to be taken, and a further reduction of 5 lbs., making the water pressure 25 lbs. to the inch, will be made before this important work will be undertaken. It is probable that but for the recent mishap to the machinery another month or six weeks' pumping would have been sufficient to bring about the required reduction in pressure, but allowing for the time now necessary to effect the repairs, it seems certain that another three months, perhaps longer, must elapse before the wash can be entered. Such wearisome delays are very trying to the patience of shareholders, some of whom have shown their faith in the mine by holding on to their shares, first of all through the great market boom in the midst of which they were floated, and when their price rose to nearly 40s.; secondly, through the period of depression which followed on the boom, and last of all, through the stage of dead work, slow development and call paying which are associated with nearly all deep lead alluvial ventures. When such confidence in a mining stock is shown by its shareholders there is generally some solid basis for their faith, and it may be said that if the New Langi Logan does not prove to be a payable concern, then few investors will again be tempted to risk their capital in an alluvial mine. The main grounds for hopefulness regarding the future of this proposition are to be found in the prospects obtained from the bores which have been put up into the gutter. The number of these bores is 36, and with the exception of the first (which did not go up into the gutter), gold has been found in them all. These are very reassuring results, and although there are instances of where the subsequent working of an alluvial lead has not fulfilled the hopes based upon payable boring prospects, which cannot therefore be regarded as absolutely reliable, still in the case of this company they have been carried out in so thorough a manner, and the results have been so consistently good, that it may be taken as assured that the gutter will prove to be a payable one—it may be sensationally so. The width is perhaps between 700 and 800ft., which is not too wide for payable gold distribution, although there will no doubt be channels of varying values through it. The New Langi Logan Company is perhaps the greatest Victorian gold mining enterprise of to-day, and any serious accident to its development work would be almost a public misfortune; it is therefore satisfactory to know that the mishap to the machinery is merely a setback, which affects only temporarily the working operations. Nothing has occurred to alter the generally-favourable opinion of the prospects of the company, and a reduction of 2s. in the price of the shares is quite out of proportion to the seriousness of the accident. It affords a good opportunity for buying.

---

# MINING IN WESTERN AUSTRALIA

(From Our Correspondent.)

Kalgoorlie, September 8.

It is reported here that the Great Unknown at Marda, 110 miles north of Southern Cross, has been acquired by a Melbourne syndicate. This mine was bought from the prospectors in 1911 by D. L. Doolette, C. Jones, A. M. MacIntyre, Randolf Bedford, and Gerald Williams. The reef on the property is 12 to 18in. wide, and, in the sulphide zone, the ground is too hard to work profitably except by machines. There is no mill in the district, owing to absence of water, and ore has to be carted 12 miles to Mt. Jackson for treatment. A year ago Charlie Jones, the prospector of Bullfinch, determined to instal machines and sink for water, and erect a mill, but the project fell through, as the rest of the party would not provide the cash. Up to date 555 tons have been treated for a return of £9600, exclusive of gold in residues, and another 100 tons, estimated to be worth £16 per ton, are ready for the mill. This is all picked ore, as it does not pay to cart and treat even 2 oz. ore where costs are so high and no immediate returns can be got from the tailings.

The Golden Ridge Co., which holds options on the Yerilla King, Viola, and Yerilla Queen, has applied for another 15 acres on the western boundary. All the mines are now being developed by contract labour to give the reef a thorough test during the option period, which has still fully four months to run. Except that the reef is only 12 to 24in. wide, the proposition looks a good one. This reef is now being opened up at 130ft. and 230ft., and carries very consistent values in the three leases held under option. The ore treated at the Government mill returned £18,610 from 4450 tons, or 83s. 8d. per ton. The company is still making a profit of £1000 a month from the Golden Ridge mine, and have enough cash in hand to go on with.

Mr. M. T. Williams, manager of the Edna May at Westons, was in Kalgoorlie during the week, and poohpoohed the idea of the intrusion of granite cutting off the reef either in the Greenfinch or the Edna May. Mr. Williams gave it as his opinion that the mode of occurrence of the Edna May formation was due to the shearing of the intrusive granites with the schist rock. In August, 1905, shortly after Messrs. Bewick, Moreing and Co. took control of Burbank's Birthday Gift mine, similar granite intrusions appeared at No. 9 level, and, two years later, in August, 1907, owing to the granite persisting, development was stopped, and the mine handed over to tributers, and is still in their hands. The shaft has not been sunk a foot in 8 years. In August, 1912, a granite intrusion cut off the reef in the Royal Standard at Yuin at a depth of 299ft., and the manager called it a fault. In March, 1913, the shaft was still in granite at 334ft., since when sinking has been suspended. The East Bullfinch had a similar experience in 1911, and the lease was promptly abandoned. It is possible that the granite intrusions at Westons are merely isolated patches, but that has to be proved, and, apparently, Mr. Stuckey, manager of the Greenfinch, is more than doubtful. The new shaft on the Edna May has safely passed through the "puggy" ground, and is expected to reach 150ft. by the end of the month, after which crosscutting for the reef will be started. The mill is treating 1100 tons monthly, and there is enough ore in sight above 70ft. to keep the mill going for 12 months at least.

The Victorious at Ora Banda has not fulfilled anticipations at No. 5 level. The first 32ft. driven east carried low values, and for the next 80ft. the grade has averaged 73s. 6d. per ton. The west drive averaged 17s. 6d. per ton for the first 12ft. driven, and since then silence has ruled. The forwarding of sulphide ore to Boulder has been very slow, and only a small tonnage of ore and 40 tons of concentrates were treated there in August. Mr. W. Martin, after a short holiday, has resumed control of the mine, and feels disappointed at the present position of affairs. Mr. G. M. Roberts, the consulting engineer, appears certain that the sulphide zone will yet turn out trumps, but Mr. Roberts is more of a metallurgist than a miner, although he has had a long experience in this State, having been in charge of the Mainland Consols, near Cue, in 1896, and was subsequently metallurgist on the Great Boulder.

The pegging of the Sydney Norseman and Cachuanca leases by the management of the Mararoa is a direct result of the prominence given to the Norseman lode by the success of the Viking Syndicate. After the latter's rich discovery at 600ft., and the exhibition of phenomenally rich specimens, the adjoining northern leases, the Mildura and Hardy Norseman, were applied for by Rawlings, Bullen and Rumble, and these adjoin the leases now applied for by the Mararoa management. All this area of over a mile on the strike of the lode was tied up from 18[illegible]6 to 1904 by the Norseman Gold Mines Ltd., who never had enough capital to work an area of 227 acres. Their deepest shaft —the Viking—was 574ft. incline, and 400ft. vertical, and the last 124ft. was sunk, backed by a Government subsidy of £1 for £1. The shaft was then stopped from 1901 till May, 1913, when the Viking Syndicate resumed work, and, after sinking 26ft. only, struck ore valued at £2000 a ton. This was a patch, but may lead to something permanent. Since 1906 the Viking Syndicate has treated 11,650 tons for £85,300 from above the 480ft. level, and are now crushing 450 tons monthly for £1600.

According to a circular published in London, the total return from the 60 hours' run in June of Mr. Ben Howe's volatilisation process was only £39. As 45 tons were treated, this shows an extraction of 17s. 4d. per ton only. In Mr. Howe's press interview he said that extractions of 95 per cent. were possible, and of 90 per cent. were assured. Just before the mill ceased running in 1910 the ore reserves of the Gwalia Consols were published as 48,690 tons, worth 31s. 10d. per ton. The actual crushings of the group of mines forming the Gwalia Consols totalled 269,250 tons for £439,700, or 32s. 8d. per ton, so that Mr. Ben Howe's extraction, instead of being 90 per cent., is barely 55 per cent. This practically confirms the results achieved by other Kalgoorlie metallurgists, which give extractions, or rather recoveries, varying from 35 to 95 per cent. The volatilisation is easy, but precipitating the gold afterwards through relays of coir matting, as practised by Mr. Howe, is as tedious and uncertain as Cassell's precipitation of cyanide gold by charcoal, in 1884. At that time the late Sir Charles Tennant, then chairman of the leading Mysore gold mining companies, offered a prize of £100 to any student of Glasgow University who could discover a precipitant more effective and quicker than charcoal. The prize was won in 1887 by John Stewart MacArthur and William Forrest, the joint patentees of the MacArthur-Forrest process of precipitation by zinc shavings, and revolutionised gold mining. Sooner or later some experimenter is bound to solve the question and give a fresh impetus to gold mining. Will no philanthropic millionaire of the Sir Charles Tennant type offer a substantial prize to the students of the various schools of mines in Australia to stimulate the search?

# OUR BIG MINES.

## Examinations of Their Yearly and Half-Yearly Reports.

(By a Mining Accountant.)

### Wallaroo and Moonta Mining and Smelting Co. Ltd.

Half-year to June 30, 1913.

The directors' report for the half-year does not show any of the revenue accounts, and, in fact, barely touches upon matters financial. It deals mostly with the underground developments and new surface equipment. The estimated profit is referred to, but the amount does not come in for mention. The report states that owing to the lower prices for copper the estimated profit was adversely affected. The half-yearly average for copper was £67 11s. 3d., as against £73 1s. 3d. for the previous twelve months. Other unfavourable factors that contributed toward the reduction in the profit were the heavy special expenditure incurred in connection with the new flotation plants at both mines, and the special exploratory work at Moonta, below the 1200ft. level on the West lode. Under the circumstances the board has not felt justified in declaring more than a shilling dividend for the quarter, payable on September 23.

The half-yearly output was:—

| | Ore. | Fine Copper. |
|---|---|---|
| Wallaroo mines, tons .. .. | 29,324 | 2,415 |
| Moonta mines, tons .. .. .. | 3,080 | 337 |
| | 32,404 | 2,752 |

In addition there were 6½ tons of fine copper from the precipitate at Wallaroo, and 377 tons from the precipitate at Moonta, making a total of 3135½ tons, not including 291 tons obtained from purchased ore. The smelter output was 3610 tons of refined copper. The average of the Wallaroo ore is stated at 8.24 per cent. copper, and that of the Moonta 10.94 per cent. But this old company has a strange way of presenting its information. The crude ores direct from the mines are nothing like so rich as the figures suggest. They are first concentrated to bring them to the indicated grades. Whether these grades represent the assay value of the enhanced product, or whether they represent the extraction obtained by the furnaces which smelt that enhanced product is a matter of doubt. The report merely states that the total weight of fine copper received from the mines, in ore and precipitate, was 3135 tons. The tonnage and grades of the crude ore from the mines nowhere appear.

The Wallaroo and Moonta is a queer mixture of the antiquated and the modern. This is evident throughout the various plants, where relics of a bygone age are in operation side by side with the very latest appliances. As a sideword, it cannot be said that this curious feature extends to the accountancy department. This latter, as evidenced by the company's publications, is wholly obsolete in method. But as there are no accounts to deal with in this particular report, this reference to them must serve as an introduction and dismissal. Returning to the subject of plant, it is interesting to note the success achieved in the flotation treatment, at both the Wallaroo and Moonta mines. At the Moonta the process is "in partial operation. So far as this treatment has progressed, there is every evidence that it will materially assist in turning to good account low-class veinstuff that would otherwise have to be rejected as useless."

The report is chiefly interesting because of its underground information. Taking each of the mines in turn, the following are the leading features:—

#### Wallaroo Mines.

Here it has become imperative to devote extra attention to development work. After an interval of two years, sinking has been resumed at Taylor's shaft. This was deepened 70ft. The drives at the 2430 and the 2310ft. levels were extended in "veinstuff of fair quality." Young's shaft was deepened to 2234ft. The results that have attended development and exploration are not detailed; in general, they are illuminated by the statement that "if the deepening of Taylor's and Young's shafts can be continued with the same satisfactory dispatch that has recently obtained, and the new ground can be opened of the same class as is now exposed in the deepest drives, there is every prospect of being able to provide regular supplies of ore equal to the present rate of extraction."

Prospecting work, by driving and diamond drilling, at 1950ft. level west of Young's shaft, was not rewarded with any particular success, but a continuance of the operations is warranted. Similar testing at the 1590ft. level east of Taylor's, and beyond Boor's shaft, did not indicate anything of much promise, and this work is now in abeyance.

#### Moonta Mines.

A winze is being sunk below the "1200 level Taylor's west lode." Above the winze the lode is 10 or 12ft. wide, and the copper contents vary considerably between the hanging and footwall. A similar variation may be expected in depth. The winze, to a depth of 80ft., disclosed lode material averaging 2 per cent. copper; from 80 to 160ft. the material improved to 3½ per cent.; still lower, in the region of a crosscourse, there has been a decline to 3 per cent. A drive at the 1320 (1320 what?) is being made south from the winze in lode material varying from 3 to 3½ per cent. copper.

The drive on the same lode "at the 1440 South of Warmington's" was, for the greater part, in valueless material. Better results are expected further south; the expectation being based on what happened at the 1200ft. level. At the 1080ft. level the drive was extended through a long stretch of worthless ground, and then intersected "solid yellow ore of a substantial character." Hereupon follows a speculation of what will be done if the new special drive at the 1440 produces similar results.

The report can not command admiration. It suggests a conversation between an underground shift boss and manager, rather than the well-ordered statement that should proceed from directoral responsibility.

# NEW SOUTH WALES MINING.

## Broken Hill.

(From Our Correspondent.)

Broken Hill, Sept. 12.

Broken Hill keeps a strike centre. This time the mines are not directly concerned, though the trouble affects everybody in Broken Hill. The strike is a farce, an absolute farce, but it is mixing up things in a remarkable way. The Union carriers now will not convey goods to any wholesale house for retail delivery, so one sees owners and managers of businesses doing all their own work. This isn't mining news, but it may help to explain Broken Hill's unfortunate position. Any moment the industrial trouble may spread. It is an open secret to a section that the Union crowd is looking for a loophole to break the 4½ years' agreement. The Unionists of the Barrier are again letting their affairs be conducted by a handful of extremists.

On the mines, what? The British hasn't yet got the lode at the 1100ft. level, neither has the North at its bottom; but each will possibly achieve its object ere this appears in print. Meantime, the South shows splendid prospects below the 1070ft. level. A great mine the South—but the North isn't far behind. Also the Central and the British are to be watched closely.

The Junction North had a mishap to one of its chief crackers a few days ago. Someone sent up a "popper" along with the ore. The cracker couldn't eat the machine, and a few hours delay in work was caused. But other crackers were in readiness, and the delay was not serious.

The Junction North deserves to be watched closely. Its slimes treatment plant is doing good work, and though the mine refuses to develop anything wonderful at depth, as a treatment concern the company will make big profits—or should do so.

Concerning slimes treatment, several ideas are being experimented with, but it may be news that the M.S. Co. has taken all of these over. The best will be used, improved by any advantages of the others. A notable achievement centres around this decision. The M.S. Co. will both control the flotation process and the slimes processes, and results will, it is expected, quickly prove the benefit of this arrangement.

One will see now, or before long, a general recovery of, say, 95 per cent. of the metal contents of the mineral raised. It is not necessary to explain what this means, or will mean.

Interesting figures are those covered by the Customs export returns for August. The B.H. mineral output was:—

| | Tons. | Value. |
|---|---|---|
| Silver-lead concentrates, .. .. | 27,982 | £295,684 |
| Zinc concentrates .. .. .. .. .. | 31,265 | 77,226 |
| Silver-lead crudes .. .. .. .. | 3,274 | 8,057 |
| Silver-lead and zinc slimes .. | 1,396 | 1,275 |

These figures were below those for June and July, both in quantity and value. The value of metals ruled one matter, the bad service of the South Australian Railways in the matter of trucks the other. Broken Hill, when it wished, could send away more product than it does if only the carriage were available.

Later.

At the moment of sealing these notes, 'phone news comes to me that the British has struck ore at No. 11 level. This means much, if it is the lode.

## New England District.

(From Our Correspondent.)

Armidale, Sept. 12.

Much interest is being shown in Uralla, in a show of gold that has been discovered not far from the town. The mine has been christened the Goldsworth, and a local company has been formed with a capital of £12,000 in £1 shares to open out and develop the reef. The whole of the shares have been taken up, and the company has a decent little plant on the ground, including a 10-head battery. A fair amount of stone has been taken out, and the battery has been at work for six weeks or so crushing it. Some of the stone taken out has run, it is stated, in respect of small parcels, as high as 250 oz. to the ton. While it is not contended that the bulk of the stone will run anything like this, it is confidently believed that the final clean-up will show a very satisfactory return. At the present time, the show is so promising that holders of shares are asking £3, and there are inquirers at that figure.

Another show adjoining the Goldsworth mine has been opened out to a depth of about 80ft., and has been floated into a prospecting syndicate, with a capital of £1500, for further development. The holders believe that they, also, are on to something good, and the assays made by the Government for the syndicate, and also by the Sulphide Corporation at Cockle Creek, have been good. The syndicate is commencing work at one; and the general opinion in Uralla is that the town is on the eve of a very fair boom in mining.

## Lithgow and District.

(From Our Correspondent.)

Another application for suspension of labour conditions on their mineral leases in the parishes of Gindantherie, Glen Alice, Barton, and Capertee has been made by the Commonwealth Oil Corporation, Newnes. There are 18 leases in all. The application will be heard on Wednesday, September 10th.

The traction engines which displaced the horse teams on the roads between Perthville and Burraga some weeks ago, are still slowly plodding along, doing the return trip to Perthville in about five days and nights. Messrs. Plank and Company, of Blayney, have put two motor lorries on the road, and are at present removing about 200 tons of scrap-iron which they have purchased from the Lloyd Copper Co. Work at the Lloyd Company's works is proceeding satisfactorily, the fine weather that at present obtains having largely contributed towards this, as it is giving the horse teams a chance to get wood on to the tram line.

Mr. Carr, of Rydal, is interested in opening up a shale seam near Kerosene Vale, and has forwarded one or two trucks for gas-making tests.

# VICTORIAN MINING ACTIVITIES.

## Bendigo and District.

(From Our Correspondent.)

The gold production for the week ending Sept. 12, 1913, amounted to 3144 oz. The principal producers were Golden Pyke, 361 oz. 2 dwt.; Central Red, White and Blue, 311 oz. 18 dwt.; Carlisle, 192 oz. 9 dwt.; South New Moon, 164 oz. 10 dwt.; Spring Gully, 145 oz.; Great Northern, 122 oz. 8 dwt.; Virginia, 120 oz. 12 dwt.; Koch's Pioneer tributers, 104 oz. 9 dwt.; Catherine Reef, 97 oz. 11 dwt. Two dividends were announced totalling £1832 10s., viz.:—Spring Gully (1/-), £1157 10s.—total to date, £76,672 10s.; Virginia (6d.), £675—total to date, £164,736.

Carlisle, in advancing the 1140ft. south level to 245ft., saw some nice colors of gold during the last term, in a full face of spurry crushing material. In side stoping at 35ft. from the end, the spurs also carry a little gold. As the formation rises south, this level is getting deeper into it, and increasing the height of workable stone. More favourable prospects were also disclosed in the south overhead stope, where the stone is more consolidated for a width of 22ft., at 25ft. under the top fault. The stope close to the crosscut is operating on the spurs extending up to the fault quartz along the slide, and reveals a little gold. At 1200ft. the north intermediate shows a few colors of gold occasionally under the faulting, in 8ft. of irregular quartz. No change has been observed in the side stopes, which are taking 25ft. to 27ft. of low-grade quartz. Better results should shortly attend operations at this depth. At 1260ft. the main north level is in sandstone at 49ft. from the crosscut. The return of 164 oz. 7 dwt. from 447 tons reflected the improvement referred to at 1140 feet.

New Prince of Wales, working under strike conditions, had a payable average from a limited output, broken in the 690ft. intermediate stopes. Operations have lately been restricted to the first and second stopes between the Nos. 1 and 2 winzes. There is 8ft. to 10ft. of quartz, but the front stope is too low to reach the better grade ore. As the second stope advances, fair results are expected. Further south are three other stopes, which, however, have been out of commission since the strike. The formation is stated to be of payable quartz in these stopes. As the shoot of payable stone is likely to retain its northerly pitch, an intermediate level has been started in that direction off the No. 1 winze, and about 60ft. below 690ft. Here the reef has a very promising appearance, and is likely to prove auriferous during the next few weeks.

Central New Chum, a venture following in the footsteps of the defunct Lazarus Co., recently found auriferous quartz in breaking over west from one of the old levels at 90ft. south of the 771ft. plat. It was subsequently ascertained that the stone was allied to the faulting of a west back, and in driving south on the latter the encouraging prospects were maintained. The first crushing of 19 tons from the stone broken in the level, taking 3ft. to 4ft. along the hanging wall, was cleaned off last week for the satisfactory yield of 7 oz. 17 dwt.; without treating the silver. As there is plenty of ground available before reaching the south boundary, the development is regarded as of some importance. It is intended to immediately increase the output. Nearer the main crosscut the company have a rise on the west leg of the reef the New Shenandoah are working further south. An important fault has just been passed through, and after getting away from its influence, prospects are expected to brighten. Above 671ft. a rise is also opening up a good width of mineralised quartz over a fault, but no gold is visible.

Golden Age's first crushing from the footwall stone and spurs in the 655ft. north level at the north shaft resulted satisfactorily, 28 tons producing 9 oz. 17 dwt. The material was broken exclusively in driving, the best prospects showing in the bedded footwall vein above a small fault that has now risen overhead. Under this break very little gold has been seen, but the outlook is expected to improve again shortly, as another small slide is coming up in the end. The level is in 58ft., and probably not more than 125ft. from the Golden Pyke boundary. A stope has been commenced from under the former company's suspended stoping at 30ft. from the present face. This should furnish fair grade stone from above the fault now showing in the back of the level, and lead to another fair average from the next milling. In extending the south level to 72ft. there is 12in. of low grade spurs. Stoping will be confined to the north end for the present. In the main shaft the milling from the 853ft. stopes was again profitable. An additional stope has been gained on the south boundary, leaving about 8ft. to reach the top of the Princess Dagmar rise. A little gold is showing in this last stope, but the reef is of better quality in the next, which has been carried 30ft. north along the break in the hanging wall. The bottom stope is 15ft. above the intermediate level, with 9in. of payable stone exposed. Of the five stopes nearer the shaft, three are above the hanging wall break, with a few colors of gold throughout in an average width of 12in. of quartz. On the Paddy's Gully line the 1580ft. crosscut is being extended to the west back of what appears to be a small west leg, which should be reached during the ensuing fortnight.

New Shenandoah outlook at the west back at 306ft. and 432ft. is more promising. The south level at the former depth has been carried in to 92ft., the reef enlarging to 10in. and containing payable gold. In the stopes there is 8in. of stone of similar quality, the last crushing of 16 tons producing 10 oz. 15 dwt. There is a large extent of ground available south, and the shoot of payable stone appears to be making stronger in this direction. In rising through to 432ft. the quartz also showed fair gold above the lower fault. An intermediate level is to be driven along this slide southward, and payable averages are anticipated. The rise over 432ft. toward the upper break revealed a few colors of gold in 8in. of stone after the last firing is in 8 of quartz. It is expected that the cap will be found intact above this fault, which should be encountered during the month.

Garden Gully have 4in. of well-mineralised stone on the east back at 482ft. in the 494ft. north level. The boundary will be reached during the next few weeks. In stoping north and south, off the rise at 300ft. from the shaft, there is 4in. to 9in. of quartz, in which a 2in. seam of pyrites is a prominent feature, a little gold showing. A few colours are also visible in the south stopes. Over 444ft., the stopes reaching to the cap, take 4in. to 18in. of favourable looking quartz. In advancing the 1552ft. south level 30ft., payable prospects continue in 2ft. to 3ft. of stone. The first stopes is also payable. At 1560ft. in the No. 3 shaft there is a level to within 150ft. of this end on the same back. These workings are to be connected by rising, and the tonnage increased, providing present prospects are maintained. Rising has been commenced on the 8in. west leg from 333ft., to ascertain if the cap of the shallow formation has been worked. In the winze going down from 485ft., to tap the reef now being worked above 494ft. at the No. 1 shaft, the top of the stone has not yet been reached. A crosscut for the east leg of the 200ft. formation is in course of extension at 300ft.

Johnson's Reef extended the 1730ft. level to about 600ft. south of the No. 2 shaft, the stone on the west back enlarging to 3ft. and greatly improving in quality for a few firings. The level started low down on the back, where the stone was small and of no value, and it is only recently that payable prospects were disclosed, the greater width of the reef being accounted for by the south pitch of the anticline. There is only a few feet to go to reach the former workings off the No. 1 shaft, where the west back is only 4in. thick at a short distance under the cap, and of low value. As it was thought that the 1730ft. level is lower than the No. 1 workings, the increased width of crushing material at 1730ft. is hard to reconcile with the same formation. It is officially stated, however, that there are no other backs that fit in with the position of the reef at the No. 1 shaft. On the "Pyke" fold the prospects are not so favourable, and the 1150ft. reef on the Derby line remains unpayable.

South New Moon 500ft. east crosscut, on the north boundary, is expected to disclose auriferous spurs associated with a fault at about the end of the month. This system of spurs was worked successfully for some time by the New Moon, but deteriorated in value approaching the boundary. At 820ft. the south level on the middle back, with which the richest spurs are the more closely associated, is in 555ft., passing through a 3in. vein, showing a few nice colours of gold. As this level proceeds, the higher grade veins seen above the 980ft. level are expected to be again intersected. The latter continue to show fair gold at 460ft. south of the shaft, and just under the 900ft. level; but the richest spur has not been drawn upon for several weeks, and stoping is to be resumed along it this month. Further east at 900ft. and 250ft. south of the main crosscut, the outer system of spurs shows gold. At 980ft. there is fair gold at intervals in the irregular quartz, similar prospects showing in the 1060ft. north stopes, where a good quantity of stone remains. At 1140ft. the south level on the fault quartz, and close to the centre, is in 293ft., on low-grade material. A crosscut is to be extended west at 33ft. from the face to determine the value of this formation nearer the faulting and the folding of the beds. A little gold is seen in the 900ft. north stopes. Tributers had a fair term, one party obtaining the fine yield of 53 oz. 15 dwt. from 53 tons, broken in the 440ft. south level.

New Golden Fleece expect to start the new mill during next week. Having stopped the 650ft. north intermediate crosscut, the main level is being continued, and an extensive width of stone of a highly mineralised character is being traversed at 349ft. from the shaft. This is the same formation as worked at 500ft. and 585ft., and should prove auriferous at the 650ft. level within the next few days, as the indications are similar to those where the best results were obtained in the upper levels. Regarding these upper levels, though recent yields have been discouraging, it will probably be found that some fair grade ore has been reserved for the new battery, and the company's position should therefore improve shortly. The under stopes at 500ft. show payable gold, and at 400ft. the rise over the south level has passed through 4ft. of irregular quartz. At a height of 20ft., there are a few promising spurs overhead, which may be connected with the stone sought for. At 300ft. the west crosscut has been re-started to prospect the Comet east back, which carried profitable stone to a depth of 244ft. It will be reached in another 60ft. of crosscutting.

New Chum Consol had a second milling from the 650ft. intermediate levels, chiefly from the fault quartz and west leg in the south end, but the return was unsatisfactory. An intermediate level is now going north at 24ft. lower on the west back, in anticipation of meeting with a better shoot of stone. At 18ft. in there is 8in. of quartz, with a colour or two of gold. A fault shows overhead, and beyond there is a possibility of the reef proving more remunerative. An important crosscut has been started off the 530ft. plat. This work will open up the "Old Chum" back and the reef from which the New Shenandoah are getting encouraging results above 500ft.

Victoria Proprietary tributers (Messrs. Gidley and party) milled 35 tons for the excellent return of 58 oz. 1 dwt. of smelted gold. They are working 6ft. of stone at 120ft. from the Goldfields South boundary, the best prospects showing in about 3ft. of quartz along the hanging wall. Tributers adjoining northward have been almost equally successful. These results have induced the company to give the 100ft. of ground intervening to the south end of the lease a further trial, while the Goldfields South have also unwatered the shaft with the object of continuing the bottom crosscut to the same formation.

South Garden United found several nice specimens in extracting a small spur within 40ft. of the Sea Company's boundary below 2030ft., the inclusion of which was reflected in the improved crushing. The spur is more closely allied to the 2030ft. outer east back, and its quality is in keeping with much of the stone beaten out to the boundary along the inner formation. As there is a strong probability of payable stone existing at this end, the Sea Company are seeking permission to open it up from the South Garden workings. If this course is sanctioned and operations are not too long delayed, it may mean a suspension of calls by the Sea Company for some time. At the south shaft, the South Garden are stoping the old "Garden Gully" reef at 1505ft.; but, so far, with discouraging results.

Victoria Consols are seriously considering the question of curtailing the output from the 512ft. reef on the Sheepshead line, in consequence of the low level of recent yields. The formation is the same as the Ironbark are getting good results from next north, and is also identical with the payable stone worked in Lansell's Little No. 180 at 300ft. The records of both mines show that success is more likely to follow the systematic beating out of the reef than by prospecting it at various points, for the gold shoots are usually short. The Victoria Consols have opened the formation up for 248ft. south and 285ft. north. From the former end to the south boundary is another 1000ft., and from the north face to the Ironbark lease an additional 350ft. There is up to 2ft. of stone in the south level, but though nicely mineralised, no gold is visible. At 35ft. behind, a side stope is taking 12ft. of spurry quartz across centre to the western wall. This stone is also very highly mineralised and of low grade, and a new splice of quartz along the western wall lately promises better things, and the level is to be driven on this side of the formation in future. There is over 80ft. to go before reaching the block of ground from which a royalty of £1000, payable only from the gold extracted, is due. The overhead stopes start 30ft. behind the side stope and run back for 150ft. in length, the reef varying from 12ft. to 2ft. in the top stope. It is closely allied to the lava in these stopes. and occasionally reveals a little gold. The upper limits of the formation are exposed at 40ft. above the level, and at 80ft. from the shaft. This length of 80ft. of reef has been all extracted, leaving a balance about 430ft. partially stoped and 1350ft. intact. The north face shows 4ft. of low-grade quartz, with the east lava on the east side. Behind this lava there is another 4ft. of stone in centre and side stoping at a short distance from the end. It is likely that this end will be stopped, as a quantity of stone has pitched under the level along the backs of an important slide, which will be picked up later from 600ft. A couple of stopes are in progress over the timber, with a little gold visible in up to 11ft. of crushing material. At 600ft. the north level is advanced to nearly 100ft., on a thin vein of bedded quartz along the east back. After driving to 200ft., a rise will be extended to 512ft., and an intermediate level started north on the stone that has gone under the latter level.

## Malmsbury and Metcalfe.

(From Our Correspondent.)

Exploring efforts are still being made in the Alluvial Company's workings. The No. 5 bore at 53ft. went through into gravel from the foot of the drive, and several specks of gold came out. A bore is now being put up between Nos. 3 and 4 bores to find out the exact depth of ground for the intermediate, which is now ready to be opened out from the rise. It is estimated that another 80ft. of driving will be necessary before the wash is reached.

New Galatea Energetic, Malmsbury, has completed baling, and the shaft has been cleared and repaired. A double shift is working, and the pug in the east end has been penetrated. The little water that has been coming through is easing off. Another 40ft. will be sunk before driving starts.

Hanover (Drummond) reports slight gold showing in two places. The main drive south is out 275ft., and a new make of stone has just come in at the end; it is 12in. thick, with gold in borings. The north drive has reached 150ft., with an 18in. formation, and leaders on both walls, carrying little gold.

On the Metcalfe field unabated activity exists, although crushings are not frequent. Read and Keith are doing quick work with their new shaft. Another clean up a week ago gave the fine return of 170oz. for a short term of work.

James Grady's small vein of quartz continues rich in average.

Bennie Bros. find the country good-looking while they sink. The gold is still going underfoot, and a crushing is being taken out.

New Sultan Reef (Blackwood) held its half-yearly meeting, with Mr. G. M. Strong in the chair. The report showed that the mine had paid its way during the term. The installation of rock drills had prevented a profit being shown. The manager had reported that payable stone had been unearthed in the No. 3 south stopes. Crushing had been delayed owing to a break at the battery. It was intended to sink the main shaft another 200ft., and to drive at 400ft. and 500ft. as soon as the new boiler was under steam. This would make a few calls necessary. The cost was estimated to be £1000, but as the stone in sight could be worked at a profit the demand on the shareholders would be slight. The motion adopting the report was agreed to.

Rather an important discovery is reported from Taradale, and its culmination will afford much curiosity and interest. Mr. Job Beer, who is well known as a prospector in the locality, professes to have traced the sometime rich alluvial of Nuggety Gully, which is situated less than a mile due west of the railway station, and running into Achilles Creek. This gully was extremely rich in coarse gold. Observation led Mr. Beer to conclude that the matrix of the gold would be on the hill close to Andrews' house. There was no reef visible, but it was noticeable that a trail of fine diamond sand terminated abruptly at a certain point. There a hole was sunk, and Mr. Beer reports that the reef was duly found. It is said to be well-defined in good north and south strata; every bit of stone broken off is a specimen, with plenty of loose gold. An area of 12 acres was immediately pegged out by Job and George Beer, and a crushing will be put through in about a fortnight.

The same party own an adjoining lease on the Plutus reef, and their opening up operations revealed good prospects. Naturally the dazzling prospects of the new show have caused a cessation of work there for the present.

### Castlemaine and District.

(From Our Correspondent.)

Spring Gully had a good yield, but not as prolific as that of the last few weeks. From 160 tons 145 oz. was obtained. This had been foretold during the week by the manager (Mr. R. Grose), who issued a progress report that the crushing would not include much of the spurs from the 200ft. stopes. Owing to the stripping of the sandstone from above the bottom spur, there will be little stone sent until the following week. The manager reckons that the spurs will carry gold for a considerable distance further south. The crushing under notice came mostly from the northern stopes at the point where a large body of stone exists along the faulting of the east back and the stope lying closer to the Thomson break.

What looks like a company meaning business is being registered to work the McDonald's Reef Co., at Fryerstown, in the Golden Hill country. It has all the elements of success in it. The claim is good-looking, and the local representative is Mr. T. T. Dunstan, of Guildford, who is holding 5000 shares. The legal manager is Mr. J. J. Stanistreet, of Bendigo, and the nominal capital is 40,000 shares at 5s. each, 30,000 of which have been subscribed for. Included in the list are some well-known Bendigo and Melbourne investors. Among them are Dr. Bryant, 105 Collins-street; Chas. Wilson, Scott's Hotel; Dr. Lulham, 133 Collins-street; all of Melbourne, 3000 each; J. B. Walker (Walker, May, printers), J. Plottel, Queen-street, architect; T. H. Turner, "Whitehall," Collins-street; Felix Gade, Bruce-street, Toorak; A. A. Samuel, Flinders-lane; J. Cragg, City Club Hotel, Collins-street; W. J. Toohey, 87 Queen-street; all of Melbourne, 1000 each; Messrs. J. J. Stanistreet and N. G. Chancellor, metallurgist, Bendigo, 1500 each; J. T. Keane (solicitor), A. W. Flowerday (merchant), W. J. Donegan (dentist), H. Siddall (investor), all of Bendigo, 1000 each.

South Wattle Gully reports a continuance of encouraging prospects. The stone in sight on the west leg at 300ft., in the No. 2 rise over the saddle, and in the turnover of saddle (showing a reef 14ft. wide), can only reveal their real value by battery tests. Stone is not being broken out in any quantity till the recently-purchased battery is erected. The No. 3 rise is being put up in order to open up the ground for the battery.

Campbell's Creek bucket dredge had a better yield last week, 58 oz. 17 dwt. This is well over the payable margin.

---

## PUBLICATIONS RECEIVED.

Victorian Year Book, 1912-13. By A. M. Laughton, F.S.S., Government Statist. Part IV., Municipal Statistics; Part V., Accumulation. (Government Printer, Melbourne).

* * *

New South Wales Statistical Register for 1911: Part xii., Land Settlement; Part xiii., Statistical View. Index to complete work. (Government Printer, Sydney, 1913.)

## MINING IN QUEENSLAND.

### North Queensland Fields.

(From Our Correspondent.)

Mareeba, September 4.

One of the most important developments in this part of the world is the success attained by the New Minnie Moxham Gold Mining Co. in their straight shaft. At 213ft. the shaft bottomed on stone. Further sinking proved the reef to be 18in. in width, gold showing freely throughout the stone. The management have now commenced a drive in a westerly direction. This drive is in about 13ft., and carries good gold all through. Mr. G. E. Bray, member of the firm of Bray and Oakes, Charters Towers and Mareeba, and of E. W. Oakes and Co., Sydney, visited the mine on Wednesday last. He is highly impressed with the present appearance of the mine, and considers that it has possibilities of developing into a valuable property. In his opinion the reef averages 18in. in width all through the workings of high-grade stone. Mr. Bray brought in some samples of stone from the level going west from the bottom of the shaft at a vertical depth of 213ft., showing gold freely. The width of the reef in the face of this level at the present time is 15in. Every foot of driving in this level very much enhances the value of the mine. He was also impressed with the length of the outcrop and the extent of the old workings on it. Work at the present time is practically confined to driving the western level at the 213ft. mark in the shaft. While he was below portion of a bench of stone was broken down in the level above referred to, and from appearance he judged it to be 5 or 6 oz. stone, any amount of visible gold being carried. The New Minnie Moxham East, which adjoins the New Minnie Moxham on the same line of reef, promises to develop into a valuable property. A syndicate has commenced to bale out an underlie shaft which was sunk many years ago. In view of the good developments in the New Minnie Moxham mine, operations in this adjoining property will be watched with great interest.

At the Mareeba goldfields, good developments have occurred in the Mareeba Goldfield Syndicate's ground. The No. 1 level has now been driven 41ft., and carries gold all the way, the last drill holes disclosing good gold values. It is estimated that the reef at this point will bulk 2 oz. to the ton. Some of the stone from the level shows gold very freely. Both the Minnie Moxham and the Mareeba Goldfield are attracting considerable attention at present, especially the former, which is developed to such an extent that the erection of a crushing plant is considered justifiable, and with the rich stone now in sight the crushings should be sensational. The chairman of directors, Mr. C. A. Jenkinson, is now making enquiries so as to secure the most up-to-date crushing appliances, as the company intend to have nothing but the very best at the mine.

The old Vulcan tin mine at Irvinebank has again entered the dividend-paying list, and judging from the present appearance of the mine it should be a regular payer for some time to come. The 44th half-yearly report to hand states that during the half-year 37,228 tons of stone were crushed for a return of 134 tons of tin concentrates, which were sold for a gross return of £12,085. There is a good face of ore at the 280ft. stope. Underfoot in the 310ft. level there is also a new make of tin in entirely new ground. At the 600ft. level there is also another good development in virgin ground. In the 840ft. stope prospects are also most encouraging. However, the winze connecting the 900 and 1050ft. levels has been one of the most important developments during the half-year. At 65ft. down an entirely new make of ore going away from the old workings and bearing south was met with. The management crosscutted on this for over 20ft., the values being worth 3½ per cent. and 4 per cent. for black tin. After proving this the sinking of the winze was resumed, and has been carried down in payable ore right through to the 1050ft. level. When the connection had been made, stoping was commenced at the 950ft. mark, where the crosscut mentioned above had been put in for a distance of 20ft. The size of the stope is approximately 28ft. by 20ft., and the ore broken bulks 5 per cent. for black tin. At the 1050ft. level a drive was put in going south to intercept the downward extension of the 900ft. ore body. The ore value is a bit erratic, but the last few feet of driving showed a good change of material, giving 2 per cent. to 3 per cent. of black tin. The order for the requisite material for the installation of an aerial ropeway has been placed with Ropeways Limited, London, and it is anticipated that the ropeway will be erected and in commission before the end of the year. The Vulcan certainly has a very promising future in front of it, and shares at present values should be a good investment. The last crushing from this mine, being for the fortnight ended 16th August, was 768 tons for 33½ tons of tin, value £2800.

The Tommy Burns tin mine is not looking so well. During the month ended 27th August, 345 tons of ore were crushed for a return of between 8 and 9 tons of tin.

At the Prince Alfred tin mine the management put in a crosscut 30ft. from the bottom of the shaft (155ft.). As this crosscut failed to locate any lode matter a winze was started at the 90ft. level on the ore body, which continued with good grade ore down to 13ft., when it became poorer, and the rich shoot appeared to be trending westward. An underhand stope is now being carried along from the bottom of the level in that direction to determine the best point to continue sinking. No stone from the mine was crushed during the month.

At the Prince Alfred Development Syndicate, which adjoins the Prince Alfred mine, a lode was struck carrying from 10 per cent. to 20 per cent. tin. This is evidently a continuation of the rich lode worked in the upper levels of the Prince Alfred mine.

At the Gilmore mine there are a few men working and getting fair results. The Irvinebank Co.'s Gurrumbah mill treated a trial lot of 50 tons of stone from the Gilmore dumps, which gave a return of 2.8 per cent. tin. This allows of a fair margin of profit for the Gilmore Co. The whole of the dumps, amounting in all to some thousands of tons, will now be treated, and in view of the developments in the mine, Gilmores should be on the Exchange list again very shortly.

The Lass o' Gowrie mine at Stannary Hills is still looking well. The winze at the 220ft. mark is going down on 12in. of ore, value 50 per cent. tin. For the fortnight ended 16th August this mine crushed 115¾ tons of ore from all parts of the mine for 17 tons 7 cwt. of tin.

At the Rainbow mine, Herberton, the mine looks exceptionally well, and operations are at present centred on the ore body, which is about 10ft. wide and 15ft. high, of solid ore. It is difficult, however, to ascertain the width of the lode at present. This mine is sending in 500-ton crushings to the battery, which are giving the owners very rich returns.

In the Chillagoe district, interest at present centres on the Mammoth Co.'s mines at Cardross, and developments continue most satisfactory. These mines evidently have a very prosperous time ahead of them.

At Mungana, the strike of ore at 710ft. in the Girofla mine is most encouraging, and should enable the Mungana Co. to send in many large shipments to the Chillagoe smelters. So far, mining operations have not been resumed at the Lady Jane mine.

On the Wolfram fields at the township of Wolfram, good results are obtaining in the Murphy and Geaney mine. The ore body at the bottom of the main straight shaft is exceedingly rich in wolfram and molybdenite. The Larkin and Wade, the adjoining mine, is also looking exceptionally well. Both these mines are returning very handsome profits to their owners.

Leisner's Wolfram Block mine, which is doing splendid development work for the field, and which is subsidised by the Government, has a shaft down over 320ft., but so far with no results. However, it is intended to continue the shaft for another 200 or 300ft., as it is now the deepest shaft on the field, and it will prove whether the wolfram and molybdenite ore bodies live to a depth. The French Rare Metal Co. has closed down its works for a while in order to allow certain modifications to be made to the machinery, but to my mind it appears that there has been too many bosses on the job, instead of allowing full control to one man. The works have certainly cost a great deal more than they would if controlled by an Australian company. What the company intend to do in the future is the question being asked in this district.

---

## CORRESPONDENCE.

### THE HANSEL MUNDY CASE.

The Editor, "Australian Mining Standard."

Dear Sir,—In your issue of 11th inst. appears an article relating to the subsidy to the above company. The matter is, for the moment, in the hands of the Mine Owners and Managers' Association, but when the whole of the facts of the case are made known, I am quite content to leave the verdict in the hands of the Victorian public as to the treatment we—a so-called foreign company—have received from the Mines Department.

Yours faithfully,

G. A. WALLMANN,
Chairman of Directors, H.M. Co.
Stock Exchange Club,
Adelaide, Sept. 13.

[We are glad to publish Mr. Wallmann's letter, though it leaves matters just as they were.—Ed., "A.M.S."]

# THE COAL MINING INDUSTRY.

## New South Wales.

### Northern District.

(From Our Correspondent.)

Newcastle, September 13.

A stoppage occurred at Burwood colliery on Monday, owing to the men demanding some compensation for the damage which they allege is done to the coal by the present method of weighing. However, after at first refusing to listen to their officers, or to the officers of the Miners' Federation, they decided to go back again at the end of four days' idleness. The Minister of Mines, Mr. Edden, spoke plainly about the action of the men in stopping work in such a manner, and said that it had completely upset the negotiations which had been pending with respect to the weighing of coal at the colliery. He said it appeared, at the time of speaking, as though every opportunity of doing the men some good in the matter had been destroyed by their ceasing work as they had done.

A stoppage also occurred at Hebburn colliery, in the Maitland district, during the week, owing to the lads on the screens refusing to continue their work unless their pay were increased or they were given assistance. Their contention was that the output of coal had about doubled with the opening of the new tunnel, and they considered that they should not be asked to handle the additional quantity without some compensation. The manager, Mr. Harle, when seen about the matter, said the position was intolerable when four or five youths could hold up the whole colliery, and so cause loss to the company and to hundreds of men. A meeting was held subsequently, and the result of advice given by the officers and by an industrial inspector was that the boys agreed to turn to again.

An agreement has been entered into for the working of the top seam at Hebburn colliery with the picks, and it will remain in force for two years. If the machines are introduced, the agreement will be abrogated, and a fresh agreement will be made on the basis of the machine rate for that district. An agreement has also been drawn up between the men and the management of Abermain colliery, but has not been signed pending the decision of the Wages Board on matters that may affect the working of the pit. At Dudley colliery, in the Newcastle district, an agreement has been drawn up for the fixing of rates and conditions for a term of years. The only matter not settled is the question of payment for wet places, and the management of the mine has suggested that this should be referred to Mr. James Hardy, mining engineer, for arbitration. The lodge has not yet accepted the suggestion.

Stockton Borehole colliery has been idle for several months, owing to a dispute over the rates and conditions in the mine. The matter was referred to at the Wages Board at the end of last week, and it has been agreed that a reference from the Minister of Labour and Industry shall come before the board on Tuesday next. The whole question will come up for consideration as soon as the small-coal question is finished.

The evidence in the small-coal question has been concluded, and Mr. Kelynack, counsel for the colliery proprietors, and Mr. Lewis, who has presented the case for the miners, are now addressing the board.

At the Greta Police Court this week, the management of the Central Greta colliery was proceeded against at the instance of the Minister of Mines for working the mine with an inaccurate plan. The case was based on evidence given at the inquest into the death of J. J. Callaghan, who was killed through a rush of water when the old workings were broken into in June last. After hearing the evidence, the Court imposed a fine of £10, with £5 12s. costs.

In practically every report of coal-mining companies issued during the past six months, reference has been made to the loss caused by the delay in getting coal to the ship's side at Newcastle, or by the lack of sufficient appliances to load the coal into vessels waiting for it. Promises have been made frequently that further wharfage and cranes would be provided, in order to do away with this handicap upon the coal trade, and a start has been made with the wharf on the western side of the present basin in Newcastle Harbour. A section of this will soon be completed, and the Railway Commissioners have cabled to England for a couple of up-to-date cranes, which will be erected there. This will give a large measure of relief, and shipowners and shippers will be glad of this additional berth: but what is needed is that the Government Departments responsible for the work should push on rapidly with the construction of the inner basin, the dredging of which has now been commenced, and as soon as possible erect cranes on the Carrington side of that basin. Only in that way can the heavy rush of trade, which now extends over the greater part of the year, be coped with.

The pits in both the Maitland and Newcastle districts are working well, on the whole, although the export of coal for August was considerably below that for August of last year. However, the total quantity exported up to the present is greater than that for the first eight months of 1912, and as trade is fairly good, the total for the twelve months should exceed that for last year.

### Western District.

(From Our Correspondent.)

Lithgow, September 13.

The Lithgow and Western coal trade is very satisfactory so far as orders are concerned, but many of these cannot be filled owing to the great shortage of trucks. One local manager a few mornings ago said that a fortune is being lost through the Department not supplying trucks to the many producers, collieries, etc., in the State. Lithgow was feeling the effect of the shortage considerably, but one of the most exasperating features was that some of the officials treated complaints as if they should not be made. The Department had a monopoly, and it was only fair that an endeavour should be made to meet requirements.

The miners employed at the five associated mines of the Lithgow Coal Association have decided to accept the subjoined proposals, which were the outcome of a conference recently held between representatives of the five lodges and the executive officers of the Federation and the manager of the collieries and Mr. A. E. Ivatt, managing director of the Lithgow Valley Company. The following are the proposals:—(1) When the miners come to work, if the manager can say to the men that there is an equivalent of two skips for every man to start with, and can ring up the railway and get a statement that there will be a normal supply of trucks during the day, the miners should go in to work; (2) at Oakey Park the present arrangements shall be continued, viz., to wait half an hour, and if no trucks are available, men to go home; (3) that miners wait one hour and a half in the mine—time to commence from when the miner gets his last skip delivered. Miners who wait the agreed time and come out will not be penalised in regard to the turn of skips; (4) further, that the railways are to let the managers know at five o'clock p.m. each day what number of trucks are coming forward for the next day's work. If 125 trucks are coming forward, all the mines in the valley will work, if less than that number are coming, one or more mines will lay off in rotation; (5) whistle to be blown at night at the mines which are not to work; (6) these proposals to be given a three months' trial.

About £3000 has been spent to date on Mr. Edden's State coal mine project, mainly on boring operations. Last session a sum of £10,000 was placed on the estimates for the purpose of land resumption, and there the matter stands. The difficulty which lies in the Minister's way is the impracticability of the Act as it emerged from the Legislative Council some time ago. When it left the Assembly it was at least workable, if not advisable. The Act as it stands is practically valueless. One of the chief factors which the Minister has to consider in deciding is the Chief Railway Commissioner. Unless he can take all the coal that a State mine can put out it is declared to be a losing proposition. Under the Act the Minister cannot sell to the public, and from the standpoint of the Railway Commissioners it would not suit them to deal exclusively with one State mine. That is the view of railway officials who have given the matter consideration. However willing the Chief Commissioner might be to help the Government in the matter, the public interest has to be considered. At present the Chief Commissioner gets his coal from twenty different collieries—more or less—in different parts of the State. He does that to save cost of haulage; if he were compelled to take all the coal that the State mine could produce it would have to be conveyed over long distances before it could be used. The departmental view of this is that it would result in infinite loss of time, cause railway confusion, and involve great expense. To meet the convenience of the Railway Commissioners, the Minister would have to establish more than one colliery, and to make these pay he would have to enter into competition with private enterprise, and sell to the public. Mr. Edden's next move, in the circumstances, will no doubt be watched with interest.

Application has been made by the Vale of Clwydd Coal-mining Co. for a 20 years' lease to mine for coal on 3a. 1r. 30p. in the parish of Lett, under the road known as Doctor's Gap-road. Possession was taken on August 27th by erecting posts and cutting trenches. It is understood that the agreement reached last week by the Conciliation Committee regarding the rates and working conditions of the Invincible colliery, Cullen Bullen, has been accepted by the miners. Messrs. Delaney and Gregory, two of the district officers, visited Cullen Bullen on Monday and explained the provisions of the agreement to the men. Steps will now be taken to have the agreement formally completed and registered under the Act.

### Southern District.

(From Our Correspondent.)

Wollongong, September 13.

The Bulli Colliery Co. have this week taken over the jetty which has been in course of construction to replace the one wrecked on a stormy night some 18 months ago. The work was carried on under considerable difficulty during the winter, the weather being of an adverse nature. This week, also, the company received the machinery ordered for what will be practically a new colliery. Already boilers (Babcock and Wilcox) have been fixed at the tunnel entrance. The plant is an electrical one (Belliss, Morcom). The new extension to be worked adjoins the South Bulli workings, and there is the same thickness and quality of seam.

The use of coal-cutting machines in this district has not extended so rapidly as was expected by some when they were introduced. They are being used almost wholly for deficient places and low seam.

Ever since the last strike there has been a movement among members of the union to bring about a change in the executive officers (president, secretary and treasurer). That movement has now culminated in the resignation of the secretary, Mr. Bowling; the president, Mr. Willis, had in a spirit of challenge resigned before. The election which will ensue will be a keen contest, and will be taken much more interest in than parliamentary elections, and really it is of more concern to the district who holds these offices in the union, than who represents it in Parliament. Mr. Bowling has felt himself ''cribbed, cabin'd and confined" in the office of secretary, and has sought to get the union to make the president's office a paid one (as in the Northern district), in which event he would have sought an exchange of positions. The proposal, however, has so far been rejected. Mr. Bowling now wants the retiring president, Mr. Willis, to be restricted to seeking re-election to that office. That Mr. Willis means to be a secretaryship candidate is quite certain. Mr. James Russell (whose dismissal from the Mt. Kembla colliery when secretary of the miners' lodge made him, per medium of a Royal Commission, almost famous) is also mentioned as likely to be nominated for the secretary's office. There does not seem much prospect of union affairs getting down to normal this side of Christmas.

## Victoria.

### Powlett River District.

(From Our Wonthaggi Correspondent.)

Work at the State coal mine is proceeding steadily, and the output for the past fortnight amounted to no less than 23,400 tons, being an increase of about 200 tons on the previous fortnight, and a record since the ''dog watch'' or night shift was abolished. As only 11 days are worked each fortnight, the average output per day was 2127 tons. There are at the present time 482 miners engaged on the coal on contract rates, and their average earnings for the fortnight amounted to 15s. per shift, which is also a record. The wheelers for the same period averaged 10s. 5d. per shift, and only two parties had to have their earnings made up to the minimum rate. The pay for the whole of the employees, distributed last Friday, was nearly £5800; but, in addition to this, there was nearly £700 deducted from the men's earnings for rent, coal, stores, doctors' fees, and hospital and other contributions, so that the pay can be regarded as one of the best the employees have had since the mine started.

This week will complete the first term of the new agreement, which has so far given satisfaction to all concerned. A cavil for places for the ensuing three months was drawn on Monday, and the men will start work in their new places on Thursday, the 18th inst. The men on the coal-cutting machines will also make a start on contract work. They are to receive threepence per ton on long wall work, and fourpence per ton for bord and pillars. These men objected to the proposition of the management, that they should work in parties of eight, and also work three shifts. They considered that it would be preferable to work in parties of four, and they also had a decided objection to working the night shift. The difficulty has been overcome, and the indications point to the present satisfactory state of affairs being continued for a lengthy period. The outlook is brighter than it has ever previously been, with the result that building operations in the town have been resumed after a protracted spell. There are no vacant houses in the town, and there are people anxious to rent cottages, who cannot get them.

## AMALGAMATED ZINC (DE BAVAY'S) LTD.

The half-yearly report of Amalgamated Zinc (De Bavay's) Ltd. to the 31st June last contains no unusual features except a slightly decreased profit for the period. The strike of the Silverton Tramway employes, no doubt, somewhat affected the bulk of the business done by the company, but the decrease in the receipts can be attributed largely to other causes. The quantity of tailings treated during the period was certainly less than that treated during the preceding six months by 33,570 tons; but by lumping the two last six monthly periods, the total exceeded that of the previous twelve months by 7792 tons. Taking the annual figures as a basis, during 1911 and 1912 the total quantity treated was 515,906 tons, yielding 146,083 tons of zinc concentrates, and 2400 tons of lead concentrates; whereas during 1912 and 1913 the total tailings treated was 523,698 tons, yielding 142,668 tons of zinc concentrates and 1841 tons of lead concentrates. A comparison of these figures shows, in the case of tailings treated, an increase of 7792 tons, and a decrease in the yield of zinc and lead concentrates of 3415 tons and 559 tons respectively. The average assay value of the concentrates during the whole two years was very uniform; therefore the decreased receipts are due chiefly to the lower percentage of concentrates won from tailings treated, and the lower average price of spelter.

Dividends, totalling £100,000, were paid during the period, being £10,634 in excess of the profit made, the latter figuring at £89,366. The balance-sheet is otherwise a colourless document, although it shows the company to be in a very strong position, and well provided for emergencies. The reserves set apart for equalisation and depreciation total £165,000, the former standing at £125,000 (to which no addition has been made) and the latter at £40,000 (this item being credited with an additional £5000 for the period). The amount carried forward (£66,711) is less by £17,514 than that brought forward from the previous period.

In the assets column, sundry debtors, deposits with interest, and cash on hand total £85,062 3s. 9d., the cash on hand and at bankers amounting to £21,648 1s. 10d.

---

## DRAINING ZEEHAN MINES (T.).

### Report by Mr. Hartwell Conder.

Mr. Hartwell Conder, the State Mining Engineer, has presented to the Tasmanian Secretary for Mines a long and carefully prepared report on various schemes suggested for draining off the water in the upper levels of the mines about Zeehan, but dealing mainly with that proposing to drive a tunnel from McLean's Falls, about four miles south-west of the town. After very fully discussing this scheme in its relation to the various companies' properties, and whether a deep or a shallow tunnel would best meet the general requirements, Mr. Conder comes to the conclusion that "a very large expenditure, spread over a long period of time, would be required if the drainage tunnel was undertaken, while the result would be so imperfect and incomplete that it could be in no sense regarded as final. If it decided to attempt some combined scheme for unwatering the field and further testing it at a depth, I consider that a central shaft would be preferable to the tunnel. The cost of this work would, however, be very heavy, and it should be deferred until cheap power has been provided to deal with the pumping that would be required. The quantity of water encountered in the mines—with the exception of the Florence —is not great. Including the Florence and the 16 other most important shafts, the total water horse-power would only amount to about 650, if all were working. This would be equivalent to a demand for about 1000 horse-power. . . . It seems more reasonable to invest money in a power scheme, which would be of permanent value whatever the mining results that accrued, than in a tunnel scheme in itself incomplete, and dependent absolutely on the vicissitudes of the mines it serves.

"The problem of the Zeehan field is no easy one; the closer the matter is enquired into the clearer it becomes that an enormous amount of work has been done here, both above and below the ground by engineers as capable at their work as any in Australia, supported by miners and tributers of more than ordinary acumen. Any scheme which proposes to follow after these men and win success from mines which they have closed down must be equipped with more resources than they possessed if it is to have any hope of prevailing. I regard the provision of cheap power as more likely to prove advantageous to Zeehan than any system of tunnelling, and as precedent to any scheme of mining development that may be proposed."

## TASMANIAN SMELTING CO.

### Government Grant.

As it is now considered certain that the amalgamation of the Hercules and Primrose mines and the Tasmanian Smelting Co. will be ultimately carried through, the Government of Tasmania has consented to submit a measure to Parliament, providing for the continuance of the assistance given to those ventures. Some time ago a State loan of £20,000 was given in order to keep the smelters busy, and the first instalment of the repayment will shortly be due. It is proposed to extend the time for two years, and also to continue certain rebates on ore freights designed to fulfil the same purpose, to maintain that part of the West Coast in sound business activity. The proposals merely mean a continuance for a couple of years of the status quo, and it is anticipated that they will secure ready acquiescence. The alternative would be to close down the mines and the smelters until the arrangements for the formation of the new company have been completed, and its dezincing process installed. In his annual statement, the Minister of Lands, Works and Mines, Mr. E. Mulcahy, points out that the fresh capitalisation and additional plant will give the Government a far more ample security than they now possess. He adds: "Mention might be made here of the result of the Government aid given towards the Smelting Co. under the regulations of the Select Committee. The existence of the smelters at Zeehan for last year caused an expenditure of £153,000 in Tasmania, exclusive of an amount of £18,000 to the Union S.S. Co. for freights. During the year 72,300 tons of ore and metal-bearing flux were treated, and the bullion produced weighed 5376 tons, containing 578,758 oz. of silver and 5872 oz. gold, the balance being lead. These are important figures in mining production."

---

## MINERAL RETURNS.

The usual return furnished by the Under Secretary for Mines for New South Wales shows that the gold yield for August was 17,861 oz. crude, equal to 14,129 oz. fine, valued at £60,018, as compared with 13,006 oz. crude, equal to 10,681 oz. fine, valued at £45,369, for the same month in 1912. The yield for the first eight months of this year amounts to 120,568 oz. crude, equal to 96,575 oz. fine, valued at £410,227, as compared with 128,035 oz. crude, equal to 105,499 oz. fine, valued at £448,129, for the same period in 1912, showing a decrease of 8924 oz. fine and £37,902 in value.

The West Australian gold yield for August amounted to 110,169 fine oz., the value of which was £467,968, showing an increase of 1373 fine oz., valued at £5833, as compared with July, and of 1529 fine oz., valued at £6495, as compared with August, 1912. The output for the eight months to August 31st was 857,335 fine oz., valued at £3,641,625.

The Victorian yield of gold for August was 43,849 oz. gross, or 41,207 oz. fine, valued at £175,038. Compared with the yield for August, 1912, a decrease of 11,805 oz. fine has occurred. The yield for the last eight months was 310,790 oz. gross, or 288,983 oz. fine, valued at £1,226,615. This shows a decrease of 26,045 oz. fine compared with the quantity won during the corresponding period of last year.

The Queensland gold yield for August was 21,736 fine ounces, valued at £92,329, as compared with 29,976 fine ounces, valued at £127,330, in the corresponding month of last year, a decrease of 8240 fine ounces of the value of £35,001. The yield for the expired eight months of the year has been 178,167 fine ounces, valued at £756,805, as compared with 231,420 fine ounces, valued at £983,009 for the corresponding period last year, the decrease being 53,253 fine ounces, valued at £226,204.

The New Zealand output of gold for August amounted to 40,364 gross oz., or 36,807 fine oz., valued at £156,348, as compared with 14,019 gross oz., or 12,851 fine oz., valued at £54,589 for August, 1912, during which production was restricted by labour troubles. The increase was 26,345 gross oz., or 23,956 fine oz., valued at £101,759. The output for the eight months to August 31 was 250,749 gross oz., or 236,409 fine oz., valued at £982,962, as against 251,867 gross oz., or 232,730 fine oz., valued at £988,575 for the corresponding portion of last year. The silver produced in August amounted to 68,135 oz., valued at £7446, as compared with 7541 oz., valued at £841 in August, 1912, while for the eight months it amounted to 674,074 oz., valued at £71,234, as compared with 605,841 oz., valued at £62,682 last year.

The mineral exports from Broken Hill (N.S.W.) for August were valued at £382,242, as compared with £398,499 for July, £474,434 for June, and £376,018 for August, 1912. The decline of the last month or two is attributed, in part, to shortage of trucks to take the produce away. The August figures were—Silver-lead concentrates, 27,982 tons, value £295,684; zinc concentrates, 31,265 tons, value £77,226; silver-lead crudes, 3274 tons, value £8057; silver-lead slimes, 1396 tons, value £1275.

The quantity of tin exported from Sydney during August was 3219 ingots, making a total of 32,289 ingots exported during the eight expired months of 1913, and being a decrease of 4983 ingots on the total for the corresponding period of 1912. Copper exported in August was 212,453 ingots, making the total for 8 months 1,698,104 ingots, a decrease of 140,321 ingots on the corresponding period of the preceding year.

---

## REPORTS OF COMPANIES AND CORPORATIONS.

### Broken Hill South (N.S.W.).

The following was the output of the Broken Hill South Silver Mining Co. for the periods indicated:—

| | 6 Weeks ended Aug. 9. | 4 Weeks ended Sept. 6. |
|---|---|---|
| Ore, tons | 41,960 | 29.154 |
| Assay— | | |
| Lead, per cent. | 14.9 | 14.3 |
| Silver, oz. | 7.3 | 6.7 |
| Zinc, per cent. | 15.0 | 13.3 |
| Concentrates, tons | 7,017 | 4,688 |
| Assay— | | |
| Lead, per cent. | 68.8 | 68.2 |
| Silver, oz. | 24.6 | 23.1 |
| Zinc, per cent. | 6.7 | 6.5 |

### Zinc Corporation (N.S.W.).

The output, costs, profits and expenditure of the Zinc Corporation for the last two months were as follows:—

| | July. | Aug. |
|---|---|---|
| Ore milled, tons | 15,915 | 14,897 |
| Tailings treated, tons | 29,150 | 28,070 |
| Zinc middlings treated, tons | 3,430 | 3,370 |
| Zinc Concentrates, tons | 7,683 | 7,743 |
| Lead concentrates, tons | 4,415 | 4,030 |
| Estimated income, all sources (spelter at £23, lead at £15) | £49,951 | £48,637 |
| Total working expenditure | £26,953 | £28.133 |
| Office expenditure (estim.) | £400 | £400 |
| Working cost per ton on ore | 14/7 | 14/10 |
| Working cost per ton on tailings and middlings | 9/5 | 10/10 |
| Approximate cost of redemption of tailings | £7,188 | £6,689 |
| Estimated profit, including cost of tailings | £15,410 | £13,415 |
| Mine development | £2,952 | £2,897 |
| New construction | £1,826 | £1,677 |

### Mt. Lyell M. and R. Co. (T.).

The following are the smelting returns of the Mt. Lyell Mining and Railway Co. for the last two four-weekly periods.—

| | Four Weeks ended Aug. 6. | Four Weeks ended Sept. 3. |
|---|---|---|
| Mt. Lyell ore treated, tons | 12,567 | 14,899 |
| N. Mt. Lyell ore treated, tons | 7,036 | 7,775 |
| Lyell Comstock ore | 225 | — |
| Total ore treated, tons | 19,828 | 22,674 |
| Fluxes and purchased ores | 98 | 28 |
| Blister copper produced, tons | 383 | 458 |
| Contents— | | |
| Copper, tons | 378 | 453 |
| Silver, oz. | 27,886 | 31,429 |
| Gold, oz. | 683 | 697 |

### Mararoa G.M. Co. N.L. (W.A.).

The August costs of the Mararoa G.M. Co., Norseman (W.A.), were as follows:—

| | £ | s. | d. | Per ton. |
|---|---|---|---|---|
| Mining 2715 short tons | £1200 | 14 | 4 | 8/10.14d. |
| Milling 2715 short tons | 645 | 12 | 1 | 4/ 9.07d. |
| Realisation of bullion | 36 | 8 | 10 | 3.22d. |
| Cyaniding 1980 sh. tons sands | 275 | 16 | 5 | 2/ 9.43d. |
| Realisation of bullion | 34 | 7 | 5 | 4.17d. |
| | | | | 17/ 0.03d. |
| Cyaniding 700 sh. tons slimes | 216 | 15 | 8 | 6/ 2.33d. |
| Realisation of bullion | 17 | 1 | 9 | 5.86d. |
| Cyaniding 12 sh. tons concentrates | 23 | 12 | 3 | 39/ 4.25d. |
| Realisation of bullion | 1 | 12 | 4 | 2/ 8.33d. |
| | £2452 | 1 | 1 | |
| Spent on development | £788 | 9 | 1 | |
| Spent on capital a/c | 32 | 1 | 10 | |
| Sydney leases, cost of work to date | 96 | 5 | 5 | |
| Total expenditure | £3368 | 17 | 5 | |
| Value of bullion won | | | | £4997 6 5 |
| Profit on ore treatment | | | | 2545 5 4 |

# ENGINEERING AND ELECTRICAL SECTION

Australian
General Electric Co.
217 Clarence Street, Sydney.
Tel.—Central, 3495, 4397; City, 2381.
"Penfold House," Cr. Queen and Little Collins Sts., Melbourne.
Tel.—Central, 2647.
Representing—
GENERAL ELECTRIC CO., U.S.A.
The
BRITISH THOMSON-HOUSTON CO. LTD., of Rugby, England.
The GUARANTEE of EXCELLENCE on GOODS ELECTRICAL

## WANTED: ELECTRICAL MECHANICS.

To "raise Cain" in the heart of a union official or a Labour member, all that is required is to suggest importing something or somebody. Their protests rise spontaneously, and it is only after they have made themselves hoarse with protest that they inquire into the facts of the case. Last week it was publicly announced that the Commonwealth Public Service Commissioner, Mr. D. C. McLachlan, had felt himself compelled by the apparent dearth of competent men in Australia to suggest that a number of young men with experience in the British telephone service should be imported in order to keep up with the increasing demands upon the Postmaster-General's Department. At the moment the requirements of the Perth branch were chiefly in mind, but the same shortage of competent men had been hampering work in New South Wales, Queensland, and South Australia; of the mainland States Victoria alone had produced candidates sufficient for her own requirements, and as many of these as she could spare had been sent to other States. As usual, the announcement of the proposal was no sooner made public than an outcry began. The secretary of the Labour Federation at Perth declared that there is no excuse for importing postal mechanics from England for Perth. Plenty of good men could be engaged in that city, but the Federal authorities never pay more than £144 a year, whereas now they are offering £176 for men from England. The Prime Minister, however, states that the salary in Western Australia is the same as that suggested for immigrants. It was when the Opposition in the House of Representatives took up the matter, however, that the ridiculous aspect of the party's attitude became so evident. The Prime Minister and the Postmaster-General asked them to send along the names of these efficient men, and if they proved on examination to be suitable they would be taken on. "You want a mechanic with a university education," exclaimed one member, and there was a general agreement amongst members on that side of the House that the education test, as distinct from the mechanical, was the great stumbling block, an Opposition dissent greeted the Prime Minister's assurance to the contrary. Let us see what the actual character of this educational obstacle is. First of all, at the last examination (the paper is dated May, 1913), there was a test in spelling. Two or three sentences comprising 105 words were presented; the slip on which these are printed gives instructions to the examiner to read the passage aloud, deliberately, before candidates commence to write, in order that they may grasp the meaning of the passage as a whole. He is then to read it a second time very slowly (the words are underlined) in groups of two or three or four words, as marked. "Give the candidates ample time to write steadily. Do not hurry them." In fact, a quarter of an hour is considered to be the time required. The longest word in the test is "experience," the least phonetic in spelling is "ought"; every word is a common one. There is also an arithmetic paper, for which an hour is allowed. It comprises a simple addition sum of four lines of five figures each and two of four figures; a compound addition sum of six lines of £ s. d., the only fractions being ¼, ½ and ¾; a question which requires simple addition and subtraction; a multiplication of five figures by four; a division of £ s. d. by 465; and a short bill for a piece of work such as any lad should be competent for, and which commences with "5 yards lead piping at 2½d. per foot." That is the whole of the "university education" required of candidates who scorn £144 a year! And in most cases, probably, they have had the advantages of a free education at the public expense. Yet, although in New South Wales there are over 150 men temporarily employed on the mechanical work of the Department, there were only 51 entrants for the examination held in May and June, and 15 of these were permanent officers connected with other branches of the work, who were seeking promotion as mechanics. In Western Australia in November, 1912, only seven candidates qualified; last May only two presented themselves to fill 11 vacancies, and they failed to qualify; at the last examination for junior mechanics only one attended, and he obtained no marks in either the practical or the oral tests. In the face of these facts it must be clear that the suggestion, reluctantly made by the Public Service Commissioner, endorsed by the Chief Electrical Engineer, Mr. Hesketh, and provisionally accepted by the Government, is the only way open to fill up the many vacancies in the service of the Department. However, advertisements are again to be inserted in the metropolitan papers for telephone mechanics, and the positions will remain open until next month.

## HYDRO-ELECTRIC AND METALLURGICAL CO.

The financial position of the Hydro-Electric and Metallurgical Company (T.) has been seriously affected by the monetary stringency produced in London by the late disturbances in the Balkan Peninsula, and the Tasmanian Government has been approached by the company with proposals that it should intervene. It is said that about £194,000 has already been expended on the hydro-electric portion of the company's enterprise, out of a total estimated expenditure of £262,734, and the directors say that negotiations were well advanced in London for raising a further £150,000 when the war broke out and diverted money into other channels than those of "fruitful strifes and rivalries of peace." Other negotiations were pending, but the directors feared that the necessary delay would imperil the carrying out and completion of the scheme within the stipulated time. In the overtures to the Government alternative proposals were put forward. Proposal A was that the Government should guarantee the interest on an issue of £150,000 in second debentures at the lowest market rates obtainable, the company to pay annually the difference between that rate and the 5 per cent. payable on the first debentures, as well as one per cent., the difference between the 5 per cent. now payable and 6 per cent. to which it is proposed to raise the first debentures. The Government also to have the call upon 20,000h.p. at £2 10s. per h.p. per annum, or at 35s. per h.p. per year if taken at the powerhouse for use at the West Coast, also a prior right to purchase the hydro-electric and distribution scheme at cost price, plus 10 per cent. Proposal B was that the Government should buy the hydro-electric undertaking right out at cost price, plus 5 per cent., the company undertaking, in conjunction with the Government, to complete the scheme, the Government providing money from time to time as required. Under this proposal the company to have a call upon all power required up to 20,000h.p. at £2 10s. per h.p. year, for use at its metallurgical works to be established at North-West Bay. The letter in which these propositions were put before the Premier was accompanied by a report on the scheme as a whole prepared by Mr. Alfred Dickinson, M.I.C.E., M.I.E.E., etc., of London, which speaks in high terms of its prospects of success. "It is difficult," says Mr. Dickinson, "to conceive of any scheme where the purely hydraulic development presents so few engineering difficulties, or where the cost per h.p. installed could be less than in this case," and he estimates that "from the contracts made and obtainable for the supply of energy and from the sale of carbide there will be a net revenue of £36,554, but this by no means exhausts the possible markets or the earning capacity of the plant installed. . . . The potentialities of the scheme in the near future are very promising, for the cost per h.p. installed in all extensions will be very much less than in the present installation." It may be mentioned that this report is dated May 7th, and was made on behalf of the debenture holders.

The matter is now being considered by the Government, and it is inevitable that this will be done in conjunction with the Lake Rolleston scheme recently put forward by the State Mining Engineer, Mr. Hartwell Conder.

## TRANS-AUSTRALIAN RAILWAY.

A progress report on the proceedings at the two ends of the east-west railway, made public last week, shows that on the South Australian section the surveyors had reached 65 miles from Port Augusta, and that the ranging, pegging and levelling of the permanent route had been carried to the same spot. Improvements in location to 75 miles have been made, many curves in the preliminary survey had been cut out, the minimum radius increased to 40 chains, and the grade reduced to 1 in 100. Earth works had been carried to 10¼ miles, and the rail head taken to 9½ miles. As soon as the first lot of bogie waggons has been delivered, the American track-layer will be affixed, when rapid progress with platelaying should be made. In view of the importance of Port Augusta as a traffic centre in the future, consideration is being given to the establishment of permanent shops for the construction and repair of rolling stock. The number of men employed on this section is 470. On the West Australian section the rail head was only at 8 miles 33 chains, or 6 miles beyond the depot. Work had been commenced on the American tracklayer, which, it is said, will lay about two miles a day, and the plant will be ready for affixing to bogie waggons on their arrival. The surveyors were encamped at 86 miles. The permanent route had been pegged and levelled to 80½ miles. Clearing had been completed for nearly 50 miles, and earth-works were finished over a distance of 42 miles. Culverts were completed to 25 miles. Altogether 246 men were employed at that end of the line.

All the steel rails and fishplates ordered from America had been delivered with the exception of 5650 tons, which were lost by the wreck of the steamer "Hector." These were being replaced by the contractors. The first delivery of powellised karri sleepers by the West Australian Government will not be made until November. The progress necessary for the carrying out of the Clyde Engineering Company's contract for 100 40-ton bogie waggons had not been made, and the extreme urgency of the matter had been constantly brought under the notice of the contractors. The contractors had now undertaken to supply four waggons per week. Consideration had been given to the method to be adopted to ensure that employees working at a distance from the base shall be able to obtain provisions and general supplies under reasonable conditions, both as to quality and cost. Efforts were being made to secure for a few months the services of a man with experience in the Army Service Corps to advise with regard to detail arrangements.

## NEW SOUTH WALES RAILWAYS.

Some interesting figures in regard to the progress of the New South Wales railways were quoted at the annual picnic of N.S.W. railway officers held recently. Credit for the expansion was largely attributed to the Railway Comissioner (Mr. Johnson). The figures quoted cover a period of six years, and the progress during that period has undoubtedly been remarkable. In proposing the toast of the Commissioners, Mr. Macoun, the chief accountant, said:—"When the Commissioners took charge in 1906 there were 17,611 employees: now there were 41,322. In order that the progress of the railways may be gauged, he mentioned that when they were placed under a commission in 1888 there were 10,000 men on the railways and 988 on the tramways. So from 11,000 the number had increased to 41,300. In 1906 the earnings on the railways were a little more than £4,000,000, and on the tramways £800,000, making a total of almost £5,000,000. In 1913 the railways were earning £6,749,000, and the tramways £1,750,000, making a total of £8,500,000. In the first year the commission took the railways over the earnings were £2,700,000. The advance had been wonderful. In 1906 the railways carried 37½ millions of people, and the trams 145,000,000. In 1913 the railways carried 79½ millions, and the trams 294,000,000. Those figures, Mr. Macoun declared, spoke eloquently of the work involved in looking after so large an amount of revenue and expenditure. The Commissioners in the past six years had got through something like £40,000,000. They had a fairly onerous duty to keep track of that expenditure. The Chief Commissioner and the assistants had increased the grant to the Railway Institute and to the ambulance five times the amount paid in 1906. They were not unmindful of those two deserving institutions.''

Mr. J. Harper, Assistant Commissioner, also had some figures to quote concerning the progress of the railways and tramways. During 1907-13 they had an increase in the coaching revenue, he said, of more than £5,000,000, or 58 per cent.; in the goods revenue the increase was also £5,000,000, or 45 per cent.; in the passenger traffic the increase was 153,000,000 passengers, and of goods 8,000,000 tons. The increase in engines totalled 342, or 52 per cent. of the total power, and of tractive power 8,518,000 lb. or 65 per cent. increase. With regard to coaching stock, the increase had been 528 vehicles, an increase of 77 per cent. upon the then existing stock. In goods stock the increase was 6434 vehicles, or 51 per cent., and the carrying capacity had been increased by 101,798 tons, more than 90 per cent. The membership of the Ambulance Association in 1906 was 2090; now it was 7822.

## WOLLONGONG ELECTRICAL SCHEME.

(From Our Correspondent.)

Wollongong (N.S.W.), Sept. 13.

Re the scheme propounded for utilising the water-supply power for generating electric current for lighting the town of Wollongong, the Works Department, in reply to a question whether they would allow the water power to be so used, have replied that all the power is needed to produce current for pumping from the lower dam into dam No. 2. This operation, as has been before reported herein, is done by an automatic working installation. The reply of the Department is somewhat surprising, as the head of water is one of great force. Local effort to get the district water supply vested in a local board is being continued, notwithstanding the decision of the Minister (on the advice of the Department) to place it in the Metropolitan Water and Sewerage Board area. The Minister is reminded that he made a promise of a local board, and that his predecessor also did so. He replies: ''Show me the promise.'' From personal recollections, I expect the Minister will be able to prove that he did not make an unconditional promise. The question is one which is of no little district importance.

## RAILWAY ELECTRIFICATION (V.).

### Rotary Converters for the Melbourne Sub-Stations.

The direct-current system has been adopted by the Victorian Government in connection with its scheme for electrifying the Melbourne suburban railways in accordance with the advice of their consulting engineer, Mr. Merz, of the the firm of Merz and McLellan, London, who, after investigating thoroughly the tenders submitted for alternating and direct current installations, came to the conclusion that in this case a direct-current system would be the most suitable. A 1500 volt direct-current system (multiple unit system) with overhead supply, has therefore been chosen. The greater part of the orders were placed immediately after the sanction of the Government, and the order for the machinery for the twelve sub-stations was placed with Messrs. Siemens Brothers Dynamo Works Limited, London.

This comprises 14 rotary converters, 2000 k.w. each; 10 rotary converters, 1000 k.w. each; 4 rotary converters, 500 k.w. each; and the necessary transformers.

The rotary converters will be required to give the following outputs:—

2000, 1000, and 500 kw. respectively for 20 hours; 3000, 1500, and 750 k.w. respectively for 2 hours; after a twelve-hour run at the first-mentioned respective loads—4000, 2000, and 1000 k.w. respectively for ten minutes; 6000, 3000, and 1500 k.w. respectively momentarily.

The continuous output of each rotary converter and transformer is, in accordance with the V.D.E. Rules, about 50 per cent. above the outputs mentioned above, that is to say, the rotary converters are designed so that giving their continuous outputs of 3000, 1500, or 750 k.w., the temperature rise will not exceed that prescribed by the V.D.E. Rules.

The transformers are supplied with three-phase current at 19,000 volts and 25 frequency. They are oil-cooled, and the oil tanks are supplied with a pipe system through which the oil circulates for cooling. The reactance necessary for obtaining the proper regulation of the rotary converters is built in with the transformers.

Six-phase current is supplied to the three-phase side of the rotary converters, and on the direct-current side current at 1500 volts is supplied from a single commutator. The converters are started up from the three-phase side by an induction motor. The speeds are as follows:—

2000 k.w. rotary converter, 250 r.p.m.; 1000 k.w. rotary converter, 500 r.p.m.; 500 k.w. rotary converter, 750 r.p.m.

## VISIT OF BRITISH ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE.

### More Distinguished Visitors.

The following additional names have been selected to represent the British Association for the Advancement of Science at its Australian Congress next year. Further selections have yet to be made, and the completed list will not be available until some time next month. The list published in our issue of the 4th inst. comprised 37 names; the present consists of 57.

Mr. JOHN OLIVER ARNOLD, F.R.S., D. Met., Professor of Metallurgy, Sheffield University.

Dr. H. T. ASHBY, M.B., M.R.C.P., Assistant Physician to Salford Royal Hospital.

Mr. HENRY BALFOUR, M.A., F.Z.S., F.R.G.S., Curator of Pitt Rivers Museum, Oxford.

Mr. HENRY BASSETT, D.Sc., Ph.D., F.I.C., Professor of Chemistry, University College, Reading.

Mr. T. HUDSON BEARE, B.Sc., M.I.C.E., M.I.M.E., Regius Professor of Engineering, Edinburgh University.

Mr. HENRY VAUGHAN BEVAN, D.Sc., Professor of Physics, Royal Holloway College, Hillside, England.

Mr. G. H. CARPENTER, B.Sc., M.R.I.A., Professor of Zoology in the Royal College of Science, Dublin.

Mr. F. D. CHATTAWAY, F.R.S., D.Sc. (London), Ph.D. (Munich).

Mr. FRANK CLOWES, D.Sc., F.I.C., F.C.S., Chemical Adviser to the London County Council.

Mr. ERNEST G. COKER, M.Sc., F.R.S.E., M.I. Mech. E., Professor of Mechanical Engineering and Applied Mathematics in the City and Guilds of London Technical College.

Mr. VAUGHAN CORNISH, D.Sc., F.G.S., F.C.S., F.R.G.S., F.R.C.I. Investigated the causes of the earthquake in Jamaica in 1907.

Mr. W. E. DALBY, B.Sc., M.I.C.E., M. I. Mech. E., Professor of Civil and Mechanical Engineering at the Imperial College of Science and Technology, South Kensington.

Mr. FREDERICK AUGUSTUS DIXEY, M.B., F.R.S., Fellow and Lecturer of Wadham College; late Demonstrator of Physiology, University College, London, and University of Oxford.

Mr. H. B. DIXON, M.A., Ph.D., F.R.S., Professor of Chemistry, Manchester University.

Professor F. G. DONNAN, Ph.D., F.R.S., Director of the Muspratt Laboratory of Physical and Electro-Chemistry, Liverpool University.

Mr. WYNDHAM R. DUNSTAN, LL.D., F.R.S., F.C.S., F.R.G.S., Director of the Imperial Institute.

Mr. F. W. DYSON, F.R.S., LL.D., Astronomer-Royal since 1910.

Mr. A. S. EDDINGTON, Chief Assistant at the Royal Observatory, Greenwich, Secretary R.A.S.

Mr. GEORGE FORBES, F.R.S., M.I.C.E., formerly Professor of Natural Philosophy, Anderson's College, Glasgow; electrical engineer for the works at Niagara Falls.

Mr. P. F. FRANKLAND, Ph.D., M.Sc., A.R.S.M., F.R.S., Professor of Chemistry, Birmingham University.

Mr. HANS F. GADOW, Ph.D., F.R.S., Strickland Curator and Lecturer on Zoology, Cambridge University.

Mr. ERNEST GOLD, Superintendent of Statistics, Meteorological Office, London.

Mr. ANDREW GRAY, LL.D., F.R.S., Professor of Natural Philosophy, Glasgow University.

Mr. J. A. GREEN, M.A., Professor of Education, Sheffield University.

Mr. W. D. HALLIBURTON, M.D., LL.D., F.R.C.P., F.R.S., president of the physiological section, British Association, 1902, Professor of Physiology, King's College, London.

Mr. W. MITCHINSON HICKS, F.R.S., D.Sc., Professor of Physics, Sheffield University.

Mr. W. H. H. HUDSON, LL.M., Professor of Mathematics, in Queen's College, London, 1883-1905.

Mr. JAMES JEANS, F.R.S., Professor of Applied Mathematics, Princeton University, 1905-1909.

Mr. FREDERIC STANLEY KIPPING, F.R.S., Professor of Chemistry, University College, Nottingham.

Mr. C. H. LEES, D.Sc., F.R.S., Professor of Physics, East London College, University of London.

Dr. THOMAS MARTIN LOWRY, Lecturer in Physics and Chemistry.

Mr. M. MACDONALD, M.A., F.R.S., Professor of Mathematics, Aberdeen University.

Mr. HUGH MARSHALL, D.Sc., F.R.S., F.R.S.E., F.C.S., Professor of Chemistry, University College, Dundee.

Mr. HUGH O. MEREDITH, Professor of Economics, Queen's University, Belfast.

Dr. BENJAMIN MOORE, F.R.S., Professor of Bio-chemistry, University College, Liverpool.

Sir DANIEL MORRIS, D.C.L., D.Sc., F.L.S., F.R.H.S., Scientific Adviser in Tropical Agriculture to the Colonial Office.

Sir JOHN MURRAY, F.R.S., LLD., D.Sc., Ph.D., Naturalist, late Naturalist on H.M.S. ''Challenger''; formerly scientific member of the Fishery Board for Scotland; accompanied Arctic and other expeditions as naturalist; took part in and paid the expenses of the ''Michael Sars'' North Atlantic expedition, 1910.

Mr. J. LINTON MYRES, F.S.A., formerly Lecturer in Classical Archaeology in Oxford University, and Gladstone Professor of Greek and Lecturer in Ancient Geography, University of Liverpool; Hon. Sec. Anthropological Institute of Great Britain and Ireland, 1900-3.

Mr. A. W. PORTER, F.R.S., B.Sc., F.R.A.S., Fellow and Assistant Professor of Physics, University College, London.

Mr. E. B. POULTON, F.R.S., Hope Professor of Zoology in Oxford University, and Fellow of Jesus College, Oxford.

Mr. A. B. RENDLE, F.R.S., D.Sc., F.L.S., F.R.H.S., keeper of the Department of Botany, British Museum.

Mr. S. H. REYNOLDS, F.G.S., Professor of Geology, Bristol University.

Mr. W. H. R. RIVERS, F.R.S., M.D., F.R.C.P., Lecturer in Physiology of the Senses, University of Cambridge.

Mr. WALTER ROSENHAIN, Superintendent of Metallurgical Department, National Physical Laboratory, Teddington.

Mr. R. F. SCHARFF, Ph.D., B.Sc., M.R.I.A., F.L.S., F.Z.S., keeper of the Natural History Collections, Dublin Museum.

Mr. C. S. SHERRINGTON, M.D., F.R.S., D.Sc., F.R.C.P., Holt Professor of Physiology, University of Liverpool.

Mr. W. J. SOLLAS, LLD., D.Sc., F.R.S., formerly president of the Geological Society; Professor of Geology, Oxford University; Fellow University College, Oxford.

Mr. J. E. A. STEGGALL, Professor of Mathematics at University College, Dundee, in St. Andrew's University.

Mr. JOHNSON SYMINGTON, F.R.S., Professor of Anatomy, Queen's University, Belfast.

Mr. J. F. THORPE, D.Sc., Ph.D., F.R.S., F.C.S., formerly Senior Lecturer in Chemistry and Lecturer in Bio-chemistry at Manchester University; Sorby Research Fellow of Royal Society, Sheffield University.

Mr. H. H. TURNER, D.Sc., F.R.S., Savilian Professor of Astronomy, Oxford University.

Mr. SWALE VINCENT, M.D., D.Sc., F.R.S., Professor of Physiology University of Manitoba, Winnipeg, Canada.

Mr. H. W. T. WAGER, F.R.S., botanist; president of botany section of the British Association, South African meeting, 1905.

Mr. A. D. WALLER, M.D., F.R.S., LL.D., director of Physiological Laboratory, University of London.

Mr. FREDERICK E. WEISS, D.Sc., F.L.S., Professor of Botany at the University of Manchester.

Mr. A. S. WOODWARD, F.R.S., keeper of Geological Department British Museum, and of Natural History, South Kensington.

Mr. W. H. YOUNG, Sc.D., F.R.S., Mathematician; Professor in Higher Analysis at the University of Liverpool.

A great railway undertaking is to be put in hand at an early date in West Africa, the cost of which is estimated at £3,000,000. The line, which will be 550 miles in length, will start from Port Harcourt, at the mouth of the Bonny River, Southern Nigeria, and pushing inland will junction with the Lagos-Kano railway at the Kaduna River. The line will be opened in sections in the quickest possible time, and surveyors and constructors are leaving England for Nigeria forthwith. The new railway will traverse the almost unknown land of ''Ju-Ju'' cannibalistic worship, the richest palm-oil belt in the world, and a coal-field at Udu, 1000 square miles in extent, of which the coal has 75 per cent. of the value of the best Welsh.

## BRITISH AND EUROPEAN DEVELOPMENTS.

(From Our Correspondent.)

London, August 15th.

In addition to the sending of its chief electrical engineer to America to study big power station plant, the Glasgow Corporation has this week despatched its tramway manager, Mr. James Dalrymple, to the United States in search of information which shall assist it in handling the ever-increasing traffic of the city. The particular phase of the matter to be investigated by Mr. Dalrymple, in conjunction with the Glasgow master of works, Mr. Thomas Nesbit, is cross-river bridges.

Shortly after my last week's notes were put in the mail, the debate in the House of Commons respecting the Imperial wireless contract was brought to a conclusion, and the necessary Parliamentary approval was given by 210 votes to 138, to this agreement. The papers on the following morning contained their editorials burying the whole matter, editors and writers, like the public, being for the most part thoroughly tired of the whole affair, glad to be rid of it, and get away for the holidays. Yesterday the House of Commons finished off its business, and only an emergency of a very serious character will bring our legislators together at St. Stephens for a good many months—it is even hoped that we shall have peace until February next, but seeing that there is the prospect of political orators running up and down the country with new vote-catching propaganda the mere respite from discussions at Westminster may not mean freedom from political strife such as we have been subjected to for several years past.

The passing of the Marconi contract put the stopper on newspaper controversy, but "Marconi" was only out of the papers for a few days, for yesterday publicity of a little different kind was given to the doings of the contracting company, all the newspapers being ablaze with the eagerly awaited and judiciously-deferred report for the year ended December, 1912. The results are such as to make your mouth water if you are not a shareholder; but if you do happen to hold an interest in the company you want to know why you haven't got a bigger dividend than for 1911. The figures for the two years may be set out comparatively, thus:—

| | 1911. | 1912. |
|---|---|---|
| Gross profit | £214,407 | £537,243 |
| Net profit | 141,717 | 413,295 |
| Preference Dividend .. | 17 % | 17 % |
| Ordinary Dividend | 20 % | 20 % |
| General Reserve | — | £100,000 |
| Carried forward to 1913 | — | £146,726 |

The directors justify the above arrangement by stating that a part of the huge profit shown "having been derived from the realisation of shares," they "deem it prudent to take this opportunity of creating a reserve account, and have appropriated £100,000 for this purpose." They explain the delay in publishing the report—last year it appeared at the end of June—by saying that they thought it desirable to await the ratification of the new contract with the Postmaster-General. We need not refer further to the financial details contained in this very full report, but we may quote references to the Marconi doings in Canada, America, and Norway:—

"The Marconi Wireless Telegraph Company of Canada Limited—under their contract with the Canadian Government for the operation of wireless telegraph stations on the Great Lakes, four stations have been established and placed in operation during the past year. One station is at present being enlarged and three other stations are to be built during the current year.

"The negotiations with the Newfoundland Government were brought to a satisfactory termination in December by the completion of a contract which will continue the company's exclusive rights in Newfoundland until the year 1926.

"Under agreements with the Canadian and Newfoundland Governments the company operates 32 stations in Eastern Canada and Newfoundland and five stations on the Great Lakes.

"The company also carries on a public telegraph service on [illegible] steamers.

"The Canadian Government has passed a law making wireless equipment of passenger vessels compulsory, which will necessarily result in further business for the company.

"The company has now in hand for the Department of Railways the construction of two high-power stations at Hudson Bay and Le Pas, Manitoba, in connection with the construction of the new Hudson Bay Railroad by the Canadian Government.

"Under their agreements with the Canadian and Newfoundland Governments the Canadian Company's subsidies from these Governments now exceed [illegible]000 per annum."

"Marconi Wireless Telegraph Company of America. This company has declared a dividend of 2 per cent. for the year ending 31st January, 1913, a satisfactory result having regard to the fact that the contract with the United Wireless Telegraph Company did not come into force until the month of July of last year, and called for considerable negotiation with shipowners and others to bring about more satisfactory terms upon which the work was in future to be conducted. The full benefit of these improved working conditions was therefore only enjoyed for a comparatively short period of the year. It will also be borne in mind that the increase of capital to the extent of £1,400,000 was for the purpose of providing a network of long-distance telegraph stations and the creation of telegraph services. Time is necessarily required to construct these stations, but this work has proceeded with all possible expedition. It is contemplated that before the end of this year a rapid and reliable telegraph service will be opened between this country and New York. Arrangements will be made to open collecting stations in the City of London and in each of the principal towns in England and Scotland. Similar arrangements have been made in the United States. It is expected that a substantial revenue will accrue from this source.

"Stations are in course of construction at San Francisco and the Hawaiian Islands which are approaching completion. It is hoped that before the end of the year we shall see a wireless telegraph service in operation between the United States and Japan, which will then be extended to the Philippine Islands and China.

"The contract with the Norwegian Government having been ratified by the Norwegian Storthing, a further Trans-Atlantic Station will be erected immediately to conduct a telegraph service direct with the North of Europe. Under the terms of the agreement the Norwegian Government will send all telegrams handed in at the telegraph offices for the United States by wireless unless specially routed otherwise by the sender. The company and the Norwegian Government will pool the receipts of their respective stations, which should add a substantial source of revenue to the American company.

"Important negotiations are in progress with South American States which should result in the construction of additional stations in the United States in the early future and open up direct wireless telegraph service between North and South America.

"At all of the stations under construction the new duplex system is being installed, which will provide for a service to be conducted in both directions at the same time. Automatic sending and receiving apparatus is also being supplied, which will enable messages to be transmitted at a speed up to about 100 words per minute in each direction, and this rate of working is likely to be exceeded."

The English company report great developments in the design and supply of portable wireless stations for military purposes, and to meet the demands of the armies of the world the following have been added to their standard types:—A 3kw. station for cart or motor-car transport, a 1½kw. station for horse or camel transport, and a ½kw. cabinet station for use as a permanent station where space is limited. For the Italian and Balkan armies important orders have been executed, and the total sales for this class of apparatus have nearly quadrupled during the year, and continue to show substantial increase. Arrangements have been made so as to give immediate effect to big orders when a demand arises unexpectedly, as it may do for this class of equipment.

Reference need not be made to all the countries with which the company has made contracts, but it is interesting to note that the directors in their allusion to the Imperial wireless chain contract say that they do not believe that the altered conditions will prove disadvantageous to the company. Is this a reply to the House of Commons references to the "hard bargain" driven by the Postmaster-General? "Having regard to the position which your company holds in the wireless industry, and which position your directors are confident the company will continue to hold, they contemplate that they will construct all the stations required for the Imperial chain." We quote the following references to technical and patent matters, and to the company's own confident feelings respecting its own position:—

"For a long-distance wireless telegraph service a number of the company's recent patents play an essential part, and during the last twelve months your Scientific Adviser, Mr. Guglielmo Marconi, has applied for patents for a number of important inventions and improvements for apparatus used in both transmitting and receiving stations.

"Notwithstanding all that has been stated and published in recent times respecting the continuous wave system of wireless telegraphy, experience has not yet proved that that system will be capable of conducting a long-distance wireless telegraph service as efficiently as the slightly damped spark system at present in use. Mr. Marconi has invented what your directors believe to be the simplest and most economical method of generating, transmitting and receiving continuous waves and he alone has been able to transmit messages across the Atlantic by a continuous wave system, of which a satisfactory demonstration, and the only one, was given to the Advisory Committee appointed by the Government. Further tests are being conducted, but considerable work and time are required before it will be possible to say with any degree of assurance that any advantage in practical working is to be obtained, either by the continuous wave system alone, or used in conjunction with the spark system.

"With the ability of the large staff of engineers employed by this company, together with their valuable experience, directed and assisted by Mr. Marconi, your directors are confident that the development of the wireless industry will continue to be pioneered by this company.

"The high-power station which is being constructed in Carnarvon, and which will be worked by the company to conduct a direct service with New York, it is anticipated will be completed and opened for service during the present year. It is being supplied with both the spark and continuous wave systems, which alone will prove from actual experience the comparative merits of the slightly damped wave and the continuous wave in all weathers, under all conditions, every day, week and month of the year.

"Important negotiations are being conducted with several foreign Governments for the erection of long-distance stations which it is hoped will be brought to a successful issue at an early date."

In June the action for the infringement of patents against the National Electric Signalling Company was heard in New York, and Mr. Marconi gave evidence at length. "The Court has not yet delivered its judgment" (August 15th).

For some time past a Select Committee has been sitting, taking expert and other evidence respecting London motor traffic. The increasing noise and danger of the streets of the metropolis rendered action of some sort, on the part of legislative authorities, a matter of extreme urgency. Last night the Committee issued its report and recommendations. The chief proposal is that a new traffic branch of the Board of Trade shall be set up so that in all metropolitan traffic matters Parliament shall be advised by one department, "which should combine the traffic duties of the Home Office, Local Government Board, and the Board of Trade, including the confirming of bye-laws." Another recommendation is that the veto of borough councils in regard to tramway schemes shall be replaced by a full hearing before the new Traffic Branch, which shall report to Parliament. But there are a host of interesting matters in this exhaustive report. Many of them are in no sense electrical, but further reference may be made to the position and suggestions in a later issue.

## N.S.W. RAILWAY CONSTRUCTION.

As the result of the controversy which is proceeding in connection with N.S.W. railway construction and the Norton Griffiths agreement, occasional scraps of information are being made public from time to time. The tabling of the Norton Griffiths agreement has been again deferred pending the pleasure of the party machine.

During last week the Minister for Public Works laid upon the table in the Legislative Assembly a return showing the estimated cost of the different sections of the North Coast railway, and also of the other lines included in the proposed agreement with the Norton Griffiths Company. The estimates which were supplied by the chief engineer for railway construction are as follow:—

| | Length. | Estimated Cost. £ |
|---|---|---|
| Wauchope to Kempsey .. .. | 30m. 24ch. | 405,764 |
| Kempsey to Macksville .. .. | 30m. 21ch. | 383,701 |
| Macksville to Raleigh .. .. | 20m. 51ch. | 259,548 |
| Coff's Harbor to Glenreagh | 26m. 65ch. | 415,846 |
| Glenreagh to Dorrigo .. .. | 41m. 77ch. | 334,146 |
| Condobolin to Broken Hill | 373m. | 1,367,142 |
| Total .. .. .. .. .. .. .. .. | | £3,166,147 |

It would seem that the Government is in a very unenviable position in regard to the proposed agreement. If the agreement be ratified the Minister and his colleagues will undoubtedly have to reckon with their electors, for at the last meeting of the Leichhardt Labour League held in the Town Hall, Leichhardt, an attempt was made to introduce a motion to the effect that the present State Government, by entering into a contract with Norton Griffiths Ltd., had violated a plank of the Labour Party's platform, which provided that the State works must be carried out by the State. This caused considerable disorder, and Mr. Carmichael, the selected Labour candidate, who was present, protested against the motion and raised the point that as the mover resided out of the district he was not qualified to submit the motion. As the meeting threatened to become an exceedingly stormy one, the chairman brought proceedings to a close by an adjournment. However insignificant the incident may seem, it is at least a straw which shows the direction of the wind.

## MISCELLANEOUS.

On the Queensland railways engine-drivers must sign a declaration that they know the sections of the railway over which they work; if they refuse to sign they must work as firemen until they gain a knowledge of the road, but are paid drivers' wages. This regulation was made after and in consequence of the Murphy's Creek disaster.

* * *

The Ballarat (V.) Gas Company has declared a dividend for the half-year at the rate of 5 per cent. per annum and a bonus of 1 per cent., together absorbing £4050. After adding £1000 to the reserve and writing £500 off the meter account, they carry £3176 forward to the next half-year.

* * *

The Numurkah (V.) Shire Council has seen its way to reduce its charge for electric power from 5d. to 4d. per unit.

* * *

There are now 4898 miles of railways in operation in Queensland, and the gross earnings for the year ended on June 30th were £3,321,672, the working expenses being £2,150,991, leaving a net revenue of £1,170,681, equal to £3 8s. 5¼d. per cent. on the capital invested in railways open to traffic, or £3 8s. 8d. on the total capital expended on all lines. The number of passengers carried, exclusive of season ticket-holders, was 10,704,412, an increase of nearly a million, and 3,418,751 tons of goods were handled, an increase of 204,000 tons. The revenue from passenger traffic was £917,818. The working expenses for the year were £233,725 higher than the previous year. The train miles run increased by 1,136,847, but the revenue per train mile decreased by a penny.

* * *

In connection with the Victorian railway service, there is a system of bonuses for various improvements, and an attempt has been made to show that these have been largely appropriated to enrich the more highly-paid "officefs," rather than the lower-paid "employees." Last week the Minister of Railways, Mr. A. A. Billson, at the request of Mr. J. W. Billson, laid on the table of the Legislative Assembly a return showing the bounties paid for the years ended on June 30, 1908 and 1913. This showed that the totals for the two years were respectively £2528 and £2550, of which amounts officers had received £1604 2s. and £605 3s. 4d., and employees £924 8s. 10d. and £1945. The details of the payments were as follows:—Honorariums or bonuses for specially meritorious actions, special work, etc.—officers £880 and £340, employees £24 and £84. Prizes for tree-planting at stations—officers, £153 12s. and £265 3s. 4d. Prizes for best-kept departmental houses —employees, £140 15s. and £518. Prizes for best-kept lengths—employees, £670 13s. 10d. and £1041 0s. 4d. Prizes to apprentices for highest marks at Working Men's College—employees, £13 and £124. Bonuses granted in connection with the strike in 1903—officers, £570.

* * *

The Victorian Railways Commissioners have accepted the following tenders for the manufacture and supply of 500 15-ton "I" trucks, as follows, the prices being per truck, exclusive of the value of certain material (£84) supplied by the Department to the contractors:—Gray Bros., Williamstown, 250 trucks at £119 5s.; Cowley's Eureka Ironworks Propty. Ltd., Ballarat East, 200 trucks at £122 9s.; A Challingsworth Propy. Ltd., Richmond, 50 trucks at £121.

* * *

Replying to a couple of deputations which waited upon him last week and asked for extensions of the suburban railway services, the Victorian Minister of Railways said that the policy of the present Government had been to build lines into the more remote country districts to serve the people in outlying portions of the State, some of whom were 60 or 70 miles from a railway. Therefore he could not promise that the line advocated by the deputations would be included amongst the lines to be considered by the Government during the present session. In the one case the request was for an extension from Essendon or Newmarket to Keilor and Bulla, and in the other from Wandin South to Monbulk, on which the Railways Standing Committee had previously reported adversely.

* * *

A sub-committee of the Mount Gambier (Sth. Aust.) town council has reported on the proposal of an electric power and lighting company to instal electric light in the town. It supplies estimates from an Adelaide firm of engineers as to the cost of an installation and what lighting with electricity would cost consumers. On a total estimated cost of £6500, including power-house, a profit of £1530 per annum is shown, and that does not include street lighting, owing to the currency of the gas contract. The maximum cost of producing the current is given as 1¼d. per unit. The committee is of opinion that the estimated cost would be exceeded, as only a five miles route of overhead cables is allowed for, but they believe that even should the distance be extended it should not alter the ratio of cost and profit. The committee find, however, on looking further into the matter, that it appears there is no power for a private company to instal and run a plant of its own in the town. The corporation itself can alone carry out and conduct the undertaking. The committee recommends that the matter should be submitted to the ratepayers as early as possible.

* * *

The South Australian Government received at the beginning of last week, ex s.s. "Dunstane," a consignment of fifteen locomotives built at Glasgow to its order by the North British Locomotive Company, which claims to have the largest locomotive works in Europe.

* * *

Mr. Johnson, the West Australian Minister of Works, stated last week that the powellising plant for the Government timber mill at Manjinup, in the karri country, on the Leeuwin Peninsula, was completed, and that the mill will begin operations next month. Two other mills, at Big Brook, will be ready to start in January. They are all connected with the Bridgtown railway.

* * *

Motor 'buses do not appear to be greatly appreciated at East Geelong (V.), for last week a deputation from that district waited upon Mr. G. G. Jobbins at the Electric Supply Works, and asked for an extension of the electric tram system to East Geelong. In reply, Mr. Jobbins stated that he thought the proposed extensions to North Geelong and Belmont should take priority. The patronage bestowed upon the motor buses was not sufficiently good to justify the laying down of a tram line. The deputation was not to be so easily disposed of, however, and it was suggested that Mr. Jobbins should submit an estimate of cost of a tram-track to East Geelong, after which the municipal council will go into the matter to see what can be done to assist in the tramway extension.

* * *

The Minister of External Affairs, Mr. Glynn, has been informed by the surveyors, Messrs. Lawrence and Chalmers, that the survey for the first portion of the North-South railway in the Northern Territory, namely, the section from Pine Creek to the Katherine River, will be completed within a month, and he intends to have everything in readiness, so that the work of building the line may be proceeded with at once.

* * *

As an aid in its self-imposed task of detecting and prosecuting people who carry on pillaging at the Melbourne wharves, the Harbour Trust has under consideration an elaborate scheme for lighting the wharves by electricity. It is thought that improved lighting will afford another check to pillagers.

* * *

Our Lithgow (N.S.W.) correspondent writes:—"About a year ago the local supply of cement was so entirely inadequate to the requirements that, had it not been for one or two fortunate purchases of shipments, several large jobs in the hands of the Works Department would have been hung up. As this state of things appeared likely to continue, the Minister (Mr. Griffith) determined to protect his Department from a recurrence by arranging for considerable importations to arrive during the current year. Through the slackening off in the building trade local supplies have now overtaken the demand, and both of the large suppliers, namely, the Commonwealth Portland Cement Company, and Goodlet and Smith Ltd., have large stocks lying in their stores, and are threatened with the necessity of a stoppage of their works. To prevent this, the Minister, on the occasion of his recent visit to the Commonwealth Company's Works, made a proposal to the effect that, if the two companies would jointly indemnify the Government in the amount necessary to pay for the cancellation of the orders for 27,000 casks from England, and so arrange matters that the Department would not be a loser, he would cancel the orders and obtain his supplies from the local companies. After considerable negotiations, it was ascertained that the orders could be cancelled on the payment of £2240, and the two manufacturers have now agreed to defray this amount. The Minister has authorised the concellation of the oversea orders, with the result that the congestion in the local markets has been relieved."

* * *

The Brisbane Tramway Co. is supplying electric power to the Automatic Bakeries Ltd., of that city.

* * *

On the night of the 11th inst. a wireless message was sent from the Governor of New Zealand, Lord Liverpool, then at Wellington, conveying greetings to Lord Gladstone, Governor-General of the South African Union, then at Pretoria. From Wellington the massage went to Sydney, from Sydney to Perth, from Perth to H.M.A.S. "Australia," in the Indian Ocean, thence to Durban and Cape Town, where the Prime Minister, General Botha, forwarded it to the Governor-General. Greetings were also transmitted by the Governor-General of the Commonwealth, Lord Denman, saying that His Excellency was glad to learn that South Africa and Australia are at present in touch by means of the flagship of the Commonwealth. The distance covered by this chain was nearly 10,000 miles.

* * *

What will be the largest unit in the world producing electrical energy has been ordered by the Commonwealth Edison Company of Chicago from the General Electric Company. The unit will be a 30,000kw. horizontal turbo-generator to be placed on the North-west generating station. It will be delivered about July 1st, 1914. The exciter will be installed on the shaft of the machine, and the length of the unit over all will be 60.5ft. The width will be 18ft. 4in., and the height 14ft. The generator will be a 9000-volt, 25-cycle, three-phase machine with two poles, operated at a speed of 1500 revolutions per minute, and designed for an output of 1925 ampere phase. The turbine will be operated at a steam pressure of 230 lb., with a super-temperature of 200 deg. Fah., the weight of the entire unit will be about 1,000,000 lb. It is a noteworthy fact that the order for this 30,000kw. unit is placed while work is under way on an addition to the Fisk-street station of the company, which will provide for an increase in output of 45,000kw.—25,000kw. from an English Parsons horizontal unit and 20,000kw. from a general electric horizontal unit.

* * *

An addition has been made to the street-travelling conveniences of Rockhampton (Q.) by the establishment of a railway-tram service between the city and Lake's Creek, a distance of 5¾ miles. One of the lightest engines has been selected to haul a long second-class carriage fitted with low steps, capable of accommodating 70 passengers, and additional accommodation is provided morning and evening. The train is run on the tramway principle, stopping at several street corners in the city, and between some of the stations on the north side of the Fitzroy River, on the journey to Lake's Creek. The route has been divided into six penny sections, and a conductor is in charge of the train to issue 1d., 2d., 3d., or 4d. tickets as required. In drafting the time-table the present trains have been interfered with as little as possible, and the service has been designed to suit both business people and workmen going in or out of the city. With extra carriages it will supersede the present trains which carry workmen and officers to and from the Lake's Creek meatworks, adhering to the present times. There will be also a service of trains on Sunday to suit the church services. Workmen's weekly tickets and season tickets remain as at present, except that the holders are entitled to travel by either the ordinary trains or the railway tram. This new departure is an experiment only, and its continuance will depend upon its patronage.

* * *

The railway receipts of the Chillagoe Company Ltd. (Q.) for August amounted to £9198, and for the five months of the financial year ending August 31st, £44,476. For the corresponding periods of the previous year the respective amounts were £8422 and £42,543.

* * *

The Northcote (V.) Town Council is calling for tenders for the following material in connection with the electric light scheme now in progress:—(a) 600 ironbark, box, or jarrah poles; (b) 4 single-phase transformers; (c) supply and erection of extra high tension and low tension fuse and switch gear for sub-stations; (d) supply of rubber-covered cables; (e) supply of metal filament lamps, cast-iron brackets, and reflectors; (f) supply of flame arc lamps; (g) supply of insulators, iron pole brackets, and pins; (h) supply of house service fuses and A.C. meters; (i) supply of bare copper cables.

* * *

The Victorian Railways Commissioners informed a deputation last week that numerous requests had been received from country towns for electric lighting installations at the railway stations, and that all would be considered at one time.

* * *

Arrangements are being made with the sanction of the Commonwealth Government to exchange time signals between the Melbourne Observatory and Dr. Mawson's base at Adele Land. It is proposed to connect the Observatory directly with the adjacent wireless station, in the Domain, to enable Dr. Mawson to establish a fundamental longitude in the Antarctic regions.

* * *

In his annual report on the Melbourne Observatory, the Government Astronomer, Mr. Baracchi, says that in view of the probable electrification of suburban railways, and the construction of electric trams in the vicinity of the Observatory in the near future, it may very soon become useless to continue magnetic work on the present site. He suggests, therefore, that steps should be taken to secure a suitable locality for a new magnetic station sufficiently removed from these disturbing causes. The Narre Warren district is suggested as fulfilling the essential conditions.

# Invited and Accepted Tenders

It is particularly requested that the information regarding contracts open, and the successful tenderers, be forwarded to The Editor not later than Monday of each week.

The following contractions are used throughout:—S—supply; D—delivery; M—manufacture; C—construction; E—erection; P—purchase; I—installation; R—removal. Where no contractions appear, supply and delivery is understood. The date at the beginning of each paragraph refers to the closing of tenders.

## INVITED.

### Commonwealth.

**Specifications, tender-forms, etc., for tenders invited for the Postmaster-General's Department of the various States under this heading may be had as follows:—Victoria—Various State G.P.O.'s. New South Wales—Departmental Stores, Sydney, and various G.P.O.'s in other States. South Australia—Adelaide, Melbourne, Sydney and Brisbane G.P.O.'s. Western Australia—Departmental Stores, Perth, and various G.P.O.'s in other States. Queensland—Various State G.P.O.'s. All States—Various G.P.O.'s. If the specifications, etc., may be had elsewhere, in addition, the** places will be given in parentheses.

POSTMASTER-GENERAL'S DEPARTMENT, Melbourne.—23rd September.—Sulphate of copper, as per schedule No. 956, in the undermentioned quantities: New South Wales, 173 tons; Victoria, 25 tons; Queensland, 55 tons; South Australia, 20 tons; Western Australia, 60 tons. (See advertising columns.)

23rd September.—500 letter-box fronts, small size, as per schedule No. 957.

23rd September.—General stores, for a period **of two years, from the 1st July, 1913, to the 30th June, 1915, as per schedule No. 913.**

23rd September.—Waterproof coats and capes, until the 30th June, 1914, as per schedule No. 936.

30th September.—S. and D. of 1,017,000 pattern "A," and 1,768,800 pattern "B" insulators, at Sydney, Melbourne, Brisbane, Adelaide, Perth, and Hobart, during the years 1913-14, 1914-15, and 1915-16, as per schedule No. 974.

30th September.—S. and D. of 2000 pairs of brass lightning guard brackets, as per schedule No. 978. (See advertising columns.)

7th October.—S. and I. of electrically-driven machinery for operating pneumatic tube services, **Central Telegraph Office, Melbourne, as per schedule No. 900.**

14th October.—S. and E., at the Telephone Exchange, Melbourne, of a common battery multiple switchboard as per schedule No. 868.

14th October.—Cable boxes, as per schedule No. 877.

14th October (extended from 16th September).—S., D., E. and I. at the Telephone Exchange, Collingwood, Victoria, of a common battery switchboard, as per schedule No. 860, or an automatic, or semi-automatic, switchboard, as per schedule No. [illegible]. (See advertising columns.)

5th November.—Galvanised iron piping, as per schedule No. 952.

15th November (extended from 4th November).—D. and E. of eight automatic telephone switchboards at the [illegible], Canterbury, Malvern, Cheltenham, Footscray, Oakleigh, Sandringham, and Williamstown Telephone Exchanges, as per schedule No. [illegible]. (See advertising columns.)

16th December.—S. and D. of one common battery multiple switchboard at the Telephone Exchange, Wills-street, Melbourne, as per schedule No. [illegible]. (See advertising columns.)

POSTMASTER-GENERAL'S DEPARTMENT, Sydney.—8th October.—S. and D. at the Telephone Exchange, Watson's Bay, Sydney, of 1 automatic switchboard, with all associated equipment as per schedule No. 234.

8th October.—S. and D. at the Departmental Stores, Sydney, of 5000 series protectors, single pole, as per Stores Schedule N.S.W. No. 336.

8th October.—S. and D. at the Departmental Stores, Sydney, of 140 Lodge Arresters, as per stores schedule N.S.W. No. 334.

15th October.—150 fire sheets (asbestos), as per stores schedule N.S.W. No. 326.

**15th October.—Measuring instruments, to stores** schedule N.S.W. No. [illegible]; telephone parts, to stores **schedule N.S.W. No. 314; switchboard parts, to stores schedule N.S.W. No. 315.**

15th October.—63,000 insulators (various), as per stores schedule N.S.W., No. 296.

22nd October.—S., D. and E. at the Telephone Exchanges, Randwick, Mosman, Parramatta, Ashfield, Burwood, Homebush, and Rookwood, Sydney, of seven (7) automatic switchboards, with associated equipment, as per schedule No. 281.

18th March, 1914.—S., D. and E. at the Telephone Exchanges, Epping, Ryde, Hunter's Hill, Drummoyne, Wahroonga, Paddington and Waverley, Sydney, of seven (7) automatic switchboards, with associated equipment, as per schedule No. 179.

POSTMASTER-GENERAL'S DEPARTMENT, Brisbane.—24th September.—Ironwork, as per stores schedule No. 264; pipes, cast iron, as per stores schedule No. 265; poles, iron, etc., as per stores schedule No. 266; wire, G.I., as per stores schedule No. 269.

15th October.—Steel date stamps, as per stores schedule No. 279.

19th November.—Bronze wire, as per schedule No. 273.

17th December.—S. and D. at the Stores Branch, Postmaster-General's Department, Brisbane, of insulators, as per stores schedule No. 280.

POSTMASTER-GENERAL'S DEPARTMENT, Perth.—1st October.—Exterminator—white ant, and plugs.

8th October.—Expansion bolts and shields to schedule No. 297.

8th October.—S. of milliammeters.

8th October.—Telephones, common battery, adjustable bracket sets.

15th October.—S. and D. of switchboard cable, W.A., schedule No. 312.

15th October.—S. and D. of conduits, steel enamelled, and fittings, W.A. schedule No. 313.

10th December.—S. and D. of 60 tons wire (galvanised iron).

POSTMASTER-GENERAL'S DEPARTMENT, Adelaide.—12th November.—One lamp signalling trunk line switchboard, of five sections, one cable turning section, and one cable storing section, one two-position recording desk, and one chief operator's desk, as specified in specification No. 431, etc., delivered at the Telephone Exchange, Adelaide, as per schedule No. 296.

POSTMASTER-GENERAL'S DEPARTMENT, Hobart.—22nd September.—S. and D. of 3 motor cycles, as per schedule No. T.77.

6th October.—Galvanised iron wire, as per schedule No. T.78.

1st December.—S. and D. of dry cells, as per schedule No. T. 84.

DEPARTMENT OF HOME AFFAIRS—Federal Capital.—24th November.—Water supply pumping plant for Canberra.

DEPARTMENT OF HOME AFFAIRS—Kalgoorlie-Port Augusta Railway.—2nd December.—600 pairs of wheels and axles (9in. x 4½in. journals).

### Victoria.

VICTORIAN RAILWAYS.—18th September.—Rolled steel joists, angle braces, etc.

18th September.—Short link chain, ⅜in.

19th September.—S. of metallic bath and screen.

19th September.—S. round iron.

19th September.—S. outlet ventilators.

19th September.—S. brass burners.

22nd September.—S. calculating machine.

24th September.—S. of bench twist drill grinder.

24th September.—Bench drilling machine.

24th September.—M., S. and D. of 45 tons cast-iron pipes, 8in. diameter. P.D., £2.

24th September.—M., S. and D. of steel castings for 30-ton wrecking crane. P.D., ½ per cent. (nearest £) of amount of tender.

24th September.—M., S. and D. of crimped wire (coppered steel). P.D., ½ per cent. (nearest £) of amount of tender.

1st October (extended from 10th September).—Neutral track relays.

1st October.—Motor, exhaust fan and accessories.

1st October.—M. (in the State of Victoria), S. and D. of locomotive parts for 20 "DD" locomotives. Particulars also at Ballarat, Geelong, Bendigo and Castlemaine stations. P.D., ½ per cent. (nearest £) of amount of tender.

8th October.—S. and D. of steel sheet piles for coffer dam. P.D., £10.

8th October.—M. (within the Commonwealth of Australia), S. and D. of 80lb. steel rails and fishplates. Contract No. 25,005.

8th October (extended from 17th September).—Pig iron.

8th October.—P. and R. of about 720 tons of 80 lb. double headed steel rails.

15th October.—Portable boring bar.

5th November.—Copper rod.

5th November.—Locomotive seamless copper tubes.

5th November.—Best Yorkshire iron angle and tees.

5th November.—Best steel boiler plates.

5th November.—Copper plates.

5th November.—100 tons of good machinery cast-iron scrap.

12th November.—Steel channel bars.

12th November.—20 tons steel ingots.

12th November.—Steel blooms, for crank pins

12th November.—Locomotive boiler tubes.

12th November.—High-speed tool steel.

12th November.—M., S. and D. of one 15-ton electric crane for Ballarat.

12th November.—Flame arc lamps.

12th November.—Insulated copper cable.

12th November.—M. and D. of one 60h.p. electric motor and accessories.

19th November.—M., S. and D. or cast steel wheel-centres for A2 engines and new truck stock

19th November.—Brass locomotive tubes.

19th November.—150 tons pig iron.

19th November.—10 tons sulphate of coppe, best quality, for electrical purposes, battery material.

3rd December.—Steel blooms, for piston rods.

3rd December.—S. and D. of vulcanised rubber electric light wire.

VICTORIAN RAILWAYS COMMISSIONERS—State Coal Mine.—18th September.—S. of Whitworth gas thread taper and plug taps.

18th September.—S. mild steel shafting.

18th September.—S. unannealed copper bar.

P & O. COMPANY'S ROYAL MAIL STEAMERS
FOR MARSEILLES, PLYMOUTH AND LONDON.

Leave Sydney on the subjoined dates, calling at usual ports.

FIRST AND SECOND SALOON ONLY.

| Steamer. | Tons. | Commander. | Noon. | Melb., 3 p.m. |
|---|---|---|---|---|
| MOOLTAN | 10,000 | Haddock | Sept. 20 | Sept. 23 |
| MOREA | 11,000 | Andrews | Oct. 4 | Oct. 7 |
| MARMORA | 10,500 | Lockyer | Oct. 18 | Oct. 21 |

PASSAGE MONEY TO LONDON—
Single, £41 16s. to £82 10s.
Return, £69 6s. and £123 4s.

Return Tickets between Inter-State Ports are available for return by Orient, Messageries Maritimes, and N.D.L. steamers having room.

SPECIAL HOLIDAY RETURN TICKETS to COLOMBO are now issued, available for two months. Fares from Sydney, £45 2s. first saloon, and £31 18s. second saloon.

A. GORDON WESCHE, Superintendent IN AUSTRALIA, 63 Pitt-street, Sydney.

**The COLONIAL MUTUAL FIRE Insurance Company Limited.**

Principal Office: 60 MARKET-ST., MELBOURNE.

Branches in all the States.
Transacts Fire, Guarantee, Employers' Liability, Marine, Burglary, and Plate Glass, Accident, Workers' Compensation and Live Stock Insurances.
Send for Prospectus.
W. TUCKER, General Manager.

Harringtons Ltd

**ANALYTICAL & METALLURGICAL DEPT.**

Lowest fees for all kinds of Assay, Analytical, and Metallurgical work.

Expert Advice on Ore Treatment, Bullion Refining, Smelting, etc., etc., Directed by a qualified Analyst from Messrs. Johnson and Sons, London: Assayers to Bank of England; H.M. Mint, The Council of India, etc.

**HARRINGTONS LTD.**
**386 George Street, Sydney.**

**SPECIAL NOTICE !**

**The Mount Morgan Gold Mining Co. Ltd.**

**ARE PREPARED TO PURCHASE Ores, Concentrates and Furnace Products, containing Gold and Copper, at most favourable rates.**

**ALSO TO INSPECT MINING PROPERTIES with a view to Developing, Financing, or Purchasing same.**

**Address:—MR. B. MAGNUS,** GENERAL MANAGER, MOUNT MORGAN, QUEENSLAND.

**A. U. S. N. Co. Ltd.**

*Fast, Regular, and Comfortable Passenger Steamers*

(also carrying cargo) from and to

MELBOURNE, SYDNEY, ADELAIDE, FREMANTLE, BRISBANE, and all QUEENSLAND PORTS.

Passage Tickets interchangeable, with other Inter-State Companies, on certain conditions.

Full Particulars at

COMPANY'S OFFICES

at all principal Australian Ports.

---

**The Mount Lyell Mining & Railway**

CO. LIMITED.

Purchasers of Ores containing Copper, Gold and Silver. Rates obtainable on application to the Secretary

Manufacturers of Coke for Smelting and Foundry Purposes, Acids, Etc.

HEAD OFFICE—
39 QUEEN-STREET, MELBOURNE.
D. G. LUMSDEN,
Secretary.

---

THE

**-PACIFIC CABLE BOARD-**

Cablegrams should be Marked

"VIA PACIFIC."

(Not Charged for.)

The quickest and most accurate route for Cablegrams from Australasia to United Kingdom, Canada, United States, Germany, New Zealand, and Pacific Islands.

This route is owned by Great Britain, Australia, New Zealand, and Canada. Australia being the largest part owner (having one-third interest), the public are urged to support the National Cable.

RATES—

| | Ordinary. | Deferred. |
|---|---|---|
| UNITED KINGDOM .. .. .. .. | 3/- | 1/6 |
| GERMANY .. .. .. .. .. .. | 3/- | 1/6 |
| CANADA .. .. .. .. .. .. .. .. | 2/4 | 1/2 |
| UNITED STATES .. .. .. .. .. | 2/4<br>to 2/8 | 1/2<br>to 2/4 |
| NEW ZEALAND .. .. .. .. .. | 4½d. | Nil |
| FIJI .. .. .. .. .. .. | 8d | Nil |

DEFERRED RATES (IN PLAIN LANGUAGE ONLY) have now been arranged to most Countries where ordinary rate exceeds 10d. per word.

Enquiries for further information, pads of cablegram forms, maps and tariff cards, address to—

The Superintendent, SOUTHPORT, QUEENSLAND;
The Officer in Charge, 408 Collins-street, MELBOURNE, telephone 2588;
The Officer in Charge, 42 Hunter-street, SYDNEY; telephones, City 1346, City 3684;
J Milward, Manager in the Pacific, 64 Pitt-street SYDNEY; telephones City 1346, City 3684.

18th September.—S. cluster fittings for Edison screw lamps.

18th September.—S. perforated galvanised steel or iron plate (20 gauge).

18th September.—S. hard-drawn copper wire.

18th September.—S. of Manilla rope.

18th September. S. of oil filter.

12th November (extended from 1st October). S. of rope road haulage engine and electrical equipment for McBride tunnel.

STATE RIVERS AND WATER SUPPLY COMMISSION. — 24th September.—C. of 12in. diameter pipe syphon, 1320ft. long.

24th September.—S. of 6000 casks of Portland cement (two contracts 3000 casks each). B. or A. manufacture.

PUBLIC WORKS DEPARTMENT.—18th September. 100 tons of zinc spelter. (See advertising columns.)

2nd October.—Oil engine and machinery for Lunatic Asylum, Beechworth. Particulars at Police Station, Beechworth.

## New South Wales.

PUBLIC WORKS DEPARTMENT.—29th September.—S., D. and E. of structural steel and ironwork for Registrar-General's old building. (See advertising columns.)

7th October.—S. and D. of 500 tons of iron spikes for 60 lb. rails. (See advertising columns.)

7th October.—S. of steel pipes and specials for the reticulation of township and supply to the mines, Water Supply, Broken Hill (see advt. cols.).

7th October.—M., S. and D. of 15 jib water cranes.

27th October.—M. of steel bridge for Wilson River, Wauchope to Kempsey section, North Coast railway. (See advertising columns.)

RAILWAY DEPARTMENT.—24th September.—S. of one induced draught fan for Newcastle Power House. (See advertising columns.)

15th October.—S. of 13 direct-current motors. (See advertising columns.)

26th November.—S. of one 2000 lb. storage battery freight truck. (See advertising columns.)

SYDNEY HARBOUR TRUST.—22nd September.—S. and D. of rolled steel joists and fishplates for runways to hand-power travelling gantry platforms at berths Nos. 5a and 5b, Darling Harbour. (See advertising columns.)

22nd September.—S. and D. of roller hangers for sliding doors to cargo sheds, Port Jackson.

METROPOLITAN BOARD OF WATER SUPPLY AND SEWERAGE (341 Pitt-street, Sydney).—22nd September. S. of C.I. ball bearing housings for centrifugal pumps. (See advertising columns.)

29th September.—S. of ironwork for two bridges. (See advertising columns.)

29th September.—S. of two automatic throttle valves and vacuum breakers. (See advertising columns.)

15th December.—M. and D. of one turbine centrifugal pumping plant for Crown-street Pumping Station. (See advertising columns).

## Western Australia.

GOVERNMENT TENDER BOARD.—18th September.—One improved lever punching, shearing, and angle iron cutting machine for Railway Department.

18th September.—50 tons of charcoal for State battery, Wiluna.

2nd October.—700 brass boiler tubes for Railway Department.

9th October.—25,000 gallon C.I. tanks, for Railway Department.

30th October.—S. moulding machine cupolas and pneumatic hack saw bench for Railway Department.

## Queensland.

TREASURY DEPARTMENT.—29th September.—S. of about 1687 tons of cast iron spigot and faucet water pipes, special castings, and valves. for Maryborough Waterworks.

29th October.—C. and E. of central sugar mill at Babinda Creek, North Queensland.

WATER SUPPLY DEPARTMENT.—3rd October.—Sinking artesian bore on reserve in parish of Gaila.

## South Australia.

SUPPLY AND TENDER BOARD.—23rd September.—S. and D. of 40 cwt. ingot tin, not under 99 per cent. pure.

23rd September.—M. (in S.A.) and D. of 1000 ½in. main and boundary stopcocks, 1000 ¾in. main and boundary stopcocks, and 500 1in. main and boundary stopcocks. (Metals in castings to be copper 87, tin 8, zinc 5, and lead 1 part.)

23rd September.—M. (in S.A.) and D. of 250 turbine water meters. 1in.

23rd September.—S. and D. of 6 Hadfields "Era" manganese steel fixed jaw faces for Jacques crusher, approximate weight 6 cwt. each.

14th October.—S. and D. in trucks on wharf, Port Adelaide, of 800 solid drawn best toughened copper tubes, for locomotive boilers, 10ft. 8¼in. long x 1¾in. outside diameter x No. 10 I.W.G. thick at the end, gradually tapering to No. 12 I.W.G. at the other end. Customs duty (if any) to be paid by contractor.

RAILWAYS DEPARTMENT.—23rd September.—P. of 25 box trucks, 5ft. 3in. gauge, at Moonta Bay.

30th September.—M. of brake reservoirs and shafts for engines and tenders, 3ft. 6in. gauge.

30th September.—P. of 64 secondhand 400 gall. tanks at Islington works.

30th September.—C. of 20 suburban carriages, 5ft. 3in. gauge.

30th September.—Sinking bore in hundred of Sherlock.

30th September.—C. of inlet tunnel to Millbrook reservoir, 5244ft. long.

## New Zealand.

RAILWAYS DEPARTMENT.—31st October.—S. and D. of stores for the period from April 1, 1914, to March 31, 1917.

## General.

CITY OF MELBOURNE.—1st October.—Insulated copper cables.

7th October.—Incandescent electric lamps, and single phase transformers.

8th October.—Insulated copper cables.

CITY OF LAUNCESTON (T.) (C. W. Rocher, Town Clerk).—27th October.—S. of electrical fittings, incandescent lamps, wire and cable. (See advertising columns.)

24th November (extended from 13th October).—Section i., S. and D. of transformers, etc.; section ii., S. and D. of feeder cable, etc.; section iii., S., D. and E. of high tension switch board, etc.

THE MELBOURNE AND METROPOLITAN BOARD OF WORKS (V.).—19th September.—M., S. and D. in position at Woori Yallock Creek of girders with hanging straps, bolts, and other fittings, for carrying the main O'Shannassy 34in. pipe over the creek. (See advertising columns.)

TOWN OF NORTHCOTE (W. G. Swift, town clerk).—29th September.—S. of 600 ironbark, box or jarrah poles; S. 4 single phase transformers; S. of and alternately S. and E. of extra high tension and low tension fuse and switchgear, for sub-stations; S. of rubber covered cables; S. metal filament lamps, cast iron brackets and reflectors; S and D. of flame arc lamps; S. of insulators, iron pole brackets and pins; S. of house service fuses and A.C. meters; S. of bare copper cables.

TOWN OF PORT MELBOURNE (A. V. Heath, town clerk).—29th September.—S. and D. of steel trackway plates for extension of steel track in Inglis-street. Tenders to be addressed to Mayor.

MUNICIPAL COUNCIL OF SYDNEY.—29th September.—S. and D. of copper for use as busbars; S. and E. of steel ladders; S. and D. of testing transformer; S. and D. of metal filament electric lamps. (See advertising columns.)

ARTHUR F. PRITCHARD, 83 Pitt-street, Sydney.—P. of 60h.p. one Babcock and Wilcox boiler; one low pressure accumulator; one set vertical high pressure single acting pumping engines; one high pressure accumulator. (See advertising columns.)

WATERLOO GLASS BOTTLE WORKS LTD., Crescent-street, Waterloo, Sydney.—For sale, suction gas plant, consisting of Premier gas engine and all accessories. (See advertising columns.)

BRISBANE—THE METROPOLITAN WATER AND SEWERAGE BOARD (Albert-street).—30th September.—Laying and jointing about 68 chains of 9in. pipes in Lytton-road, Balmoral; boring, sinking 2 wells to a depth of 3000ft. in the vicinity of Roma, Queensland. Apply to Percy Douglas, Barrack-street, Sydney; or Robert Falkiner, Wynnum, via Brisbane.

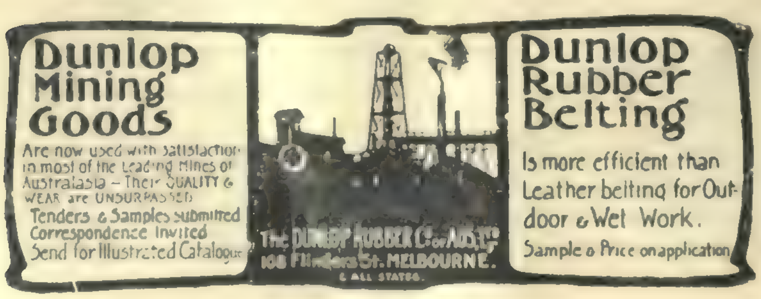
MACKAY HARBOUR BOARD (Q.) (H. F. MacDonnell, secretary).—15th October.—S. of mild steel round bars and steel wire.

29th October.—S. of Portland cement.

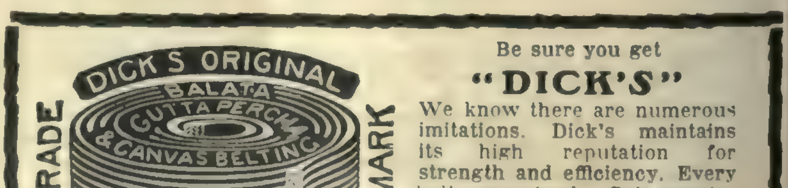
MOUNT LYELL MINING AND RAILWAY CO. LTD. (D. G. Lumsden, Secretary, 39 Queen-street, Melbourne).—20th September.—S. of stores (including electrical goods and chemicals) for 12 months ending 31st December, 1914.

STANLEY REWARD TIN MINING COMPANY (L. A. Cleveland, manager, 31 Queen-street, Melbourne).—18th September.—Tributing the lode section of the company's property, Stanley River, West Coast, Tasmania.

GEELONG WATERWORKS AND SEWERAGE TRUST (V.) (J. S. Sharland, secretary).—25th September.—Contract No. 7—M., S. and D. and the



Dunlop Mining Goods
Are now used with satisfaction in most of the Leading Mines of Australasia – Their QUALITY & WEAR are UNSURPASSED
Tenders & Samples submitted
Correspondence Invited
Send for Illustrated Catalogue
The DUNLOP RUBBER Co. of AUS. Ltd
108 Flinders St. MELBOURNE.
& ALL STATES.
Dunlop Rubber Belting
Is more efficient than Leather belting for Outdoor & Wet Work.
Sample & Price on application



Note this on every belt.
Be sure you get
"DICK'S"
We know there are numerous imitations. Dick's maintains its high reputation for strength and efficiency. Every belt guaranteed. Sole agents:
JAMES HARDIE & CO.
Melbourne and Sydney.

**WRISTLET WATCHES**

They have come to stay. Why?
Fashion's decree of "no" pocket calls for some safe way to carry a watch.
They have a very handsome appearance.
They are distinguished looking.
We make the bracelets.
We set them with diamonds, with pearls, with turquoise, and stock them in plain gold.
We sell only reliable watches at bedrock prices.
See our large stock of watches.
Write for watch pamphlet.

Good, Reliable Lever Watches, fully jewelled, from £5/5/-; set with pearls, from £11/11/- upwards; with diamonds, £25, are the rage.

**FAIRFAX and ROBERTS LTD.,**
**The Oldest Jewellery House in Sydney, 23 and 25 HUNTER STREET.**

Plain figures—Cash.

laying and jointing of about 10,250 lineal feet of oviform reinforced concrete pipes.

WANGARATTA WATERWORKS TRUST (V.) (T. C. Muntz, secretary).—22nd September.—S. of secondhand pumps, 20,000 galls. or more (Worthington preferred).

SHIRE OF NUNAWADING (V.) (J. R. Kefford, secretary, Box Hill).—20th September.—Wires and cable and wood poles.

18th October.—Electrical equipment. (See advertising columns.)

AUST. GAS RETORT AND FIRE BRICK CO., Toorak road, South Yarra.—18th September.—One 10h.p. horizontal engine, one 15h.p. watertube boiler, one pair clay rollers, one 7ft. grinding pan, one 6ft. grinding pan, two wire-cut brick machines, hoisting gear, shafting, and pulleys.

STAMP BATTERY (Walter G. Ingpen, 414 Collins-street, Melbourne).—27th September.—P. of one 5-head Californian pattern battery, engine, boiler, pump, Phoenix weir table, all complete, and in good order, delivery on Grey Horse mine, Happy-go-Lucky. Or, alternatively, tenders for dismantling and delivering the plant at Walhalla and Cooper's Creek.

FINLAYSON BROS. and CO. LTD., Devonport (T.).—20th September.—P. of slipping plant at Battery Point, suitable for vessels up to 1200 tons, weight approx. 300 tons; tenders can be for whole or in lots to suit purchasers.

CHRISTCHURCH CITY COUNCIL (H. R. Smith, town clerk).—5th January, 1914.—S. and D. of series street lighting plant and accessories. Specifications may be seen Town Clerk's office, Melbourne.

## ACCEPTED.

### Commonwealth.

POSTMASTER-GENERAL'S DEPARTMENT, Victoria.—Item 2, 1770 lbs. bolts and nuts, 6in. x 7-16in., £19 7s. 2d.; item 3, 1770 lbs. bolts and nuts, 7in. x 7-16in., £18 11s. 4d.; item 4, 2000 lbs. bolts and nuts, 8in. x 7-16in., £19 11s. 4d.; item 5, 15,000 lbs. bolts and nuts, 9in. x 7-16in., £146 15s. 4d.; item 6, 17,000 lbs bolts and nuts, 10in. x 7-16 in., £160 6s. 8d.; item 7, 11,500 lbs. bolts and nuts, 11in. x 7-16in., £112 10s. 4d.; item 8, 13,500 lbs. bolts and nuts, 12in. x 7-16in., £132 1s. 8d.; item 9, 3200 lbs. bolts and nuts, 13in. x 7-16in., £31 6s. 2d.; item 10, 1100 lbs. bolts and nuts, 14in. x 7-16in., £10 15s. 3d.; item 11, 1 ton bolts and nuts, 6½in. x ½in., £20 15s.; item 18, 3600 bridle rings, pattern C, size No. 1, £16 17s. 6d.; item 19, 5400 bridle rings, pattern C., size No. 2, £30 18s. 9d.; item 20, 1400 bridle rings, pattern C, size No. 3, £9 9s. 7d.—Edward Duckett and Sons, Melbourne.

Item 29, 10 tons W.I. washers, £170—J. H. Garbutt.

Item 1, 30,000 wooden spindles, £153 15s.—Thornton and Watson.

Item 4, 5750 spindles, steel galvanised, swan neck, £503 2s. 6d.—Sherardizing Pty. Ltd.

Item 3, 5 tons wire, galvanised iron, 60 lbs. per mile, £69 5s.; item 4, 30 tons wire, galvanised iron, 100 lbs. per mile, £355 10s.; item 5, 260 tons wire, galvanised iron, 400 lbs. per mile, £2567 10s.; item 7, 5 tons wire, steel galvanised, 7 strand, No. 20, S.W.G., £144 2s. 6d.—Briscoe and Co. Ltd.

Item 1, 400 bends, normal, ⅜in., £4; item 2, 500 bends, normal, ½in., £4 2s. 6d.; item 5, 3000 clips, ⅜in., £2 5s.; item 6, 4000 clips, ½in., £2 10s.; item 7, 26,000ft. conduit steel, ½in., £48 15s.; item 9, 3000 crampets, ½in., £1 17s. 6d.; item 10, 3500 elbows, ⅜in., £28 17s. 6d.; item 11, 5000 elbows, ½in., £21 5s.; item 15, 500 tees, ⅜in., £6 5s.; item 16, 500 tees, ½in., £5; item 17, 2000 unions, steel, ⅜in., £10; item 18, 2000 unions, steel, ½in., £8.—Noyes Bros. (Melb.) Pty. Ltd.

Item 2, 80,000 tapes, copper, for 70 lb. wire and pattern B insulator, £55 6s. 8d.; item 3, 30,500 tapes, copper, for 200 lb. wire and pattern A insulator, £75 1s.; item 4, 30 tons wire, bronze, 70 lbs. per mile, £2593 10s.—F. Vanderkelen and Co.

DEPARTMENT OF HOME AFFAIRS.—S. of machinery and tools for electrical workshops, Canberra, £529 6s. 2d.—McPherson's Pty. Ltd.

Murrurundi Post Office—Installation of air gas system, "Light of Australia," £62 10s.—Quirk's Lighting and Engineering Ltd.

Woollen Mills, Geelong (V.)—Structural steelwork for power loom, weaving, etc., houses, £4299 6s. 10d.—Johns and Waygood Ltd.

S. of lavatory basins, urinals, £519 16s.—J. Tylor and Sons.

S. of W.I. mall, I. fittings for the Royal Naval College, Jervis Bay (N.S.W.)—£169 19s. 2d.—R. Joyner and Sons.

### Victoria.

VICTORIAN RAILWAYS.—S. and D. of steel channel bars for 100 "U" trucks, at £9 17s. 2d. per ton, delivered at Spencer-street Railway Station—Edward Duckett and Sons.

S. and D. of block tin, 10 tons 24 lbs., at £187 10s. per ton—The Pioneer Tin Mining Co. Ltd.

M., S. and D. of ⅜in. pins for 60 lb. "T" rails, at £14 19s. per ton—McPherson's Pty. Ltd.

S. and D. of 1 portable steam engine and boiler, 20 N.H.P., new, at £710—Robison Bros. and Co. Pty. Ltd.

M., S. and D. of driving gear for speed recorders for "A2" engines, at £7 13s. 6d. per set—Orton and Burns.

M., S. and D. of 1 railway and electric tramway crossing, complete, for Glenhuntly-road, Elsternwick, at £252 14s.—Thompson and Co. (Castlemaine) Pty. Ltd.

PUBLIC WORKS (PORTS AND HARBOURS).—1 ⅜in. punching and shearing machine, with angle irons, £170—Messrs. Bevan and Edwards Pty. Ltd.

Copper pipes for use in connection with construction of Dredge No. 1, £105 15s.—A. Hayes.

WORKS—P. of 25 miles 42 x 17 x 1½in. wire netting, without public tenders being invited, £25 2s. 6d. per mile—Messrs. Lysaghts Bros.

P. of "A" grade wire netting, 42 x 17 x 1¼in., and "B" grade wire netting, 42 x 17 x 1¼in., for period 1st July, 1913, to 30th June, 1914, without public tenders being invited, "A" grade £32 per mile, "B" grade £30 per mile—Messrs. Lysaghts Bros.

### New South Wales.

PUBLIC WORKS DEPARTMENT.—S., D and fixing of roller shutters at new Temporary Meat Markets, £1176 18s.—Wormald Bros. Ltd., Waterloo.

S., D., E. and M. of hydraulic presses, pumps, and cages at the new abattoirs, Homebush Bay, £2800—Stamp and Powell.

M., S. and D. of 20 5-ton steel gantry cranes for railway station yards, contract No. 29-13, £1788 10s.—Structural Engineering Co., Erskineville.

### New Zealand.

RAILWAY DEPARTMENT.—S. of one stationary steam engine, £310—W. Crabtree and Sons.

S. of one stationary boiler, £349 17s. 6d.—Charles Judd Ltd.

### Western Australia.

1 only steam winch, £135—Tomlinson Bros. and Co.

1 only "New Hudson" motor cycle, £57 10s.—Grave and Dwyer Motor Co. Ltd.

1 only secondhand air compressor, f.o.r. Kalgoorlie, £90—Forward, Down and Co. Ltd.

Cast iron split rings, £5 19s. each—T. Eilbeck and Son.

Copper firebox tube plates, items 1927 to 1930, £468 12s.—Elder, Shenton and Co. Ltd.

## INDUSTRIAL.

We have been advised by Messrs. P. T. Taylor Ltd., of 141 York-street, Sydney, that the firm have been appointed sole N.S.W. agents for the Victoria Safe Co. of Melbourne. They are in a position to quote for all kinds of steel fireproof safes and strongroom doors, of which stocks are held in Sydney, and would be pleased to show samples to anyone interested.

## Commonwealth of Australia.

Postmaster-General's Department,
Melbourne, September 12, 1913.

It is hereby notified that the date for receipt of Tenders for Switchboards at Collingwood (Schedules 859 and 860) has been extended to October 14, 1913.

AGAR WYNNE,
(1253) Postmaster-General.

---

Postmaster-General's Department,
Melbourne, September 15, 1913.

TENDERS FOR SULPHATE OF COPPER FOR VARIOUS STATES.

It is hereby notified that Item 1 of Schedule No. 956 (Sulphate of Copper for Various States) has been amended, and now reads 173 tons in lieu of 140 tons. Tenders close on the 23rd inst.

AGAR WYNNE,
(1254) Postmaster-General.

## Government Notices (N.S.W.).

Metropolitan Board of Water Supply
and Sewerage,
341 Pitt-street, Sydney.

TENDERS for the works specified below will be received up to 2 p.m. on the dates mentioned. For particulars, see "Government Gazette."

SEPTEMBER 22, 1913.

C.I. Ball-bearing Housings, for Centrifugal Pumps.

SEPTEMBER 29, 1913.

Ironwork for two Bridges.
Two Automatic Throttle Valves and Vacuum Breakers.

DECEMBER 15, 1913.

Manufacture and Delivery of one Turbine Centrifugal Pumping Plant for Crown-street Pumping Station.

WILLIAM HOLMES,
September 12, 1913. Secretary.

---

New South Wales Government Railways,
Office of the Chief Commissioner,
Sydney, September 13, 1913.

TENDERS will be received at this office until 12 o'clock noon on the dates specified for the undermentioned works, etc., viz.:—

WEDNESDAY, SEPTEMBER 24, 1913.

The Supply of One Induced Draught Fan for Newcastle Power House. Specification No. 424, price 2s. 6d.

WEDNESDAY, OCTOBER 15, 1913.

The Supply of Thirteen Direct Current Motors, to Specification No. 412, price 2s. 6d. each.

WEDNESDAY, NOVEMBER 26, 1913.

The Supply of One 2000 lb. Storage Freight Truck. Specification No. 426, price 2s. 6d.

All specifications are obtainable at the Electrical Engineer's Office, 61 Hunter-street, Sydney.

Tenders are to be endorsed, "Tender for Draught Fan," or as the case may be.

The Chief Commissioner does not bind himself to accept the lowest or any tender.

By order,
J. S. SPURWAY,
Secretary.

---

Sydney Harbour Trust Office,
Circular Quay, September 12, 1913,

TENDERS FOR ROLLED STEEL WORK.

TENDERS will be received at this office up to 2 p.m. on the 22nd inst., for the Supply and Delivery to the Trust of Rolled Steel Joists and Fishplates for Runways to Hand-power Travelling Gantry Platforms at Berths Nos. 5a and 5b, Darling Harbour.

Forms of tender and full particulars may be obtained upon application to the Engineer-in-Chief of the Trust.

HAROLD F. NORRIE,
(7a17) Secretary.

## MUNICIPAL COUNCIL OF SYDNEY.

TO CONTRACTORS.

SEALED and ENDORSED TENDERS will be received by the undersigned until 3 o'clock p.m. on Monday, September 29, 1913, for the following:

(a) The Supply and Delivery of Copper for Use as Bus-bars.
(b) The Supply and Erection of Steel Ladders.
(c) The Supply and Delivery of Testing Transformer.
(d) The Supply and Delivery of Metal Filament Electric Lamps.

Copies of Specifications, etc., may be seen or obtained upon application at the office of the City Electrical Engineer, Town Hall, Sydney, upon payment of the sum of 10s. 6d. in each case.

The lowest or any tender not necessarily accepted.

Tenderers please note that they must pay their CASH DEPOSITS direct into the City Treasury, and not enclose same with their tenders, otherwise their tenders will be rejected as INFORMAL.

THOMAS H. NESBITT,
Town Hall, Sydney, Town Clerk.
September 12, 1913.

## CITY OF LAUNCESTON, TASMANIA

ANNUAL ELECTRICAL SUPPLIES, 1914.

TENDERS, addressed to the Mayor and Aldermen, and endorsed "Tender for Electrical Supplies," and name of Tenderer, will be received up to 4 o'clock p.m. on Monday, October 27, 1913, for the Supply of the following Electrical Stores for the year 1914:—

ELECTRICAL FITTINGS.
INCANDESCENT LAMPS.
WIRE AND CABLE.

Copies of conditions, specifications, schedules and form of tender may be obtained upon application to the City Electrical Engineer, Town Hall. Duplicate copies will be supplied on payment of Two Shillings and Sixpence each, which will not be returned.

The lowest or any tender not necessarily accepted, and the Council reserves to itself the right to accept the whole or part of any tender.

C. W. ROCHER,
Town Hall, Launceston, Town Clerk.
September 15, 1913.

## CATHCART CENTRAL GOLD MINING CO., No Liability.

A Dividend (3rd) of 2s. per share has been made, payable on Tuesday, September 30, 1913. Books for transfer close from Tuesday, September 23, inclusive. D. MURRAY, Manager.
430 Lt. Collins-st., Melb., Sept. 9.

## FOR SALE.

Suction Gas Plant, consisting of 65h.p. Premier Gas Engine, with Mersey producer, scrubber, expansion box. Tanks and piping all complete, good working order; can be seen running.. Apply—

WATERLOO GLASS BOTTLE WORKS LTD.,
Crescent-st., Waterloo, Sydney, N.S.W.

## GRAFTON COPPER MINING CO.

REQUIRE for Cangai, 30 WOOD CUTTERS, 5s. to 9s. per cord, at stumps. Secretary of Grafton Copper Mining Co., Grafton, N.S.W.

## BOURKE'S HILL TIN SLUICING Co., No Liability, Emmaville, N.S.W.

A Dividend (the 14th) of Sixpence per share has been declared in the above Company, payable at the registered office, 125 Queen-st., Melbourne, on Tuesday, September 30, 1913. Share Register will be closed from September 25 to 30.

JAMES MACKAY, Manager.

---

Shareholders in the Commercial Banking Company of Sydney last Monday unanimously confirmed the resolution previously passed to increase the capital of the company to £4,000,000 by the creation of 20,000 new shares of £25 each.

A prospector, named Holden, when testing the outcrop of a reef lying 60 miles north of Meekatharra and 16 miles west of Ruby Well (W.A.), is reported to have struck sensational values, as good as anything yet found in the Western State. Several leases have already been pegged out, a rush in motor cars having set in from Meekatharra.

## BROKEN HILL PROPRIETARY BLOCK 14 Co. Ltd.

NOTICE is hereby given that a Dividend, the 67th, of 1s. per share on the ordinary shares, and the 13th, of 1s. per share, on the preference shares, together with the half-yearly interest of 10 per cent. on the preference shares, has been declared, payable on October 15, 1913. Transfer books close on Wednesday, October 1, at 3 p.m. By order of the Board,

JOHN BRANDON, Secretary.
31 Queen-st., Melb., Sept. 15, 1913.

---

NOTICE is hereby given that the Patentee of Australian Letters Patent No. 18,186/10, dated June 13, 1910, for "Improvements in Turbines, Pumps, and the Like," is prepared to satisfy any demands and all requirements of the public respecting said invention. Further information and particulars obtainable from Edward Waters and Sons, Patent Attorneys, 414-418 Collins-st., Melbourne, and 7 Moore-st., Sydney.

---

TENDERS are invited for the PURCHASE and REMOVAL of COMPLETE HYDRAULIC PLANT, at present installed at Pyrmont, consisting of:—

1 60h.p. Babcock Wilcox Boiler, working pressure 120 lb. per sq. in., with all mountings, iron stack, approximately 80ft., and Worthington feed pump; 1 Low-pressure Accumulator; 1 Set Vertical High-pressure Single-acting Pumping Engines, suitable for a pressure of 2000 lb. per sq. in.; 1 High-pressure Accumulator, having ram approximately 6in. dia., 2000 lb. working pressure.

All the above machinery is in first-class working order. Separate items may be purchased. For further particulars apply to—

ARTHUR F. PRITCHARD,
83 Pitt-street. Architect.

---

TENDERS are invited for the PURCHASE of one 5-head Californian Pattern BATTERY, Engine, Boiler, Pump, Phoenix Weir Table; all complete and in good order. Delivery on Grey Horse Mine, Happy Go Lucky. Or, alternatively, tenders for dismantling and delivering the plant at Walhalla and Cooper's Creek. Tenders close September 27, 1913, and addressed to WALTER C. INGPEN, 414 Collins-street, Melbourne, from whom full particulars may be obtained.

## STANLEY'S DRAINING LEVEL.

A cheap, precise instrument, with 4 levelling screws, good telescope, tripod, and case, £6. 10ft. Levelling Staff, £1/5/-. Stock just to hand. Illustrated list of surveying instruments gratis.

W. WATSON & SONS,
The Optical Centre, 78 Swanston-st., Melb.

## THE CARPATHIA TIN MINING CO., No Liability.

NOTICE is hereby given that an EXTRAORDINARY GENERAL MEETING of the Shareholders of the abovenamed Company will be held at the Meeting-room, Chamber of Commerce Building, George and Grosvenor-sts., Sydney, on Tuesday, September 23, 1913, at 12 o'clock noon, when the subjoined resolution, which was passed at the Extraordinary General Meeting of the Company, held on September 2, 1913, will be submitted for confirmation as a special resolution:—

That the Rules of the Company be amended as under:—

1. That Rule 20 of the Company's Rules be deleted.
2. That Rule 43 of the Company's Rules be amended by the addition thereto of the words "or March" after the word "February," and by the addition of the words "or September" after the word "August."
3. That Rule 85 of the Company's Rules be deleted, and the following Rule be substituted therefor:—
   85. The Directors may from time to time appoint one of their body to be Managing Director of the Company, either for a fixed term or with any limitation as to the period for which he is to hold such office, and may from time to time remove or dismiss him from office, and appoint another in his place.
4. That Rule 119 of the Company's Rules be deleted, and the following Rule be substituted therefor:—
   119. At the Ordinary General Meetings to be held in August or September in every year the Directors shall lay before the Company a statement of the income and expenditure and balance-sheet containing a summary of the property and liabilities of the Company, made up to a date not more than six weeks before the meeting from the time to which the last preceding statement and balance-sheet were made, or in the case of the first statement and balance-sheet from the incorporation of the Company.
5. That Rule 123 of the Company's Rules be amended by inserting the words "or September" after the word "August" in the fourth line therein.

By order of the Board,

R. VERNON SADDINGTON, Secretary,
109 Pitt-st., Sydney, Sept. 9, 1913.

## WANTED.

YOUNG MAN, with long and good experience, desires Position as Manager of Battery or Cyanide Plant. Has designed and erected complete Treatment Plant. Excellent references. Will go to any part of the world.

Apply:—"GOLDDUST," Office of this Paper, Melbourne.

---

Abridged Prospectus.

Parramatta,
September 11, 1913.

## THE AUTOMATIC GOLD RECOVERY (JONES PROCESS) LIMITED.

(To be incorporated under the N.S.W. Companies Acts.)

CAPITAL—£2500 in 5000 shares of 10/- each.

2500 shares fully paid up are to be issued to the Vendors in payment for their interest in the invention.

2500 are offered for subscription, payable 1/3 on application, 1/3 on allotment, and 1/- per month, if required.

PROVISIONAL BOARD.

THOMAS TAYLOR, ESQ., Civil Engineer, 12 Kensington-street, Sydney.
JOHN GEORGE DALLEY, ESQ., Independent Means, Paul-street, Waverley.
LETCHFIELD WHITEHEAD, ESQ., Builder, Parramatta.
WILLIAM BURTON BURTON, ESQ., Engineer, 39 Post Office Chambers, Pitt-street, Sydney.
JOHN WAUGH, ESQ., Independent Means, Parramatta.
SOLICITOR, Francis G. Clark, 63 Pitt-street, Sydney.
PROVISIONAL SECRETARY AND OFFICE, F. J. Thomas, F.I.I.A., George-street, Parramatta.
BANKERS—The Commercial Banking Company of Sydney Limited (Parramatta Branch).

OBJECTS.—The principal objects for which the Company is established are: (1) To acquire from the Vendors all their right title and interest in and to a certain process for the recovery of gold and/or other metals and in respect of which application for provisional protection rights has been made by Sydney Newton Jones. (2) To erect a small trial plant to more fully demonstrate the efficiency of the process.

The whole of the subscribed capital will be placed to the Company's credit; and after payment of the expenses of flotation, will be available for working Capital.

The Vendors agree to transfer fully paid up shares to applicants for Contributing Shares in the proportion of one to every five upon which application and allotment fees shall be paid.

The Company will be registered when 1250 shares have been applied for.

Full prospectus and application forms can be obtained at the office of the Provisional Secretary.

APPLICATION FORM.

I enclose herewith cheque for..........................being a deposit of 1/3 per share on ..................shares in your Company, and I request you to allot me that number of shares upon the terms of the Company's prospectus dated the 11th day of September, 1913.

And I hereby agree to accept the same, or any smaller number that may be allotted to me and to pay the sum of 1/3 per share on allotment, and the balance in accordance with the said Prospectus, and authorise you to register me as the holder of the said shares, or of any smaller number that may be allotted to me.

Name in full..................................................
Address..................................................
Description..................................................
Date..................................................
Signature..................................................

ABRIDGED PROSPECTUS OF

# Portland Place Mansions Limited, St. Kilda.

(To be Registered under the Companies Act 1910.)

**CAPITAL: £50,000 IN 5000 SHARES OF £10 EACH.**

**Of which**

**3,200 are offered to the Public at £10 each, payable £5 per share on application, £5 per share on allotment.**

**500 are to be issued fully paid up to the Promoter.**

**1,300 are to be held in reserve for future issue.**

**5,000**

**The proceeds of this issue will be placed to the credit of the Company without deduction, except for brokerage and flotation fees and expenses.**

**A brokerage will be paid of 5 per cent. on application money.** **Flotation fees and expenses, £375.**

PROVISIONAL DIRECTORS—CHARLES PATTISON, J.P., Moonee Ponds. R. J. MOOREHEAD, Hawthorn. E. BRANFILL HARRISON, 97 Elizabeth-street. BANKERS—ROYAL BANK, Melbourne. SOLICITOR—To be Appointed. AUDITOR—To be Appointed. SECRETARY (pro tem)—E. BRANFILL HARRISON. REGISTERED OFFICE—London House, 97 Elizabeth-street, MELBOURNE.

The property which is being acquired by the Company presents advantages quite unrivalled in any part of St. Kilda. It consists of a triangular block of land, three acres in area, bounded by Acland-street, Barkly-street, and Belford-street respectively; the City Cable Tram to North Carlton runs along the Acland-street frontage; the Electric Tram to Brighton runs along the Barkly-street frontage; and the Prahran and Malvern Trust Electric Tram that runs from the Esplanade via Carlisle-street and Balaclava-road to the terminus at Central Park, Burke-road, Malvern, passes within a few feet of the corner of Belford-street. This property is, therefore, provided **with unique transport facilities within a stone's throw of the Esplanade.**

The property itself consists of two estates, the first the Oakrood Estate, the property of Mr. F. P. C. Beyer, 1½ acres in area, containing a 15-room two-storeyed brick house, standing in a charming well-wooded garden, with extensive lawns and flower-beds.

The second estate comprised in this property is that of Mr. Harvey Patterson, 1½ acres in extent, "Taroona," now containing a fine villa residence. This property has for one boundary the entire length of Belford-street, and also frontages to the two main streets, **Barkly and Acland streets.**

It is intended to erect a succession of stately mansions of flats, ultimately five in number, commencing by rebuilding and converting the Oakrood house into a five-storeyed mansion of flats, containing some 90 rooms. The plans for this have been supplied by a leading architect, Mr. A. H. Fisher, showing a building beautiful in outline, and with an interior designed to fulfil every want, and fitted throughout with all the latest conveniences. There will be suites of three, four and five rooms to suit varying requirements, and single **bachelor apartments. These will be let either furnished or unfurnished as required.**

The approach to the building will be along a fine carriage drive, leading up to a handsome entrance-hall, with inner hall furnished **with an artistic and roomy inglenook.**

**On the completion of the first mansion, and its successful launching, it is proposed to at once erect a second similar one, to be** followed by three more in succession, the complete proposition being a set of five mansions of similar design and appointments, standing **in common grounds artistically laid out in lawns, shrubberies, and flower-beds, and forming one homogeneous whole.**

It will thus be seen that the Company is acquiring a self-contained block, which it is proposed to convert into a populous residential **and business area, while still retaining the beauty and privacy of the Central Mansions.**

The capital subscribed, £32,000, will amply suffice for the purchase of the freeholds, less a small amount to remain out on mortgage, and for the building and furnishing of the first mansion, while the reserve capital, £13,000, will be available for the commencement of the second, the question of raising the extra capital for the completion of the whole scheme by the issue of debentures, by increase **of capital, or by mortgage, being left for subsequent decision by the shareholders.**

In these estates the Company has ample security for the capital invested in valuable freeholds of rising value, and buildings that **fulfil a want, and will be in demand.**

The returns from the letting of the flats, the dining-room and catering, the shops, garage, etc., will on a close estimate return **approximately 15 per cent. after due deduction for all contingencies.**

A large proportion of the shares have already been applied for, and it is anticipated that the whole will be readily taken up.

The several persons whose names and addresses are subscribed are desirous of being formed into a Company in pursuance of the Memorandum of Association, and they respectively agree to take the number of shares in the capital of the Company set opposite to their respective names:—

| NAMES, ADDRESSES, AND DESCRIPTION OF SUBSCRIBERS. | Number of Shares Taken out by Each Subscriber. |
|---|---|
| **R. J. MOOREHEAD, "Yarradale," Fordholm-road, Hawthorn, journalist** | One. |
| **EDWARD BRANFILL HARRISON, London House, 97 Elizabeth-street, secretary** | One. |
| **CHARLES PATTISON, Mantell-street, Moonee Ponds, investor** | One. |
| **HARVEY PATTERSON, c/o. Dalgety and Co., Bourke-street, investor** | One. |
| **FRANCIS PETER CHARLES BEYER, 201 Barkly-street, St. Kilda, investor** | One. |

**Any details and particulars as to Estimates, Plans, etc., will be supplied on application to the Office.**

## BANK CLEARINGS.

The report of the Melbourne Clearing House for the week ended 15th September was:—

| | | |
|---|---|---|
| Total clearance | | £4,562,855 |
| Balances— | | |
| Settled by certificates | £483,500 | |
| Settled in coin | 84,316 | |
| | | 567,816 |
| Total clearance for the corresponding week, 1912 | | £5,219,564 |

The Yellow Girl, a mine on the Glen Wills field in the Omeo district of Victoria, is little known except locally, yet it started its career a few years ago with a first crushing, which gave 42½ oz. to the ton: last year 140 tons of stone yielded 575 oz. of gold of the value of £1630; its total production to the end of 1912, according to the annual report of the Secretary for Mines, was 11,437 oz. from 5782 tons, or close upon 2 oz. to the ton, and it has paid £7500 in dividends. Last week the manager was able to report that from a parcel of 12 tons he had obtained 132 oz., or 11 oz. to the ton. This stone was taken from the cap of the shoot at the bottom level.

In his last quarterly report the Commonwealth Statistician quotes the number of industrial disputes which occurred in the Commonwealth during the first half of the year 1913 at 88. As 28 of these were spread over five States, and the remaining 60 occurred in New South Wales, that State has the unenviable record of 75 per cent. of the disputes, with a proportion of 40 per cent. of the total population of the Commonwealth.

BALLARAT
School of Mines

DEPARTMENTS:
CHEMISTRY and METALLURGY,
ENGINEERING and SURVEYING
ELECTRICAL ENGINEERING,
GEOLOGY and MINING
MATHEMATICS and PHYSICS.

Prospectus on Application.
F. J. MARTELL, Director.

Gates Rock Breakers.

Fewer moving parts than any other breaker in the world.
Solid Main Shaft suspended by simple contrivance.
Drop Bottom facilitates repairs to eccentric.
Improved Spider permits changing of concaves without removal of hopper or spider.
Manganese Steel concaves and mantles.
REPAIR PARTS in stock.

Allis-Chalmers Co., FRANK R. PERROT, Sole Representative,
204 CLARENCE STREET, SYDNEY, and at 883 HAY STREET, PERTH.
Sales Agents: Melbourne: L. Bannister, 39 Queen-st.; Broken Hill: E. B. Hack, Blende-st.;
Brisbane: Evans, Deakin & Co., 172 Edward-st.

# HART

# ACCUMULATOR CO. LTD.

STRATFORD, LONDON, ENGLAND.

## Storage Batteries

FOR

**Power Stations & Private Installations.**

## Hart Batteries

are supplied in very large numbers to the

**British Post Office,**

HIS MAJESTY KING GEORGE V.,

H. R. H. THE DUKE OF CONNAUGHT,

AND THE PRINCIPAL DEPARTMENTS OF THE BRITISH GOVERNMENT

**Longest Life. Lowest Maintenance.**
**High Efficiency.**

**Special Types of Cells suitable for all Purposes.**

NOYES BROS. (SYDNEY) LTD.,
115 Clarence Street, Sydney,
and 45 Adelaide Street, Brisbane.

NOYES BROS. (MELBOURNE) PTY. LTD.
499-501 Bourke Street, Melbourne,
and 42 St. George's Terrace, Perth.

## CONTENTS

THURSDAY. SEPTEMBER 25.

EDITORIAL—

"Inadvertent Negligence" .. .. .. 247
Leaderettes .. .. .. .. .. .. .. .. 248
News and Notes .. .. .. .. .. .. .. 248
Personal .. .. .. .. .. .. .. .. .. 249
Brief Comment .. .. .. .. .. .. .. 249
Investor's Column—
Hampden (Q.) .. .. .. .. .. .. .. 250
Huddart Parker Ltd. .. .. .. .. .. 250
Adelong Gold Estates .. .. .. .. .. 250
Metal Quotations .. .. .. .. .. .. 250
Victorian Mining Activities .. .. .. 251
New South Wales Mining .. .. .. .. 252
Tasmanian Mining .. .. .. .. .. .. 253
Western Australian Mining .. .. .. 253
Queensland Mining .. .. .. .. .. .. 253
The Coal Mining Industry .. .. .. .. 254
Mining in New Zealand .. .. .. .. .. 255
Demand for Radium .. .. .. .. .. .. 255
Amalgamated Zinc (De Bavay's) Ltd. 255
New Zealand Oilfields Ltd. .. .. .. 256
**Commonwealth Oil Corporation** .. .. 256
Gippsland Copper Co. (V.) .. .. .. 256
Strikes in New Zealand .. .. .. .. 256
A Great Engineering Scheme .. .. .. 257
N.S.W. Railway Loan .. .. .. .. .. 257
Melbourne's Tramways .. .. .. .. .. 257
Royal Agricultural Show .. .. .. .. 258
Explosives in Agriculture .. .. .. .. 258
Thermit Welding .. .. .. .. .. .. 259
Municipal Council of Sydney .. .. .. 260
**Hydro-Electric Scheme (T.)** .. .. .. 260
British and European Developments .. 261
New Zealand's Wireless Chain .. .. 261
University of Melbourne .. .. .. .. 261
N.S.W. State Cement Works .. .. .. 262
Miscellaneous .. .. .. .. .. .. .. 262
Invited and Accepted Tenders .. .. 263
**Portland Place Mansions** .. .. .. .. 265
New Zealand Re-afforestation .. .. 266
Victorian Oversea Trade .. .. .. .. 266
Falkenthal Rectifiers .. .. .. .. .. 269

HENLEY'S
Electric Wires and Cables
AND INSULATING TAPES
ARE THE BEST.
W. T. HENLEY'S Telegraph Works Co. Ltd.
546 COLLINS ST., MELBOURNE.
61 YORK ST., SYDNEY.

BELTING!
Largest stock of all kinds of Machine Belting in the Commonwealth.
Conveyor and Elevator Belting for all purposes.
HOPKINS BROS. & ODLUM PY. LTD.
LEICESTER ST., CARLTON, MELBOURNE.
Phone, Central 754 and 5202. Box 377 G.P.O.

COKE!
NORTH BULLI COLLIERY
Limited
Supplies best quality hard
SOUTHERN
SMELTING COKE.
(Weekly output 1250 tons.)
H. G. Hyde, Secretary.
Royal Insurance Building, 16 Spring-street,
SYDNEY.

AUSTRALIAN MINING STANDARD.
PUBLISHED EVERY THURSDAY.
Forwarded Post Free to any Address.

| | Per annum. |
|---|---|
| Australasia .. .. .. .. .. .. .. .. .. .. | 26/- |
| British Possessions .. .. .. .. .. .. .. .. | 32/6 |
| Foreign .. .. .. .. .. .. .. .. .. .. .. | 34/8 |

Payable half-yearly or yearly, in advance.
All amounts should be made payable to order of "CRITCHLEY PARKER, Bank of Australasia."

12 O'Connell-street,
Sydney.
Tel. Central 2703.
P.O. Box 331.

376 Flinders-lane,
Melbourne.
Central 7931 & 1838.
P.O. Box 253.

### BACK NUMBERS OF THE "MINING STANDARD."

The following is the rate for back copies more than a month old. Applications by post must be accompanied with cash and postage added. In no case can we guarantee to supply copies, as our storage accommodation is limited.

A postcard will be sent if the number required is out of print.

For copies three months old, ninepence; six months, one shilling; and beyond that period, one penny per month per copy.

As there is a regular demand for back copies of the "Mining Standard," newsagents are requested to send back all returns uncut and in good condition, otherwise they will not be accepted.

All Returns from Newsagents must reach us by the end of each month (the whole paper must be sent). No credit will be allowed beyond this term.

Postage British, 1d.; Foreign, 1½d.; Australasia, ½d. per copy.

Stamps will be accepted as pre-payment.

Address communications: Publishing Department "Mining Standard."

### CASUAL ADVERTISEMENTS.

The rate for this class of advertisement is governed by the position it occupies.

If it appears on leader page or amongst or next to reading matter, the rate is 15s. per inch (nonpareil) per insertion.

Towards end of reading section—
Brevier, 16 ems width, 6s. per inch per insertion.
Nonpareil, 8s. per inch per insertion.

For the convenuience of advertisers, we might state that Brevier has approximately 7 words to a line, and 8 lines to the inch—6s. Nonpareil has approximately 8 words to the line, and 11 lines to the inch—8s.

### ALTERATION TO ADVERTISEMENTS.

As our publishing arrangements necessitate the "Mining Standard" being issued simultaneously in Sydney, Melbourne and Adelaide on the same day each week, advertisers wishing to change their advertising matter must supply same ten days in advance of publication.

### ADVERTISEMENT PROOFS.

Proofs are submitted to advertisers in order to give them an opportunity of going over the advertisements before printing.

Advertising Copy must be typed and so arranged as to clearly indicate the display required for the more important features of the advertisement.

Any departure from the original copy will be charged for. Advertisers are specially requested to instruct their publicity departments to give us clear and definite instructions respecting changes of matter or new copy in order to avoid incurring unnecessary charges.

AUSTRALIAN MINING STANDARD.
PUBLISHED EVERY THURSDAY.
ESTABLISHED 1888.

It is requested that all business communications be Addressed to Critchley Parker.

THURSDAY, SEPTEMBER 25, 1913.

## "INADVERTENT NEGLIGENCE."

We have more than once had occasion to comment very unfavourably upon the way in which the affairs of no small proportion of Victorian mining companies are conducted. The latest example of "how not to do it" is afforded by the Duke Extended Co. of Maryborough. The shares of the company had been exhibiting some remarkable fluctuations in value; and, in consequence, the posting of the latest yield was looked forward to with more than ordinary interest. The news is usually posted in the Melbourne Exchange on a Thursday evening, but this Thursday (that is to say, Thursday, the 18th inst.) no announcement was made. The first intimation given occurred about noon the next day, when the legal manager forwarded the figures as they had been received by telephone from one of the directors. These figures proved to be wrong, and later in the day were subjected to a correction. The whole proceeding strikes us as distinctly unsatisfactory. Why should the mine manager report to a director instead of to the legal manager? and why should the legal manager be left in the dark until such time as the director might choose to ring him up on the 'phone to give him information? Even had no error arisen from the way in which the news was transmitted, it is still in the highest degree undesirable that information of the mine's doings should filter through to the general body of shareholders and to the public at large by a method that leaves the way so clearly open for a transaction that is not in the best interests of the shareholders as a whole. It is, to say the least of it, extremely inadvisable that one director should thus be given an advantage, which, if an honourable man, he would be ashamed to make use of, and of which, if a dishonourable man, he could make such very profitable use. If the shareholders of the Duke Extended Co. submit calmly to such proceedings, they can only be characterised as a very lethargic and very short-sighted collection of individuals.

Since the above was penned, the legal manager of the Duke Extended Co. has written to the press as follows:—"The explanation of the yield of the Duke Extended Co. not having been promptly reported is that the mine manager inadvertently neglected to send the usual telegram to the office. The clean-up took place on Thursday, 18th inst. Mr. McCrorey, a director, who had been present at the clean-up, seeing, on Friday, that the result did not appear in the metropolitan papers of that date, rang up the office to learn the reason of the omission. Upon being informed that the manager had not duly reported it, he supplied the office with particulars, as far as he recollected them, with a view to remedying the mine manager's failure to report the yield." If this be entirely correct, the director is to be commended; but that is more than can be said of the mine manager. To "inadvertently neglect" to forward to the office of the company the usual announcement regarding the weekly clean-up, when he must have known that it was being looked forward to with unusual interest, was singularly remiss. It is also worthy of remark that the legal manager did not apparently think it worth while to communicate with the mine manager to know why he had not reported. He probably "inadvertently neglected" to do so. If so, he should bear in mind that he is employed to take an interest in the affairs of the company; and that, if the mine manager fail to report, it is his duty to see that he does so. There seems to have been too much "inadvertent negligence" about the Duke Extended Co.

The motion of Sir Allen Taylor in the N.S.W. Legislative Council, in favour of a definite scheme of decentralisation, affords a hope that something will be done towards relieving the congestion which must follow from having only two overseas ports in a State as large and as productive as is New South Wales. There is far too much of the policy of concentration in Australia, and, in a country, the trade of which is of such growing magnitude, this policy is now distinctly uneconomic and absurd, though once it may have been distinctly politic and wise. In railway construction a distance of fifteen miles on either side is considered as approximating the limit over which produce can be transported to it profitably. Is there not also a limit to the distance over which produce can be profitably conveyed to a seaport, to say nothing of that port being taxed beyond its capacity? Everything is governed by conditions, and conditions alter—sometimes with surprising rapidity, and the expediency of a certain policy under certain conditions disappears when those conditions change, as they must do with development or stagnation. Conditions have materially altered for the better with regard to national trade during the last decade; so much so that not even our capital ports can bear the burden thrown upon them, desperate as have been the efforts to accommodate the expansion and keep the traffic in certain channels for the benefit of vested interests. But what self-interest may shrink from doing, dire necessity may at length compel, and, for that reason, New South Wales, in common with the other States of the Commonwealth, will, in time, have more ports along its coastline, with proportionately greater internal trade and prosperity.

* * *

The fluttering of the Union Jack on the poppet legs of the Virginia mine, Bendigo (V.), was not intended as a demonstration against avowed disloyalty to the throne of Great Britain, about which the recent action of a Member of Parliament has caused a good deal of talk lately. In the Bendigo demonstration the Union Jack stood for British liberty—the right of the Britisher to live and work without dictation by any body of men who may choose to band themselves together to carry things their own way, and deny the rights of living and thinking to all who will not march under their special banner. There had been a strike of the men working the Virginia mine, which had then entered on its twelfth week, the trouble being that some of the miners refused to join the union, and the directors refused to compel them to do so, or even to inquire whether applicants for employment were unionists or not. In spite of the strike, the directors had been able to carry on, and the flag-flying emphasised the fact that they had been able to pay two dividends since the strike began, as well as symbolising the determination of the board to maintain the open mine at all costs. The flag and the directorate both stood for liberty; the union officials stood for tyranny. In spite of their failure at coercion in Bendigo, the union officials are repeating the experiment at Beaufort. In the first place they demanded that non-unionists working in the Beaufort Deep Leads mine should be dismissed or compelled to join the union, and their answer was that the management would do neither. They failed similarly when they sought the support of directors of other companies which were not actually employing any non-unionists, and against whom, therefore, there was no ground of complaint. Evidently, everything and everybody must bow the knee to this despot, or put up with its wrath, for next day the miners in all the Beaufort mines were called out, numbering upwards of 160, and all because four men preferred liberty to bondage, the unoffending Hope group of five mines being served in the same way as the Deep Leads. The directors of the Hope Extended and the Hope Extended West mines gave immediate orders to close down their shafts; at the Southern Hope the machinery is being overhauled, while pumping operations are being continued at the Hope and the Northern Hope. Work is going on at the Deep Leads mine (it is said, with the help of some unionist miners), and the directors will not find it an impossible task to obtain further hands as they are required.

* * *

The "Daily Telegraph," Sydney, publishes some figures, giving a comparison of the earnings per employee on the State Railways. A remarkable feature of the table is that, with a steady increase in the revenue, the number of employees required to earn it has increased out of all proportion. In other words, in 1902 it took 14,558 employees to earn for the State the sum of £3,668,686, the average earnings per employee being £252. In 1913 it took 31,746 employees to earn £6,748,985, or an average per employee of £212. This shows that in 1913 it was necessary to employ more than twice the number of men to earn less than twice the revenue earned in 1912. The highest earnings per unit, however, occurred in 1906, when the average was £314. It is admitted, however, that the foregoing is probably an exaggeration of the true position, although the figures are official, a more correct comparison being submitted, in which working expenses are taken into account. In this it is shown that in 1901 12,447 employees each earned £295 at a cost of £182, showing a profit per unit of £113, whereas in 1913 23,118 employees each earned £292 at a cost of £201, showing a net profit of £91 per employee. In this comparison the men employed on capital account have been deleted, and only revenue earning employees considered. Whichever comparison is used, a marked decrease of earnings per unit is apparent. The exact cause (or causes, as there are obviously several) of this would necessarily be hard to locate. It is quite clear that the chief one is lessened efficiency, in that it now takes more men to do a given amount of work than it did ten years ago. Is it the fault of administration, or a "mark time" attitude on the part of employees? Altered conditions also have something to do with it; but, whatever the causes may be, the hard fact remains, not only in connection with the N.S.W. railways, but in many other branches of industry also.

* * *

Two notable addresses were delivered at the Melbourne Trades Hall last week, notable not only for the clearness with which the speakers propounded their industrial views, but also for the fact that they arrived at opposite conclusions. The speaker in the one case was Mr. R. S. Ross, and his subject One Big Union Practicable. If, he said, from a working class point of view one big political party was desirable, so also one big union was not only equally desirable but equally practicable. He insisted that in each State there should be a Federation of Labour to which all unions should be affiliated, prepared to make common cause in industrial disputes, and he considered the formation of such a body far more important than returning labour representatives to Parliament. He pictured what he described as the absurd position of several strikes in progress in a State at one time, each union acting independently of every other, and all asking for financial assistance from unions which, for the time, had no strike on hand, and he argued that it would be far preferable for all to belong to one Federation, to whose fighting fund each member would contribute a penny a week. Mr. Ross did not disguise the fact that his only hope for industrialism was to maintain the right to strike. From his plan of operations, "such ideas as compulsory arbitration and wages boards" were "naturally and necessarily excluded." To surrender the right to strike was to surrender all. The other speaker, whose address was delivered the night following Mr. Ross's, was Mr. E. J. Kavanagh, M.L.C., secretary of the New South Wales Labour Council, who stated that at the Labour Congress, which would be held in Adelaide next month, the New South Wales Labour Council would bring forward a proposal for the creation of a Trades Unions' Grand Council. It was necessary that such a council should be formed, if it only had to deal with applications for financial assistance at times of strikes. Apparently this is much the same as Mr. Ross's Federation, except that it is broader and would cover the whole Commonwealth. But after this they parted company. The New South Wales Labour Council, said Mr. Kavanagh, stood for industrial arbitration. Many people favoured arbitration as long as they got what they wanted. It was no good taking arbitration on the "heads I win tails you lose" principle. As a fundamental principle in arbitration, the rights of the other side must be recognised. He deplored what he considered the fact, that, while the capitalistic system existed, strikes could not be abolished, but he also deplored the eargerness with which a section of the workers in New South Wales, claiming to be socialists, took advantage of every industrial dispute to advocate a general strike "with the idea that it would produce the millennium." Mr. Kavanagh also advocated the taking of individual votes on industrial matters, so that the real feeling of unionists might be learned, and he was prepared to submit even the question of compulsory arbitration or "direct action," the favourite euphemism for "strike," to the test of the ballot box. It was because fully 75 per cent. of unionists are not capable of striking effectively, by reason of the scattered nature of their employment, that the New South Wales Labour Council favoured compulsory arbitration.

## NEWS AND NOTES.

Applications are invited by the Minister in charge of Home Affairs, Mr. Kelly, from candidates competent to fulfil the duties of supervising engineer at the Kalgoorlie end of the Trans-Australian railway, at a salary of £750 per annum. To succeed a candidate must have a thorough knowledge of railway construction in all branches, and he must be capable of handling large bodies of men. The supervising engineer is to be directly responsible to the engineer-in-chief of Commonwealth Railways. Applications must reach the Secretary to the Department of Home Affairs by noon on October 6.

Mr. Justice Higgins, President of the Commonwealth Court of Conciliation and Arbitration, has seen occasion, on account of the increased cost of living, to advance the minimum living wage from 7s. to 8s. a day. This decision was embodied in his Honor's judgment in the case of the Federated Gas Employees' Union v. the Metropolitan Gas Co. and others.

The gold received at the Melbourne branch of the Royal Mint during the week ended on the 20th inst. amounted to 7982.63 oz.

Apparently someone has met with a rebuff. In an address delivered at the Melbourne Trades' Hall last Thursday, Mr. E. J. Kavanagh, M.L.C., who is the secretary of the New South Wales Labour Council, mentioned that lately there had come before the N.S.W. Council two requests for aid by Victorian unions, and only about 500 men were concerned in the disputes. The Council considered it peculiar that the Victorian unions should not be able to support so few men.

The board of examiners of mine managers appointed under the N.S.W. Mines Inspection Act, 1901, have submitted to the Minister of Mines, Mr. Edden, their report upon the examinations for mine managers' certificates of competency, held recently at Sydney, Broken Hill and Cobar. Of the total number of 19 candidates who presented themselves, 12 passed and 7 failed. The following are the passes in order of merit:—E. F. Harris, A. G. Campbell, C. H. J. Clayton, E. M. Holder and A. C. Morris (equal), R. Ingram Moore, E. N. Mulligan, E. H. Fraser, R. G. B. Ashcroft, V. A. Haigh, L. C. Alford, M. B. McGrath. In the optional subjects the following have qualified:—Mine Accounts—A. C. Morris, R. G. B. Ashcroft, M. B. McGrath, C. H. J. Clayton and E. F. Harris (equal). Geology—M. B. McGrath and E. N. Mulligan (equal), R. G. B. Ashcroft.

The August output of black tin from the Briseis Tin and General Mining Co.'s properties, Derby (T.), was 40 tons. At the Briseis the drift and overburden removed amounted to 26,000 cubic yards; Ringarooma drifts, 44,000 cubic yards; Ringarooma, overburden, 10,000 cubic yards. Mutual Hill yield, 27 cwt. black tin. Wallace Properties, Yackandandah (V.) yield, 454 oz. gold from 135,800 cubic yards, inclusive of 99 oz. from 27,500 cubic yards from the Argo company. The July return was:—Black tin, 40 tons; Mutual Hill yield (month), 28 cwt. black tin. Wallace Properties.—536 oz. gold from 145,100 cubic yards, inclusive of 187 oz. gold and 30,300 cubic yards from Argo property.

Fifty-seven acres, forming lease No. 6707, held by the South German Reef Extended G.M. Co., Maldon (V.), was recommended last week by the warden, Mr. Arthur Barlow, P.M., for forfeiture to T. J. S. Best, on the ground of non-compliance with labour conditions. The applicant said that his syndicate were prepared to spend from £2000 to £3000 if an effort to float a company failed.

They were prepared to commence work at once, and expected to eventually employ 20 men.

The following changes are about to be made in the staff of the Waihi Gold Mining Co. (N.Z.): Mr. H. P. Barry (superintendent) will relinquish office on September 30, instead of at the end of the present year as proposed. Mr. E. G. Banks (metallurgist) has been appointed superintendent, and Mr. W. P. Gauvain (engineer) assistant-superintendent. The Hon. Seymour Thorne George and Mr. Charles Rhodes will continue to act as local directors. Mr. Barry's services will be available in a consulting capacity. Mr. R. E. Williams (late assistant superintendent) has been appointed consulting mining engineer to the company.

Although the miners and other employees at the Victorian State coal mine, Wonthaggi, have succeeded time after time in obtaining improvements in their own financial position, and are now so fortunately placed that at the last pay, a fortnight ago, they averaged 15s. a day, while the wheelers earned 10s. 5d. a day, it has been found necessary to reduce the salaries of the assistant-secretary and the steward of the Workmen's Co-operative Club by 5s. a week each, while a motion to reduce that of the manager by 10s. a week was lost by one vote only.

The terms of the prospectus of "The Mirror Ltd." are further elucidated on another page, wherein criticism is replied to by contrasting the proposals and prospects of the new Melbourne newspaper with the actual position of one of its critics. In future, the promoters declare, they will ignore criticism of their business principles, unless these should be libellous and slanderous, and will go right on in the course they marked out for themselves at the outset. "Independent, unfettered, but bold, and enterprising" represents a policy which will commend itself to readers generally, and a new journal which sets out determined to adhere to it may look with confidence to public support. That there is ample room in Melbourne for a second evening journal, and that the competition will work beneficially for the public in keeping both staffs well up to their collars, there can be no doubt, and the newcomer will be warmly welcomed. The promoters have faced the complicated questions connected with starting and successfully conducting a newspaper, and in choosing directors they have been guided solely by the special needs of such a business, irrespective of wealth and social distinction. Copies of the full prospectus, on which alone shares will be allotted, may be obtained from the company's solicitors, or from Mr. S. B. Bagley, 408 Collins-street, Melbourne.

## PERSONAL.

The Toongabbie (V.) Progress Association, acting on a strong local sentiment, is asking for contributions towards erecting some memorial to the discoverer of gold at Walhalla, Edward Stringer, who was buried in the Toongabbie Cemetery. The treasurer of the fund is Councillor W. Henderson, J.P., "Millring," Toongabbie.

Mr. S. E. Townshend, B.A., LL.B., a graduate of Sydney University, has been appointed registrar of the Perth University.

Mr. John McKenzie, a member of the Ballarat (V.) Stock Exchange for the past 27 years, and for many years previously more closely associated with mining, died at Ballarat on the 17th inst., aged 87 years. Deceased was a native of Aberdeen. He arrived at Adelaide in 1852, went to Ballarat early in 1853, and, after following various gold rushes, settled there as underground manager of the Southern Cross mine, Ballarat West.

The chairman of the Professor Kernot Memorial Fund, Mr. Jas. Alex. Smith, has convened a meeting of the professional and scientific bodies interested, for the purpose of completing the arrangements, under which a Kernot medal will be awarded annually and in perpetuity for the most meritorious achievement in Australian engineering. Further contributions may still be addressed to Colonel Monash (acting treasurer), Collins House, Collins-street.

The Hon. John McWhae, M.L.C. (V.), for 24 years a member of the Melbourne Stock Exchange, during which period he was for 12 years on the committee of that institution, and for six years its chairman, has resigned his seat in favour of his son, Mr. John Wilson McWhae, who was duly elected to the position on the 16th inst. On the occasion, the chairman, Mr. W. J. Roberts, referred to the conspicuous usefulness of Mr. McWhae's administration of his office as chairman and to invariable helpfulness on the committee. Amongst other incidents, Mr. Roberts mentioned that it was during Mr. McWhae's term of office that the Melbourne and Metropolitan Board of Works made its first appeal to the public to subscribe for a loan. On this occasion valuable work was done by Mr. McWhae in establishing the influence of the Stock Exchange of Melbourne as a factor in connection with the flotation of public loans. The members, continued Mr. Roberts, would all regret that gentleman's resignation, while wishing his son every success. Mr. McWhae leaves to-day, with his wife and other members of his family, on an extended tour, going first to the Philippines and thence on to India, Egypt, and England, returning to Australia, via America, about July next year.

## BRIEF COMMENT.

We have received a pamphlet which bears the illuminating title, "Petroleum Exists in Australia." It is by George D. Meudell, F.J.I., F.R.C.I., F.R.G.S., and it also contains a report made by T. J. Whaley, "oil engineer," on the oil areas held by the Australian Oil Wells Co. No Liability, of Melbourne. So far as can be seen, the subject matter of the booklet is chiefly devoted to a comparison of the supposed oil-bearing country of Australia with that in which oil has been proved to exist in other parts of the world. Briefly, to quote authorities, petroleum belongs to no particular geological age, but will most likely be found in the formations of the carboniferous and tertiary periods. The principal argument in support of the statement that petroleum exists in Australia is that carboniferous and tertiary deposits abound in Australia and have never been thoroughly tested. There is as much to be said for as against the enterprise. A most contentious point with regard to the surface indications of oil so far investigated in Australia is that these, in the opinion of many persons who should be qualified to judge, are due to decomposition of vegetable matter, and that the oily substance hitherto found, on which much has been assumed, is in fact vegetable oil, and not worthy of further consideration. However, in the pamphlet, attention is directed to the fact that eminent authorities agree on this point, that "petroleum is derived from organic matter, and the typical petroleum of the carboniferous strata of Pennsylvania and Virginia is derived from organic matter yielded by bituminous shale, and is probably of vegetable origin." This, of course, proves nothing, and is not even an indication that the classification is relevant; but it affords food for reflection. Otherwise the pamphlet is a bald invitation to speculators to participate in a pure gamble, in which the prospects of abundant wealth are attractively coloured, providing petroleum does exist in Australia, and the company is fortunate enough to find it. In regard to that possibility it is candidly admitted that boring to a depth of at least 2000ft. will be necessary with a properly equipped oil-boring plant, so that intending shareholders need not plead ignorance of the nature of the enterprise if the search end in disappointment.

The oil shale business of New South Wales is in a very precarious plight indeed. No enterprise can survive for long on the benevolence of shareholders and the bounty of the State, and, unless some drastic alteration occurs whereby oil can be produced from N.S.W. shale at a profit, it is only a question of time when the industry will be consigned to the limbo of forgotten things. In the application of the Commonwealth Oil Corporation, made in the Warden's Court, Lithgow, recently, for total suspension of the labour conditions on the company's leases at Gindantherie, Capertee, Glen Alice and Barton, the reason given was that the company wished to concentrate its energies in such a way as to effect economies. As reprinted in another column, Mr. David Fell, local receiver, in giving evidence, said he estimated the annual loss of the company at Newnes alone, during the time he had been receiver, at £24,000.

The change which has occurred in the direction of the underlay from west to east in the Long Tunnel mine (V.) has necessitated a change in the direction of development work, which is now being carried on in what is called centre country. In the absence of any definite information as to the extent of the occurrence, it is difficult to say what effect this may have on the future of the mine. If purely local, it is of no significance; but as a permanent change, it may be regarded as important, and considerably enhancing the future prospects of the company.

The statements of Mr. Joseph Cox, managing director of the Papuan Rubber and Trading Co., who has just returned to Sydney from Papua, indicate that, although great activity in mining is being displayed, the task of developing the mineral resources of that dependency will be attended with considerable difficulty. The mineral wealth, even if taken for granted, does not represent everything. The difficulty of obtaining native labour is likely to have an important effect on the industry, as only those ignorant of the impossibility of white labour being successfully employed under tropical conditions would assume success to be assured because all other conditions are favourable. A mint in the middle of the Sahara is Dead Sea fruit, and extensive experience alone will teach the most profitable method of developing the mineral resources of the island. Several companies are said to have good prospects, but that is all; and, on account of the hardships to be endured, Mr. Cox warns individual miners against proceeding to Papua.

The disappointing values encountered in development work at No. 5 level in the Victorious Leases (Associated Northern Co.) at Ora Banda (W.A.), will undoubtedly have a very depressing effect on what promised to be a very attractive field. The values over the last 100ft. driven are satisfactory as far as values go, but, compared with those encountered in the level above, they are disappointing, and apt to create uneasiness. Sufficient development work, however, has not yet been done at the 5 level to determine whether the outlook at that point is really serious or not.

An evidence of what an important part individual enterprise will play in the career of a mining company is shown by the present position of the Walwa tin mine (V.). The mine, formerly owned by a Melbourne syndicate, was bought by Mr. James Grant with certain provisions for the old shareholders. After spending £4800 in development and various works, Mr. Grant sold out to an English syndicate for £25,000 cash and a fourth interest, the syndicate being committed to the flotation of the mine into a company having 100,000 £1 shares, which, according to Mr. Grant, will subsequently be increased to 200,000 £2 shares. Apparently, everything will be conducted on a wholesale scale, as the scheme is to instal 200 head of stamps, besides complete transport and pumping plant, and ultimately a face extending over three-quarters of a mile will be worked, everything going through the plant with the exception of grass and roots. It is to be hoped the desired results will be achieved.

The August return of the Bullfinch Propty. Ltd. (W.A.) rather gives the lie to the estimated average monthly yield. In the case of a mine like the Bullfinch, an estimate of the average monthly yield would be made on the bulk tonnage of low (or, rather, average) grade ore, leaving the rich material which made the mine notorious as a "bank" or "sweetener." In this case the position of the mine as a regular producer is unassailable, and it will no doubt remain unassailable until the rich mass of ore near the surface becomes exhausted. It may safely be concluded that the average monthly yields will not, under the circumstances stated, be below the estimate for some time to come. When the output falls below the mark, unless it can be directly attributable to plant breakdown or other causes, the situation will require a little investigation.

The result of development work in the Gibraltar mine, Adelong (N.S.W.), during the past year has placed that property in a very satisfactory position. Values throughout have been exceptionally consistent, but this advantage is offset by the fact that the ore-bodies, with only two exceptions, are somewhat small. The mine values have been well supported by mill returns, the total quantity treated for the year—6040 tons for 6785 oz.—averaging over an ounce per ton. The gross turnover was in the vicinity of £30,000, on which a profit of only £6035 is shown, leaving it to be assumed that development and other charges have gone against it, no statement of costs being shown. A statement of ore reserves also would be welcome.

It was only to be expected that recent developments at Cloncurry (Q.) would lead to a revival of interest in many derelict shows in the district. The Corella copper mine (formerly Wilcock's Cloncurry) is a case in point. Records indicate that the leases held never had particularly bright prospects, but latterly some vigorous prospecting work has been done on the Rosebud and Secret blocks. It is not improbable that some development has occurred which has caused an order for a number of shares in this company to come from the field. As these shares are mostly held in Melbourne, orders had to be supplied from that centre, and the demand caused a slight hardening of values.

The vendors of the Adelong Estates Dredging Company (N.S.W.) might easily have made a worse bargain in accepting as part payment for the venture £15,000 in 6 per cent. debentures. The failure of the dredges to effect as complete a recovery as had been expected has placed the company in financial straits, from which the shareholders have been called upon to relieve it. In addition to the payments to be made to the vendors from time to time under the debentures, the first of which was due on the 30th June last, other liabilities have accumulated which must be met, and the fresh capital sought will not, in the opinion of the directors, exceed 2s. 6d. per share. The difficulty in connection with the recovery is, so far as can be ascertained, not insurmountable, and the addition of fresh capital should rescue the concern from the struggling stage with which it was confronted. It is to be hoped that better results will be obtained from dredging operations in future.

## THE INVESTOR'S COLUMN.

### Some Companies Attracting Attention To-day.

(By Our Exchange Reporter.)

### Hampden (Q.).

For a long period now there have been few mining stocks in which there is so free and reliable a market as this; in fact, if a record of the Stock Exchange transactions were available, it is probable that Hampdens would take a second place in this respect only to the Melbourne Tramways. This opinion refers to the dealings on the local Exchange, but if it were not for this limitation the Cloncurry Company should be easily first, as it is an important medium for investment not only here, but also in the other States and London and Paris. Such a widespread field of operations helps to give stability to the quotations, for if sellers predominate on one Bourse the buyers on the others, even if at slightly lower prices, help to absorb the supplies. For this reason the setback which occurred during the week in the shares of the company was unusually severe, and caused a great deal of anxious inquiry as to the cause. Prior to the payment of the 2s. dividend the shares were in better demand than for some time, and were worth about 43s., but the date of the dividend seemed to be the psychological moment for selling determined on by many holders, for as soon as it was passed a fair number of realisations, some on Cloncurry account, took place, with the result that the quotations relapsed to 39s. 9d., some of the sellers being brokers who are generally supporters of the stock. This was the position of affairs when a parcel of 1000 shares was placed upon the market. These and a few more were absorbed without much loss in price, and the following day a recovery to the previous level of value ensued. The recovery was not, however, maintained, and several fairly heavy selling orders caused a reaction to below 38s. The next day further ground was lost, and on Thursday morning a quotation from London of 35s., or 35s 6d. middle, showed that the market there was also depressed, but, contrary to expectation, the Melbourne market ignored the cabled price, and after early sales at 36s. 6d. a recovery to 38s. ensued, the buying being general and well sustained, despite the fact that one broker had a fairly large selling order. This brief resume of the transactions may be of service in illustrating the unsettled state of market opinion, and, as is usual under such conditions, various rumours were abroad respecting the mine. One of these was that the company would be unable to maintain its highly payable returns over any great length of time, as the rich ore at the Duchess mine was being unduly depleted in order to keep up the yields, and that the average value was being reduced. Another statement with more substance for it was that the question of water supply was a serious one for the company, as there was so much mineral contained in that obtained from the mine that its use was affecting the reducing plant and causing stoppages.

With commendable promptness the directors on Friday morning published a statement from the general manager with the object of giving the true position of affairs. This pronouncement is of a decidedly reassuring character, inasmuch as it shows that on the important matter of reserves there is absolutely no cause for alarm—quite the reverse there being 255,000 tons of ore in sight containing 25,600 tons of copper. Taking the value of the metal at £70, which is a conservative estimate, as recent quotations have been in the vicinity of £75, and putting the cost of production at £40 per ton, which should be an outside figure and sufficient to cover all incidental expenses as well, then there is about £2 5s. per share in sight. This is without making any allowance for favourable mining developments which may justly be expected. There cannot be any doubt that the mine is sound; the values are there, and there should not be any hesitation in buying them at the present reduced prices were it not for one or two other reasons which must be taken into account, one being the depressed state of the mining market, not only here, but in London and Paris. The price of copper is good, but the course of the quotations indicates a want of confidence and also that unsettled and unreliable conditions exist.

This is, however, a general cause of anxiety for all copper producing companies and not particularly so for Hampdens. It is rather significant also that neither Mount Morgans nor Mount Lyells have lately suffered a loss in price, so it may be assumed that there is a more particular reason for the weakness in the Hampden shares. The company perhaps lost some of its market popularity over the purchase of the McGregor properties, and its financial position was not improved thereby. This, however, if an error in judgment, or a good purchase, is now past history, and if there be any reason for a decline of four shillings per share in so popular a stock it must be found elsewhere.

The most probable cause may have been anxiety with regard to the water supply for the smelting operations, for that obtained from the mine is not of the most satisfactory quality, being, as already stated, highly mineralised, so that it eats into the water jackets, with the result that the reducing operations are hampered by small stoppages and accidents. The management prudently made provision for this difficulty some time ago by making a connection by pipe with Farley's Creek, but the fresh water will not be available until the rain arrives and the river runs. This will be after the first good thunderstorm, but this can hardly be expected until later in the year, and in the meantime small cessations of operations may now and then be expected. The statement of the general manager is to the effect that these stoppags will not be of a serious character, and it seems probable that the market has taken alarm quite unnecessarily. Something similar happened the other day in Ajax Central shares, rumours of a probable falling off in the returns going round the market. These rumours also caused a serious decline in the value of the shares, but they have since had a good recovery. Such scares or panics about stocks which have scarcely as yet arrived at the fulness of their powers as producers would be almost impossible under healthy or buoyant market conditions, but there is so much nervousness existing at present that prices fall much more easily than they rise. Apart from the labour difficulty, which has been temporarily patched up, there does not appear to be any substantial cause for anxiety about Hampdens.

### Huddart Parker Ltd.

The market has during the last two or three weeks begun to realise that the small-pox epidemic in New South Wales must have had a serious effect upon trade and industry not only in that State but throughout the Commonwealth. Private reports which are coming to hand are to the effect that general business has been considerably lessened in Sydney, and as that city has been proclaimed an infected port, and the whole State is under quarantine, it can easily be surmised that the great sea-going carrying companies are probably suffering a considerable reduction in profits. The course of the Stock Exchange quotations supports such a belief, for although the decline in prices has not been very marked, the tendency has certainly been a downward one, and associated with a great falling off in the volume of business in the shares of the shipping companies. The last sale in Huddart Parker's was at 21s. 9d., which, allowing for the half-yearly dividend, is equivalent to 22s. 5d. as against a buying price of 23s. not long ago.

Howard Smith's, one of the strongest of the investment stocks, are also easier, and although the dividend was paid as usual, it was out of the profits earned by the company's coal mines rather than from the maritime portion of its business.

The paid-up capital of Huddart Parker's is now £1,000,000 in 500,000 fully paid 6 per cent. cumulative preference shares, and 500,000 fully paid ordinary shares. The net profit for the year ending December 31st, after deducting flotation, auditing, and preliminary expenses, was slightly under £69,500, and the dividend for the last six months of that year was £35,000, being at the rate of 6 per cent. on the cumulative preference shares, and 8 per cent. on the ordinary.

In order to maintain the yearly dividend on the two classes of shares at 6 per cent. and 7 per cent. respectively, a net profit of £65,000 is necessary, so that on last year's business there would not be much left to come and go on, that is for so big a concern. The dividend recently paid was, however, at the above rate, and it may be taken as assured that the business for the earlier part of this year has been good.

The market seems to indicate, and it is not unreasonable to expect, that there will be some reduction in the receipts for the current term.

### Adelong Gold Estates.

When this company was floated its shares were generally regarded as more of an investment than a speculation, the main reason for such a belief being the fact that bucket dredging is looked on, and justly so, as one of the most reliable branches of the mining industry, that is when the alluvial area which is to be treated has previously been carefully sampled or prospected. In this latter respect no fault can be found with the promoters of the company, for the reason that the ground was carefully tested by Messrs. Sturzaker and Frank Powell, who are regarded as two of the most reliable mining authorities in New South Wales and Victoria.

Under these circumstances it may be considered as reasonably certain that as far as the ground is concerned, the values are there, but if so, the question naturally follows, how is it that the returns have been so much below the original anticipations? The gold contents of an acre of the dredging area are estimated at about 400 ounces, and as the capacity of the two dredges should be an acre and a half per month, it was hoped that eventually the yields would be between five and six hundred ounces for the month's operations. It is true that the results for the six weeks ending April 30th, during which only the first dredge was at work, were much below this average, being at the rate of just under 25 ounces per week. There are, however, almost invariably some initial disabilities to be overcome, which would account for lower returns. It was confidently expected also that when the No. 2, which was the larger and more important dredge, got to work that there would be a marked increase in the yields, especially as it was understood that it would open out in ground which was known to be good. As this second dredge got to work only two months ago, it should now be in full swing, but so far the returns from this dredge have not been up to expectations, although the last two have been 31½ and 47½ respectively. These are good yields, and in the case of some Victorian gold dredging enterprises, would mean, if maintained, substantial dividends for the shareholders, but the difficulty in the case of this company is the size of the capital and a debenture issue, which amount to £75,000 and £15,000, the latter having to be redeemed in annual payments of £3000 each. This latter responsibility has caused the determination of the directors to place the company in a strong financial position by increasing the capital by another £10,000 by calling up 2s. 6d. or 3s. per share in three monthly payments. This proposal, following as it does on a previous increase of £15,000 on the original capital, will come as an unpleasant shock to the shareholders, but there is no doubt that under the circumstances it is the proper course to adopt.

It may fairly be pleaded that the company has had some bad luck, as a hard bar of rock was met with at the outset of the dredging, and this, no doubt, affected the yields, and the clayey overburden running up to 27 and 30ft. must also have made the opening up operations more difficult. These are, however, but the usual drawbacks incidental to this class of mining, and a more important cause for anxiety is the possibility of some of the gold being lost through some defect in the machinery or gold-saving appliances. As the No. 1 dredge has been closed down in order that some alterations may be made, it is evident the directors are not satisfied the best results are being obtained, and it is probable that better yields will eventually be forthcoming. This is about the most consoling reflection available for those who became shareholders some time ago at much higher prices. The latest quotations have been: buyer, 11s. 3d.; seller, 13s.

## METAL QUOTATIONS.

### By Cable.

### London, Tuesday.

(From Our Correspondent.)

In the early part of the week prices showed an all-round improvement for copper and tin, whether for spot or deferred delivery, but a downward tendency set in on Wednesday, and this was only just being reversed when the week closed. Copper, however, closed at a higher rate than that of the previous Friday, but tin was lower by 10s. After Monday lead was very firm. In the minor industrial metals there was no change.

COPPER.—Monday's quotation for spot was £74 15s., or 30s. above that of the previous Friday, and the price then went to £75 7s. 6d., but afterwards the rates were £74 12s. 6d, £73 10s., and £73 17s. 6d.

For three months' parcels the successively daily rates were £74 7s. 6d., £75, £74 7s. 6d., £73 5s., and £73 13s. 9d.

Electrolytic, which opened the week at £77 10s., rose to £77 15s., £78, and £78 5s. Yesterday this week opened at £78.

TIN.—The opening rate for spot lots was £194 5s., showing a rise of 20s. since Friday, and on Tuesday the rate was £195 10s., but later on £193 5s., £192, and £192 15s. were accepted.

Three months' parcels brought £193 15s., £195, £192 15s., £191 10s., and £192 10s.

LEAD began the week with a fall of 5s., that is, at £19 17s. 6d., but the loss was only temporary, later prices being £20 10s., £20 15s., £20 10s., and £20 15s.

SPELTER fell back to £21, the rate which ruled three weeks ago.

SILVER.—The demand for silver was good, and prices rose, the quotations being 27 13-16d., 27 15-16d., 28 3-16d., 28 3-8d., and 28 5-16d.

ANTIMONY.—There was a fall for both "Star" brand metal or 50 per cent. ore, the quotations being still £28 10s. and £6 per ton respectively.

WOLFRAM (70 per cent. ore).—The market was steady at 33s. 6d. per unit, equal to £117 5s. per ton.

MOLYBDENITE showed no change from 2s. 8d. per lb., equal to £298 14s. per ton.

MANGANESE (50 per cent. ore) was firm at 10d. per unit, or 41s. 8d. per ton.

# VICTORIAN MINING ACTIVITIES.

## Ballarat and District.

(From Our Correspondent.)

The desired stone has not yet been met in the Central Plateau 700ft. level. It is evidently pitching north rather more sharply; but the fact that the winze is at latest down 43ft. below the 600ft. level in a full sink of payable ore and the face of the north drive at 700ft. has yet to go another 60 or 70ft. to reach a point perpendicularly below the winze gives hope that the payable chute of stone will make very soon, possibly any day before the line of the winze is reached. As the winze is dry, sinking therein may conveniently be carried on till it connects with the level below, or a short rise may be started underneath to meet it. Meanwhile they are opening a stope on the west side of the winze, and are sending the stone to the battery, which will be started again when sufficient ore has been accumulated.

They have also started to crosscut west off the north drive at the 700ft. level, as there is a fair drop of water from that point, and stone may be close at hand. The crosscut was opened at 195ft. a few feet back from the face.

Slightly slower but nevertheless fair progress is being made in sinking the Central Plateau Extended shaft, which is down close on 300ft. At the present rate of progress another three or four months will see the required depth of 600ft. reached, and if there is anything in the belief that the country in general and one track in particular passed through in shaft sinking resembles that at the Central Plateau, the lode may be found striking into the shaft.

Bids are being made for South Berry scrip in the belief that there will be a final dividend of close on 1s. 6d. when work ceases if the present intention to close down when the payable wash so far proved is taken out is followed.

Easier rates have ruled for Williams' Fancy during the past few days. The time is now almost ripe for the appearance of the northern end of the long shoot of gold in the 700ft. south drive. Another week or two's driving should determine if the lode is living down with the same pitch and underlay as in the level above. That is to say the shoot should then appear, when the drive will be turned to recover the lode. The position in this mine is causing interest, inasmuch as the company was an applicant before the Warden last Friday for the adjoining southern leases (two) held by the South Fancy syndicate. The company, if successful, proposes to sink a second shaft and equip it on up-to-date lines out of profits from the present shaft, and the syndicate, should the warden's judgment favour it, intend to push forward the scheme of flotation already launched. In any case there should be a start made soon to work the lease.

The strike on the Beaufort field is much to be regretted, being so inopportune. The Hope Lad reached a stage of development that meant early dividends, as the past two or three returns showed a fair profit, and the indications pointed to an increase in the output. At present the credit balance is something like £500, and as the leading drives were in better wash when work had perforce to cease because of the miners' ill-advised stand, there is every hope of a good time for shareholders when work is resumed. The character of the gold is changing for the better, the sample being much coarser and nuggety. A slug weighing 4½ oz. was picked out of the sluice before the last clean up.

The North Hope mine has been re-equipped with a shaft and plant in every way suitable to requirements, and about three weeks from the date of resuming should see the wash workings again entered and the leading drives pushed across the lead. At present both sides are standing firm, but there is reason to hope for a revulsion of feeling against the strike on the part of some of the men, particularly those who had no quarrel with the management of their own mine, a reflection that obtains in every mine on the field save the Beaufort Deep Lead, the real storm centre. The Hope Extended, Southern Hope and Hope West have been secured, and the water will be allowed to rise in the shafts, as no drives have yet been opened to any extent, and it is understood that the Hope, North Hope and Beaufort Deep Leads will be kept drained as long as possible.

Latest advices indicate that the strike may quickly settle itself in that the number of non-unionists has dwindled down to one, and he is expected to go over to the unionists, in which case the men will doubtless be prepared to return to work.

The position at the Llanberris No. 1 continues healthy enough to ensure a continuation of dividends in alternate months. The directors declared a dividend on Friday last, though the return 475½ oz.—was not quite equal to the last yield. The financial position is very satisfactory, and there should be about £1000 in hand after paying the dividends. The pyrites on hand is worth nearly £500. The 122ft. south drive is expected to meet stone beyond the break any day, and up to the point of disturbance the average value is 5 dwt. per ton.

## Bendigo and District.

(From Our Correspondent.)

The gold production for the week ending September 20th, 1913, amounted to 3399 oz. 14 dwt. The principal producers were Central Red, White and Blue, 559 oz.; Carlisle, 330 oz. 16 dwt.; Golden Pyke, 216 oz. 17 dwt.; Great Northern, 187 oz.; Johnson's Reef, 164 oz. 12 dwt.; Virginia, 102 oz. 3 dwt.; Garden Gully, 99 oz. 18 dwt.; Catherine Reef, 99 oz. 12 dwt. Three dividends were declared, aggregating £3022 10s., viz.:—Golden Pyke, 1s., equal to £1372 10s., total to date £80,802 17s.; Carlisle, 6d., equal to £900, total to date £57,600; Great Northern, 6d., equal to £750, total to date £170,200.

Clarence United, in sinking the eastern shaft on the Paddy's Gully line last year, passed through a small east leg and spurs showing a few nice colours of gold. The discovery attracted a lot of attention at the time, but shaft sinking was continued without opening out to ascertain the value of the reef. Instead of testing the quartz where it proved auriferous at a depth of 335ft., the company afterwards drove a crosscut at 50ft. lower down, where the stone was stated to have been uncovered again, below an important fault. Here the leg was small and apparently non-auriferous. Subsequently the top of the formation was found with a winze below the west crosscut at 300ft., but the stone was of low value. At this stage the reef as abandoned for a time. With a change of management, operations were resumed a few months ago by opening out on what was considered to be the same stone as proved auriferous in sinking. A trial milling, however, proved of no value. Again the reef was discarded, and the eastern shaft closed down. When first discovered, the presence of the auriferous quartz in the shaft created a strong demand for the company's scrip, the cost price being increased by several calls since that period. Several shareholders have held the view that the trial crushing was drawn from the wrong stone in the shaft, and colour was lent to this theory last week when the company received an application from tributers to take the eastern shaft over on a royalty basis. It is stated that the tributers purposed further exploration at about the depth indicated, and as one of the party was formerly employed in the shaft the application has impressed the management. In view of the difference of opinion that exists regarding the prospects of this shaft, the directors were not disposed to grant the tribute without a further inquiry into the whole of the circumstances, and the application was consequently deferred for a fortnight. At the main shaft the old west leg above 417ft. has yielded a couple of payable averages, as anticipated, and in order to work it more systematically the main crosscut is being repaired, and at present operations are conducted at 80ft. north of the shaft and there is a good length of the leg intact, affording up to 3ft. 6in. of stone. Tributers in the 1580ft. north level have been getting good results from a west leg for several weeks. The company have started a winze at 50ft. ahead of the tributers' workings on the same back, with the object of determining how far the payable shoot of stone extends and connecting with the 1730ft. crosscut off the north shaft. From the latter base it is proposed to follow the stone northward, where the west back has not been seen under the saddle. At 2280ft. the north level on the centre reef is in 275ft., gold showing occasionally in over 2ft. of quartz. Since getting through the lava in the stopes more stone is exposed with payable gold. There are several additional spurs in the top stope showing fair gold at intervals. The south level is within 25ft. of the New Argus boundary and in the saddle of the reef. The material is evidently of low grade, but better results are expected in carrying the stopes forward. An east back, believed to be the South New Moon middle back, has been reached in the 835ft. west crosscut. The highly auriferous spurs seen in the next mine should be to the west of this back, providing they extend so far southward. The same back is being prospected by rising over 799ft. at the main shaft. At 980ft. a fair sample of gold is visible in the eastern spurs, but the stone is still of low value.

Great Northern improved return was due chiefly to the higher grade quality of the larger reef in centre at 1184ft. This level is in 815ft. north of the shaft, traversing a full width of quartz, carrying a little gold. It is in stoping for a width of 14ft., at 30ft. from the face, that the best prospects are disclosed, a better sample of gold showing for the greater part of the term. There is another parallel level further east on the McDuff back, where the gold in the footwall stone of the latter reef is of coarser sample. This level is extended to over 850ft., along the bottom of the richer shoot. Two or three stopes are taking up to 9ft. of crushing material of good quality. It is from these workings that most of the gold has been produced for the past two years north of the shaft. From 700ft. north a level is now coming back south well under the previous workings, opening up payable stone. The north boundary is about 1200ft. from the shaft, and both formations are intact for several hundred feet. At 1287ft. there is 18in. of unproductive stone at 475ft. north. This level is along the lower portion of the 1184ft. centre reef. Owing to the reef channel rising the 2680ft. north is showing very little stone at present at about 300ft. from the plat. Another 6d. dividend was announced, absorbing £750.

New Argus expect to have the bottom plat at 2380ft. clear of water by the end of the month. A survey will then be undertaken to locate the continuation of the Clarence 2280ft. stone. It is likely that operations will afterwards be conducted from both mines to exploit the reef more expeditiously. There is a strong probability of the formation having been tested to some extent by the centre winze connecting the 2180ft. and 2380ft. crosscuts. Though yet of no value, the irregular reef in the 1580ft. north level has a promising appearance. There is 5ft. of well mineralised quartz, which is expected to improve in quality, before opening up the length of 400ft. of ground still necessary to reach the Clarence United boundary. Having risen to 60ft. on the east back above 1480ft., through spurs, a crosscut is now going west in search of a shoot of better grade stone exposed in the adjoining mine south. Another milling is being put through from the spurs at 770ft.

Central New Chum, stimulated by the payable average from the initial milling from the west back at 771ft., are sinking a winze in the stone. There is 7ft. of quartz, but the gold appears to be confined to about 3ft. of it adhering to the wall. In sinking to 10ft. a little gold is still showing. The back is of a slidy character, extending above the cap of a reef worked extensively at 830ft., where it carries 10ft. of quartz. This stone was tested in conjunction with the more regular deposit, but evidently proved of low grade. As there is a fault across the back between these levels, there is a possibility of a winze leading to more favourable developments.

Central Red, White and Blue suspended stoping at 4ft. from the No. 5 winze above the 400ft. intermediate level several weeks ago, having plenty of high-grade quartz under the 318ft. rails to maintain a substantial gold production. While the latter workings were being filled last week the stope near the No. 5 winze was taken off, dislodging rich stone. The reef here is highly mineralised, and shows gold very freely. At 100ft. further north good prospects are also officially reported in connecting a rise from the intermediate level with the No. 6 winze. This assures a length of 100ft. of ground of good quality north of the No. 5 winze, with the chance of the payable shoot continuing to the Little No. 180 boundary, at 120ft. ahead. South of the No. 5 winze there is a fairly solid block back to the No. 4 winze. From the latter about 150ft. of the reef is still available under 318ft., but only to a depth of 4ft. to 6ft., and nearer the shaft is another, but shorter, block, which is expected to yield well. In stoping back to the shaft from the 720ft. north level an unexpected development occurred last week, the 12ft. of stone on which the company have been operating for several weeks proving to be under the cap of the 650ft. formation, though it was assumed that the stone represented the upper limits of this reef. A much greater width of crushing material is now exposed than anticipated, carrying a little gold. A little gold is visible in the 318ft. south stopes, and shaft sinking has uncovered another important fault, which appears to have displaced the reef channel a few feet. A small formation exists above the break, and more stone is likely to be found in centre immediately under the slide. There will be another 2s. dividend before the half-yearly meeting next month.

Victoria Consols, discouraged by the low value of the 512ft. reef in the north level, stopped driving in a full face of quartz at 285ft. from the shaft, or about 330ft. from the Ironbark boundary. The level was higher in the reef here, and the stone that pitched underfoot is to be worked later from intermediates. After extending the 600ft. level another 100ft., a rise is to connect the 512ft. north workings and driving started at about midway between these depths. A fault having gone under the 512ft. level, along with the saddle, better results should follow on the projected work, as the more profitable stone in the next mine is found along the cap. Stoping will also be restricted to the south level for the present. This level is now being continued on the west back, opening up more favourable quartz than revealed along the east back. Though highly mineralised, no gold is seen in this new make of quartz. The saddle of the formation is exposed in this end. A little gold is visible in stoping up to 10ft. of reef.

Ironbark stopped the lower south intermediate on the west leg of the 480ft. reef, and will drive closer to the cap to keep in touch with the payable stone near the saddle. There is not more than 60ft. to go to reach the Victoria Consols lease in driving, but the stopes run back for a length of about 150ft., taking 8ft., 10ft., and 14ft. of good-looking stone to above the turnover. The higher reaches of the neck stone appear to be of inferior quality in this direction. Northward the 511ft. level is advanced to 35ft. beyond the new shaft, but less gold has been seen of late. Very little stoping is in progress here. The winze between the No. 1 winze and the new shaft has not shown anything of value below the faulting. On the New Chum line the rise on the Hercules east back is approaching an interesting stage.

Golden Age footwall stone in the 655ft. north level at the north shaft is again showing gold, after several days of inferior prospects. As the stope following the level is close to the shoot of payable quartz that recently rose overhead, a fair return is looked for from the second crushing, to be cleaned off this week. An average of well up to ½ oz. resulted from the general crushing from the 853ft. south stopes, though little gold had been detected in stoping. On the Paddy's Gully line a strong fault, underlying toward the reef channel, is showing in the 1581ft. crosscut. A reef may exist under this break in deepening the shaft another 100ft.

Golden Pyke suspended the most advanced 543ft. stope at 30ft. from the Constellation boundary for a week or two. There is good quality stone here. The next stope is still operating on high-grade ore, though it is not as rich as earlier in the month. A third stope has been started north of the No. 1 rise. In the south stope the reef is larger, but not as productive. The 643ft. stopes are showing a little gold. More gold is revealed in the 447ft. north level and stopes. Better returns are expected from Chadwick's reef now that another stope is being started off the north rise. The 740ft. crosscut will reach the reef about November.

## Castlemaine and District.

(From Our Correspondent.)

The number of legitimate companies in active operation on the Castlemaine field is gradually assuming quite dignified proportions. The latest addition is the Little Nuggety, at Campbell's Creek. One of the difficulties the flotation party had to contend with was the natural query as to why such a desirable property—to judge by the prospectus—had lain so long idle. These prospects have been dealt with before. The chief reason given is that when fair gold was being got 30 years ago the hauling was all done by the Old Nuggety Co., higher up the line. Below 500ft. in the latter mine the stone got very poor, and work ceased. This left the Little Nuggety stranded for machinery, and before any steps could be consummated to place a plant on the lease the mine filled with water, and there it stopped. In the old days the water and stone were pulled with a whip or a whim, and the quartz was carted about three miles to be crushed. There are two shafts on the lease, one 90ft. deep, and the other (the main shaft) is down 240ft. The shares are 36,000, and 29,000 have been placed. The bulk are held by Melbourne investors, with Mr. Bernard Bradley, of 150 Queen-street, Melbourne, as the legal manager. The intention is to at once install the latest pattern winding plant, with a boiler capable of driving a 10-head battery. It is intended to put up the latter, with all the best gold-saving appliances, as soon as the mine is unwatered. The engine will be strong enough to unwater and haul for 1000ft. Mr. John Roberts, an old Campbell's Creek native, now of 120 Rosslyn-street, West Melbourne, is the prime mover in getting the mine floated, and he has put a lot of time into it. Mr. H. Leverington will be in charge of the mine. He worked in it for six years up to the time it stopped, and his report is very favourable.

McCann's Reef Co., Yapeen, is making fair progress with the limited labour being utilised. The west crosscut is out 150ft., in sandstone and slate. The east crosscut has been driven 23ft. in sandstone and quartz spurs. There is no special significance in the prospects so far.

New Golden Hill, towards Fryerstown, sent a crushing of 14 tons to the Spring Gully battery. It yielded 9 oz. 14 dwt. This is the second parcel treated since the new company commenced work.

McDonald's Reefs Co. lies to the west of New Golden Hill, and is expected to embrace a fault formation that exists in the latter. Active operations have commenced under Mr. J. T. Dunstan, of Guildford. Four distinct saddle reefs are said to have been worked from 1872 to 1886, and the returns were fairly good, going as far down as 276ft., and below water level. It is intended to stick to the old shaft for the present. This property lies to the south-west of Spring Gully.

The past three weeks have resulted in a gross yield of 516 oz. 1 dwt. from the Spring Gully mine, and early last week a second dividend of 1s. was declared since the rich stone came into view. Last week's yield was 61 oz. 5 dwt. from 145 tons. All the stone came from the northern stopes; none of the rich dirt from the eastern spurs at 200ft. being included. In order to increase the crushings a second shift began work this week. In addition to working the two localities mentioned above, the 240ft. south level is being pushed out, and a rise will be put up to connect the 200ft. stopes. The result will be awaited with concern, because the level is at the western end of the spurs. A few colours are showing in the spurs seen whilst driving. At the 170ft. level, spurs are showing under the fault in the stopes. An important work to be commenced forthwith is a crosscut from the old 318ft. workings at 300ft. south of the main shaft, which is hoped to reveal a continuation of the golden spurs along the southerly pitch. After making provision for all accounts and increasing the reserve fund to £300, as well as paying a 1s. dividend, £642 remains in the working account. The laudable practice of giving the miners a "pick" at the profits was again adopted, 10 per cent. being added to the wages for the term of all hands.

The Spring Gully No. 1 was to be re-opened on Tuesday of last week. In the 300ft. level, a rise had been put up, and it passed through 12in. of good-looking stone. The intention now is to open up on this stone and make out to the east, in order to open up the same belt of country as is now being so profitably exploited at 200ft. in the main mine.

There is no change of importance at South Wattle Gully. The 300ft. level has been driven on the west leg for 68ft.; and a reef 1ft. thick is showing, the stone being stacked for crushing. Fair stone is in sight in the No. 2 rise, which is up 10ft., and 24ft. from the saddle. Hard sandstone is showing in the No. 3 rise, but a change is expected within a few feet. Preparations are being made for installing the new machinery.

Campbell's Creek bucket dredge had a somewhat improved yield last week, a full run of 270 hours by the double plant bringing up 58 oz. 5 dwt. The 35th dividend was declared, being at the rate of 6d. per share.

## Maldon.

(From Our Correspondent.)

South German had a general clean-up, not including any of the company's dirt in the battery. Cyanide brought 58 oz. 10 dwt. from 660 tons of sand; sundries, 56 oz. 5 dwt.; tributers, Grigg and Jubber, 123 tons, 33 oz. 5 dwt.; Merlo and party, 63 tons, 15 oz. 15 dwt.; Best and party, 45 tons, 8 oz. The intermediate level is being extended on 4ft. 6in. of mineralised stone, with no change in appearance. The 2000ft. level has been extended north 8ft., and 3ft. of promising stone is showing in the end. The crosscut east off the level has been extended 9ft. in heavy ground. Timbering has impeded operations somewhat.

Oswald's Gold Mine had a crushing for the company, the battery return only being given. From 356 tons 173 oz. 8 dwt. was taken. Two shifts were lost whilst the slum dam was being cleaned. At 400ft. the rise is up a distance of 44ft. in a mixture of quartz. A stope is being taken out from 500ft., and it is about 5ft. wide, and worth half an ounce. At Tabletop the stone is making stronger, and is now worth 10 dwt. The east crosscut is out 22ft., and the reef should be cut in about 30ft. At 1100ft. level, the east crosscut is being extended in hard country.

New Day Dawn has extended the north level at 90ft. to 54ft., and payable ore is reported to be seen 4ft. wide. In the prospecting shaft prospects are also payable.

Derby United has started to crosscut west from the bottom of 825ft. level. Several spurs have been seen in the end, showing gold in dish trials. Crosscutting west is also being done at the 680ft. level. The face is showing 2in. of stone. At 470ft. level, the end of east crosscut is showing spurs and slate, with a few colours of gold in the dish. Stopes north of Cymru shaft have broken through into the winze, and a trial crushing is being broken out. Cyaniding is in progress.

An enterprising group of investors has started to work some ground near the butts. It will be called the Golden Horse, and 40 shares have been decided on. More than this number were applied for. A shaft of 80ft. was on the ground, and it will be operated on at once. The committee of management are Messrs. Rollason, A. Johnston, F. Hodge, McLeod, Bohn, J. McKnight and Haesler.

The Warden (Mr. A. Barlow, P.M.) heard an application on Monday of last week from Thos. J. S. Best for the forfeiture of lease No. 6707, at present in the name of the South German Extended Co., for non-compliance with the labour covenants. The applicant deposed that he knew no work had been done for 18 months. There was a winding engine and other machinery on the ground which he did not want. It may bring about £400, but he would not like to give that much for it, although prepared to treat with the bank for it. The syndicate behind him, including Messrs. A. C. Meyer, G. Buchanan, T. Moran, W. Hoare, J. Warne and W. Plain, were prepared to spend £2000 or £3000, and wanted to go into the main shaft between the 300ft and 400ft. levels. They were ready to start operations right away with eight men below, and would comply with the labour covenants later on by employing 20 men. The Warden commented on the fact that there was no opposition from the company. He was satisfied the labour covenants had not been complied with, and would recommend that the lease be forfeited and a new one be issued to the present applicant.

## Daylesford.

(From Our Correspondent.)

The North Nuggety Ajax have started to deepen their main shaft. The North Ajax are doing likewise, and for the present other development work is pretty well suspended, and it seems that not much more will be done in this direction until the battery which has been purchased from the Old Jubilee is transferred to the mine. On the surface, ready for crushing, there is a large heap of quartz estimated to be of payable quality. It is stated that the Ajax intend to shortly deepen the shaft by 400ft., and get away below what appears to be a barren zone.

The Central Ajax stopes continue pretty good, and the new crosscut going west on the new bottom level is being pushed ahead. The lode is expected to be met here in about 20ft. to 30ft. of further driving. The Lord Roberts have, it is understood, secured a mill which will now be shortly placed on the lease. The North Lord Roberts are testing their western reef, and a good-sized body of formation gives very fair prospects for milling purposes. Waiting for timber is delaying the sinking of the main shaft. Now that the new winder is in going order the Olive Branch is pushing on with its western crosscut. On the Abundance reef the plant is ready to combat the water in the shaft which proved too much for the windlass and hindered the sinking of the shaft. Crushing dirt is being broken at the 50ft. level. It does not seem probable that the Christmas Ajax will do much more work. The plant is not strong enough to develop the lower levels, and the raising of sufficient capital is a difficult problem.

---

# NEW SOUTH WALES MINING.

## Broken Hill.

(From Our Correspondent.)

Broken Hill, Sept. 19.

The one delightful thing to mention about Broken Hill mining this week is in connection with Block 10, which has certainly come from under its cloud. The 615ft. level has come out on top. The west crosscut has gone through good ore for quite a long distance, and the latter portion of it shows high values. This is a big thing for Block 10. The lower levels look as if they have failed—or figures they have—but there is no knowing. The Proprietary is understood generally to have petered out at depth, but when the occasion arises something may be found. Work at the North, the South, and the Central has proved that the ore lives at depth. This has also been decided on the South Blocks (Zinc Corporation) and on the mines further south. Certainly, geologically, the lode may have apexed in the region of the Proprietary or Block 14, but there is yet no geological evidence to prove that ore is not in existence deep down.

There is this always to be considered with regard to the Broken Hill mines. The world's demand is such-and-such. The demand must not be exceeded, or the value of metals will be reduced. In my notes a few months ago I mentioned that the big companies would not touch outside "shows," because if they were successful production might exceed the demand. Actions rather prove this. Block 14 and Block 10, both alleged (be careful of the word alleged) to be run down, looked around for further propositions. They secured some, and hold them. But they are not working them. For the main thing, there is no necessity.

Victorian money is being put into some of the small end prospects—this only because the B.H. companies are, on the whole, content with what they have.

Of course, there are exceptions. The Junction North, as regards underground work, looks in Dismal-street, but there remains a large area of unexplored ground. The Junction stands as a drug in the market, but there is still ore in the mine—strange management keeps this property where it is.

A number of visitors have been in Broken Hill recently—some mining men, some men with ideas on mining. Opinions have not differed. None of them attempt to calculate the end of Broken Hill. Seeing the immense amount of ore disclosed before them, they all have agreed with the local estimate of, "at least," 10 to 15 years.

This general discourse is on account of paucity of development successes. But if there are few developments, there is rich production—and Broken Hill was never in a better position than at the present time. Broken Hill certainly has a strike on, and the wave of crime has been particularly pronounced, but the field "lives." I'm rather afraid, however, about the end of the year. The four and a half years' wages agreement was for three years, one and a half years then to be renewed. One socialist mob, it is believed, will attempt to smash the one and a half years' continuation.

## Lithgow and District.

(From Our Correspondent.)

Lithgow, Sept. 19.

A mining gentleman who has just returned from the rivers reports that Messrs. Goodwing and Lougher have erected a sluicing plant at the junction of the Turon and the Macquarie Rivers, and have made very satisfactory headway. Under the management of Mr. E. Goodwing, the proposition has been a payable one from the start, although there was from a fortnight to a month of almost dead work. They have made 7 oz. for the first fortnight's run. Messrs. Baxter and Grimshaw have installed a pumping plant which will greatly reduce the handling of the washdirt.

In connection with the telegram reporting a rich gold find at Scabbing Flat, Trunkey, Mr. G. Marsh, C.P.S., states that in 1869 or 1870 he was one of the party of six who worked a claim on the same line of reef. The first lot of stone raised was 52 tons, which realised 4 oz. 18 dwt. per ton, and the party received £4 2s. 10d. per ounce for the gold when sold. Mr. Marsh says that he believes all the others of the party are dead They sold out their interests to private individuals, who floated the concern into a company. A ten head battery was erected, but those working the mine did not seem to know a great deal about it. Between 300 and 400 tons of stuff were put through, but apparently it was not the goldbearing reef, as the crushing only yielded about 10 dwt. to the ton. The reported rich stone, Mr. Marsh considers, is from the same line of reef as that worked by his party in the early seventies.

# TASMANIAN MINING.

## Mount Lyell District.

(From Our Correspondent.)

Queenstown, Sept. 19.

The Mount Lyell Company's smelting return for the last four weekly period showed a very appreciable increase on that of the preceding period, and was a long way the best since smelting operations were resumed after the North Lyell disaster in October last. A yield of 453 tons of copper from an aggregate of 22,264 tons of ore furnaced, of which only 7775 tons came from the North Lyell mine demonstrates strongly that the ore from this mine was worth quite 6 per cent. copper.

Taking the probable return for the current four-weekly smelting period, which closes at the end of the month, it is pretty certain to reach nearly 600 tons of copper. The half-yearly term of the company closes on September 30, and every effort is being made to keep three furnaces in constant operation till the end of the month. As this number of furnaces has been running uninterruptedly for more than half of the present four weekly period, they have got a good start, and, with ordinary luck, they will be able to keep them going for the remainder of the term. With three furnaces in blast for the full four weeks, and assuming that the present output of 400 tons a day from the North Lyell mine is maintained, they will have treated a total of 9600 tons of ore from this mine. It is quite safe to put the value of this at 6 per cent., and at this calculation the production from the North Lyell ore alone (after allowing for smelting losses) should be 490 tons of copper. As far as the material from the Mount Lyell mine is concerned, the quantity treated with three furnaces going will probably reach 20,000 tons, and, based on the average value of the pyrites, the copper production from this source should be something like 75 tons. It is therefore fairly certain that the yield of copper for the last four weekly run of the half year closing on September 30 will not be far short of 600 tons, and anyway it is practically certain to be at least 100 tons higher than for last month's campaign. It looks, therefore, as if the company's productive operations have pretty well regained their normal extent, and when one considers the extraordinary difficulties which have had to be overcome to bring about this satisfactory state of affairs, the fact that it has been accomplished in the short time of about nine months reflects very great credit upon all concerned, and particularly upon the engineer in charge of the company's mines, Mr. R. M. Murray, who, in spite of difficulties which at one time appeared to be almost insurmountable, has "won through" in a manner deserving of the highest praise.

Just now the workers in the Lyell district are very much concerned over a couple of bills dealing with industrial legislation which are being introduced into the State Parliament now in session. One of these is a bill drafted by Mr. N. K. Ewing, M.H.A., which provides for the prohibition of preference to unionists. The other, which has been framed by Mr. Fullerton, M.H.A., seeks to prevent trade unions from investing their funds in the purchase of shares in newspapers. Now it happens that the unions on the West Coast (and in fact all over the State) are, as associations, large shareholders in the "Daily Post," which is published in Hobart, and is the organ of Labour in Tasmania. Consequently Mr. Fullerton's bill is regarded by unionists as a deliberate attempt to break the journal. Naturally the miners on the West Coast, which is the stronghold of unionism in this State, are up in arms at what they consider is an attempt to impose upon them legislation which from their point of view is both unjustifiable and tyrannical, and in every centre on the West Coast meetings of the men have been held, and strongly worded resolutions passed denouncing both of the proposed bills—and, incidentally, their authors. Both bills will probably come on for discussion in Parliament during the next week, and the opinion is generally held that neither of them will be passed. But whatever uncertainly there may be in this respect, there is none as to what the result will be if both or even only one of the bills in question becomes law. The writer does not wish to pose as an alarmist any more than he desires to see industrial trouble occur; but, as sure as the sun rises and sets, if the proposed legislation be endorsed by Parliament there will be an industrial upheaval throughout Tasmania which will give its authors something to think about as long as they live. And, as far as the West Coast is concerned, it is "£1000 to a thimble" that, if Messrs. Ewing and Fullerton are successful in their attempt to interfere with unionism, within three months of their proposed measures becoming the law of the State every mine on the West Coast from Mount Bischoff to Mount Lyell will have to close down.

# WESTERN AUSTRALIAN MINING.

(From Our Correspondent.)

Kalgoorlie, Sept. 15.

Since absorbing the Hainault the grade of ore treated by the South Kalgurli Consols has dropped from 23s. 2d. to 21s. 1d. per ton, and, during the last two months, there has been a loss. In July this amounted to £360, and in August to £754. During the two months expenditure on capital account amounted to £1180. Even allowing for this, the mine can hardly make much profit on the grade of ore now being treated. Holders of old South Kalgurli scrip will receive a final liquidation dividend of eightpence per share on October 8. This means a total disbursement of £6667. The lode in the bottom of the mine continues very low grade, with no signs of improvement.

The main shaft on the Ivanhoe is now down to 2870ft., and is being pushed on at the rate of 20ft. a month. The shaft is to be steadily pushed down another 600ft., at which depth Dr. McLaren reckons that the graphite intrusion, which has impoverished the lode below 2270ft., will be passed through. The head gear on the mine is to be strengthened, and a new winding engine capable of hauling a 2-ton load from 5000ft. is to be installed. The cost of these improvements is to be spread over a period of four years, and as the cash and liquid assets amount to £100,000 odd, the payment of dividends will not be affected. An expenditure of £20,000 is anticipated. The deepest shaft on the goldfields is the Great Boulder's Edwards shaft, which is down 2879ft., but sinking has been suspended for two years.

A good deal of scepticism exists among metallurgists regarding Mr. J. H. Niemann's statements regarding the properties of selenium, and they scoff at the idea of Mr. Niemann recovering four to twelve times as much gold as fire assays indicate. The fact is, nobody here seems to know anything about selenium, and the text books barely mention it. One metallurgist told the writer of a case at Cripple Creek, Colorado, where no two assays could be got to agree, and varied by hundreds of per cents. The cause was never revealed, but the presence of selenium might have been the cause of the discrepancies.

The Sons of Gwalia's 50-stamp mill has been completely renovated, and new mortar boxes, guides, etc., together with heavier stamps, installed. The capacity of the mill has been increased to 15,000 tons monthly. The ore-shoot at the nineteenth level is much more regular and also richer than at the upper levels, and shows fewer breaks and throws. In addition to a new winding engine, gas producers are to replace steam for driving all the treatment plant, and three new tube mills and extra filter presses are also being added. After these extensions are completed the accumulated tailings will be reground and filtered-pressed. Up to date the mine has produced 1,966,400 tons of ore for a return of £3,851,940, and paid £932,362 in dividends. Costs should be considerably reduced when all the alterations and extensions are complete.

Since the Government mill started operations at Ora Banda the poverty of the lodes in the district has been fully exposed. Most of the parcels treated have averaged less than 5 dwt., and some have been so poor that the manager of the mill has refused to continue crushing when he saw the poverty of the plates. The future of the district depends solely on how the sulphide zone in the Victorious pans out, as the oxide zone only bulks about 20s. a ton.

Mr. Greenhard, Inspector of Mines, has reported that the creep in the Victorious has been overcome, but that no ore can be removed from above the second level. This will considerably reduce the tonnage of ore reserves, and also the grade, as the cave-in of the walls of the open-cut has completely covered up most of the oxidised ore. Mr. Wm. Martin is again in charge of the mine after a short holiday in the Eastern States, and he can be relied on to push on deeper developments.

Developments on the northern lode series in the Bullfinch continue satisfactory, and both Mr. R. Hamilton and Mr. Fred Morgan are pleased with the outlook. This lode is striking north-west with the country, which is fortunate for shareholders, as a diamond drill bore cut granite at a depth of 400ft., at a point 700ft. east of the shaft. The grade of ore treated last month was 57s. a ton, whereas the grade of the ore reserves was estimated by Mr. Morgan at 46s. 2d. per ton. The output will in future be 6000 tons a month, and the grade will then be brought down to normal.

# QUEENSLAND MINING.

## North Queensland Fields.

(From Our Correspondent.)

Mareeba, September 12.

The Railway Commissioner, Mr. Chas. Evans, is at present in the Chillagoe District on a visit of inspection. He also has a rather important proposal to report on for his department, and that is, the practicability of building a railway line from Forsyth to Percyville. A railway line between these two places has been mooted for some years, but, up to the present there have been no prospects of it realising.

Mr. A. S. Frew, the constructing engineer of the Etheridge railway line, whilst engaged on that work, devoted some time to mapping out a route to Percyville, and it is understood he furnished the Chillagoe Company with information concerning three routes. One of the routes was to the Chillagoe Company's gold mines on the Percy River, and another and a more practicable route was to the "Ortona" copper mine, which is owned by Mr. John Moffat, and which is situated about 20 miles lower down the Percy River. The distance as the crow flies from Forsyth to the Percyville group of mines is 30 miles, and to the Ortona copper mine 42 miles.

For some time past both these properties have been actively worked, and developments are such as has warranted the management asking for railway communication. At both places concentrating plants are being erected, and in view of the shortage of copper ore in and around the Chillagoe district, a railway to the Ortona copper mine as well as to the Chillagoe Company's Percyville mines will be a distinct advantage to that company, as there is no doubt but that the ores will be sent to the Chillagoe Company's fine works for treatment.

The result of the Railway Commissioner's visit will be awaited with interest. When interviewed, that gentleman said he had only been asked to furnish a report to the Minister for Railways, and he declined to state whether the proposition was on behalf of private enterprise or whether the Government were thinking of building the line. In the event of this line being built it will open up one of the richest portions of the Etheridge field, and bring more grist to the Chillagoe Company's mills.

During the past month or two the company's copper furnaces have been idle, and large stocks of copper ore from the Einasleigh mine have been accumulated. A good deal of repairs and improvements have been effected to the furnaces, and one furnace is now in commission and will run for a considerable period.

The Mungana Co. has entered into a contract with the Chillagoe Co. for increased supplies of silver-lead ores, and in view of the good development in the Girofla mine there should be no difficulty in maintaining the increased output.

Mr. Eardley Smith and Mr. Cliff Rutledge, the supervising engineer and mine manager of the Mammoth Co.'s mines at Klondyke, passed through to Chillagoe yesterday. If the company adhere to the active policy planned, Cardross will be one of the largest mineral producers west of Cairns.

At Wolfram Messrs. Murphy and Geaney's mine is producing large quantities of molybdenite and wolfram. The metals in the bottom of the new shaft are equal to anything previously produced by the mine.

As the shaft being sunk by the Leisner's Wol fram Block Ltd. is directly in front and not far distant the directors and manager are hopeful of cutting the lode in the deeper ground. In the manager's last report he mentioned that the shaft was down 320ft. Occasional heads and a slide dipping into the workings from Murphy and Geaney's mine are hopeful signs.

On the Atherton fall of the Herberton Range a syndicate has been at work trying to locate a lode which has been prospected for over a considerable number of years. During the week, at a depth of 30ft., a strong lode made its appearance in the shaft, and carries good coarse tin. The next few weeks' work will most likely give some idea of the value of the find.

At Mt. Carbine, the Irvinebank Co.'s wolfram property is developing well, and the usual output of stone is being maintained. Twenty head of stampers are kept going on the company's stone. Pack teams are continually coming and going from and to the Mt. Armit, Mt. Spurgeon, and Mt. Windsor tin fields. It is generally understood that the miners at Mt. Armit have asked the Mines Department for a grant of money towards the construction of a pack track to the head of the Daintree River, as motor boats can travel from there to Port Douglas. If this road is made the miners will be saved considerable expense.

### Anakie Field.

(From Our Correspondent.)

Sapphiretown, September 13th.

An important new development in the sapphire industry is the establishment of a lapidarian plant at Sapphiretown by Mr. J. F. Plechacek, late of Sydney, who arrived here last week. Visitors to the field will now be able to see the whole process of the evolution of the sapphire from the digging-up to the rough gem to the washing, cutting and polishing of the finished jewel. A lapidary located on the field will also be a considerable advantage to the miners, and a large business should be done.

A rare and valuable stone has just been cut for Mr. O. J. McIntyre of this field. It is a red-flame-coloured sapphire of 5 carats, almost unique on this field. Mr. Gordon-Cumming, gem buyer, has collected six rubies and ruby-sapphires, which are also a rarity here.

The industry appears to be booming, fresh men arriving daily. Country that at one time was considered too poor to work is now paying handsomely owing to increased prices obtained for the stones and the better facilities for treating the wash dirt.

## THE COAL MINING INDUSTRY.

### New South Wales.

### Northern District.

(From Our Correspondent.)

Newcastle, Sept. 20th.

Pelaw Main Colliery was not able to put out a full amount of coal on three or four days this week owing to the machine-men stopping work on Wednesday. They came out without saying anything to the management or to their officers, and when a meeting was held in the evening to find out what was the matter, they said they had certain grievances which they wished to ventilate, and they had taken that means of drawing attention to them. The secretary of the Miners' Federation got them to consent to return to work on Thursday; but although some of them did so, others would not, and the output of the mine was consequently seriously diminished. The men say that the management has interfered with their rights in the matter of cavilling, by taking men away when they have cavilled as mates, and putting strangers with them; by putting day wage men in to do part of the cutting, and then not paying the machine men for all the cutting done by them. The management, on the other hand, says the men are paid for all they do, and that there is no truth in their allegations. The Department of Labour has intervened, and the men have now made certain proposals, which have been submitted to the owners of the colliery. If they are accepted, the dispute will come before the Wages Board for settlement, and the trouble may be ended. If not, it may spread, and other pits may be affected. The proprietors are much put out over the action of the men, and say that it would appear as though they wished to take advantage of both the legal tribunal and the illegal method of the strike to enforce their demands. Mr. A. J. Kelynack, counsel for the Colliery Proprietors' Association before the Wages Board which is now sitting in Newcastle, drew attention to the stoppage of the machine men, and informed the Board that the output of the mine had been reduced about 33 per cent. during the last few days. The normal output of the mine, if the men worked in a proper manner, was 3000 tons per day, but in two and a half days they had got out only 5000 tons. This was a serious matter for the owners of the mine, and the action of the men was most exasperating. The men were throwing away about £250 per day in wages by stopping in this way, and it seemed strange that they should so act while they were making application for increased payment for the work they did. On Thursday afternoon, Mr. Kelynack said the whole of the pit was idle owing to the action of the machine men, and it looked like a deliberate attempt to interfere with the work of the Wages Board.

The evidence given before the Wages Board for the Northern collieries was concluded last week. Mr. Kelynack pointed out that the high wages earned by the miners, particularly in the Maitland district, had had the effect of making the men careless whether they worked constantly or not, and the result was that the output of the mines was diminished, and the owners were at a loss. One could not very well understand the attitude of men who were doing so well that they could afford to lose one-fifth of their time in asking the board to grant them anything more for the work they did. Mr. A. Lewis, who presented the case for the miners in the claim for payment for small coal, addressed the Bench at considerable length, and brought forward all the arguments that the men have for long used in support of their claim. He laid special stress on the fact that the small coal was worth nothing when the price for the hewing of coal was fixed, many years ago, and also that the proprietors had practically admitted that they did not pay for the small coal when they agreed to give the men one-eighth of a penny per ton, some years ago, in order to comply with the Coal Mines Regulation Act.

The second shift will be abandoned in the Abermain collieries, Maitland district, on the 27th inst., and it is stated that, in consequence, 210 men will be thrown out of work. Formal notice was served on that number of men by the company last Saturday. The position is a serious one for the men and their families, as it will not be easy to get work elsewhere at present. Certain new mines are developing on the field, but it will be some time before they will want a large number of men. Mr. Humble further recommends the Minister to try to secure the services of Mr. I. H. Thorne, of Perth station, as instructor.

### Western District.

(From Our Correspondent.)

Lithgow, Sept. 20.

The truck trouble is still "on deck," though it has not been so pronounced as during the previous fortnight. It is felt in some quarters that, though a good deal of time is lost and inconvenience caused, the department is really making an effort to reduce the trouble to a minimum. At both the Lithgow and the Hermitage mines, the men went down ten days, but only eight and a half days were worked in each instance. There was a good deal of broken time at the Vale of Clwydd, but a better fortnight was put in by the men than for previous "pays." The miners went down every day. At Oakey Park the men also worked every day, but broken time was experienced, and nine and a-half days were put in in all. The Zig-Zag miners worked eight and a-half days, broken time, trucks not being available on several days. The Mudgee line collieries—in the same district—did not fare so well. At the Irondale colliery eight and a-half full shifts were worked, while about seven were worked at the Invincible.

Mr. W. G. Cook, manager of the Invincible colliery, has written to the Minister in the following terms:—"I have to inform you that shortage and irregularity in the supply of trucks is still retarding the work at this colliery. This means financial loss to the company, and serious interference with the industrial conditions here, and has affected everybody concerned—even the railway locomotive depots themselves. During the past week there was a big shortage on two days, meaning the loss of half-a-day's work in each instance, and as this is pay-Saturday, the first part of the present fortnight has been anything but good. The 'truck question' is of such great importance to the whole of this district, and to those depending upon it for coal supplies that every effort should be made with a view to bringing about a change in the present totally inadequate supply. Under existing conditions the men cannot earn proper wages, and the customers cannot get coal, to say nothing of the loss to the proprietors."

Mr. J. Dooley, M.L.A., has received a letter from the Secretary for Railways, which states:—"With reference to the petition presented by you from miners employed at the collieries at Lithgow, relative to the irregular supply of trucks, I am directed to inform you that this matter has had close and careful consideration. A scheme has now been evolved whereby the colliery managers are made acquainted the previous day what waggons they may expect the following day, and, so far, the experience has been satisfactory. Contingencies, such as the dislocation of train-working brought about by the late supply and shortage of engine-power, and congestion on the suburban area, cannot be wholly provided against, but, given normal conditions, the innovation should, in a measure, prove advantageous, and daily efforts will be made to secure the best possible results from it with a view to avoiding the interruption of work at the Western industries. The Chief Commissioner regrets that inconvenience has been occasioned."

### Southern District.

(From Our Correspondent.)

Wollongong, Sept. 20.

In these days of great ships, the question is of some interest to this district, what size of ship will Port Kembla harbour, when complete, accommodate? It has been contended that vessels could get out of Port Kembla with a larger cargo than they could clear Newcastle harbour with. The silting up with sand, however, which has taken place at Port Kembla to such an extent, has probably altered that position. The estimates passed during the present session of Parliament provided £19,000 for carrying on the harbour work at Port Kembla. At present the harbour is without lights, of which condition the local progress association, in patriotic endeavour to enhance the importance of the port, keeps reminding the authorities. The latest reply of the Department is an acknowledgment that leading lights are necessary, and an assurance that a site is being inquired about. The shipments of coal at this port continue to average about 1½ cargoes per week, and as a jetty gang have to be kept available, this quantity must be rather costly to ship. The biggest cargoes at present go to Western Australia.

At the Mt. Kembla mine, the haulage having been extended, makes room for about 40 more miners; applications for work there, however, are few just now. A Sullivan coal-cutting machine recently received, and said to be the forerunner of others of the same make, was got into work this week in this mine, and it is expected to cut nearly 100 tons a day.

The question of giving separate tokens to a pair of miners, who, having drawn a place, are separated by the management, cropped up again in a claim before the conciliation committee during the week. This question shared with the dismissal of lodge secretary Russell the responsibility of having been the ostensible cause of the strike last year, on which occasion the decision of the Court was in favour of the company's right to separate miners and not give each a token, but its opinion was that miners when separated it would be better that they should each receive a token. The point is that separating is practised in some cases of deficient places, one of the pair being put in a good place, and if they continue on the one token the earnings of the good place go to make up the deficiency on the other; if each gets a token, then the earnings of the good place are his who works it; while the management have to make up whatever is short of 11s. per day in the earnings in the deficient place. The conciliation committee differed on the question, and there the matter stands. The chairman of the committee, Mr. Elliot, S.M., was also chairman of the wages board, but has resigned that office this week.

### Victoria.

### Powlett River District.

(From Our Wonthaggi Correspondent.)

The drawing of the cavil for places in the State mine for the ensuing three months passed off satisfactorily. The whole of the differences in connection with the machine-men and others were adjusted between the officials of the V.C.M.A. and the management. The report of the scrutineers on the working places was the best ever submitted, not one place being condemned. A total of 106 places were provided, 101 ordinary (employing 404 miners on coal), and five special places (employing 30 miners), making a total of 434 miners on coal. In addition to this number, 28 men are employed on the coal-cutting machines. The wheelers to the number of 64 also cavilled for places, and of these 42 are on contract and 22 on shift rates. This is the first time the wheelers have cavilled for places, and it is regarded somewhat in the light of an experiment. It means that the wheelers not only have to change places every three months, but they also have to change ponies or horses. If the innovation proves successful it will mean a big thing to the management, as in time the wheelers will know the whole of the roads throughout the mine. Work in the new places was commenced on Thursday, and in a few days the average output of between 2200 and 2300 tons per day should be reached. Later on, the output should show a further increase, as the machine-men are now on contract rates.

The whole of the splint in the dumps at the Nos. 3 and 5 shafts, estimated at about 1500 tons, has been disposed of to a private individual, who intends to retail it to local residents at so much per load. Not being able to get coal, residents are glad to get the splint, as some of it burns well, the only drawback being that it leaves a lot of dirt in the grate. The disposal of the splint adds another source of revenue to the mine, although the increase is not a very large one.

## MINING IN NEW ZEALAND.

In the Dominion House of Representatives lately the Minister of Mines, Mr. W. Fraser, said that the Government was doing a great deal to encourage gold mining by assisting prospecting and in other ways, besides granting direct subsidies to prospecting associations and miners to prospect new ground. Loans had been granted for the development of mines the prospects of which were reasonably assured. Subsidies and direct grants had been made for the construction of roads and tracks to open up mineral lands. Subsidies had been granted for the exploration of deep levels of existing mines. The use of both diamond and keystone drills had been granted free of charge, and water had been supplied from Government water races at exceedingly reasonable charges. Under the head of subsidised prospecting, no fewer than 56 approved prospecting parties were granted subsidies last year, and as a result of such expenditure no fewer than 8407ft. of drives had been put in, 390ft. of shafts had been sunk, and 39 boreholes had been drilled, all in search of gold. The policy of the Department was to continue granting similar subsidies in the future, especially in cases where the local governing bodies were also willing to assist. In the latter class of cases subsidies were granted at the rate of £2 of Government money to £1 contributed by the local bodies.

A proposal has been made to reconstruct the Kuranui-Caledonian Limited, and shareholders have been circularised accordingly. It has been estimated that the new machinery necessary and the deepening of the shaft to the 1000ft. level called for about £7000, and provision had to be made for the development of levels and working capital. Therefore, the following scheme for the reconstruction of the company had been submitted to shareholders:—A new company to be formed with a nominal capital of £30,000, divided into 300,000 shares of 2s. each, of which 244,609 shares are to be offered to the present shareholders, credited with the sum of 6d. per share paid up, leaving a liability of 1s. 6d. per share, of which 3d. per share will be payable on application, and the balance as and when required, in calls not exceeding 3d. each. The new company to acquire the whole undertaking and assets of the present company, and to defray its liabilities and the costs and charges incidental to its liquidation.

Writing from Waihi at the end of August, the special correspondent of the "Otago Witness" gives the result of his examination and inquiries at the Talisman Consolidated mine, Karangahake, where interesting exploratory work is being carried out in the hope of again picking up the Maria reef, which, in the Dubbo section, at No. 14 level, had for a distance of 50ft. to 60ft. pinched and fallen below paying point. "The present face, which is still about 50ft. north of the point where the second run of value in the Dubbo section came in at the level overhead (No. 13), shows a compact, good-looking body of stone, which appears to be making stronger, there being about 4ft. of ore exposed near the floor of the drive. Recent developments have thus placed it beyond doubt that the values are becoming more continuous at a depth in the Talisman mine. Some little distance back from the south face at the fourteenth level a winze is being sunk in the reef. This is going down in ore of good average grade, with no walls showing. At No. 13 level, the drive south, which for the last 40ft. or 50ft. had been advanced in country rock, has been temporarily suspended. Close up to the face a crosscut is being carried into the east wall to ascertain whether the reef has gone off in this direction, which seems quite probable from appearances further back. In the stope on the Dubbo chute, where recent operations disclosed a strong body of payable ore lying very flat, further development work, both north and south, has been carried out. North, a rise is going up and is in quartz, and south, a winze is being sunk, this also being in milling ore. A few feet of sinking will take the winze down to a depth corresponding with No. 3 level, and if the lode lives a crosscut will be put in from the east wall of the drive to intercept it. These operations will clear up the question as to whether the south drive at No. 13 level had been following the west branch of lode, and left the main vein in the east wall. If developments go to show that this has been the case, driving, rising, and a winze on the main body from the thirteenth level will be proceeded with. In the meantime all that can be said is that a big body of quartz, which must add further to the company's ore reserves, has been met with directly under a point where nothing of value existed in the drive on the level. The drive on the west vein is still in progress, and the lode formation in the face is about three feet wide, and still low grade. The drive will be carried beyond the fault, which it is thought possible will have some influence on the lode as far as values are concerned, and this should soon be reached. The sinking of the Woodstock shaft has been resumed, and the shaft should be down to the random of the Talisman No. 14 level (provided there are no interruptions) inside three months. The country rock being penetrated is of a most favourable description, and should the same class of country be found encasing the lodes when the northern section of the company's area is being explored by the crosscut from the Woodstock, there is good reason to anticipate that they will carry values."

For the four-weekly period ended August 23, the Waihi-Paeroa Gold Extraction Company Limited treated 11,450 tons of tailings for a return of £3600. Continual freshes during the last fortnight of the term prevented dredging for several days, and brought down large quantities of fine sand, reducing both values and quantity. The total amount won by the company to date was £61,511, from the treatment of 186.950 tons of tailings.

At Greymouth interest is just now centred in the Greenstone rush, and shares are changing hands at fair prices. The rush has revived the opinion that a large tract of rich gold-bearing country exists between Maori Point and the Teremakau. It has always been contended that the Three-mile locality is auriferous, and now that attention is directed to the locality probably something will be done to prove if gold does exist there. It was at Greenstone that gold was first discovered (in 1864), in the Grey subdivision of the West Coast district of the Middle Island, followed towards the end of that year by a discovery at Red Jack's. Then followed further discoveries on the sea-beaches north and south of the Grey River, and during the first 15 or 20 years the miners spent about £100,000 and the Government £90,000, in making water-races, tail-races and dams.

## DEMAND FOR RADIUM.

### £480,000 an Ounce.

The "remarkable results" reported by a surgeon of the Middlesex Hospital, London, as having followed upon the use of radium in the treatment of cancer, are highly satisfactory in themselves, though only time will tell how far the treatment has proved actually curative. The unsatisfactory portion of the Press cablegram which brought this news to Australia is that which states that the hospital is handicapped by the lack of radium, sometimes a single patient using the whole of the 144 milligrammes which the hospital possesses, so that for twenty-four hours afterwards no other treatment is possible, although hundreds of patients are awaiting their turn. The need is the greater, the surgeon adds, because small quantities of radium are useless in the treatment of cancer.

At the best, radium is very scarce, but it will be seen from the following statement in the London "Standard" that European countries, and particularly Germany, have been eagerly buying up all the English radium procurable.

"Germany," says the "Standard," "has purchased for her hospitals and medical institutions every available milligramme of British-made radium. Her emissaries, who came to London with an appeal for eight times the quantity that they were able to obtain, paid cash down, and returned without delay with their precious charge. There is a boom in radium, and it is apparent that the two great sources are quite unable to supply the demand. These sources are certain pitchblende mines belonging to the Austrian Government and the Trenwith mine of the British Radium Corporation, near St. Ives, in Cornwall. In the latter the pitchblende takes the form of a lining to a lode of copper ore. For two years radium of extraordinary purity has been extracted from this pitchblende, and sales of radium and uranium amounting to £40,000 have been effected.

"In an interview with the British Radium Corporation it was admitted that an extraordinary demand had developed recently for British radium. Several German agents had visited London, appealing for quantities far in excess of the available supplies, and had offered to pay on the spot. 'It will take us at least a year to supply that portion of the demand which we were unable to satisfy,' it was stated. Germany, it appears, has been recently educated by her scientists and medical men on the subject of the extraordinary healing powers of radium. In view of the scarcity of this wonderful substance, special appeals have been made for funds to enable the hospitals to obtain, whilst it is available, such quantities as are necessary to effect cures. Frankfort, for instance, appealed to its citizens for 300,000 marks (£15,000), and of this 150,000 marks were subscribed within a few days. The Frankfort appeal reminded the citizens that the 'Gamma' rays, effecting such wonderful cures on skin diseases, were but a small percentage of the rays emitted by radium, and that it was necessary for a comparatively large quantity of radium to be purchased if complete and rapid cures were to be secured by its means. The signatories to this appeal, which includes many of Germany's most famous doctors, are confident that the entire sum asked for will be subscribed shortly.

"The result of this raid upon British radium is that British hospitals, apart from those which have already obtained small quantities of this precious substance, will have to wait many months before they can hope to give their patients the wonderful curative treatment now being exploited abroad. This is unfortunate, because the Trenwith pitchblende has been proved by Sir William Ramsay and other scientists to be from mock radiums giving emanations over a restricted period. The radium which has gone to Germany bears with it Sir William Ramsay's guarantee of the highest degree of purity. The price of radium to day is £16,000 per gramme, or the equivalent of about £480,000 per ounce, and its production is a very slow process."

## AMALGAMATED ZINC (DE BAVAY'S) LIMITED.

### Half-Yearly General Meeting.

The half-yearly ordinary general meeting of Amalgamated Zinc (De Bavay's) Limited was held at the registered office of the company, Nos. 360-366 Collins-street, Melbourne, on Thursday, the 18th day of September, 1913, for the following purposes, viz.:—

(a) To receive and consider the balance-sheet and profit and loss account for period ended 30th June, 1913, and the reports of the directors and auditors.

(b) To transact any other business that may be legally brought forward.

Mr. John L. Wharton (managing director) occupied the chair. During the past term spelter has fallen from the high level ruling at the date I last addressed you. This and other causes have contributed to the less satisfactory position that the accounts disclose. Eliminating these features, it will be observed, on comparison with previous periods, that our averages have been well maintained, but the shortage can almost wholly be ascribed to the cessation of production during the Silverton Tramway strike, which, in our case, covered some three weeks.

The profit on working account totals £92,085 0s. 3d., and is made up as to £59,244 11s. 3d. in respect of tonnages treated and concentrates produced during the period in question, plus £32,840 9s., being surpluses on concentrates produced during the preceding six months, but settled for on the basis of January to June metal prices. Hitherto it has been our good fortune to collect surpluses in respect of final settlement on concentrates produced during preceding periods, and this has been brought about by our standard valuation of £22 per ton for spelter being exceeded. Furthermore, it may be stated this method has largely corrected the possible fluctuations between wide limits of our profit disclosure.

My co-directors and myself desire to further draw your attention to the incidence of this way of accounting in respect of the period now current and that just closed. The actual profit for the term, irrespective of surpluses in respect of the antecedent half-year, taking spelter at £22 per ton, was £59,244 11s. 3d.; but, should the average of the current six months be, say, £21 per ton, then the present half-year will be debited with the ascertained difference of the previous term, which, on the tonnage affected, would amount to £9150.

Assuming normal conditions, we may reasonably expect to outturn 75,000 tons of concentrates during the current half-year, and on this expectation, taking spelter at £21, the profit would be £56,800, less the debit of £9150 previously mentioned, but subject to dividends from other companies and interest received in respect of investments.

With respect to our published monthly statement of profit on working account, we propose in future to deduct all royalties payable. It has been our practice hitherto to deduct these half-yearly. The monthly statement which we publish only purports to be a reasonably close approximation, and it does not include or take into account dividends from other companies or interest on investments. These, when ascertained, are brought into the figures at the close of each half-year.

After dealing with the financial position of the company, the chairman continued:—Liquid assets total £96,127 2s. 9d., but this amount does not include the sum of £124,217 5s., which has been paid in respect of tailings purchased, nor for our 45 per cent. holding in Minerals Separation and De Bavay's Processes Australia Proprietary Ltd.

In connection with this business, I would advise you that the various licenses report the very satisfactory working of the process both in respect of zinc flotation and copper concentration. Additions have recently been made to the installations at both the Wallaroo and Moonta mines, and since I last addressed you, the unit at the Lloyd's copper mine has been put into commission, and is doing satisfactory work. The Mount Morgan Company are exhaustively experimenting with a working unit, and we are hopeful that at no distant date we will be able to advise that that company has decided to adopt the process and erect a larger plant.

The case tried in the Montana District Court of the United States, against Mr. J. M. Hyde, for infringement, resulted in a complete victory to the Minerals Separation Company. The judge contrasted our patent in the suit with patents cited against it by the defendant, and held that the latter are widely different, and that the defendant's contentions of ''Lack of novelty'' and ''Anticipation'' failed. Amongst patents cited by the defendants were the C. J. Everson, Elmore, Potter, Delprat, and quite a number of others. In fact, nearly all the prominent and important patents in flotation were cited, but the ruling of the judge was very complete, and in consequence we feel that the patents controlled by the Minerals Separation and De Bavay's Processes Ltd. are indefeasible.

Due primarily to the causes mentioned at the last meeting, the price of spelter has been adversely affected. Whilst the average for the term just closed was £24 11s. 5d. per ton, the present price is only £21 5s. per ton. Our advices go to show that financial restriction and a distributed industrial position on the Continent resulted in accumulations of spelter that may take some little time to work off. It is hoped, however, the operation of the convention in regulating production will alleviate the position. The difficulty of correctly appreciating the varying factors that at present confuse the position renders it almost impossible to offer any valuable opinion with respect to the immediate future of this market. What one has to keep before them is that the average cost of producing spelter is somewhere in the vicinity of current rates, and this consideration will in time operate to bring about an adjustment of values. The average price over the last 10 years is considerably higher than that at present ruling, viz., £23 13s.

Shareholders will appreciate that the dividend distribution of this company is based on the price of spelter at £22, and should it appear, in the opinion of this board, that there is a probability of a lower average than this, it will be necessary for us to bring our dividends into line with current earnings. These, with spelter at £21, may be put at approximately £100,000 per annum. It may be suggested that we have established the reserve to meet such cases, but I would mention that whilst this reserve is available to meet any unusual or unexpected decline, it would be unsound from our point of view to weaken the present strong financial position of the company by a continued encroachment as would arise should spelter long remain at its present price.

Since the close of the half-year a dividend of 1s. 6d. per share has been made, making the total distribution to date £400,000. It will be noted that during the past six months we distributed £100,000, but of this £25,000 represented a bonus paid in respect of the preceding half-year's very high earnings, which, if you will remember, totalled some £155,295.

Mr. M. Cohen, in seconding the motion for the adoption of the report and balance sheet, said:—The directors think in their own interests and in the interests of the company a conservative policy should be adopted. We cannot always expect to be at high water mark. We have £125,000 set aside for the equalisation reserve. We have not encroached upon this nor have we taken into the liquid assets some 500,000 tons of tailings which we have acquired and paid for, nor shares we hold in another company amounting to approximately £120,000, nor do we include our slimes. These are quite as good as the liquid assets set out in the report, so we have what may be said to be internal reserves, totalling about quarter of a million. I think the shareholders will agree that we can be congratulated on finding ourselves in such a sound and satisfactory position. What we have particularly to look to is safety and reasonable conservatism, and I think the members of this board are recognised as people who will follow such a course.

The motion for the adoption of the report and balance-sheet was agreed to unanimously.

## NEW ZEALAND OILFIELDS LTD.

### Profits of Promoters.

A cablegram from London stated recently that, according to the "Daily Express," a number of shareholders in the New Zealand Oilfields Ltd are promoting an action against the directors, promoters and vendors, with a view of recovering their subscriptions They allege that the property was sold at an inflated price, and also that the directors loaned the company's money to friends, and that it has not been repaid. Meetings of shareholders and creditors of the company were held at the end of last week, at which the official receiver reported that the prospectus insufficiently disclosed the enormous profits to the promoters. It appeared that the original concessionaire was willing to sell his interest for £50,000, while the company paid £110,750 for it. The expenditure includes £7500 to Mr. Macdonald for the acquisition of Gisborne Oilfields, which dropped through, as the report on the property was unfavourable, but Mr. Macdonald retained the cheque.

## GIPPSLAND COPPER CO. (V.).

### Government Assistance Refused.

After the ordinary business had been disposed of at the annual meeting of the Gippsland Copper, Platinum and Gold Mining Co., Walhalla, last Friday, the chairman, Mr. H. B. Black, made lengthy reference to the refusal of the Victorian Minister of Mines to grant a loan of £1500 to the company, which, he said, had been a great disappointment to the board. They were the more surprised on account of the strong case they were able to put before the department, and more particularly so on account of the favourable report on the mine in 1911 in his then private capacity of a now prominent Government mining official. On the strength of his report most of the shareholders put up their money. Besides this report, there was also the report of Mr. W. H. Cundy, the well-known mining engineer, which was also a favourable one. From a business point of view alone, the application was well worthy of favourable consideration, bearing in mind the fact that the amount asked for would be more than repaid in twelve months in the way of freights for coke, matte, carriage of goods and passengers over the railway, which would all be lost if the mine were shut down; and, besides, a township of 400 to 500 people would be squeezed out of existence; and the only copper mine in Victoria, containing also the noble metals platinum and palladium, would be a thing of the past. In view of the above, it was inexplicable that assistance had been refused, when other mines in the vicinity and elsewhere, with nothing like their showing, were readily given a helping hand. The board wished to point out that in 1911, on the favourable report of the Government geologist of that day, Mr. E. J. Dunn, a sum of £1500 was granted, but not availed of, and they could not conceive why, seeing that the above favourable report in 1911 was made by the present Government geologist, Mr. Hyman Herman, and developments since had more than borne out his figures, assistance should now be refused. Shareholders would, therefore, have to put up the necessary funds themselves, or else they would have to go to London with the property.

Dr. Friedman said the directors felt sore at the treatment meted out to the mine, especially in view of the experience of the Long Tunnel mine, which was turned down by shrewd business men with £15,000 unexpended. The copper company was a live proposition, and Mr. Herman had turned them down. It was the most scandalous thing he had ever heard of that a ten times more deserving proposition should be so treated.

Mr. Kaepell, director, emphatically endorsed the remarks of the chairman. He considered it was, apparently, largely due to the action of Mr. Herman, on whose advice the Australian Metal Co. had made a three years' contract for the purchase of the company's ore, besides advancing £1000 for coke, and had expended money in the reception of plant in Germany to treat it, as well as encouraging shareholders to put their money into the mine.

It was ultimately decided that formal notice of the Government refusal be given to shareholders by circular, and that a time be fixed for the payment of the calls before shares were forfeited. A meeting of holders of live shares will then be called to decide as to the future of the company.

## STRIKES IN NEW ZEALAND.

### £443,620 Lost in 18 Years.

In the annual report of the New Zealand Secretary for Labour, it is stated that, during the last financial year, there were 35 strikes in the Dominion, the most important being those of the Waihi and the Reefton miners, and that of the slaughtermen. The first-mentioned was one of the most serious industrial disturbances in the history of New Zealand, and was remarkable for the fact that the dispute lay, not between employers and their workers, but between two bodies of workers. Next in importance was the dispute with the Reefton gold miners, which kept the industry at a standstill for six months. The report includes an interesting summary of the strikes in New Zealand from the inception of the Industrial Conciliation and Arbitration Act of 1894, to March 31, 1913. The number of strikes coming within the scope of the Act was 35; while the number outside the Act was 63—a total of 98. Of this total 43 are classed as unimportant. The men were successful in winning 25, the employers 42, while 28 were compromised. The average duration of all the strikes (trivial cases not included) was 23 days, and the total number of strikers (excluding trivial cases) was 3686. The total number of men rendered idle by strikes was 8380, and the loss in wages to workmen concerned represents £283,206. Approximately the loss to employers was £160,414. Strikers have been fined a total of £1917, and the amount collected to date equals £1532, or 80 per cent. of the total fines inflicted..

## COMMONWEALTH OIL CORPORATION.

(From Our Correspondent.)

Lithgow (N.S.W.), September 19.

At the Lithgow Mining Warden's Court, before Mr. A. B. C. Bourke, held on the 16th inst., a further application for total suspension of labour conditions on their leases at Gindantherie, Capertee, Glen Alice and Barton was made by the Commonwealth Oil Corporation. The application was for 18 leases, 26 leases, totalling 16,031 acres, having been surrendered since the last application. It was stated that an average of 20 men had been employed on the leases. The total expenditure on the leases amounted to £1,450,136. The area of the leases now held by the corporation was 10,960 acres, and the annual rent £822. The surrendered leases required 162 men to fulfil labour conditions; the present leases required 140 men. The company had never made any profit.

David Fell, local receiver, said he had made investigations, and he estimated that the annual loss at Newnes alone during the time he had been receiver was £24,000. He thought the company was losing a similar amount before he was appointed. The object of the receivers was to concentrate their energies in such a direction as to effect economies. This had been done by reducing the number of leases, but the main economy had been in the sending of money from England, awaiting the final consummation of the reconstruction scheme. In last July the reconstruction scheme was approved by the court. The receivers endeavoured to see those interested, but it was an inopportune time, as the financial classes were out of London, and the receivers now had to wait until October for their return. Personal interviews with interested persons were necessary. He would venture the opinion that if the present shareholders and debenture holders could raise the money it only remained for private speculators to come in after the company was in liquidation. They were doing all they possibly could to prove to those interested that, provided the necessary capital was raised, it was possible to make the works pay. Everything possible had been done to secure the necessary capital. Witness presented a list of dates for payment of proposed calls upon £350,000 prior lien stock if the scheme was arranged by September 1st, as follows.—September 1, first call, 5s.: December 1, second call, 2s. 6d.; March 1, third call, 2s. 6d.; June 1, fourth call, 2s. 6d.; September 1, fifth call, 2s. 6d.; December 1, sixth call, 2s. 6d. The last four are for 1914. The final call—the seventh—is 2s. 6d., due on March 1, 1915, making a total of £1. The circular showing these proposals was issued on July 22nd to share and debenture holders. It provided for a working capital of £61,000, and for developments £190,000. There was a suggestion that if this additional capital could be raised, the retorts should be built at Capertee, near Lithgow, and the refinery on the Parramatta River, near Sydney. It was the opinion of some experts that this would be a far more favourable proposition. It would mean the reconstruction of the whole works if the proposal was adopted. Another encouraging factor was that the demand for oil was such that its price was gradually increasing. So far, little or no capital had been subscribed by the Australian investors, and the indications were that little or no capital would be subscribed by them. If the capital was subscribed, the first call would produce £87,500, which would enable them to take the earliest possible opportunity of getting the works in operation; but he did not think the works could be re-started under six months, owing mainly to the large amount of initiatory work which would have to be carried out. However, work in some directions would be commenced as soon as the amount required was subscribed. He was of opinion that the amount was likely to be subscribed within the next three months.

The circular referred to by Mr. Fell states that £50,000 of the desired £350,000 has been promised by Sir John Brunner. It proceeds: "Should adequate assistance be given, it is estimated that the business can be made to yield 6 per cent. on the £350,000 of new money and the reduced debenture capital, leaving a substantial surplus, of which half would belong to the existing shareholders and half to the holders of the new prior lien security."

The warden granted a partial suspension of three months from date of hearing, ten men to be employed on the leases.

# ENGINEERING AND ELECTRICAL SECTION

THE FAMOUS
"Brimsdown"
"Wirum"
BRITISH MADE Lamps.

The most popular, reliable and economic lamp on the market.

Sole Agents—
THE
LAWRENCE & HANSON
Electrical Co. Ltd.
405 LONSDALE ST., MELBOURNE.
33 YORK ST., SYDNEY.
and at WELLINGTON, N.Z.

## A GREAT ENGINEERING SCHEME.

### The Burrinjuck Dam.

The statement of Professor David in regard to the effect which the weight of water to be stored in the Burrinjuck dam will have on the earth's crust in the vicinity contains some interesting information. It is intended to test the effect of this weight by means of subterranean pendulums, which there is plenty of time to instal (and which, it is hoped, will be loaned by the Director of the Potsdam University, Prussia), as it will probably be four years before the reservoir is filled to its maximum capacity of 33,000,000,000 cubic feet, the weight of which will be over 919 thousand million tons. Professor David explains that in order to correctly determine the effect of this weight of water it will be necessary to place these pendulums 20ft. in the ground, so that the bases on which they rest are away from the influence of any surface changes of temperature. This condition can easily be secured by driving a couple of short tunnels into the rocky hill side, at the two sites which have been selected.

Professor David points out that in almost all parts of the earth's surface, when accurate measurements have been made, as on geodetic surveys, areas where levels have been taken for the construction of canals, railways, observatories, etc., it has been found that the earth's crust is not firmly set, but is moving, though very slightly, either upwards, downwards, or horizontally. When such movements are rapid they culminate in earthquakes. For example, in the Assam earthquake of 1897 a large portion of the Himalayas was pushed forward in a moment in a southerly direction to the extent of from 12ft. to 14ft., and upwards to the extent of 8ft. or 9ft., the whole of this portion of the vast range being forced up an inclined plane, or geological fault. The earthquakes at Mukamuka, to the east of Wellington (N.Z.), in 1855, at Tanna, in the New Hebrides, in 1878, and at San Francisco in 1906, furnished notable examples. In the last-mentioned case a horizontal displacement of the earth's crust was effected along the line of a crack extending for over 300 miles, so that fences became dislocated by the crack. It has been observed that in the neighbourhood of any area where the earth's crust has been subjected to a progressively increasing load, as for example at the mouth of rivers, such as Mississippi, Ganges, and Rhine, the earth's crust is on the whole in a state of subsidence. This is found to be due to the vast amount of pulverised rock material carried down to the sea, the result being the formation of deltas of great thickness. Bores put down in the delta of the Ganges show that fresh water beds of peat, containing the remains of land animals, are now submerged hundreds of feet below sea level, thus proving that subsidence has taken place. Salt Lake, in Utah, furnishes an instance of the earth's crust having been forced upwards, so that what was once a lake nearly 100 miles long and 1000ft. deep has shrunk enormously, owing, probably, to a reduction of the surface load.

## N.S.W. RAILWAY LOAN.

In pursuance of a previous announcement, the State Treasurer (Mr. Cann) introduced in the Legislative Assembly last week a bill providing for the raising of a loan of £3,000,000 for the purpose of railway duplication, deviation and rolling stock.

The bill, which is a short one, provides for the money being raised by the issue of debentures or stock, which may be sold in Sydney or London, and pending the issue of such stock or debentures sums may be raised by the issue of Treasury Bills, having a currency not exceeding five years, and bearing interest not exceeding 4 per cent. Moneys borrowed under the Act are to be paid to the Treasurer and carried to the railways loan account, 1913, and applied towards the purchase and construction of rolling stock for railways and to meet the cost of duplicating portions of the main trunk lines and other works in connection therewith. Trustees and corporations are empowered to invest moneys in the debentures and stock issued under the bill.

In speaking to the measure, Mr. Cann quoted figures to show that he had exhausted the authority given him by Parliament and had been finding the Railway Commissioner about £100,000 per month to keep the work going. There was about half a million for engines on order. These proposals were urgent ones that the Railway Commissioner had suggested. He thought £3,000,000 for the time being would be sufficient to be going on with, and so he was asking authority to raise that amount. He was already in negotiation with the same people who had raised the money last time to raise the money in London, but not locally. He had no definite arrangement; but he had a promise that, providing the loan was issued through the usual channels, they would be prepared to underwrite it and take a portion of it.

## MELBOURNE'S TRAMWAYS.

Of the numerous tramway schemes which are now being considered by various suburban municipalities, the most matured is that for the construction of an electric tramway from Clifton Hill through Richmond, via Church-street to Prahran, all the councils interested, with the exception of the City of Melbourne, having agreed to the insertion in the Order-in-Council of a provision guaranteeing the Melbourne Tramway Company against loss on the working of the existing lines by reason of the competition of the projected line. The Premier, Mr. Watt, has informed Mr. Cotter, M.L.A., that he will push on with the preparation of the Order-in-Council, in anticipation of the consent of the Melbourne City Council, so that there may be no unnecessary delay in obtaining the consent of Parliament to the undertaking after the City Council has decided to fall into line with the other municipalities regarding the required guarantee.

At a conference of the municipalities concerned, held last week, consideration was given to a report on the project by Mr. H. S. Dix, engineer and manager of the Prahran and Malvern Tramways Trust.

Mr. Dix gave the length of the proposed line as 3.9 miles, and recommended a double track, with power from the Melbourne Electric Supply Company until such time as the various tramways are amalgamated. Twenty cars of the single truck and bogie type in equal proportions would be required. A complete depot, including car shed, workshops, messroom and offices would also be required. The total cost of the line would work out somewhat as follows:—Permanent way and overhead equipment, £47,000; tramway crossings, £2550; M. and M. Board of Works alterations, £19,970; alteration to telephones and electric light wires, £750; cars—10 single truck at £1100, 10 bogie cars at £1700—£28,000; depot and equipment, £10,000; engineering charges, interest on capital during construction, and contingencies, say, £7000; total, £115,270. Assuming that each municipality bears the cost of construction within its own borders, and contributes towards the common assets proportionately to its frontage to the line, the proportional shares would be approximately as follow:—Prahran, £9622; Richmond, £40,539; Collingwood, £65,709; total, £115,270. The annual car mileage, allowing for a service of 10-minute and 5-minute intervals at different portions of the day, and a liberal allowance of special car mileage during the rush hours and on Friday nights, etc., would be about 470,000. The operating costs as per car mile would not exceed 9d. The financial result would therefore work out somewhat as follows:—Estimated revenue, £28,000. Estimated expenditure—470,000 car miles at an operating cost, including power, of 9d., £17,625; interest at 4½ per cent. on £115,270, £5187; renewals fund, 2½ per cent. on £87,000, £2175—£24,987; surplus, £3013. Despite the heavy capital outlay involved, Mr. Dix expressed the opinion that the density of the population of the districts served would enable a revenue to be earned which would more than meet all outgoings.

The question of compensating the present tramway company for loss through competition has also been considered in connection with the proposed line from Burwood to Melbourne, via Swan-street, Richmond, and at a recent meeting of the Richmond Council a resolution was carried, of which the following is a portion:—"In view of the opinion of the Crown law officers on section 3 of the Tramways Act 1890, as reported by the Premier at an interview with municipal representatives on August 13th, and as the proposed extension to Prince's Bridge is being opposed by the Melbourne Tramway and Omnibus Company, this council is not opposed to provision being made in the proposed bill for making good to the said company any proved losses that may arise by reason of the construction and running of an electric tramway to Prince's Bridge. And this council requests the Premier to provide a clause that in the event of any regular motor omnibus service along Bridge-road or Swan-street, Richmond, the company or individuals running same shall keep accurate accounts of the revenue derived, and shall give information relating thereto in the event of the aforesaid Melbourne Tramway and Omnibus Company endeavouring to prove losses above referred to."

In the Victorian Legislative Assembly last week, while "grievances" were being ventilated, mention was made of the possible position of the tramway finances under the competition of motor-'buses, and the opinion was expressed that Parliament should take steps to restrict that new method of transport before it was too late. There is no doubt, as we mentioned at the time of the shareholders' meeting of the Metropolitan Tramway and Omnibus Co., that should that company decide to carry out its acknowledged intention of continuing its operations in some such way, the motor-'bus or the trackless electric trolleys will become a serious rival to any form of tramway, but how far a Government should go towards blocking improved methods of inter-communication between city and suburbs, purely in the interests of capital already invested, is a question which requires to be looked at from more than one point of view.

The following resolution, intended to meet the objections mentioned by the Premier, Mr. Watt, against the draft Bill presented by the municipalities for the creation of a Metropolitan Municipal Tramways Trust, has been agreed to by the municipal councils concerned:—"That this executive recommends to the respective councils that the draft Municipal Tramways Trust Bill prepared on behalf of the metropolitan municipalities, and submitted to the hon. the Premier, be amended in order to meet the views of the Premier, by making provision to the following effect:—1. As regards all new routes, that the sanction of the Governor-in-Council be first obtained. 2. As regards tolls and fares, that the same be submitted to and approved by the Governor-in-Council before coming into force. 3. As regards borrowing powers, that a fixed limit be stated, and that further borrowing from time to time be subject to endorsement of the Governor-in-Council."

---

With the object of promoting the establishment of new industries locally and to counteract the reigning tendency to centralisation in the metropolis, the Bendigo (V.) City Council, on the notion of Councillor Abbott, has passed a resolution favouring a new clause in the Amending Local Government Act Bill to give municipalities power to remit rates on new industrial establishments.

## ROYAL AGRICULTURAL SHOW (V.).

In the hope that more favourable, though not less seasonable, weather conditions might fall to their lot this year than has usually been the case, the Council of the Royal Agricultural Society of Victoria decided to postpone the annual Spring Show until the end of the month. As it happened, the earlier part of September was finer than usual, and as one week followed another and the weather was still in equinoxial mood, there was still uncertainty whether the fine opening day would be followed by others equally propitious for the events still to come. The hearts of the farmers and pastoralists were cheered at the end of last week by news of a fine general rainfall, affecting all parts of the State and extending well into South Australia, so that any slight discomfort which might have to be borne later on was recompensed beforehand. There was the customary migration from the country to the metropolis, and even members of the country party confessed that there is something not altogether objectionable in centralisation, provided always that it does not become permanent. Every year witnesses an increased attendance; farmers are growing less disposed than formerly to remain satisfied with methods and appliances which have paid for themselves again and again, and are increasingly interested in and anxious to secure the best and latest machinery which manufacturers have to offer them, and nowhere can the achievements of inventors be so easily compared as at a big show like that held this week. Many of the exhibits, as usual, have interest for others besides farmers, squatters, and graziers, and some which are especially interesting to those concerned in mining and engineering work may be specified here:—

AUSTRALIAN METAL CO.—The stand of the company contains features of considerable interest in the nature of electrical innovations. The appliance which appears to attract most attention is a 65 h.p. Robson acetylene gas plant with a generator driven from same. The current from the generator is utilised for driving various smaller appliances, and also for supplying the lighting to the stand. Other features of the exhibit include several electric welding machines, and an electric automatic pump for house water supply. A speciality is also made of the automatic electric house lighting set, which is demonstrated to be useful for lighting effects in mines, stations, townships, etc.

AUSTRALIAN WOODPIPE CO.—The exhibits displayed by this company are well worth inspection by anyone who is carefully making a study of Australian industries and manufactures as presented at the Agricultural Show. Various classes of pipes, including the 30in. wood-stave type, and coated and uncoated sections are shown.

THE AUSTRAL OTIS ENGINEERING CO. shows an interesting working exhibit of Mayer's seed grain cleaners and graders, and the manner in which oats and wheat are separated proves an instructive spectacle. Several small graders are on exhibition, and we understand that the sizes range from a capacity of 11 bushels to several hundred bushels per ton. The company is also exhibiting Geipel steam traps in action. Users of steam would do well to inspect these ingenious appliances. A selection of chain blocks, of British manufacture, together with various pumps and a small self-contained boiler and engine set complete a very interesting and instructive exhibit.

Mr. L. Bannister, of 39 Queen-street, Melbourne, is exhibiting at stand 165, the Bates oil engine and the "Badger" petrol engine in the portable type. The Hutchinson economic transport system is being demonstrated; it is shown that great bulk can be handled singly and with considerable despatch. In this system the bodies are interchangeable from one vehicle to another. An empty top is rolled off the lorry, motor, or railway truck on to a loading stage, and a full body is drawn on in its place, the exchange occupying but a few seconds. Bodies can either be tipped in the same fashion as with an ordinary tip dray, or exchanged as above.

THE BRITISH IMPERIAL OIL CO. LTD. are again displaying widely-known brands of petroleum products marketed by them, among which are included "Shell" benzine for motors, "Silverlight" kerosene for oil engines, and "Shell" kerosene for illumination and heating purposes. Other lines shown include motor grease, anti-friction grease (both yellow and black). Some honey or pulp tins, fitted with a patent lever top, should command a ready sale amongst apiarists. To all those who are in any way interested in motor traction, the British Imperial Oil Co.'s exhibits will prove very interesting.

MESSRS. BROOKS, ROBINSON & CO. are making a special feature of their electrical appliances this year, and an interesting hour can be spent in their inspection. The firm have a complete building of their own on the grounds, and are, therefore, able to give an effective display of their various apparatus and fittings. The chief exhibits include several types of 4-light radiators, Bastion electric irons, and various styles of the Osman and Phillips metal filament electric lamps. Samples of 3 h.p. Rhodes motors are also shown. These motors are specially suitable for workshop use, and are well worth inspection. Messrs. Brooks, Robinson and Co. should be congratulated on the effective manner in which they have arranged their exhibits.

DALGETY'S MACHINERY DEPARTMENT make a feature of their "T" type Tangye suction gas engine, which drives a Silvertown dynamo. This combination is at the present time being used for the electric lighting of Horsham, Daylesford, Dandenong, and other towns. The "T" type Tangye engine is specially adapted for work where steadiness of revolution is essential. Another item, shown for the first time this year, is the Gane milking machine with automatic releaser, which takes the milk direct from cow to milk cans or separator—a considerable saving in labour and a decidedly more sanitary method of milking. That this device is being appreciated by the dairy farmers seems evident from the success it has met with in the country. Within their pavilion is a working display of the Wolseley sheep-shearing machines, showing the latest improvements that have been introduced, specially noticeable amongst which is the No. 6 handpiece, which is superseding all others owing to there being less vibration, friction and wearing parts. The Wolseley separator is also in evidence. It is of simplest construction, and has the reputation of being a most thorough skimmer; it is little wonder that its popularity is increasing.

GOLDFIELDS DIAMOND DRILLING CO. PTY. LTD.—This firm are exhibiting at the Royal Show for the first time, and are making an exceptional display. Until recently they confined themselves to diamond core drilling on mining properties, artesian and sub-artesian well-boring and the manufacture of machinery for such work, but they have now launched out into a general manufacturing and agency business, in which they include the following lines:—Rumely kerosene-burning tractor for ploughing and hauling; Falk kerosene engines; Armstrong traction and non-traction well-boring machinery; Goldfields all-steel portable well-boring machinery; Armstrong gasoline and kerosene engines; silos, and silo fillers; "Princess" cream separators; Rumely hay presses; Dennis scoops and scrapers, mowers, rakes and lucerne renovators; Myers' and Gould's pumps; Elgin and Model B. windmills, which have to be "oiled but once a year"; pump jacks; casing, and all machinery and fittings necessary for complete pumping plants of every kind. In their exhibit they are making a special feature of the following:—(1) Rumely "Oil Pull" tractor, burning the cheapest fuel oil that can be purchased; (2) the Falk farm engine with the same system of carburetion as the tractor; (3) Russell all-steel portable silo, and the Appleton silo filler at work filling the silo; (4) a special 8ft.-cut mower for extra heavy work, made by the Emerson Brantingham Co.; (5) a lucerne renovator, with special seeding attachment; (6) the Gile farm pump jack, gasoline driven. The company will also give a ploughing demonstration with the Rumely tractor and Messrs. Robinson's ploughs at "Gladstone Park," Broadmeadows, during the first week after the show, on October 1st and 2nd. All those interested who have not received an invitation should apply at the company's exhibit.

MESSRS. JAS. HARDIE & CO., whose stand is situated in Patterson-avenue, present an effective illustration of the practical uses of their various exhibits. The stand itself is constructed of fibro-cement sheets, faced with timber and stained with Cabot's stains. The lighting of the stand is effected with Simpitrol air-gas. A high-pitched gable of red cement slates, with a double band of inlaid blue, adds a conspicuous effect from a distance. Inside the stand the heavy, stained woodwork shows off the lighter fibro-cement panels. The colouring has been carried out with taste, and is enhanced by the brilliancy of the light thrown by the Simpitrol air-gas, which is manufactured by a compact little machine which should prove useful to those located some distance from large towns. The principal items shown in addition to the above are:—Dick's patent Balata belting, Pyrotan patent leather belting, Dodge wood split pulleys, and a number of other interesting exhibits.

R. HORNSBY & SONS LTD. give an effective display of their various engineering apparatus, consisting principally of a suction-gas engine and gas plant, a crude oil engine, and a number of oil and petrol engines of various sizes and types. The crude-oil engine—semi-Diesel—stationary "R" type is the first of its kind exhibited on the show ground. It is of 45 brake h.p., and of the electric lighting series. This firm are also exhibiting their latest pattern petrol engines, which are substantially built, easily handled, and economical in running. Various types of this engine are being effectively demonstrated at the show, of both the stationary and the portable types. Messrs. Hornsby and Sons also show various types of oil engines, and interesting demonstrations can be witnessed of various powers bolted to beds, and others on wheels for portability. Various agricultural machines are also exhibited, which complete a very enterprising and successful exhibition by this firm.

MESSRS. HORROCKS, ROXBURGH PTY. LTD., of 519 Little Collins-street, Melbourne, are exhibiting at their stand specialities in the way of stone crushing machinery, and other plant which will be interesting to shire engineers, private contractors, and others, the crushers which this firm handle being the Hadfield and Jack's patent solid steel frame, without joints, entirely in one piece, of specially annealed and toughened steel. These machines are now well known, and their reputation is being supported not only by their capacity, but also by their simplicity and extremely low running costs. A special feature about the machine is that, for a capacity of 80 to 100 yards per day, the machine weighs but 3½ tons, and mounted on transport, with elevators complete, barely two tons more. This is very important when the heavy costs of transport are taken into consideration. Also, this firm are showing a complete set of separate elevators and bins on transports, where depot crushing is found most suitable. In addition, they supply small elevating gear suitable for raising the stone to the crusher platform in a very economical manner. In connection with the wearing parts of these machines, which are of Hadfield's patent "Era" manganese steel, it is interesting to know that the jaw faces are so hard and durable that, in one authenticated instance, a pair of jaws have been in use for over two years, and have crushed considerably over 50,000 yards, with still half or more of the life of the material left. One of these jaws is now being exhibited as an illustration. They can also offer Hadfield's gyratory and jaw crusher, as well as the "Dodge" and disc machines, the latter for crushing stone suitable for ferro-concrete and similar work. The firm have the agency of Richard Garrett and Sons, of Leiston, and supply portable engines, traction engines, road rollers, and scarifiers, etc., all suitable for road-making purposes. An important branch of Garrett's agency is their superheated steam-engines and boilers, both stationary and portable, and for tractive purposes. Several of the special semi-stationary type are now in use in this State, and are doing excellent work. Another line is their superheated steam motor waggons, on steel or rubber tyres, and these are represented by a 5-ton and 3-ton of each kind. They are fine examples of engineering, and are the latest in design, for practically all classes of work that any horse waggon can be put to.

SURREY ENGINE AND BOILER WORKS PTY. LTD. are showing a number of water-tube boilers. The principle of steam generating is new. In all the water tube boilers there is a circulation through the tubes, but the patentee, Mr. Harry Turnbull, an Australian, has set out to entirely stop circulation through the tubes, and in doing so has made it possible to generate steam quickly and in great volume. A steam chest is almost unknown in the Turnbull boiler. It is hardly a necessity, as the steam is generated so quickly, in fact more quickly than it can be used. Turnbull boilers are in daily operation, working up to 160 lb. to the square inch; they are capable of working up to 300 lb. The Turnbull boiler is self-contained, and a 50 h.p. type takes up about a quarter of the space of other boilers of this capacity. The Turnbull engine is built on the pocket-valve system of the inverted high-speed enclosed type, the instrument of steam being controlled by pocket-valves which are self-adjusting. It can be worked on small steam consumption and will run at 1000 revolutions per minute entirely without knocking. The pump has a capacity of 1000 gallons a minute and will deliver water up to 100ft. in height. This boiler is likely to prove a popular product; quick steaming and small fuel consumption are the prominent features of the appliance.

---

## EXPLOSIVES IN AGRICULTURE.

During the past three or four years Nobel's Explosives Co. Ltd., of Glasgow, have, by means of practical demonstrations throughout Australia, and particularly Victoria, been bringing under the notice of landowners the great saving in time, money, and labour to be made by using explosives for clearing land of trees, stumps, and boulders, and also for sub-soiling. For such work explosives have been used very extensively in America for quite a number of years past, and it is now stated on good authority that in the United States more explosives are annually used by farmers than by mines. The cost of clearing land varies very much with the class of country operated upon, but in Victoria the saving to be made by the use of explosives ranges from 40 per cent. to 75 per cent., while the great speed of the work enables land to be put under cultivation much earlier than would otherwise be the case. This is, of course, a most important point. Fruitgrowers find that, by planting trees in holes blasted by dynamite, a gain of fully 30 per cent. to 50 per cent. is made in growth, the roots having ample room to spread in the loosened earth. In Victoria the demand by farmers and orchardists for explosives is increasing by leaps and bounds, and it is now certain that any landowner who uses any other means to clear his property is spending more money than he needs to spend for an inferior result. We learn from Messrs. Dalgety and Co. Ltd., Melbourne, who are sole Victorian agents for Messrs. Nobel's, Glasgow, that a biograph film showing the whole process is being exhibited at Wirth's Picture Theatre during this week.

---

# THERMIT WELDING.

By Alfred J. Higgin, F.I.C., Lecturer in Metallurgy, University of Melbourne.

(Continued from issue of September 11.)

On etching this specimen and examining it under the microscope it was found to bear no resemblance whatsoever to the structure of the original steel rail. As this section was made right across the place where the edge of the foot was situated it proves that fusion has taken place at that spot. (Illustration No. 4.)

A comparatively small amount of the rail has undergone fusion, however, and only just at the edges of the foot, where the white hot metal flows round them. I was surprised to find such a small amount of fusion, but of course one has to remember that the rail is conducting the heat away very rapidly all the time the welding operation is going on. The molten metal evidently solidifies very rapidly, because at the extreme edges of the weld the iron does not adhere to the foot of the rail at all.

I next examined microscopically those portions of the rail which had been heated to a high temperature by contact with the Thermit mixture, in order to ascertain whether any alteration in internal structure had been brought about.

Before giving you the results of the examination, however, it will be necessary to say a few words about the microscopic structure of the steel under consideration. The steel from which these rails are made contains about .4 per cent. of carbon.

It will be found on microscopic examination that the ingots from which the rails are rolled consists of two distinct constituents. One of these is ordinary iron, or, as it is called, "ferrite," and the other is a dark coloured substance which goes by the name of "pearlite." Pearlite is composed of alternate lamellae of carbide of iron, $Fe_3C$, called "cementite," and ferrite. It is called pearlite because it shows under the microscope a play of colours resembling mother of pearl.

Now, in order that these constituents may separate into distinct masses, the steel must be allowed to cool undisturbedly from a high temperature. In order to roll the steel rails the metal must, however, be heated to a high temperature in order to render it plastic.

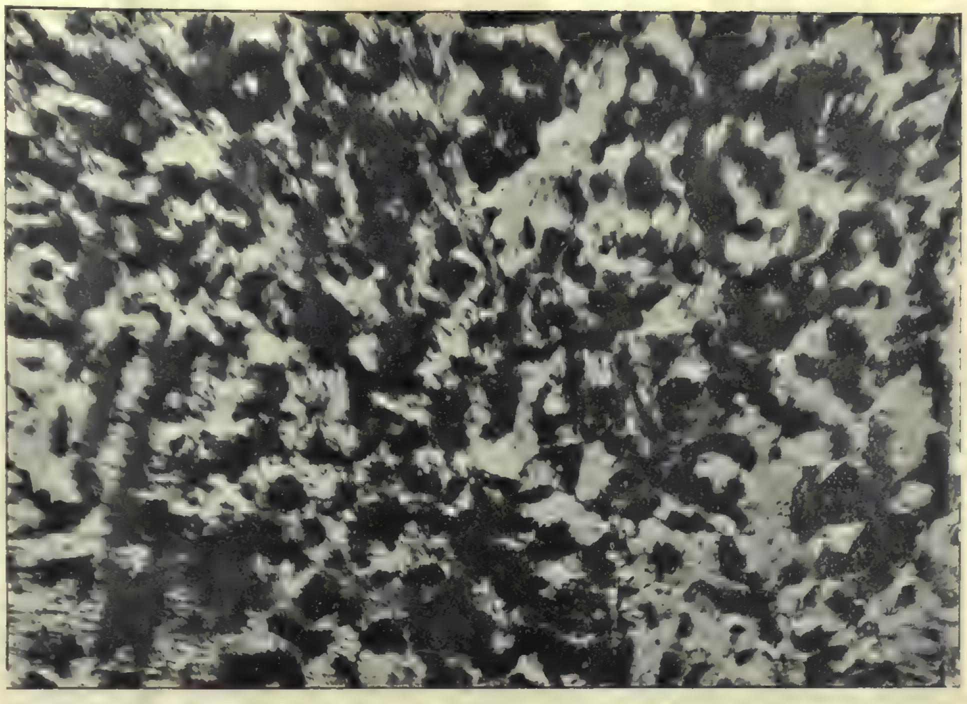
Now, if this steel be heated to a high temperature it passes from the state of an aggregate of ferrite and cementite to that of a solid solution. By this I mean that the carbide of iron dissolves in the iron, which by heating has been transformed into an allotropic modification, known as gamma iron.

On rolling the hot steel ingot into the form of a rail it cools as the work proceeds. On cooling below a certain temperature the solid solution commences to decompose into ferrite and pearlite, but owing to the mechanical treatment the steel is undergoing, the constituents cannot arrange themselves symmetrically.

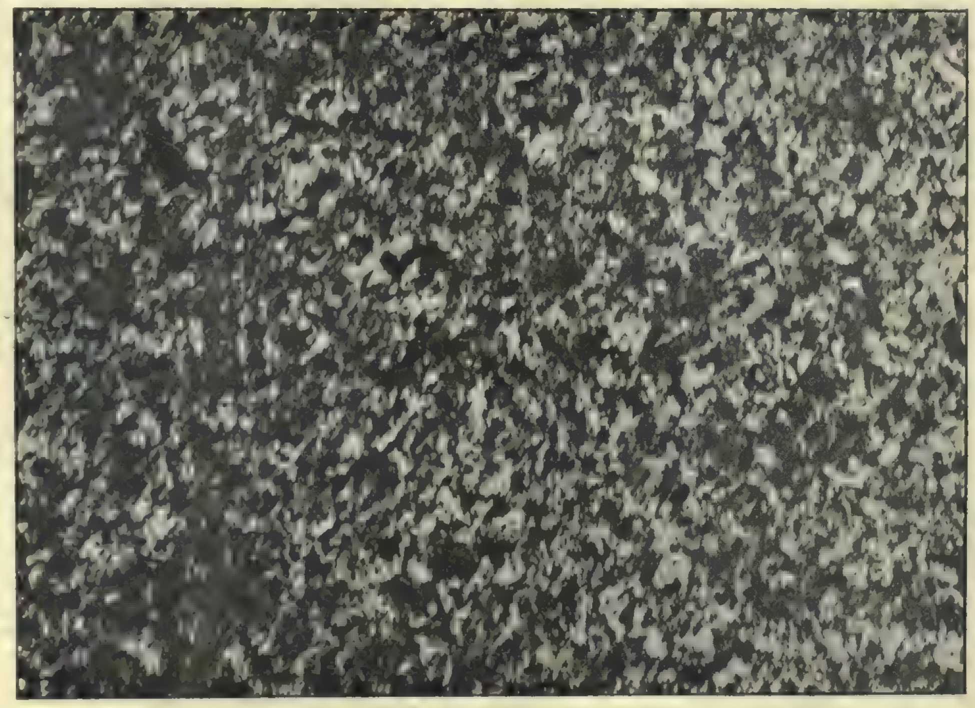
Hence in rolled and forged steel we find a more or less confused structure. (Illustration No. 5.) If, however, rolled or forged steel is heated above that temperature at which it changes to a solid solution, and be then allowed to cool slowly, the ferrite and pearlite will re-arrange themselves again definitely. (Illustration No. 6.)

The temperature to which the steel is heated has an important influence on its crystalline structure. If the temperature of the steel is carried considerably above its critical range, that is to say, the range at which it changes to a solid solution, its crystalline structure, which was at its finest as it emerged from the range, begins to coarsen on further heating, and the crystals continue to grow as the metal cools slowly to the range, so that its final structure wil be relatively coarse. The microscopic examination of the steel discloses the fact that the intense heat to which the metal has been subjected at the weld causes it to become very coarsely crystalline.

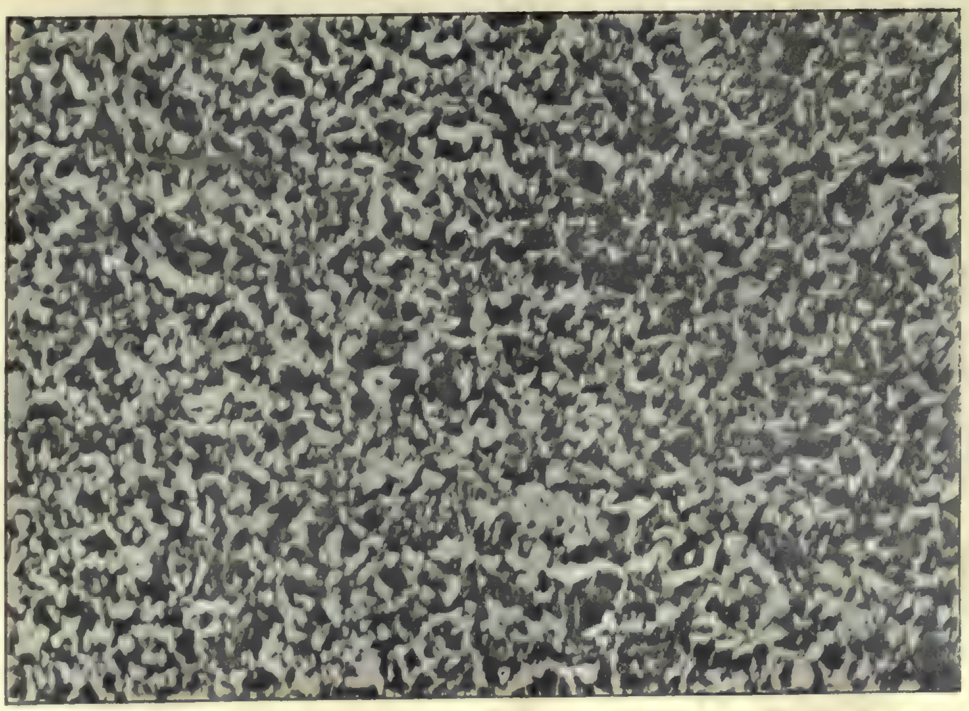
Now a coarsely crystalline steel is never so strong as a fine grained steel, so that the metal in the neighbourhood of the weld is weakened by the intense heat. It is, however, stronger than the weld. The area covered by the hot slag is com-



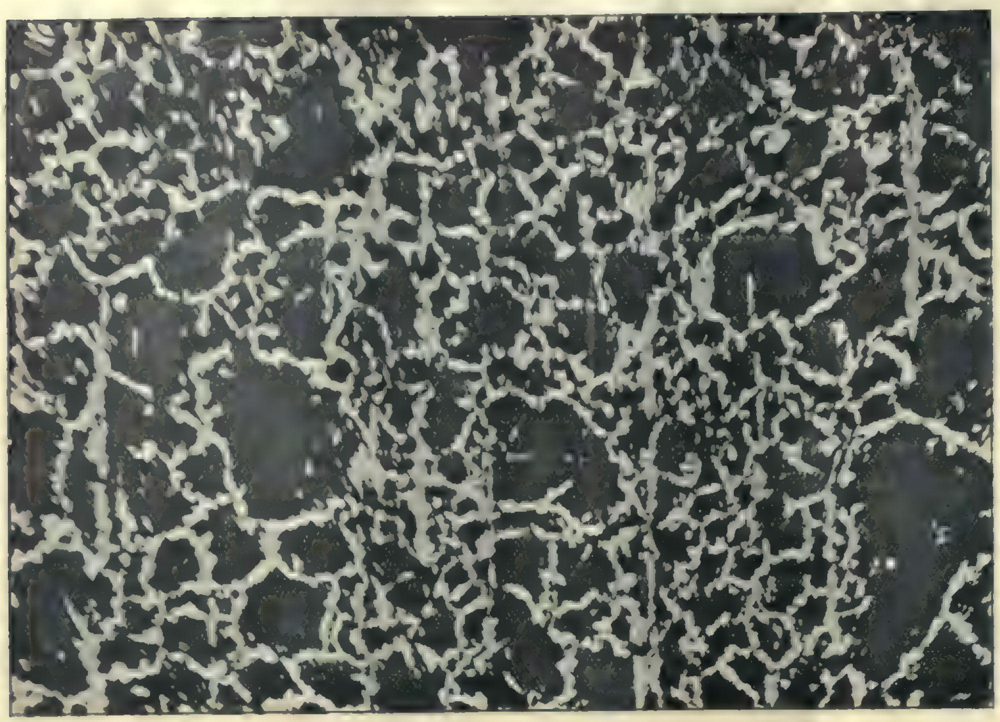
No. 4.—Microscopic structure of section just referred to (No. 3). This specimen is etched.



No. 5.—This shows the microscopic structure of the rail. The specimen was cut from the foot of the rail, some distance from the weld. The dark portions are pearlite, the light ones are ferrite.



No. 6.—This specimen was cut from the foot of the rail just beyond the weld. It shows that at this spot the steel has been heated to above the temperature at which it forms a solid solution. On cooling the pearlite and ferrite have arranged themselves definitely. The dark patches are pearlite, the light ones are ferrite.



No. 7.—Microscopic structure of a section of the head of the rail at the weld which has been covered with the intensely hot slag, resulting from the oxidation of the aluminium contained in the "Thermit" mixture. Shows a very coarse structure.

paratively small, and moreover. the rails are held together strongly by the mass of iron surrounding the foot and part of the web. (Illustrations Nos. 7 and 8.)

Mr. Goodman, general manager and chief engineer of the Municipal Tramways Trust, Adelaide, S.A., has kindly communicated to me the conclusions arrived at regarding "Thermit" welding after many years' practical experience. They are as follows:—

(1) The electrical conductivity of the joints average 90 to 100 per cent. of the conductivity of the rail, and only 0.77 per cent. fail to come up to the standard, and are bonded with one or two bonds according to the state of the joints.

(2) The percentage of joints originally passed which have now been found after several years' running not to come up to the electrical standard is almost negligible, and in connection with this it is generally the case that if a joint starts to become faulty it has to be rewelded.

(3) Up to the present, 0.173 per cent. of the joints have broken out of a total number of 17,467.

In most cases where fractures have taken place (amounting to about 0.21 per cent.) these occur at a distance of several feet from the nearest weld, and in the solid rail. Expansion joints are provided at a distance of 30 chains apart. From a very exhaustive series of experiments taken at the Adelaide University, it was found that the breaking strain of a Thermit weld when carried out under favourable conditions is as high as 80 per cent. of the original breaking strain of the solid rail. In the average welding carried out on the road, it has been found that the strength of the joint has sufficient margin to allow of the elastic limit being well exceeded without breakage. From a series of tests taken from various portions of Thermit welded rails, the tensile strength of the weld varies from 21.5 to 28.6 tons per square inch.

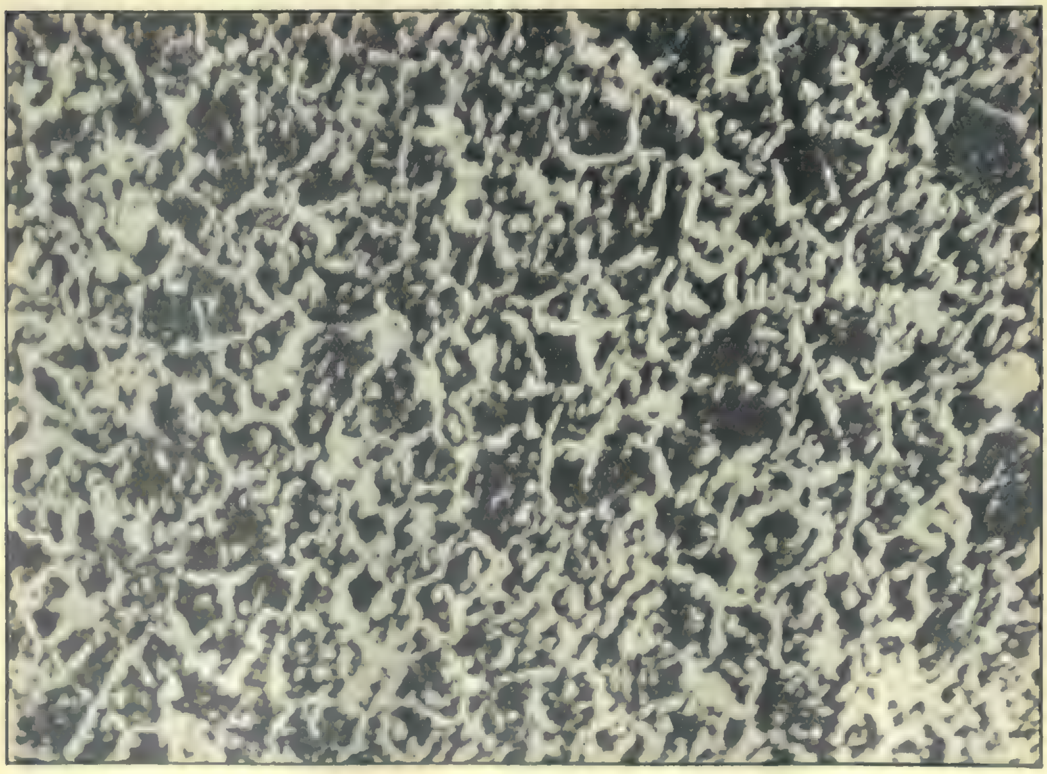
(Concluded.)

---

## MUNICIPAL COUNCIL OF SYDNEY.

The latest report of the Electric Light Committee of the Municipal Council of Sydney contains the following recommendation:—

That tenders for the purchase of scrap metal be accepted as follows:—Scrap copper, lead brass filings and phosphor bronze borings.—The Moreland Smelting Works Proprietary Limited, in the sums of £3 for scrap copper No. 1, £2 9s. for scrap copper No. 2, 18s. 6d. for scrap lead, £1 17s. 6d. for brass filings, and £1 15s. for phosphor bronze borings, etc., per cwt. in each case. Scrap brass.—Messrs. Bramwell and Vincent, in the sum of £2 11s. 4d. per cwt.



No. 8.—Microscopic structure of a section of the head of the rail. This was taken at some distance beyond the weld. The structure of the steel at the weld would be the same as this before it was heated so intensely by the "Thermit" mixture.

That the tender of Messrs. Siemens Bros. for the supply of a 1500 kilowatt rotary convertor at a speed of 375 revolutions per minute, for the Town Hall substation, in the sum of £4380, be accepted.

That spares for certain testing instruments be purchased as follows:—1 Weston Standard portable wattmeter for a pressure of 75 and 140 volts and a maximum current of 2 amperes; 1 ditto., maximum current 5 amperes; 1 ditto., maximum current 25 amperes; 3 external multipliers for the above to increase voltage range to 300 and 450 volts; at an estimated cost of £41.

That spare parts required for stock to enable the "Beck" arc lamps used in public lighting to be efficiently maintained be purchased from Messrs. Dick, Kerr and Co., at an estimated cost of £208.

That high tension insulators, urgently required, be purchased from the British General Electric Co. at a cost of 28s. per dozen up to a sum of £30.

That three spare wattmeters for use in the meter room and for motor testing for 2 amp., 5 amp., and 25 amp., be purchased at an estimated cost of £32.

That seventeen feeder pillars required in connection with the laying of new feeders and for stock, be purchased from the British Insulated Co. at a cost not to exceed £975.

That a switchboard set be installed in Floss-street substation No. 57, Canterbury, at an estimated cost of £125.

That additional distributor panels required to extend the low tension Ferranti switchboard at Substation No. 8, Pearl-street, and No. 9, Paddington, be obtained from Messrs. Ferranti Ltd. under their existing contract, at a cost of £144 2s.

That tenders be invited for the following in accordance with specifications submitted by the City Electrical Engineer:—Gangway and ladders to provide for more convenient inspection of boiler gauges in new boiler house; trimming chutes for coal bunkers at power house; black iron cable clips for suspension of high-tension feeders; stoneware bridges for laying 75 x 1in. concentric feeders; wood troughing, for laying 75 x 1in. concentric feeders.

That the regulations governing the connection and use of electric cooking stoves, agreed to between the Fire Underwriters' Association and the Council's Electric Light Department, as set out in a report by the City Electrical Engineer, dated 10th September, 1913, be approved and adopted.

That authority be sought from the Governor-in-Council for the borrowing of a further sum of £250,000, for the purposes of the electric lightning undertaking on Corporation debentures under the provisions of the Sydney Corporation Amendment Act, 1905.

---

## HYDRO-ELECTRIC SCHEME (T.).

### Proposed Government Option.

The proposals put before the Tasmanian Government by the Hydro-Electric and Metallurgical Co. as the basis on which the company's present financial difficulties might be relieved by the Government, were given in our last issue. These were promptly considered by the Ministry, and there was a disposition to seize the opportunity of taking over the hydro-electric portion of the company's scheme, though the terms of the transaction proposed by the company were not entirely satisfactory. The Government, therefore, drafted proposals which it was prepared to lay before Parliament, and submitted these for the acceptance of the directors of the company, with the result that they were accepted. The proposals of the Cabinet, which will be embodied in a bill to be introduced this week, are as follow:—

"The Government to advance to the Hydro-Electric Company all the sums required to complete the power works, and pay interest on the debentures, and also £46,000 to erect carbide and metallurgical works at North-West Bay, and transmission wires from the Hobart power station. Three months after the completion of the Hydro-Electric Company's works the Government to have the right to give six months' notice of intention to exercise the option of purchase; during the currency of the notice the company to have the right to repay the money advanced, with 4½ per cent. interest. If the loan be not repaid, the Government is to purchase at an amount equal to 17s. 6d. in the £1 on the shareholders' money already expended, calculated at about £46,000, the purchase not to include the carbide and metallurgical works, but the purchase money to be utilised in paying off the loan to the company on the carbide and metallurgical works. If the Government purchases the Hydro-Eelectric works, it undertakes to supply the company with from 5000 to 20,000 horse-power, at £2 10s. for horse-power, the amount supplied not to exceed half that available."

## BRITISH AND EUROPEAN DEVELOPMENTS.

(From Our Correspondent.)

London, August 22nd.

During the next three or four weeks several autumn meetings and conventions of institutions and associations will be held. The Institute of Metals leads off next week with its meeting at Ghent for the discussion of a number of papers and reports, and several interesting visits. The Iron and Steel Institute will next open its meeting at Brussels at the Palais des Academies on September 1st, continuing until September 4th. Six days later Sir Oliver Lodge will deliver his presidential address at the opening meeting of the congress of the British Association for the Advancement of Science at Birmingham. There is every reason to believe that the week's proceedings in so important and accessible a centre will bring together one of the largest attendances that the association has recorded, at any rate in recent years. Three thousand is the figure anticipated, including local membership. Nothing is yet announced regarding arrangements for 1914 for the vast number of members who are unable to spare the time or the money to come with the favoured 250, who will form the Australian contingent. It was at one time stated that there was to be a French meeting organised so that the majority of the association who must perforce be nearer Home would not be deprived of their annual opportunity for fraternising and discussing their scientific questions. Maybe the knowledge that whatever form the afterthought gathering of 1914 may take, the Lions will not be present owing to Australian engagements, will incline many to make a special effort to attend next month at Birmingham. When the association was debating a couple of years ago whether it would come to you or not, there was a good deal of very reasonable appeal made on behalf of members of university staffs, and of busy and perhaps somewhat impecunious scientific young men, who have come to regard a B.A. meeting as one of the chief events of the year, providing an exceptionally favourable opportunity for them to renew old scientific relationships and friendships, but everybody wanted to do the right thing, and the Imperial spirit being uppermost, there were not many hands held up against holding an Australian meeting. As you in Australia will soon be getting forward with your preparations for the event, it is perhaps not untimely that readers should understand that the arrangement could only be fixed up by somebody making a sacrifice. I am sure that the point of view of those who objected will not be misunderstood in the Commonwealth. Perhaps before the end of next month's meeting it will be announced whether a second 1914 congress will be held at Home. So far as the Birmingham proceedings are concerned, the address of Sir Oliver Lodge may or may not be of electrical interest: the president's versatility in science may be our excuse for expressing doubt on this point. He might touch on so many matters that it would not be at all surprising were he to leave untouched such subjects as wireless and devote himself to one of those themes which will make its appeal to the million through the newspapers the morning after delivery. In the engineering section, Dr. Gisbert Kapp, of Birmingham University, an ex-president of the Institution of Electrical Engineers, will sound a railway electrification note in his sectional address, according to present anticipations. Other matters to come before the engineering section, so far as they are now known, will consist of papers by Prof. Marchant on effects of atmospheric conditions on wireless signals, and by Prof. Howe on the nature of electro-magnetic waves employed in radio-telegraphy and the mode of their propagation; also an account of the reconstruction of Snow Hill railway station, Birmingham. The nature of X-rays, lightning and protection from it, a method of sealing electric conductors through glass, and mercury vapour lamps, are some of the electrical topics coming before the Physical Science Section. The congress will close, so far as open meetings are concerned, on September 17th, and six days later at Sheffield a gathering of a somewhat different type will open, the occasion being the three days' annual convention of our most important tramway organisation—the Municipal Tramway Association.

The proposals mentioned here last week, by means of which it was thought an arrangement would be made for more satisfactory relations between the Sheffield municipal electrical department and contractors of the city, have not been adopted by the Corporation, as that body has preferred to have a report thereon by a perfectly independent special committee, which will investigate and report upon the working of all departments of the electric supply undertaking. This will probably lead to a fair and permanent settlement of the whole affair.

Supply authorities are continuing to study how by reasonable rates and systems of charging they may encourage the domestic load, and what has happened at Whitehaven is worthy of mention. The announcement recently made respecting the coming of half watt lamps has led to an impression getting abroad that this related to lamps of smaller candle powers, whereas the manufacturers are anxious for it to be known that in the first instance it is only the very high candle power lamps that will be commercially available. However that may be, the Whitehaven engineer has advised his committee to adopt one combined rate of charge for domestic lighting, heating and cooking, owing to the circumstance that a new and improved lamp giving more light for less current consumption will be available shortly. At other places just now efforts are being made to satisfy the demands of shopkeepers for more favourable charges for energy. For instance, at Bradford, Mr. Roles, the city electrical engineer, has been in conference with the local chamber of trade. It seems that about 20 per cent. of the energy supplied to shops is taken on the maximum demand system, and among the other ideas that have emerged from the discussion is a suggestion that it may be possible to revise the maximum demand charges now obtaining by, say, charging 6½d. per unit for the first 365 hours' use of max. dem. per annum and ½d. per unit after. This, it will be observed, would be an encouragement to use electric heating and cooking in connection with shop-business houses. At Sunderland it has been resolved to charge a reduced uniform rate of 1⅜d. per unit for energy used for the lighting of exteriors of business premises.

A new company has just been registered in London with the title Reineke's Wireless Telephones Ltd., and with a capital of £25,000, to acquire the rights of J. H. Reineke in his patent process or system of wireless telephony for mines.

An important report has been issued this week relating to the wages and conditions of employment of Postal and Telegraph employees. The increased cost of living is taken into account. Since the year 1907 the advance has been about 13.7 per cent. in retail prices of standard commodities, and higher wages are recommended in a number of classes, the alterations to come into effect within six months. Both male and female telegraphists and counter-clerks are to be raised, and "recognition" is to be given to the unions or associations representing the employees. It may be remembered that at the time of the transfer of the National Telephone Service to the State there was dissatisfaction on the part of the employees at the terms on which they were required to make the change. This committee, however, considers that there was no ground for complaint. Taken altogether, it is calculated that the increased pay will cost a million pounds a year.

The industrial horizon is by no means free from labour war clouds. The railway men, the miners, the engineers, and those connected with the building trades, are all making fresh demands. It is said to be the intention of the engineers to fight again for the eight-hour day; they struck for it in 1897, but the memorable struggle of that year was disastrous to the men owing to the solidarity of the Employers' Federation. The depletion of the men's funds brought victory to the employers then, but now there is stated to be a far bigger war-chest. A minimum wage of 30s. a week for all railway men, a five-day working week for some other classes of labour, and the employment of only union labour—these are some of the claims which bring the present clouds across the sky. There has been a strike of moulders at Sheffield for a week or two, on the non-union labour question, and at the time of writing there is a big strike beginning in the building trades in London, a period of exceptional activity having been seized upon by the men for raising objection to non-union workers. It is argued in some quarters that there will be wars and rumours of wars in the industrial world until wages have been advanced to cover the increased cost of living to which allusion is made above, but the spirit that is at work everywhere is not due to that factor alone. By the way, it is interesting to see it pointed out this week that the recent advances in cost of living have merely brought us back to the figures that prevailed in the eighties of last century.

---

## NEW ZEALAND'S WIRELESS CHAIN.

The wireless system of New Zealand, which is a very perfect one, is now practically complete, says the "Auckland Weekly News." There is a high-powered station at the northern extremity of the North Island, and a corresponding station at the southern extremity of the South Island. Between these stations are two of lesser range, and an outlying station on the Chatham Islands. This arrangement makes New Zealand as far advanced in wireless telegraphy as most other countries, and communications from within a 1000 miles or more of our shores are practically certain to be picked up by one or other of the stations.

The most northern station in the Dominion is between Awanui and Kaitaia, and the corresponding southern one is at the Bluff. Both these are 30 kilowatt stations, and the power of each is derived from an 80 horse-power gas engine. They have a guaranteed range of 1200 miles in the day time. It is a well-known fact that the night range is about double that obtainable in the day. Under exceptionally favourable conditions a message has been received and sent over a distance of 4000 miles. The station at Perth has been communicated with on several occasions.

The two minor stations are at Auckland and Wellington, and these are 2½ kilowatt stations. Their nominal day range is 300 miles, with a night range of double that distance. But here again atmospheric conditions determine the range obtainable, and under good conditions Sydney and Melbourne have each been spoken.

The two high-powered stations are undergoing a prolonged series of tests. Time is an important factor in arriving at a correct estimate of the working efficiency of the apparatus, and it must be tested under all manner of atmospheric conditions. As showing what a small-powered station is capable of under ideal conditions, a recent achievement of the station on the Macquaries is of interest. Mr. A. Sawyer, the wireless expert, who was there for 20 months, was able to talk to Port Moresby, Papua, a distance of 2800 miles, with only a 1½ kilowatt set.

---

## UNIVERSITY OF MELBOURNE.

### Proposed Chair of Architecture.

Following hard upon the presentation to the Melbourne University Council of the report of the joint committee, which, as stated in our issue of the 11th inst., recommended that steps be taken to raise funds for the establishment of a Chair of Architecture at the University, a deputation from the Victorian Architectural Students' Society and other bodies called upon the Premier, Mr. Watt, last week, and asked him to promise to provide £1000 a year for the salary of a Professor of Architecture; the students' fees, it was said, would suffice to meet other and contingent demands.

Mr. G. Murphy (president of the Architectural Students' Society) ~~said that the~~ deputation had arisen out of the dissatisfaction among the students at the system of education at present being followed in Victoria. Architecture could only be studied at two places in Melbourne—the University and the Working Men's College. The course provided at the Working Men's College was all right as far as it went, but it did not go far enough for modern architecture; it did not differentiate between those who desired to follow the trade and those who desired to make architecture a profession. The course at the college lacked the discipline and ideals of a University course. The scheme as outlined by the students to the Council of the University brought the practical closely in touch with the theoretical side, which was a thing needed in the architectural course every bit as much as it was needed in the medical course. The diploma course at the University entailed so much work in the day-time that many students were prevented from attending. It could almost be regarded merely as a side line of the engineering course. Architecture was more than engineering; it was both constructional and aesthetic. There were 99 students of an average age of eighteen ready to take the course if it should be established. Six of these students would leave the State and go abroad if the course were not established, for they could not get the proper training at present in the State.

The financial aspect of the proposal was dealt with by Mr. Arthur Williams, who said that the course would be a four-year one, as they proposed, and the fees would be £15 15s. per annum. They looked to an average attendance of 60 students. The total expenses each year would be about £2000, and if the Government found the £1000 necessary for the professor from England or America, the students' fees would cover the remainder, provided the Government erected the necessary buildings.

"But why import a professor?" asked the Premier. "Are not Australian architects good enough?" And the last speaker unblushingly answered "No."

Mr. W. Henderson, president Royal Victorian Institute of Architects, Dr. J. W. Barrett and Dr. MacFarland, Vice-Chancellor of the University, and Mr. H. Brookes, president of the Chamber of Manufactures, supported the request.

In reply, Mr. Watt said he was not convinced that students were really unable to get the best training in Melbourne, in view of the many fine architects who had been trained in the city. He did not want to give a direct negative to the request, for he was in sympathy with the movement. Large sums of money had been obtained for University work, so that in 1912 it had grown to an expenditure of £43,000, having started in 1883 with £9000. He desired now to get some large scheme covering the work of the advancement of the University for some years to come, for his political lifetime, so that he might know exactly where he stood. It would be impossible, therefore, for him to yet grant the establishment of the Chair of Architecture. But it seemed that it might be possible to get over the present difficulty by improving the course at the Working Men's College, and by changing the hours for the diploma course at the University. He would look into the question on these lines, pending any definite answer in regard to the chair at the University.

## N.S.W. STATE CEMENT WORKS.

### Choice of Site.

(From our Lithgow correspondent.)

Mr. J. Carne, F.G.S., assistant Government Geologist, and Mr. Cutler, superintendent of Fitzroy Dock, were in Lithgow a few days ago, and paid an official visit to McDonald's Hole, in the vicinity of Excelsior, on the Mudgee line of railway, for the purpose of inspecting a limestone property there which has been represented to the Government as a suitable site for the establishment of State cement works. It is stated that the officers were very favorably impressed, the quantity and quality of the deposit being considered suitable in every respect.

Mr. Cutler, who has been deputed to report on various sites recommended to the Government as suitable for the establishment of State locomotive works, inspected two sites at Wallerawang, the junction of the Western and Mudgee lines. He was accompanied by Mr. Carne (unofficially). Mr. Cutler expressed himself as favourably impressed with the contour and extent of the land available at Wallerawang.

The party also motored to Carlo's Gap, and visited the limestone deposits there, and were surprised to see such tremendous deposits, practically mountains of the mineral. One of the party estimated the height of the limestone from the bed of the creek in the gully to the highest point of the deposit to be quite 400ft. The stone was proved to be of excellent quality.

## MISCELLANEOUS.

The Melbourne Tramway and Omnibus Co. Ltd. will pay a dividend and a bonus each of 6d. on October 1.

* * *

A poll of the ratepayers of Colac (V.), taken last week, resulted in a large majority of votes being cast in favour of the Silvertown Electric Co., Melbourne, being allowed to obtain the Order-in-Council to instal electric light and power works in that town.

* * *

As soon as the conferences now going on relative to the final design for the laying out of the Federal capital are concluded, competitive designs will be invited for the Parliament House, and those for other public buildings will follow in due course.

* * *

It is stated in Berlin that negotiations are in progress to secure for the English Marconi Wireless Telegraph Company the patent rights of the Goldschmidt Wireless Company.

* * *

The sustained efforts of the Victorian Railways Commissioners to bring their supply of rolling stock up to the fast-increasing demands upon it, promise very shortly to remove all cause for complaint that trucks are not available for produce, and that passengers are uncomfortably crowded. Since 1st July last 18 new engines have been placed in running, in addition to 20 passenger cars and 299 freight trucks. It is stated that in a few weeks' time the whole of the Melbourne suburban passenger trains will be composed of none but bogey cars, and that gradually the country services will be similarly dealt with and the antiquated and uncomfortable vehicles now doing duty will be withdrawn. This change has already been made on main lines, but branch lines still remain to be dealt with, which will be done as early as possible.

* * *

The New Zealand Government has accepted the tender of Mr. George Niccol, of Auckland, for the building of a reinforced concrete bridge over the eastern arm of Manukau Harbour, to connect Onehunga with Mangere, the contract price being £22,574. The work has to be completed in 15 months, and, in order to avoid interference with the water traffic, the bridge is to be built in two sections. Six other tenders were received as follows:—J. McLean and Sons, £23,010 16s.; G. M. Fraser, £24,934 16s. 8d.; Donald McLean and Co., £28,780 10s.; W. Wolfe, £30,242 16s.; and R. B. Martin and Co., £32,970 15s. The cost had been estimated at £25,000, so that three tenders were within the anticipated outlay. Another reinforced concrete bridge is to be erected in the same country at Panmure across the Tamaki River, the plans for which have just been approved. The plans provide for a high level structure to avoid the steep grade of the approach to the present bridge, and it will be 520ft. long and 30ft. wide, the design being similar to that of the Mangere bridge. The cost is estimated at £15,000, which the Manukau County Council proposes to distribute among 13 local bodies.

* * *

At the last fortnightly meeting of the Launceston City Council the mayor was asked whether the Council had approached the Government with respect to the motor traffic in the city. The traffic was becoming a danger to life. The mayor replied nothing had been done, but the question would be considered.

* * *

The effectiveness of the receiving powers of the wireless installation at the Williamstown (V.) Naval Depot was proved last week by a comparison of a message sent from H.M.A.S. "Australia," when in the Indian Ocean, to Fremantle (W.A.), but which had reached Hobson's Bay, with the official wording as subsequently delivered at the Navy Office, when they were found to correspond precisely. The transmitting power of the Depot equipment is not, however, sufficient to enable it to speak at the same distance, which was about 3000 miles.

* * *

Giving evidence at the Board of Trade inquiry into the causes of the collision at Aisgill, Yorkshire, between two Scotch express trains, Sir Guy Granet, general manager of the Midland Railway Company, stated that since the Hawes Junction disaster at Christmas, 1910, the company had been steadily installing apparatus for correcting acts of forgetfulness on the part of employees. Mechanical devices had been installed in 753 places to prevent signalmen lowering signals while another train was in the danger zone. The directors had set aside £100,000 as the first instalment towards introducing the device into 2000 selected signal-boxes where there was the greatest likelihood of human error. Sir Guy Granet outlined other precautions that were being taken to minimise the effects of accidents. As a precaution against fire the floors of all new carriages were being laid with asbestos; improvements were being introduced in order to reduce the risk of telescoping; collision buffers and emergency windows were also being used. In view of the fact that the consensus of railway opinion favoured gas as a carriage illuminant the directors had decided against electricity. During 32 years, he said, only eight fires on trains had been caused by gas.

* * *

The Queensland Railways Commissioner in his annual report mentions the savings which have been made during the last two years at the Government Railway workshops at Ipswich. Learning that the chief engineer was obtaining all his sawn timber from outside contractors, Mr. Evans instructed that, as far as possible, this timber was to be obtained from the Ipswich workshop mill. The saving worked out, for the two years since the band mill was installed, at £5932; so that the mill has already paid for itself. Further; about two years ago it was decided to adopt, as far as possible, chilled wheels for waggon stock in place of various other kinds previously in use. Altogether 5000 pairs of chilled wheels were purchased, and, as the price averaged a little over £10 12s. 6d. as against £14 previously paid, the saving could be set down at approximately £16,193. In the past two years they had manufactured 4800 stem buffers at an average of £1 11s. each; had they adhered to the Turton buffer (averaging £2 18s. each), the additional cost would have been £6480. A hydraulic machine had been constructed, which, with two men in attendance, puts through just double the quantity of pig iron per day formerly dealt with by hammer. Approximately 1850 tons of pig iron had to be broken up per annum, and this would cost by machine £54 10s., as against £109 by the former method.

* * *

A few interesting figures relating to the Victorian Railways Department's workshops at Newport were given to the party of British Parliamentarians on their visit to the works last week. The works stand on an area of 130 acres, the buildings covering 17 acres. The number of men employed is 4143, and their wages amount to £600,000 per annum. The value of material used for the year is £500,000, and the work turned out for the year ending June 30 was—Locomotives, 46; cars and vans, 156; trucks, 907. The number of each class of stock used on the Victorian railways is—Engines, 668; trucks, 15,863; vans, 464; cars, 1399; electric cars (St. Kilda and Brighton trams), 22. As many, if not most, of the employees come from long distances daily to their work, spacious dining-rooms have been erected, which seat 500 men daily, and a dinner of soup, entrees, choice of two joints, sweets, and tea is provided for 6d. The men order their meals the day before, and they are all ready punctually on the stroke of twelve.

* * *

In the light of statements made by Mr. H. Deane, Engineer-in-chief to the Federal Railway Department, in his evidence before the Senate committee of inquiry into Mr. Chinn's dismissal, the news telegraphed last week from Kalgoorlie (W.A.) that, although only a quarter of an inch of rain fell a fortnight ago, great damage was done to the prepared track, caused less surprise than otherwise would have been created. It was stated that in 15 places between the 25 and the 60 mile posts it is necessary to raise the track from 6in. to 30in., and that 10ft. steel flood-water openings are being substituted for the 3ft. 6in. culverts previously constructed along the line.

* * *

It was stated last week by the Honorary Minister in charge of the Department of Home Affairs, Mr. Kelly, that tenders are to be called for a further 100,000 sleepers for the Trans-Australian railway, delivery to be made at Port Augusta. A former contract, let to the Victorian Powell Wood Process Co. Ltd., for 100,000 powellised mountain ash and messmate sleepers at 7s. 6d. each, was altered, with the Minister's consent, to one for 6000 sleepers at 7s. 6d. each, less 1s. 5½d. for freight to Port Augusta.

* * *

With the seeming fatuity which characterised so many of the late Federal Government's financial methods, the Minister of External Affairs in the Fisher Ministry, Mr. Josiah Thomas, called for tenders for the construction of the proposed railway line from Pine Creek to Katherine River, in the Northern Territory, although a Bill authorising the construction of the line had not been passed, and has not been yet. Several tenders were sent in, with accompanying deposits, one at least of which was £1000. The present Minister, Mr. Glynn, has, therefore, given instructions for the return of the deposits pending the necessary legislation, which, although notice to introduce the Bill was given last week, is to all appearances, a long way off, owing to obstruction tactics. Meanwhile some of the residents are criticising the route recommended by the N.T. Railways Commission, and are strongly of opinion that further investigation should be made of what is known as Pearce's route, which would start from Brock's Creek, would proceed in an almost straight line to Alice Springs, tap the rich Victoria River district en route, and be shorter and less expensive than the route via Katherine. The opinion is also freely expressed that the proposal to commence construction work at the beginning of the wet season is ill-advised. According to the survey now nearly completed, which the Government proposes to adopt, the length of the line will be 54 miles, and the route practically the same as that followed in 1889 by the present Engineer-in-chief of South Australia (Mr. Graham Stewart). The Bill will give the necessary power for the railway to be made, and some preliminary steps have been taken towards that end. Tenders have been called, and received, for the sleepers, which will be capable of being utilised for either the 3ft. 6in. or the 4ft. 8½in. gauge. Mr. Glynn hoped, during last week, to give notice of a measure providing for the survey, before construction, of the railway from Oodnadatta to the MacDonnell Ranges.

* * *

Our Lithgow (N.S.W.) correspondent writes:—"Everything is progressiing smoothly at the Commonwealth Small Arms Factory. A consignment of about 100 rifles is ready to leave the factory almost immediately, and it is expected that a further consignment of a couple of hundred rifles will be despatched to Melbourne before the end of the present month. Mr. A. C. Wright, manager of the factory, has been laid off for some days with an attack of laryngitis. Over twenty members of the School of Musketry, at Randwick, Sydney, are at present on a visit to the factory, viewing the various processes of manufacture.—A young man named Alfred Richards was badly burned on Thursday afternoon at the Lithgow blast furnace. He was engaged in cleaning out a number of boiler tubes, when by some means unexplained he fell into a big heap of very hot ashes, and sustained serious injuries to both hands and both legs. He was admitted to Lithgow Cottage Hospital.—Mr. G. R. W. McDonald, a director of the New South Wales Cement, Lime, and Coal Company, states that practically the whole of the money required for the company has been subscribed, and that no public subscription will be asked for. The company will probably go to allotment at once, and the initiatory work will be commenced almost immediately afterwards. All the necessary leases have been secured, and details connected with the establishment of the works completed. The bulk of the money has been subscribed by the friends of the vendors and promoters. The manufacture of cement is expected to start in the early part of the next year. The site of the works will be close to the Mudgee-Lithgow line, at Clandulla, seven miles on the Sydney side of Rylstone."

# Invited and Accepted Tenders

It is particularly requested that the information regarding contracts open, and the successful tenderers, be forwarded to The Editor not later than Monday of each week.

**The following contractions are used throughout:—S—supply; D—delivery; M—manufacture; C—construction; E—erection; P—purchase; I—installation; R—removal. Where no contractions appear, supply and delivery is understood. The date at the beginning of each paragraph refers to the closing of tenders.**

## INVITED.

### Commonwealth.

**Specifications, tender-forms, etc., for tenders invited for the Postmaster-General's Department of the various States under this heading may be had as follows:—Victoria—Various State G.P.O.'s. New South Wales—Departmental Stores, Sydney, and various G.P.O.'s in other States. South Australia—Adelaide, Melbourne, Sydney and Brisbane G.P.O.'s. Western Australia—Departmental Stores, Perth, and various G.P.O.'s in other States. Queensland—Various State G.P.O.'s. All States—Various G.P.O.'s. If the specifications, etc., may be had elsewhere, in addition, the places will be given in parentheses.**

POSTMASTER-GENERAL'S DEPARTMENT, Melbourne.—30th September.—S. and D. of **1,017,000 pattern "A," and 1,768,000 pattern** "B" insulators, at Sydney, Melbourne, Brisbane, **Adelaide, Perth, and Hobart, during the years** 1913-14, 1914-15, and 1915-16, as per schedule No. [illegible].

30th September.—S. and D. of 2000 pairs of brass guttering guard brackets, as per schedule No. 978.

7th October.—S. and I. of electrically-driven machinery for operating pneumatic tube services, **Central Telegraph Office, Melbourne, as per schedule No. 900.**

14th October.—S. and E., at the Telephone Exchange, **Melbourne, of a common battery multiple switchboard, as per schedule No. 868.**

14th October.—Cable boxes, as per schedule No. 877.

**14th October (extended from 16th September).**—S., D., E. and I. at the Telephone Exchange, Collingwood, Victoria, of a common battery switchboard, as per schedule No. 860, or an automatic, or **semi-automatic, switchboard, as per schedule No.** [illegible].

14th October.—S. and D. of 1000 protectors, as per schedule No. 964. (See advertising columns.)

21st October.—S. and D. of 12 auto re-winding **electric clocks for wireless stations, as per schedule** No. [illegible]. (See advertising columns.)

**5th November.—Galvanised iron piping, as per** schedule No. 952.

**11th November (extended from 4th November).**—S., D. and E. of eight automatic telephone switchboards at the Ascot, Canterbury, Malvern, Cheltenham, Footscray, Oakleigh, Sandringham, and Williamstown Telephone Exchanges, as per schedule No. [illegible].

16th December.—S. and D. of one common battery multiple switchboard at the Telephone Exchange, Wills-street, Melbourne, as per schedule No. [illegible].

POSTMASTER-GENERAL'S DEPARTMENT, Sydney.—8th October.—S. and D. at the Departmental Stores, Sydney, of 5000 strips protectors, single poles, as per stores schedule N.S.W. No. 336.

8th October.—S. and D. at the Departmental Stores, Sydney, of 440 Lodge Arresters, as per stores schedule N.S.W. No. 334.

15th October.—450 fire sheets (asbestos), as per stores schedule N.S.W. No. 326.

15th October.—**Measuring instruments, to stores** schedule N.S.W. No. 303; telephone parts, to stores **schedule N.S.W. No. 314; switchboard parts, to** stores schedule N.S.W. No. 315.

15th October.—63,000 **insulators (various), as** per stores schedule N.S.W., No. 296.

22nd October.—S. and D. of 7 miles copper-clad steel wire, as per schedule No. 335.

22nd October.—S. and D. of 3000 caps for supervisory lamp, schedule No. 338.

22nd October.—4500 cords, 3 steel conductors, schedule No. 328.

22nd October.—500 fuses, 3 ampere, schedule No. [illegible].

**22nd October.—250 telephonometers, schedule** No. [illegible].

22nd October.—S., D. and E. at the Telephone Exchanges, Randwick, Mosman, Parramatta, Ashfield, Burwood, Homebush, and Rookwood, Sydney, of seven (7) automatic switchboards, with associated equipment, as per schedule No. 281.

12th November (extended from 8th October).—S. and D. at the Telephone Exchange, Watson's Bay, Sydney, of 1 automatic switchboard, with all associated equipment as per schedule No. 234.

18th March, 1914.—**S., D. and E. at the Telephone Exchanges,** Epping, Ryde, Hunter's Hill, Drummoyne, Wahroonga, Paddington and Waverley, Sydney, of seven (7) automatic switchboards, **with associated equipment, as per schedule No.** 179.

POSTMASTER-GENERAL'S DEPARTMENT, Brisbane.—15th October.—Steel date stamps, as per stores schedule No. 279.

19th November.—Bronze wire, as per schedule No. 273.

17th December.—S. and D. at the Stores Branch, Postmaster-General's Department, Brisbane, of insulators, as per stores schedule No. 280.

31st December.—S. and D. at the Stores Branch, Postmaster-General's Department, Brisbane, of insulators, as per stores schedule No. 282.

POSTMASTER-GENERAL'S DEPARTMENT, Perth.—1st October.—Exterminator—white ant, and plugs.

8th October.—Expansion bolts and shields to schedule No. 297.

8th October.—S. of milliammeters.

8th October.—Telephones, common battery, adjustable bracket sets.

15th October.—S. and D. of switchboard cable, W.A., schedule No. 312.

15th October.—S. and D. of conduits, steel enamelled, and fittings, W.A. schedule No. 313.

10th December.—S. and D. of 60 tons wire (galvanised iron).

19th November.—S. and D. of rectangular dry cells.

POSTMASTER-GENERAL'S DEPARTMENT, Adelaide.—12th November.—One lamp signalling trunk line switchboard, of five sections, one cable turning section, and one cable storing section, one two-position recording desk, and one chief operator's desk, as specified in specification No. 431, etc., delivered at the Telephone Exchange, Adelaide, as per schedule No. 296.

POSTMASTER-GENERAL'S DEPARTMENT, Hobart.—6th October.—Galvanised iron wire, as per schedule No. T.78.

1st December.—S. and D. of dry cells, as per schedule No. T. 84.

DEPARTMENT OF HOME AFFAIRS—Federal Capital.—24th November.—Water supply pumping plant for Canberra.

DEPARTMENT OF HOME AFFAIRS—Kalgoorlie-Port Augusta Railway.—2nd December.—600 pairs of wheels and axles (9in. x 4½in. journals).

DEPARTMENT OF DEFENCE—Small Arms Factory, Lithgow, N.S.W.—29th December.—P. of scrap steel, brass, jute bags, whale oil, etc. (See advertising columns.)

### Victoria.

VICTORIAN RAILWAYS.—26th September.—S. exhaust fan.

26th September.—S. bezine.

26th September.—S. of I.R. air hose.

26th September.—S. self sealing condensers.

26th September.—S. of automatic voltage for single direct current generator.

26th September.—S. staff iron.

26th September.—S. Whitworth thread taps.

26th September.—S. long flame arc lamp globes.

26th September.—S. system cards.

26th September.—S. best mixed tallow.

29th September.—S. and D. of locomotive seamless copper tubes. P.D., £1.

30th September.—S. 16,000 hardwood fencing droppers.

30th September.—Embossing ticket dating presses.

1st October.—S. and E. of two collapsible gates at Spencer-street station. Particulars at Room 153, Railway Offices, Spencer-street.

1st October.—S. and E. of two steel revolving shutters at Spencer-street station. Particulars at Room 153, Railway Offices, Spencer-street.

1st October.—E. and E. of 10,000 gallon tank and tower, Newport.

1st October (extended from 10th September).—Neutral track relays.

1st October.—Motor, exhaust fan and accessories.

1st October.—M. (in the State of Victoria), S. and D. of locomotive parts for 20 "DD" locomotives. Particulars also at Ballarat, Geelong, Bendigo and Castlemaine stations. P.D., ½ per cent. (nearest £) of amount of tender.

8th October.—S. and D. of steel sheet piles for coffer dam. P.D., £10.

8th October.—M. (within the Commonwealth of Australia), S. and D. of 80lb. steel rails and fishplates. Contract No. 25,005.

8th October (extended from 17th September).—Pig iron.

8th October.—P. and R. of about 720 tons of 80 lb. double headed steel rails.

8th October.—P. and R. of brass, iron and steel scrap.

15th October.—Portable boring bar.

5th November.—Copper rod.

5th November.—Locomotive seamless copper tubes.

5th November.—Best Yorkshire iron angle and tees.

5th November.—Best steel boiler plates.

5th November.—Copper plates.

5th November.—100 tons of good machinery cast-iron scrap.

12th November.—Steel channel bars.

12th November.—20 tons steel ingots.

12th November.—Steel blooms, for crank pins.

12th November.—Locomotive boiler tubes.

12th November.—High-speed tool steel.

12th November.—M., S. and D. of one 15-ton electric crane for Ballarat.

12th November.—Flame arc lamps.

12th November.—Insulated copper cable.

12th November.—M. and D. of one 60h.p. electric motor and accessories.

19th November.—M., S. and D. or cast steel wheel centres for A2 engines and new truck stock.

19th November.—Brass locomotive tubes.

19th November.—150 tons pig iron.

19th November.—10 tons sulphate of copper, best quality, for electrical purposes, battery material.

3rd December.—Steel blooms, for piston rods.

3rd December.—S. and D. of vulcanised rubber electric light wire.

VICTORIAN RAILWAYS COMMISSIONERS—State Coal Mine.—29th September.—S. of stocks and dies.

29th September.—S. of Bronskal brushes.

12th November (extended from 1st October).—S. of rope haulage engine and electrical equipment for McBride tunnel.

PUBLIC WORKS DEPARTMENT.—2nd October.—Oil engine and machinery for Lunatic Asylum, Beechworth. Particulars at Police Station, Beechworth.

16th October.—A. and extension pier, Portland.

23rd October.—Extension breakwater, Warrnambool.

### New South Wales.

PUBLIC WORKS DEPARTMENT.—29th September.—S., D. and E. of structural steel and ironwork for Registrar-General's old building.

**P. & O.** COMPANY'S ROYAL MAIL STEAMERS

FOR MARSEILLES, PLYMOUTH AND LONDON.

Leave Sydney on the subjoined dates, calling at usual ports.

FIRST AND SECOND SALOON ONLY.

| Steamer, | Tons. | Commander. | Noon. | Melb., 3 p.m. |
|---|---|---|---|---|
| MOREA | 11,000 | Andrews | Oct. 4 | Oct. 7 |
| MARMORA | 10,500 | Lockyer | Oct. 18 | Oct. 21 |
| MOLDAVIA | 10,000 | Gordon | Oct. 29 | Nov. 4 |

PASSAGE MONEY TO LONDON—Single, £41 16s. to £82 10s.
Return, £69 6s. and £123 4s.

Return Tickets between Inter-State Ports are available for return by Orient, Messageries Maritimes, and N.D.L. steamers having room.

SPECIAL HOLIDAY RETURN TICKETS to COLOMBO are now issued, available for two months. Fares from Sydney, £45 2s. first saloon, and £31 18s. second saloon.

A. GORDON WESCHE, Superintendent IN AUSTRALIA, 63 Pitt-street, Sydney.

**The COLONIAL MUTUAL FIRE Insurance Company Limited.**

Principal Office: 60 MARKET-ST., MELBOURNE.

Branches in all the States.
Transacts Fire, Guarantee, Employers' Liability, Marine, Burglary, and Plate Glass, Accident, Workers' Compensation and Live Stock Insurances.
Send for Prospectus.
W. TUCKER, General Manager.

Harringtons LTD

**ANALYTICAL & METALLURGICAL DEPT.**

Lowest fees for all kinds of Assay, Analytical, and Metallurgical work.

Expert Advice on Ore Treatment, Bullion Refining, Smelting, etc., etc., Directed by a qualified Analyst from Messrs. Johnson and Sons, London: Assayers to Bank of England; H.M. Mint, The Council of India, etc.

**HARRINGTONS LTD.**
**386 George Street, Sydney.**

**A. U. S. N. Co. Ltd.**

*Fast, Regular, and Comfortable Passenger Steamers*

(also carrying cargo) from and to

MELBOURNE, SYDNEY, ADELAIDE, FREMANTLE, BRISBANE, and all QUEENSLAND PORTS.

Passage Tickets interchangeable, with other Inter-State Companies, on certain conditions.

Full Particulars at

**COMPANY'S OFFICES**
at all principal Australian Ports.

**The Mount Lyell Mining & Railway**
CO. LIMITED.

Purchasers of Ores containing Copper, Gold and Silver. Rates obtainable on application to the Secretary

Manufacturers of Coke for Smelting and Foundry Purposes, Acids, Etc.

HEAD OFFICE—
39 QUEEN-STREET, MELBOURNE.
D. G. LUMSDEN,
Secretary.

**THIS POWER FOR MOST PROFIT!**

Here is the Engine for you, Mr. Mine Manager—the right power for the Mine, operating with the cheapest fuel obtainable.

No waste power, and no useless wear and tear and vibration. These are some of the prominent features of the

**ATLAS DIESEL OIL ENGINE.**

Test your present Engine, see if it consumes more than 0.55 lbs. of fuel per B.H.P. per hour. If it does, you are losing money which the Atlas Diesel would save for you. Power waste is a serious thing, and one that is often overlooked. You probably use a considerable amount, then you owe it to yourself to see that there is no leakage.

"Atlas Diesel" Engines are the only true Internal Combustion Engines, as they require no devices for ignition.

Easy to run, always reliable, and made from 15 H.P. upwards.

Send for full particulars or call and see the Engine working.

**STAWN LTD.,**
Engineers, **343 KENT STREET, SYDNEY.**

7th October.—I. of electric passenger lift in On Chong's Building, George-street North; and I. of two electric goods lifts in Argyle Bond, Argyle-street, Sydney.

7th October.—S. and D. of 500 tons of iron spikes for 60 lb. rails. (See advertising columns.)

7th October.—S. of steel pipes and specials for the reticulation of township and supply to the mines, Water Supply, Broken Hill (see advt. cols.).

7th October.—M., S. and D. of 15 jib water cranes. (See advertising columns.)

27th October.—M. of steel bridge for Wilson River, Wauchope to Kempsey section, North Coast railway. (See advertising columns.)

8th December.—M., S. and D. of steel bridges for Cooperbung and Piper's Creeks, on fifth section, North Coast Railway, viz., Wauchope to Kempsey. (See advertising columns.)

RAILWAY DEPARTMENT.—15th October.—S. of 13 direct-current motors. (See advertising columns.)

26th November.—S. of one 2000 lb. storage battery freight truck. (See advertising columns.)

METROPOLITAN BOARD OF WATER SUPPLY AND SEWERAGE (341 Pitt-street, Sydney).—29th September.—S. of ironwork for two bridges.

29th September.—S. of two automatic throttle valves and vacuum breakers.

15th December.—M. and D. of one turbine centrifugal pumping plant for Crown-street Pumping Station.

WATER CONSERVATION AND IRRIGATION COMMISSION, 29 Elizabeth-street, Sydney.—8th October (Fresh tenders).—P. of one pair of cross-compound horizontal, direct-acting reciprocating condensing engines, and two horizontal, double-acting lift and force pumps; also two colonial type tubular boilers, complete, with all mountings and furnace fittings, funnel, etc., and feed pumps.

## Western Australia.

GOVERNMENT TENDER BOARD.—2nd October.—700 brass boiler tubes for Railway Department.

9th October.—25,000 gallon C.I. tanks, for Railway Department.

30th October.—S. moulding machine cupolas and pneumatic hack saw bench for Railway Department.

## Queensland.

RAILWAY DEPARTMENT.—30th September.—S. of 500 tons pig iron.

TREASURY DEPARTMENT.—29th September.—S. of about 1687 tons of cast iron spigot and faucet water pipes, special castings, and valves, for Maryborough Waterworks.

29th October.—C. and E. of central sugar mill at Babinda Creek, North Queensland.

WATER SUPPLY DEPARTMENT.—3rd October.—Sinking artesian bore on reserve in parish of Gaila.

## South Australia.

RAILWAYS DEPARTMENT.—30th September.—M. of brake reservoirs and shafts for engines and tenders, 3ft. 6in. gauge.

30th September.—P. of 64 secondhand 400 gall. tanks at Islington works.

30th September.—C. of 20 suburban carriages, 5ft. 3in. gauge.

30th September.—S. and D. of fixed jaw faces for rock crusher.

30th September.—Sinking bore in hundred of Sherlock.

30th September.—C. of inlet tunnel to Millbrook reservoir, 5244ft. long.

14th October.—S. and D. in trucks on wharf, Port Adelaide, of 800 solid drawn best toughened copper tubes, for locomotive boilers, 10ft. 8¼in. long x 1⅞in. outside diameter x No. 10 I.W.G. thick at the end, gradually tapering to No. 12 I.W.G. at the other end. Customs duty (if any) to be paid by contractor.

4th November.—S. and D. 368 tons coloured or white cotton waste.

## New Zealand.

RAILWAYS DEPARTMENT.—31st October.—S. and D. of stores for the period from April 1, 1914, to March 31, 1917.

## General.

CITY OF MELBOURNE.—1st October.—Insulated copper cables.

7th October.—Incandescent electric lamps, and single phase transformers.

8th October.—Insulated copper cables.

TOWN OF NORTHCOTE (W. G. Swift, town clerk).—29th September.—S. of 600 ironbark, box or jarrah poles: S. 4 single phase transformers; S. of and alternately S. and E. of extra high tension and low tension fuse and switchgear, for sub-stations; S. of rubber covered cables: S. metal filament lamps, cast iron brackets and reflectors: S and D. of flame arc lamps; S. of insulators, iron pole brackets and pins; S. of house service fuses and A.C. meters; S. of bare copper cables.

TOWN OF PORT MELBOURNE (A. V. Heath, town clerk).—29th September.—S. and D. of steel trackway plates for extension of steel track in Inglis-street. Tenders to be addressed to Mayor.

GEELONG WATERWORKS AND SEWERAGE TRUST (V.) (J. S. Sharland, secretary).—25th September.—Contract No. 7—M., S. and D. and the laying and jointing of about 10,250 lineal feet of oviform reinforced concrete pipes.

SHIRE OF HEIDELBERG (V.) (H. J. Price, Secretary).—16th October.—S. steam road roller fitted with scarifier.

16th October.—S. portable stone crusher.

COUNTRY ROADS BOARD (W. L. Dale, Secretary).—27th September.—S. of 3 steam road rollers, 3 combined road rollers and tractors, 10 hopper waggons (self-spreading type), 2 tar spraying machines, 2 road scarifiers.

SHIRE OF NUNAWADING (V.) (J. R. Kefford, Secretary, Box Hill).—25th October (extended from 18th October).—Electrical equipment.

SEYMOUR WATER WORKS TRUST (V.) (R. Fennelly, Engineer). — 29th September. — Altering 7in. main and supplying and fixing new 9in. main on bridge, Trawool.

DUKE AND MAIN LEADS CONSOLS GOLD MINING COMPANY NO LIABILITY (V.) (D. Murray, 430 Little Collins-street, Melbourne).—P. on cash or terms of slimes heap, Bet Bet. (See advertising columns.)

STAMP BATTERY (Walter G. Ingpen, 414 Collins-street, Melbourne).—27th September.—P. of one 5-head Californian pattern battery, engine, boiler, pump, Phoenix weir table, all complete, and in good order, delivery on Grey Horse mine, Happy-go-Lucky. Or, alternatively, tenders for dismantling and delivering the plant at Walhalla and Cooper's Creek.

MUNICIPAL COUNCIL OF SYDNEY.—Offers invited for S. of punts constructed of timber or metal; also steam hoppers.

29th September.—S. and D. of copper for use as busbars; S. and E. of steel ladders; S. and D. of testing transformer; S. and D. of metal filament electric lamps. (See advertising columns.)

27th October.—S. and D. of curve drawing ammeters. (See advertising columns.)

BRISBANE—THE METROPOLITAN WATER AND SEWERAGE BOARD (Albert-street).—30th September.—Laying and jointing about 68 chains of 9in. pipes in Lytton-road, Balmoral; boring, sinking 2 wells to a depth of 3000ft. in the vicinity of Roma, Queensland. Apply to Percy Douglas, Barrack-street, Sydney; or Robert Falkiner, Wynnum, via Brisbane.

13th January, 1914.—M. and D. of material for aerial ropeway. (See advertising columns.)

MACKAY HARBOUR BOARD (Q.) (H. F. MacDonnell, secretary).—15th October.—S. of mild steel round bars and steel wire.

15th October.—S. of such plant and material, or any portion thereof, as is contained in the Mackay Harbour Board's specified list, open for inspection at the office of the Engineer for Harbours and Rivers, Brisbane.

29th October.—S. of Portland cement.

ELDERSLIE STATION, Winton, W. Q'land.—19th November.—Sinking and completion of an artesian bore, maximum depth 4500 feet.

CITY OF LAUNCESTON (T.) (C. W. Rocher, Town Clerk).—27th October.—S. of electrical fittings, incandescent lamps, wire and cable. (See advertising columns.)

24th November (extended from 13th October).—Section i., S. and D. of transformers, etc.; section ii., S. and D. of feeder cable, etc.; section iii., S., D. and E. of high tension switchboard, etc.

THE NATIONAL INCANDESCENT MANTLE CO. OF AUST. LTD., Adelaide (S.A.).—29th September.—P. as going concern, plant, etc., of company.

CHRISTCHURCH CITY COUNCIL (H. R. Smith, town clerk).—5th January, 1914.—S. and D. of series street lighting plant and accessories. Specifications may be seen Town Clerk's office, Melbourne.

CO-OPERATIVE BRICK CO. PTY. LTD., 120 Queen-street, Melbourne (V.).—For sale one Tangye suction gas engine, 170 I.H.P., etc. (See advertising columns.)

CITY OF BRUNSWICK (V.) (R. McGregor Dawson, Town Clerk).—13th October.—One 12½ ton steam roller, with scarifier attached. (See advertising columns.)

## ACCEPTED.

### Commonwealth.

POSTMASTER-GENERAL'S DEPARTMENT, Victoria.—Item No. 1, 1 information clerk's desk, 4 position (Melbourne common battery exchange), £230; item No. 1, 1 information clerk's desk, 2 position (Windsor common battery exchange), £115; item No. 1, 1 information clerk's desk, 2

Dunlop Mining Goods
Are now used with satisfaction in most of the Leading Mines of Australasia – Their QUALITY & WEAR are UNSURPASSED
Tenders & Samples submitted
Correspondence Invited
Send for Illustrated Catalogue

The DUNLOP RUBBER Co. of AUS. Ltd
108 Flinders St. MELBOURNE.
& ALL STATES.

Dunlop Rubber Belting
Is more efficient than Leather belting for Outdoor & Wet Work.
Sample & Price on application

**"FIBRO-CEMENT" Fireproofing**

Everyone about to build should obtain full particulars of this cool, acid-proof, ant-proof and fire-resisting material. The slates for roofs and the sheets for walls and ceilings are specially suited for the Australian climate. Used by the Federal and State Governments and by all the leading Architects and Builders.

ECONOMICAL AND EVERLASTING.

Full particulars, etc., from Sole Agents and Importers—

**JAMES HARDIE & CO.** Melbourne & Sydney

**WRISTLET WATCHES**

They have come to stay. Why?
Fashion's decree of "no" pocket calls for some safe way to carry a watch.
They have a very handsome appearance.
They are distinguished looking.
We make the bracelets.
We set them with diamonds, with pearls, with turquoise, and stock them in plain gold.
We sell only reliable watches at bedrock prices.
See our large stock of watches.
Write for watch pamphlet.

Good, Reliable Lever Watches, fully jewelled, from £5/5/-; set with pearls, from £11/11/- upwards; with diamonds, £25, are the rage.

**FAIRFAX and ROBERTS LTD.,**
**The Oldest Jewellery House in Sydney, 23 and 25 HUNTER STREET.** Plain figures—Cash.

position (Hawthorn common battery exchange), £115; item No. 1, 1 observation clerk's desk, 4 position (Melbourne common battery exchange), £200; item No. 2, 180 tell tale circuits, at 2s. 6d. per circuit, £22 10s.; item No. 1, 1 observation clerk's desk, 2 position (Windsor common battery exchange), £100; item No. 2, 80 tell-tale circuits, at 2s. 6d. per circuit, £10; item No. 1, 1 observation clerk's desk, 2 position (Hawthorn common battery exchange), £100; item No. 2, 40 tell-tale circuits, at 2s. 6d. per circuit, £5—British General Electric Company Limited.

Item No. 1, 400 pipes galvanised iron, 14ft. x 1¼in., at 5s. 10d. each, £116 13s. 4d.; item No. 2, 300 pipes, galvanised iron, 14ft. x 2in., at 8s. 1d. each, £121 5s.; item No. 3, 16 pipes, galvanised iron, 14ft. x 3in., at 12s. 6d. each, £10; item No. 5, 200 bends, pipe, galvanised iron, 1¼in., at 11 1/6d. each, £9 6s. 1d.; item No. 6, 30 bends, pipe, galvanised iron, ¾in., at 3 1/10d. each, 7s. 9d.; item No. 7, 570 bends, pipe, galvanised iron, 2in., at 1s. 6½d. each, £43 18s. 9d.; item No. 1, 420 pipes, galvanised iron, 14ft. x 1¼in., at 5s. 10d. each, £122 10s.; item No. 2, 110 pipes, galvanised iron, 14ft. x 2in., at 8s. 1d. each, £44 9s. 2d.; item No. 3, 110 pipes, galvanised iron, 14ft. x 2½in., at 10s. 10d. each, £59 11s. 8d.—Stewarts and Lloyds (Australia) Limited.

Item No. 5, 100 tons wire, hard-drawn copper, 200 lbs. per mile (in casks containing not more than 8 cwt. each), at £85 6s. per ton, £8530.—British Insulated and Helsby Cables Limited.

Item No. 4, 12,000 sleeves, jointing, £42 15s.; item No. 5, 10,000 tapes, copper, for 70 lb. wire, and pattern B insulator, at 14s. 1d. per 1000, £7 0s. 10d.; item No. 6, 20,000 tapes, copper, for 200 lb. wire, and pattern A insulator, at 38s. 2d. per 1000, £38 3s. 4d.; item No. 7, 100 tons wire, bronze, 70 lb. per mile (in casks containing not more than 8 cwt. each), at £86 9s. per ton, £8645—F. Vanderkelen and Company.

Item No. 1, 60,000 binders, copper, for 70 lb. wire, at 1s. 11½d. per 100, £58 15s.; item No. 2, 39,500 binders, copper, for 200 lb. wire, at 5s. 5½d. per 100, £162 7s. 9d.; item No. 1, 10,000 porous pots, at 5 7/16d. each, £226 11s. 3d.—The India Rubber, Gutta Percha, and Telegraph Works Company Limited.

Item No. 2, 2000 lamps, 25 candle power, metallic filament, at 1s. 6d. each, £150; item No. 6, 500 lamps, line, 24 volts, at 6s. 10d. per dozen, £14 4s. 8d.; item No. 7, 100 lamps, pilot, 24 volts, at 10s. 4d. per dozen, £4 6s. 1d.; item No. 8, 500 lamps, supervisory, 12 volts, at 6s. 10d. per dozen, £14 4s. 8d.; item No. 9, 200 lamps, 4 volts, at 6s. 10d. per dozen, £5 13s. 11d.; item No. 10, 125 lamps, switchboard, 40 volts, at 8s. per dozen, £4 3s. 4d.; item No. 11, 100 lamps, switchboard, 36 volts, at 8s. per dozen, £3 6s. 8d.—British General Electric Company Limited.

Item No. 1, 90 miles wire, tinned copper, rubber insulated, cotton covered and braided, No. 22 S.W.G., at £2 19s. per mile, £265 10s.; item No. 3, 25 miles wire, twisted pair, tinned annealed copper, vulcanised, india rubber insulated, taped and braided, at £13 15s. per mile, £343 15s.—The Armorduct Manufacturing Company Limited.

POSTMASTER-GENERAL'S DEPARTMENT. Sydney.—Item 1, S. and D. of 1500 relays for common battery switchboard, 9s. each; item 2, S. and D. of 300 relays, at 9s. each; item 3, S. and D. of 350 relays, at 11s. each; item 4, S. and D. of 160 mounting plates, at 3s. each—The British General Electric Co. Ltd.

Item 1, S. and D. of 575 detectors, at £2 12s. 9d. each—Lawrence and Hansen Electrical Co. Ltd.

Item 5, S. and D. of 75 tons G.I. wire, 500 lbs., per mile, at £10 10s. per ton; item 6, 200 tons G.I. wire, 400 lbs. per mile, £10 15s. per ton; item 7, 320 tons G.I. wire, 200 lbs. per mile, £11 12s. 6d. per ton; item 8, 540 tons G.I. wire, 150 lbs. per mile, £12 per ton; item 9, 18 tons G.I. tie wire, 60 lbs. per mile, £15 10s. per ton.

## Victoria.

VICTORIAN RAILWAYS.—S. and D. of locomotive engine, tender, carriage, and waggon tires. —Fried Krupp Company.

S. and D. of locomotive engine, tender, carriage, and waggon tires.—Vickers Limited.

S. and D. of locomotive engine, tender, carriage, and waggon tires.—Brown, Bayley's Steel Works Ltd.

S. and D. of locomotive engine, tender, carriage, and waggon tires.—Cammell, Laird, and Co. Ltd.

S. and D. of locomotive engine, tender, carriage, and waggon tires.—Otto Harcourt.

S. and D. of locomotive engine, tender, carriage, and waggon tires. Deposit, £350.—John Brown and Co. Ltd.

S. and D. of locomotive engine, tender, carriage, and waggon tires. Deposit, £100.—Fraser and Chalmers Ltd.

S. and D. of wrought-iron steam pipe, unscrewed and without couplings, 1 inch diameter inside measurement, at 2.582d. per lineal foot.—Stewarts and Lloyds (Australia) Ltd.

M., S., and D. of flexible belt and jointing material for band conveyor for State coal mine—Item No. 1, flexible belt, at 15s. 6d. per foot; Item No. 2, jointing material, 11s. 6d. the lot.—Hopkins Bros. and Odlum Pty. Ltd.

S. and D. of rolled steel joists, etc., for new lines of railway.—Dorman, Long, and Co. Ltd.

M., S., and D. of water cranes, at £48 17s. 6d. each.—Sewell and Gaskell.

S. and D. of best steel boiler plates for steam cranes, at £9 13s. per ton.—Blair and Co.

M., S., and D. of crane anchors, complete, at £8 19s. 6d. per set of (2) crane anchors.—Sewell and Gaskell.

M., S., etc., of wrought-iron "W" guard forgings for maintenance of trucks, at 16s. 2d. each. —F. Long and Co.

C. and rivetting of mild steel girders, second section, Moorabool-street bridge, Geelong, £9244 15s. 1d.; C. and rivetting of mild steel girders, third section, Moorabool-street bridge, Geelong, £11,510 14s. 11d.—Dorman, Long and Co. Ltd., South Melbourne.

PUBLIC WORKS DEPARTMENT.—S. of 100 tons spelter at £22 17s. 6d. per ton for wire netting factory, Pentridge.—Broken Hill Propy. Ltd.

## New Zealand.

PUBLIC WORKS DEPARTMENT.—M. of dredge for Waihou River, £7677.—Stevenson and Cook Engineering Co.

## Western Australia.

TENDER BOARD.—P. of C.I. scrap, at 40s. per ton.—Tomlinson Bros. and Co.

S. of three cylindrical tanks, £78 15s. each.—Tomlinson Bros. and Co.

S. of C.I. pipes, £4598 15s.—Monteath Bros.

## General.

MELBOURNE CITY COUNCIL.—S. of insulated copper cables, £2929.—Johnson and Phillips.

S. of subway ventilating fans (6 for £307).—I.R. Gutta Percha and Telegraph Works Co. Ltd.

S. of pit frames and covers, £123 6s.—Holden and Lewis.

S. of electric light fittings, £16 17s. 6d.—J. E. Andrews.

---

## BANK CLEARINGS.

The report of the Melbourne Clearing House for the week ended September 22 was:—

| | | |
|---|---|---|
| Total clearance .. .. .. .. .. .. .. | | £4,572,621 |
| Balances— | | |
| Settled by certificates .. .. | £466,500 | |
| Settled in coin .. .. .. .. | 67,354 | |
| | | 533,854 |
| Total clearance for the corresponding week, 1912 .. .. .. .. .. .. .. .. .. .. | | £5,028,999 |

## DIVIDENDS.

The following dividends and bonuses of mining companies in Australia have been declared, and are payable on the dates noted:—

September.

25th.—Zinc Corporation (N.S.W.), pref. 2s., less income tax, £24,569.

25th.—Ajax Central G.M. Co., Daylesford (V.), 1/6, £2250.

25th.—Wandiligong G.D. Co. (V.), 1/-, £300.

26th.—Sons of Gwalia Ltd., North Coolgardie (W.A.), 1s., £17,500.

26th.—North Broken Hill Silver-Lead M. Co. (N.S.W.), 2s., £60,000.

26th.—Broken Hill South Silver-Lead M. Co. (N.S.W.), 6s., £60,000.

27th.—Great Boulder Prop. Ltd., Kalgoorlie (W.A.), 9d., £65,625.

27th.—Mt. Bischoff T.M. Co. (T.), 10/-, £6000.

30th.—Bourke's Hill Tin Sluicing Co., Emmaville (N.S.W.), 6d., £1125.

30th.—Cathcart Central G.M. Co., Ararat (V.), 2/-, £5000.

30th.—North Mount Farrell S.-L. M. Co. (T.), 3d., £1000.

October.

1st.—Broken Hill Water Supply Ltd. (N.S.W.), 1s. 6d., and bonus 1s., £6250.

1st.—Eureka G.M. Co., Walhalla (V.), 3d., £150.

1st.—Walhalla Deep Lead, Walhalla (V.), ½d., (final).

2nd.—Llanberris No. 1 Co., Ballarat (V.), 6d., £600.

4th.—Kalgurli Gold Mines, Kalgoorlie (W.A.), 4/-, £24,000.

8th.—South Kalgurli G.M., Kalgoorlie (W.A.), second and final cash return of 8d., £10,000.

13th.—Porepunkah Gold Dredging Co., Bright (V.), 1s., £250.

15th.—Broken Hill Propy. Block 14 (N.S.W.), pref. and ord. 1/-, and pref. interest at rate of 10 per cent. per annum, £11,500.

21st.—Campbell's Creek Dredging Co., Castlemaine (V.), 6d., £800.

22nd.—Tongkah Harbour T.D. Co., Siam, 2/-, £15,000.

---

## PORTLAND PLACE MANSIONS LTD.

The modern tendency to abandon housekeeping and occupy flats in stately structures and attractive surroundings, so securing the maximum of comfort with a minimum of the vexations arising from the management of a large establishment, is being so well catered for in various directions around Melbourne as to create the impression that it is to become a permanent feature of town life, at least amongst the wealthier classes. The continued demand for flats has led to a scheme being formulated for erecting a palatial mansion at St. Kilda, near the southern end of the Esplanade, and a company is being formed, under the name of Portland Place Mansions Ltd., for the purpose of carrying it out. The site selected is the triangular block at the point where Acland and Barkly streets meet, with Belford-street forming the third side, and comprises three acres. The cable tram to the city, the St. Kilda-Brighton electric tram, and the electric tram from the Esplanade to Malvern, all pass close to the property. The area chosen for the Mansions comprises two estates, viz., those of Mr. F. P. C. Beyer and Mr. Harvey Patterson, and the proposal is that, ultimately, five mansions shall be erected, but a commencement is to be made by converting Mr. Beyer's "Oakrood" residence into a 5-story building containing about 90 rooms, so designed as to be suitable for suites of three, four and five rooms, as well as single bachelor apartments, and these will be let either furnished or unfurnished. Notwithstanding the traffic facilities provided by the three tramways, privacy is secured by the already finely-grown trees in the grounds of both estates. All modern fittings and conveniences are to be introduced into the new buildings, as well as conservatory, roof-garden, etc. The capital of the company will be £50,000 in 5000 shares of £10 each, of which 500 shares go to the promoters as fully paid, 3200 are now offered to the public, and 1300 are held in reserve. A prospectus of the new company appears on another page.

---

Our Wollongong (N.S.W.) correspondent writes: —The incident of most interest of late has been a find of molybdenite on the Black Range, about six miles south of Bega. A local syndicate has it, and has put two experienced miners on it to open out for a test. It is close to an old working for silver. At Wolumla, Chegwidden and Biddulph are reported as getting fair stone (gold) in the old Meaker claim; Mr. S. Durkin, a member of this party, has a commission from a wealthy syndicate to report upon a copper proposition in the Northern Territory.

Mr. Marconi recently announced that the Government of Brazil had granted a 50 years' concession to the Marconi Company to enable it to inaugurate a wireless service between that country and New York.

## NEW ZEALAND RE-AFFORESTATION.

New Zealand's efforts in re-afforestation may be commended to the attention of some of the States in the Commonwealth which show no special activity in the same direction. During the past year over ten million trees were successfully raised in the four N.Z. State nurseries, a little more than half being in the North Island at Rotorua, whilst the remainder were grown in the three South Island nurseries. Over five million trees were sent out to the State plantations in the same period, and at March 31 last there were estimated to be nineteen million tree plants remaining in the nurseries available for planting out during the current and successive season. Since the formation of the nurseries in 1896 over sixty million trees have been sent to the plantations, and three million trees to outside places. The total cost to date of the seven nurseries (three of which have now been closed) is £117,743, of which, however, £25,323 is represented by permanent works. In the nine plantations in which operations are at present being carried on, an area of 1604 acres was planted during the year, making a total of 20,634 acres planted since 1896. The cost per acre planted during the year ranged from £3 to £6 15s. 8d. per acre, which is a reduction on former figures. The total expenditure, inclusive of the estimated value of prison labour, since 1896 amounts to £170,347, of which £26,517 was on permanent works, such as the formation of buildings, roads and fencing. Some five million trees are available in the Rotorua nursery, and these will be planted during the year at the plantations in this district. It is hoped that the area under plantation will be increased by 1500 acres during the year.

## VICTORIAN OVERSEA TRADE.

The total imports of Victoria for August amounted to £1,905,090, as compared with £2,163,745 for August, 1912, the greatest decline being in bulk oils, which fell from £104,558 in the earlier period to £23,532 last month. Amongst the other items were:—Gold (bullion and specie), £11,639 (last year £31,945); implements and machinery, £96,613 (£82,307); iron and steel, £120,343 (£115,452); leather, £19,155 (£16,514); timber, £51,522 (£99,729). The exports for the same two months respectively totalled £706,055 (£762,425), of which £672,678 (£709,285) represented Australian products. Amongst the items of export were:—Gold (bullion and specie), £9977 (£95,866); implements and machinery, £21,679 (£11,146); leather, £17,601 (£26,499); oils in bulk, £8093 (£3149). The imports for the first eight months of this year totalled £15,667,069 as compared with £16,318,900 for the same portion of last year. Amongst the items were:—Gold (bullion and specie), £266,636 (£278,158); implements and machinery, £857,559 (£949,299); iron and steel, £938,610 (£847,208); leather, £188,207 (£172,517); oils in bulk, £279,458 (£423,629); timber, £608,293 (£646,898). The exports for the first eight months of this year and last totalled respectively £8,410,063 (£11,410,090), of which £8,136,426 (£11,069,567) represented Australian products. The items include:—Gold (bullion and specie), £372,539 (£2,862,260); implements and machinery, £233,647 (£139,841); leather, £138,236 (£144,311); oils in bulk, £33,469 (£30,159). It may be noted that of the oil exported this year Australian oil represents £28,372, as compared with £26,953 for the corresponding period last year.

## MIXED MEMS.

A deputation representing the Brisbane Coal Workers' Union called upon the Queensland Treasurer, Mr. W. H. Barnes, early in the month, and asked for the reinstitution of the bounty which some time ago was granted for bunker coal supplied to shipping companies. The members realised that they benefited very considerably by the bounty. The rebate was reduced on a sliding scale until it was finally abolished in July, 1911. Since then there had been a considerable dropping off of the trade in the port. The outgo for 1911 was 322,254 tons cargo and bunker, while in 1912 it was 299,055 tons. Shipping companies which usually took large quantities were now taking practically none at all, and one owner had informed a colliery proprietor that it was partly because the rebate had been dropped. With the rebate the men could earn bigger wages than at present, and more would be employed. Mr. Barnes promised to go carefully into the matter and to let them know the result.

The strike of colliers at Blackball, Westland (N.Z.), after lasting nearly four weeks, has ended at last, and work has been resumed. The dispute arose through the demand of the men for the abolition of the dog-watch, and their refusal to work unless this were conceded; it had been brewing for a considerable time, but came suddenly to a head, and the men declined to enter the pits on August 18th. The union represented that the men on night work did not get enough sleep, as many of them lived in lodgings and could not sleep in the daytime on account of noises and interruptions. The management of the mine, however, said it would be impossible to do without night work, for on it the work of development of a mine depended. At the Blackball mine only twelve men were actually on duty on the night shift. The third shift was absolutely necessary to carry on the work of opening up places where the main body of the miners could work when they had got out the coal in their present positions. The output of coal had increased from 400 to 850 tons a day, which made it increasingly necessary to keep well ahead in development work. Eventually the men decided to leave the matter in the hands of the United Federation of Labour, but the Mine Owners' Association declined to deal with that body, though expressing willingness to meet representatives of the men themselves. Later on, however, this point was waived, the parties came together and arrived at a settlement, the terms being that not more than six pairs of men shall be employed on the dog-watch for development work, excepting in cases of emergency, when the manager may employ as many as are required. Twopence per ton extra will be payable in "three-shift" places. The owners agreed that there should be no "victimisation" of men who had taken prominent parts in the fight.

Mr. A. S. Bloomfield, who is associated with rubber-growing in Papua, interviewed in Brisbane, said that the copper-fields near Sapphire Creek, about 12 miles from Port Moresby, were being rapidly developed, and he anticipated that there would be a boom in copper there as soon as the promised railway was built. A lot of gold had been obtained from Woodlark Island, and one of two companies had been getting 10 oz. to the ton of ore. Some gold dredging areas had also been taken up. Reports in regard to the oil-fields on the Bailala River continue to be very favourable, but the public knew that as the oil-fields were to be made a Government monopoly there was nothing to be made out of them.

Yet another British Antarctic expedition is announced, this one being under the generalship of Mr. J. Foster Stackhouse, formerly an intimate friend of the late Captain Scott. The expedition will leave London next August in a steam yacht, the Polaris, which is being specially strengthened to withstand ice pressure. It is intended to spend two years in the Antarctic, wintering amongst the ice-packs, while the Polaris will go to Ross Sea for the winter, and thence to New Zealand. Mr. Stackhouse will take with him a large staff of scientists and a crew of 40. The cost of the expedition is expected to be about £40,000, and the scene of its operations will be to the East of King Edward VII. Land.

The Postmaster-General, Mr. Wynne, announced recently that the late postage fee is to be abolished in rural districts, so that letters may in future be posted at railway stations at ordinary rates, as they had been formerly. The only stations at which a late fee is to be charged from now on will be those at the State capitals. The privilege is meant for people living in small country places, and if the residents of big towns rush the trains the sorters will not be able to deal with the letters, and they will have to be carried on to the head office. If business people in the larger country towns rely too much upon the railway station boxes they will do so at their own risk.

## INDUSTRIAL.

The expansion of the business of the Sterling Telephone and Electric Company Ltd. has rendered it necessary for them to leave their premises at 200 Upper Thames-street, and take more commodious premises at 209 to 212 Tottenham Court-road, London, W.C.

---

## NOR-WEST PROSPECTING CO. NO Liability, West Australia.

Notice is hereby given that the Annual General MEETING of the shareholders will be held at the board room (seventh floor), Broken Hill Chambers, 31 Queen-street, Melbourne, on Tuesday, 30th September, 1913, at 4 p.m. Business:—1. To receive and adopt reports and balance-sheet for period ended 13th September, 1913. 2. To elect directors. 3. To elect auditor. 4. To transact any other general business that may be lawfully brought forward.—ALEX. GORDON, Manager. 31 Queen-street, Melbourne, 23rd September, 1913.

N.B.—Nominations for the position of director to be lodged at the office not later than 12 o'clock noon on Thursday, 25th September, 1913. Proxies must be lodged at the office not later than 12 o'clock noon, Saturday, 27th September 1913. Books close on Saturday, 27th September, 1913, at 12 o'clock noon until after the meeting.

---

## Commonwealth of Australia.

Postmaster-General's Department,
Melbourne, September 19, 1913.

TENDERS will be received at the office of the Deputy Postmaster-General, Melbourne, until 3 p.m. on the undermentioned dates:—

October 14 (re-advertised).—1000 Protectors (Sch. 964). See Commonwealth Gazetter September 20.

October 21.—12 Auto Re-winding Electric Clocks (Sch. 969). See Commonwealth Gazette, September 20.

AGAR WNNE,
(1257) Postmaster-General.

---

### SMALL ARMS FACTORY.

### TENDERS FOR THE PURCHASE OF SCRAP.

Tenders will be received by the Manager, Small Arms Factory, Lithgow, up to noon on Monday, December 29, 1913, for the purchase of Scrap Steel, Brass, Jute Bags, Whale Oil, etc. Particulars may be obtained, and samples of the material seen, at the Small Arms Factory, Lithgow, and at the office of the Senior Ordnance Officer, George-st., North Sydney.

A. C. WRIGHT, Manager.

---

### KALGOORLIE TO PORT AUGUSTA RAILWAY.

### APPLICATIONS FOR POSITION OF SUPERVISING ENGINEER AT KALGOORLIE.

Applications are invited from persons competent to fill the position of Supervising Engineer at the Kalgoorlie end of the Kalgoorlie to Port Augusta Railway.

Applicants must have a thorough knowledge of Railway Construction in all its branches, and capable of handling large bodies of men. The successful applicant will be immediately responsible to the Engineer-in-Chief for Commonwealth Railways. The salary will be at the rate of £750 per annum.

Applications, accompanied by copies of testimonials, and addressed to the Secretary, Department of Home Affairs, will be received until noon on Monday, 6th October, 1913.

JOSEPH COOK,
Minister of State for Home Affairs.

---

Melbourne, August 28, 1913.

### KALGOORLIE TO PORT AUGUSTA RAILWAY.

### TENDERS FOR WHEELS AND AXLES.

Tenders, addressed to the Secretary, Department of Home Affairs, Melbourne, will be received up to 11 a.m. on Tuesday, December 2, 1913, for—

600 Pairs of Wheels and Axles (9in. x 4½in. journals).

Specifications and plans will be on view on and after September 9, at the undermentioned offices:—Commonwealth Railways, 84 William-street, Melbourne; Commonwealth Works Director, Customs House, Sydney; Commonwealth Works Registrars, Brisbane, Adelaide, Perth and Hobart, and at the office of the High Commissioner, London, a month later.

The charge for each copy of specification will be £1/1/-, and for each plan 5/-, which must be paid before the documents can be issued.

Tenders are to be endorsed "Tender for Wheels and Axles," and are to be accompanied by the deposit mentioned in the form of tender.

JOSEPH COOK,
Minister of State for Home Affairs.

---

## CITY OF BRUNSWICK.

TENDERS are invited, returnable up to 4 p.m. on Monday, October 13, 1913, for the Supply and Delivery of one 12½-ton Steam Roller, with Scarifier attached.

Tenderers to submit maker's specification.

Preliminary deposit of 2½ per cent. to be lodged with each tender.

Conditions of tendering may be seen at the City Surveyor's Office, Town Hall, Brunswick.

R. M'GREGOR DAWSON,
Town Hall, Town Clerk.
Brunswick, Sept. 3, 1913.

## Government Notice, (V.).

VICTORIAN RAILWAYS COMMISSIONERS.

STATE COAL MINES.

SEPARATE TENDERS are invited for the undermentioned Works, etc. Tenders, endorsed "Tender for [illegible]," must be addressed to the General Manager, State Coal Mines, Wonthaggi, and deposited with the preliminary deposit, at his office at Wonthaggi, not later than 12 noon of the date specified. Particulars and forms of tender at the Melbourne office of the State Coal Mines, [illegible] Buildings, Collins-street, and at the office of the General Manager, Wonthaggi.

MOTORS, ETC.

Monday, October 22.—Supply and Delivery of Two [illegible] h.p. Motors, etc. P.D., £2.

TRUCK PEDESTALS.

Monday, October 22.—Manufacture, Supply and Delivery of 3000 Cast Iron Truck Pedestals. P.D., £2.

STEEL SKIP WHEELS.

Monday, October 22.—Manufacture, Supply and Delivery of 2000 Steel Skip Wheels. P.D., £2.

No tender will necessarily be accepted.

G. H. BROOME,
General Manager.

## Government Notices (N.S.W.).

New South Wales Government Railways,
Office of the Chief Commissioner,
Sydney, September 20, 1913.

TENDERS will be received at this office until 12 o'clock noon on the dates specified for the undermentioned [illegible], etc., viz.:

WEDNESDAY, OCTOBER 15, 1913.

For Supply of Thirteen Direct Current Motors, to Specification No. 412, price 2s. 6d. each.

WEDNESDAY, NOVEMBER 26, 1913.

For Supply of One 2000 lb. Storage Freight Truck. Specification No. 426, price 2s. 6d.

All specifications are obtainable at the Electrical Engineer's Office, 61 Hunter-street, Sydney.

Tenders are to be endorsed "Tender for D.C. Motors," or as the case may be.

The Chief Commissioner does not bind himself to accept the lowest or any tender.

By order,
J. S. SPURWAY,
Secretary.

Department of Public Works,
Sydney, September 20, 1913.

TENDERS FOR MACHINERY, ETC.

TENDERS, specified below, will be received at this Department until 2 o'clock p.m., on the dates mentioned:—

TUESDAY, OCTOBER 7, 1913.

Supply, etc., of 500 Tons Iron Spikes for 60-lb. Rails.

Supply of Steel Pipes and Specials for Reticulation of [illegible], and Supply to Mines, Water Supply, Broken Hill.

Manufacture, etc., of Fifteen [illegible] Water Cranes.

MONDAY, OCTOBER 27, 1913.

Manufacture, etc., of Steel Bridge for Wilson River, Wauchope to Kempsey Section, North Coast Railway.

MONDAY, DECEMBER 8, 1913.

Manufacture, etc., of Steel Bridges for [illegible] and Piper's Creeks, on 5th Section, North Coast Railway.

Further particulars may be obtained from N.S.W. "Government Gazette."

(6482) ARTHUR GRIFFITH.

## TONGKAH HARBOUR TIN Dredging Co. N.L.

Notice of Dividend.—Notice is hereby given that a Dividend (the [illegible]) at 10 per cent., of 2[illegible] per share, amounting to £15,000, be declared, payable on October 22, 1913, and for this purpose the Share Register be closed from 15th to 22nd October [illegible]. Dated at Hobart, this 12th day of September, 1913. By order of the Directors. H. J. WISE, Manager.

## COMMODORE GOLD MINING CO. N.L.

Certain Shares have been forfeited for non-payment of the Twelfth Call of [illegible] per share due August 22, 1913, and will be offered for sale by Public Auction at the Vestibule of the Stock Exchange of Melbourne, on Tuesday, 30th September, 1913, at 2.15 p.m., by Messrs. [illegible] and Co. By order of the Board, [illegible] S. SCOTT, Secretary, [illegible], 16th September, 1913. N.B.—Shares may be redeemed up to 1 p.m. on the day preceding the sale.

## MUNICIPAL COUNCIL OF SYDNEY.

TO CONTRACTORS.

SEALED and ENDORSED TENDERS will be received by the undersigned until 3 o'clock p.m. on Monday, September 29, 1913, for the following:

(a) The Supply and Delivery of Copper for Use as Bus-bars.
(b) The Supply and Erection of Steel Ladders.
(c) The Supply and Delivery of Testing Transformer.
(d) The Supply and Delivery of Metal Filament Electric Lamps.

Copies of Specifications, etc., may be seen or obtained upon application at the office of the City Electrical Engineer, Town Hall, Sydney, upon payment of the sum of 10s. 6d. in each case.

**The lowest or any tender not necessarily accepted.**

Tenderers please note that they must pay their **CASH DEPOSITS direct into the City Treasury, and not enclose same with their tenders, otherwise their tenders will be rejected as INFORMAL.**

THOMAS H. NESBITT,
Town Hall, Sydney, Town Clerk.
September 12, 1913.

## MUNICIPAL COUNCIL OF SYDNEY.

TO CONTRACTORS.

SEALED and ENDORSED TENDERS will be received by the undersigned until 3 o'clock on Monday, October 27, 1913, for the Supply and Delivery of Curve Drawing Ammeters.

Copies of specifications, etc., may be seen or obtained upon application at the office of the City Electrical Engineer, Town Hall, Sydney, upon the payment of the sum of 10s. 6d.

**The lowest or any tender not necessarily accepted.**

Tenderers please note that they must pay their CASH DEPOSITS direct into the City Treasury, **and not enclose same with their tenders; otherwise** their tenders will be rejected as INFORMAL.

THOMAS H. NESBITT,
Town Hall, Sydney, Town Clerk.
September 19, 1913.

## THE METROPOLITAN WATER and Sewerage Board.

TO IRONFOUNDERS, MACHINERY MERCHANTS, ETC.

EXTENSION OF TIME.

Contract No. 21 of 1913.

**SEALED TENDERS will be received until 12 o'clock noon on Tuesday, January 13, 1914, for the Manufacture and Delivery of Material for an Aerial Ropeway, in accordance with Plans and Specification, which may be seen at this office.**

**On application to the Chief Clerk, conditions of tendering and forms of tender will be supplied free of charge. If copies of the specification, plans, and general conditions of contract are supplied, a fee of one pound sterling (£1) for a** complete set will be charged, or for specification and general conditions of contract only, a fee of **ten shillings (10/-) will be charged, which fees respectively will, after receipt and consideration of a bona fide tender, be refunded to the tenderer, on application in writing.**

Tenders to be endorsed on front of envelope containing same, "Tender for Material and Machinery for Ropeway."

**The lowest or any tender not necessarily accepted.**

By order,
GEO. JOHNSTON,
Office of the Board, Secretary.
Albert-street, Brisbane,
September 18, 1913.

## THE LORD ROBERTS G.M. COMPANY NO LIABILITY,

Daylesford.—The Second General Half-yearly Meeting of shareholders of the above company will be held in the board-room (7th floor), 60 Queen-street, Melbourne, at 11 o'clock a.m. on Saturday, 27th September, 1913. Business. **—To receive the directors' and manager's reports and balance-sheet for half-year ending 30th August,** 1913, and to transact any other business that may **be legally brought before the meeting. T. Morres,** Manager. Melbourne, 18th September, 1913.

## HARDINGE CONICAL PEBBLE MILL FOR SALE.

New, 4ft. 6in. × 72in.
F. H. REYNOLDS, South British Buildings.
19 Queen-street, Melbourne.

SECONDHAND Machines for Sale, in good order, Mandrie Saw, Rack Feed, Circular Saw Bench, Lathe Mill, Planer, 4-sided; 8 h.p. Portable Engine, Boring Machine, Overhead Travelling Cranes, **Pulleys, Shafting, Plummer Blocks, Bearings. Call** and inspect, Moore's Timber Yards, South Melb.

## FOR SALE.

One TANGYE SUCTION GAS ENGINE, 170 I.H.P., and Generator complete. Also ONE TANGYE SUCTION GAS ENGINE, 75 I.H.P., and Generator, complete.

Specifications can be seen at
CO-OPERATIVE BRICK CO. PTY. LTD.,
120 Queen-street.

## DUKE AND MAIN LEADS CONSOLS G.M. Co. No Liability.

Tenders, returnable on Monday, 13th October, **1913, to the undersigned, are invited for purchase** for cash or on terms of SLIMES HEAP at company's mine, **Bet Bet, estimated to contain about 250,000 cubic yards. Deposit, £10.—D. MURRAY,** Manager, 430 Little Collins-street, Melbourne.

## THE BUKIT KUBU RUBBER Estates Ltd.

Notice is hereby given that the fourth ordinary **general Meeting of the shareholders of this company** will be held at the registered office, No. 375 **Collins-street, Melbourne, on Friday, the 26th September, 1913, at 2.15 o'clock p.m. Business:—General.** By order of the Board,—S. J. WARNOCK, Manager. Melbourne, 18th September, 1913.

## MOUNT MURPHY WOLFRAM Mining Co. N.L.

The first GENERAL MEETING of shareholders **will be held at company's office, Leadenhall, 28 Market-street, on MONDAY, the 29th day of SEPTEMBER, 1913, at 3.30 p.m.**

Business.—To receive and adopt reports and balance-sheet for period ending 15th September, 1913; to consider any other business that may be legally brought forward.

G. WALLACE CRABBE, Legal Manager.
Melbourne, 17th September, 1913.

## SOUTH WATTLE GULLY GOLD Mining Company N.L., Chewton.

The Half-yearly General MEETING of share**holders in above company will be held at London House, 97 Elizabeth-street, Melbourne, on Monday, 29th September, 1913, at 3.15 p.m.**

**Business:**

To receive and adopt reports and balance-sheet.
To elect directors.
To elect auditor.
To authorise the directors to deal with the **shares in the hands of the company.**

General. S, J, PLAIN, Manager.

## BLOW REEF GOLD MINING COMpany N.L., Newstead.

The Half-yearly General MEETING of shareholders in above company will be held at London House, 97 Elizabeth-street, Melbourne, on Friday, **26th September, 1913, at 11.30 a.m. Business:—** To receive and adopt reports and balance-sheet. **To authorise the directors to deal with the shares in the hands of the company. General.—S. J.** PLAIN, Manager.

## TOWN OF WILLIAMSTOWN.

Applications will be received until 4 p.m. on **Tuesday, 30th inst., from persons qualified to act as Consulting Electrical Engineer, in connection with the installation of electricity within the municipality. Further information may be obtained at the Council Chambers. By order,**

**Sept. 19, 1913. F. J. OGDEN, Town Clerk.**

NOTICE is hereby given that the Share Register of the BELLAMBI COAL CO. LTD. will be Closed for Transfer from 30th September to 9th October, both days inclusive. By order of the Board—W. W. GUDGEON, Secretary.

## THE JOHNSON'S REEF GOLD Mines Co. N.L., California Gully.

Tenders for Purchase and Removal of OLD MACHINERY at Nos. 1, 2 and 3 Mines. Tenders **close 4th October, 1913. All information supplied** at mine personally or by letter.

JOHN VEALE, Mine Manager.

## THE CAMPBELL'S CREEK Dredging Co. No Liability.

**Notice is hereby given that a Dividend (the 35th) of sixpence per share has been declared, due and payable at the registered office of the company,** third floor, Broken Hill Chambers, 31 Queen-street, **Melbourne, on Tuesday, the 21st October, 1913. Transfer books close from 14th to 21st October,** both days inclusive. A. F. SHOWERS, Manager.

## STANLEY'S DRAINING LEVEL.

A cheap, precise instrument, with 4 levelling **screws, good telescope, tripod, and case, £6. 10ft. Levelling Staff, £1/5/-. Stock just to hand. Illustrated list of surveying instruments gratis.**

**W. WATSON & SONS,**
**The Optical Centre, 78 Swanston-st., Melb.**

# THE MIRROR LIMITED.

**Has now been registered under the Companies Act 1910.**

**The Promoters of the "Mirror," having had their attention called to unfair criticism concerning their proposals, as contained in the prospectus of "The Mirror Limited," now feel that in justice to themselves a comparison should be made between those proposals and the governing principles of another newspaper company in Victoria, whose prosperity is known to be very great.**

| THE OTHER NEWSPAPER COMPANY. | THE MIRROR LIMITED. |
|---|---|
| **Capital, £250,000—**<br>125,000 6 per cent. preference shares.<br>125,000 ordinary shares. | **Capital, £200,000—**<br>180,000 8 per cent. preference shares.<br>20,000 ordinary (B) shares. |
| **No Votes at all—**<br>For preference shares.<br>Ords. have all the votes. | **Half the Votes—**<br>For preference shares. |
| **6 Per Cent. Only—**<br>For prefs., and the balance for ords. | **8 Per cent.—**<br>For prefs. and **one-third** of surplus profits. |
| **Market Price—**<br>Of these 6 per cent. preference shares is about **22/6.** | **What Will These be Worth,** if, as one hostile critic suggests, the Company may earn sufficient to pay them **12 per cent.?** |
| **Commissions—**<br>To canvassers and other agents vary from **10 to 20 per cent.** | **The Mirror Limited** have contracted to pay a **fixed commission of 15 per cent. to cover commissions to all canvassers and other agents.** Newspapers usually pay 25 per cent. and sometimes more, but the men in charge of the "Mirror" understand the business. It is a great regret to the Managing Director that he will not receive it **all.** |

**If "Mirror" preference shareholders receive 12 per cent. for their money, will they complain that the organisers, promoters, and staff of the paper are well paid? Good workers will receive good pay, and all of them will be shareholders as well.**

**Half the Voting power in The Mirror Limited has been secured by the promoters to ensure a continuance of the policy upon which the paper is being started. That policy is JUST (to everybody), FEARLESS (at all times and under all circumstances), and GENEROUS (with its space to friend and foe alike).**

**Equality of votes does not give the promoters any financial benefit, and their shares receive no dividend until preference shareholders have been paid 8 per cent. and depreciation and reserve funds provided for.**

**Prominent advertisers are being offered 50,000 of the 8 per cent. preference shares. They will be invited to form a committee, and the SALES ledger will be placed at their disposal. They will also have an important voice in the regulation of advertisement rates. These will not be raised until the "Mirror" has a larger daily circulation than any other newspaper in Victoria.**

**In their selection of Directors, the promoters have been guided solely by the special needs of a business of this kind, quite irrespective of wealth or social distinction. This decision has been supported by 20 successful business men in Melbourne.**

**The Mirror will be a people's evening newspaper, owned, controlled, and directed by "The People."**

**Equal opportunities to all public men to place their views before "Mirror" readers.**

## Independent -- Unbiased -- but Bold and Enterprising

**Mud-throwing may be a useful occupation for some people, but in this case it represents waste of time and energy. The "Mirror" is surrounded by men and women who are determined to keep it clean. This army of protectors grows from day to day, and contains newspaper producers, distributors, prominent business men, lawyers, medical practitioners, and others.**

## In the Mirror you will see everybody and everything!

**Collected from Everywhere by Competent Local Journalists assisted by others.**

**The promoters will ignore further criticism, except libellous or slanderous statements, and will complete their original plans unperturbed by anything their opponents may say or do.**

**Applications for shares will only be received on the basis of the full prospectus, copies of which may be obtained from**

Messrs. MADDOCK, JAMIESON & LONIE, 136-138 Queen Street, Solicitors.

S. B. BAGLEY, Esq., 408 Collins Street, and Stock Exchange, Broker.

A.E.M. SYNDICATE, Flinders Buildings, Flinders Street, Promoters.

## FALKENTHAL RECTIFIERS.

Alternating current rectifiers on the Falkenthal principle work with swinging contacts, and consist of an auto-transformer and a contact system. The swinging contact lever of this system is connected, by means of permanent magneto or winding, with a similarly polarised iron armature, which is arranged to turn easily in a leakage field of the transformer iron core. When alternating current passes through the transformer winding, the polarised armature will develop vibrations which will coincide exactly with the alternating current, both in the number of cycles and in the phase. The swinging contact closes one contact during the first half of the cycle, and the other during the second half of the cycle, whereby the alternating current is converted into a pulsating direct current. The contacts must always be adjusted so that they will invariably be opened and closed at the moment of absence of current, and they will therefore work without sparking. The efficiency of the rectifier depends upon the proportion of the alternating tension to that of the direct current, and will be found most favourable when the rectifier is dimensioned for a maximum direct current tension amounting to 43 per cent. of the alternating current tension. With the proportion of tension of 3: 1, which is so general, the efficiency of the several types will lie between 60 and 90 per cent. The no-load losses amount to about 4 per cent. of the maximum capacity. The apparatuses are made for capacities of from 20 to [illegible] watts, but higher capacities can be obtained by switching several single apparatuses on parallel. These rectifiers can be employed everywhere for moderate direct current capacities, when only alternating current is available and value is attached to simplified attendance, moderate original cost, and low working expenses. The various purposes for which they can be applied entail a difference in adjustment of the contacts of the rectifier. Rectifiers for inductive loads are further fitted with a condenser which will eliminate the pulsations of the direct current. Rectifiers are manufactured for charging accumulators, for galvano-technical purposes, and for inductive loads.

---

Between 1902 and 1912 inclusive New Zealand indulged itself in no less than 76 Royal Commissions, the resultant bill paid by the taxpayer having been £[illegible]. A few of the inquiries seem to have been made for nothing, but when matters of large public policy have been touched the expense has generally topped a thousand pounds sterling, as the following items from a recent Parliamentary return show:—Reprint of Statutes, £5625; Native Reserves Trust, £2364; Land Commission, £10,377; Scenery Preservation (1904-5), £1822; J. J. Meikle claims, £2419; Scenery Preservation (1905-6), £1221; cause of fires on ships, £1403; Nightcaps' disaster, £1121; Native Land, £9883; Police, £1052; Timber, £2577; Ohinemuri Sitting, £1093; Mines, £3057; North Auckland Railway, £1310; Education, £2275; Gaming, £1889; Public Service, £601.

There has for some time been an agitation in Tasmania for a re-organisation of the Mines Department. At present the duties of Government Geologist and Chief Inspector of Mines are committed to one man, while those of Chief Inspector of Machinery and Chief Inspector of Explosives are entrusted to another, and it is pointed out that, in consequence, the other inspectors of mines have to act under two chiefs. As the Government turned a deaf ear to the demand made in the direction of re-organisation, Mr. J. E. Ogden, M.H.A., has given notice that he will move, (1) That the present system of combining the offices of geologist and chief inspector of mines is unsatisfactory; (2) that the Minister should at once take steps to separate the two offices, and make an appointment of chief inspector of mines and explosives.

During the last half-year the Central Ajax G.M. Co., Daylesford (V.), derived £23,783 from the sale of gold and pyrites, £12,000 was distributed in dividends, and £1741 was spent on plant. The company has a reserve of £3000 at fixed deposit, and in hand there is £3,131, of which £2,250 will be required to meet a dividend of 1s. 6d. per share, payable to-day. The gold won equalled 6006 oz. from 6120 tons.

The question of light railways for rural districts came up for discussion at the Farmers' Conference at Wellington (N.Z.) recently. In introducing the subject, Mr. Ross (Auckland) said he did not advocate private railways in the usual, but he thought the advantages were decidedly in favour of branch railways constructed by private enterprise. The State did not build railways as efficiently as private companies. After discussion the following motion was carried: "That the conference urges the Government to adopt a progressive policy for the construction of branch lines and the development of the system of light railways, and in cases where the Government cannot undertake their construction to afford facilities for the work being undertaken by local bodies or by private enterprise on the lines of the Belgian system."

PROFESSIONAL CARDS.

**G. H. BLAKEMORE,**
CONSULTING METALLURGIST
For Copper and Lead,
MINING ENGINEER,
CASTLEREAGH CHAMBERS, 10 CASTLEREAGH ST
Telegraph Codes· Bedford McNeill 1908 Edition.
Moreing & Neal.
A.B.C. 5th Edition.
Cable Address. Radgarn. Telephone 7124 City

**MATTHEW C. COATES, A.M.I.E.E.**
CONSULTING MECHANICAL and ELECTRICAL ENGINEER. Expert Reports given for Power Generating Plants, Factory Installations, Steam, Gas and Electric.
99 QUEEN-STREET, MELBOURNE.

**VALENTINE J. CROWLEY,**
CONSULTING ELECTRICAL ENGINEER.
Hydro-Electric Plants and Transmission Lines Designed and Supervised.
Austral Chambers, Telephone 7736.
97-99 QUEEN STREET, MELBOURNE.

**GOYDER & HALLETT,**
ASSAYERS AND ANALYSTS
110 Gawler Place, Adelaide.
Telephone 169.
Metallurgical and Chemical Processes Investigated.
Ores Sampled and Assayed.

**T. J. GREENWAY, M.I.M.M., F.I.C.**
MINING AND METALLURGICAL ENGINEER.
60 QUEEN STREET, MELBOURNE.

**KAY, MACNICOL & CO.,**
Mechanical, Mining & Electrical Engineers.
BROKEN HILL CHAMBERS.
31 QUEEN STREET, MELBOURNE.
Cable Address: "Engineer," Melbourne.
Telephone, No. 4883.

**McCARTY, UNDERWOOD & CO.,**
CONSULTING ELECTRICAL AND MECHANICAL ENGINEERS,
31 QUEEN STREET, MELBOURNE
Telephone, 7096

**J. D. AUDLEY SMITH,**
MINING ENGINEER,
9 Bridge-street, Sydney
Telephone No.— City 2677.
Telegraphic Address— Audley Smith, Mining Engineer, Sydney

**WALTER F. SMITH,**
MANAGER FLOATER G.M.
Ravensthorpe, W.A.
Mines Sampled, Valued, and Reported on.
ASSAYS MADE.
Code: Bedford McNeil.
Reliable Information Furnished on the Phillips River Gold and Copper Field.

**A. A. SUMMERHAYES,**
CONSULTING MECHANICAL ENGINEER,
1 VIADUCT BUILDINGS, MELBOURNE.
TELEPHONE 4528.
Supervision or Erection Mining and Metallurgical Plants.

**E. A. WEINBERG,**
MINING AND METALLURGICAL ENGINEER,
19 QUEEN STREET, MELBOURNE.

**FRANKLIN WHITE,**
MINING ENGINEER,
CITY MUTUAL CHAMBERS,
62 HUNTER ST., SYDNEY.
G.P.O., Box 1498.
Code: Broomhall Imperial Combination.

**MAX GORLER**
Buyer of
ORES, METALS, CONCENTRATES.
HEAD OFFICE—
60 Queen St., Melbourne.
And at Castlereagh House, SYDNEY.
Argent Street, BROKEN HILL.
FRIEZLAND (Cloncurry District), Aubrey C. Waight.
Sole Agency Australasia —
C.E.A.G. MINER'S ELECTRIC SAFETY LAMP.

ESTABLISHED 1860.
**BONDHOLDERS' REGISTER**
Publishes the Actual Numbers of all Drawn Bonds Throughout the World.
PUBLISHED FORTNIGHTLY.
10s. PER ANNUM.
73 FARRINGTON ST., LONDON, E.C.
Australian Offices,
376 FLINDERS LANE, MELBOURNE.

250 H.P. Turbine.
Showing Wheel and Guide Vanes.
**G. Weymouth Pty. Ltd.**
Electrical Engineers,
Neptune-street, RICHMOND, VIC
Telephones:—
Office, 2651 Windsor.
Works: 2507 Central.
Manufacturers of all Classes of Electrical Machinery, Turbines, Pumps for Irrigation and Mining, Underground and Surface Mining Locos., Winches, Haulage and Winding Plants, Motors, Generators, etc.
Estimates submitted.
Correspondence invited.

**WELDLESS TUBES**

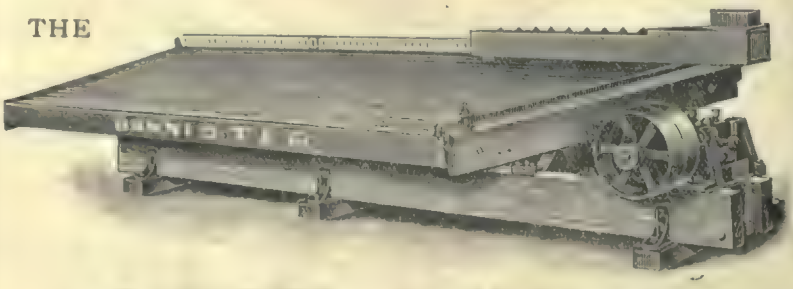
# MANNESMANN

**LAPWELDED TUBES**

**For Water, Steam, Gas, Air, Oil, Etc.**

USED BY STATE **GOVERNMENTS, MUNICIPALITIES** & THE **PRINCIPAL MINING COMPANIES IN AUSTRALIA.**

**Stocks carried by** NOYES BROS. **(SYDNEY) LTD.**
**(MELBOURNE) PTY. LTD.**



**MY CARD**

THE **CONCENTRATOR**

4 "Bannister" Concentrators have just been installed at the Central Tin Mine, Renison Bell, Tasmania, similar in design to the Tables at Mt. Bischoff and other Tin Mines in Tasmania.

**Victorian and Tasmanian Representative for Allis-Chalmers Co.**

**L. BANNISTER,** (Late of N. Guthridge Ltd.),
'Phone 7354. 39 QUEEN STREET, MELBOURNE.

**Department of Mines, Victoria.**

Available for Issue—Geological Maps of Australia, Victoria, and various mining districts and parishes; Underground Survey Plans of various mines and goldfields; Progress Reports; Memoirs, Bulletins and Records of the Geological Survey of Victoria; Various Special Reports, etc.

Price Lists supplied on Application to the Secretary for Mines.

THE

**University of Sydney.**

DEPARTMENT OF ENGINEERING.

The course for the degree of Bachelor of Engineering in Mining and Metallurgy extends over a period of four years, during which lectures and practical instruction are given in the following subjects:—

Chemistry, Physics, Mathematics, Descriptive Geometry, Geology, and Economic Geology, Mineralogy, Engineering Construction, Mechanical Engineering Materials and Structures, Electrical Engineering, Surveying, Building Construction, Mining, Metallurgy, Assaying, Engineering Design and Drawing.

The Chemical, Metallurgical, Physical, Geological, Mechanical and Electrical laboratories are thoroughly well equipped with modern plant and machinery.

The Academic year commences in March. The fees are nine guineas per term, or a total cost for graduation of £125 8s., including Matriculation and Degree Fees. Students who do not wish to take up the full course may select individual subjects.

Full particulars will be found in the University Calendar, which may be obtained upon application.

H. E. BARFF,
Registrar.

**S. A. School of Mines and Industries, Adelaide.**

***Associate Diploma Courses.***

- Mining.
- Metallurgy.
- Mechanical and Electrical Engineering.
- Architecture.

***Fellowship Diploma Courses.***

- Mining.
- Metallurgy.
- Mechanical Engineering.
- Electrical Engineering.

*The fellowship carries with it the Diploma in Applied Science of the University of Adelaide*

Full particulars from the Registrar, Mr L. Laybourne Smith.

By direction of the Council,

**J. Langdon Bonython,**
President

**DEPARTMENT OF MINES SOUTH AUSTRALIA.**

MINERS' RIGHTS are issued at the Mines Office, King William-street, authorising the holder to prospect for Metals and Coal, or Oil, and to peg out Gold, Mineral, Coal, or Oil Claims. Price, 5s., tenable for 12 months. Licenses to search for Precious Stones, Phosphates, Oil, Rare Minerals, Metals, or Earths are issued over specific lands, not exceeding five square miles, to each person, at 20s per mile for 12 months; the holder has a right to a lease. Leases are issued of the following areas:—Gold, 20, Mineral, 40; Coal or Oil, 640; Salt or Gypsum, 640; Phosphates, 100, Precious Stones, Metals, or Earths, 40; Mineral Springs, 40, Mining Works, 10; Smelting Works, 10 acres respectively. Each lease is for 42 years. Gold Mineral, Salt, and Gypsum, at 1s per acre per annum, Coal and Oil, at 6d per acre per annum till Coal or Oil is found, then 1s. A royalty of 6d. in the pound on net profit must be paid in **addition.**

One man must be kept employed for every five acres held on gold lease, one man for every 10 acres on mineral lease, and one man for every 40 acres on coal or oil leases.

Any number of Gold, Mineral Coal, or Oil Leases may be held by one person, and up to four Gold or Mineral leases may be amalgamated

Business and Occupation Licenses are granted.

**Subsidies are granted to assist the development of** Mines, and Diamond Drills are loaned. Free assays are made of Ore from Crown Lands. Ore is treated at **Government batteries — Mount Torrens and Petersburg—** at 5s. per ton, and cyanided for 5s per ton. Tarcoola at 10s. per ton for parcels over 5 and under 25 tons, and **cyanided at 7s. 6d. per ton for parcels over 5 tons. Assays** are made of samples sent to **the works.**

**Advances made on parcels delivered at batteries.**

MINING ON PRIVATE PROPERTY.

Private Land can be Resumed for Mining or Proclaimed a Goldfield, or owners can be compelled to grant leases over their property on conditions.

The Minerals on all Leasehold Lands and on all Lands **granted since 1888 belong to the Crown, and are available for mining on after the miner has arranged for** paying for any damage he may do to the surface of the ground.

F. C. WARD,
Secretary to the Minister of Mines

**BALLARAT School of Mines**

DEPARTMENTS:

**CHEMISTRY and METALLURGY,**
**ENGINEERING and SURVEYING**
**ELECTRICAL ENGINEERING,**
**GEOLOGY and MINING**
**MATHEMATICS and PHYSICS**

**Prospectus on Application.**

**F. J. MARTELL, Director.**

**QUEENSLAND MINES DEPARTMENT**

**GEOLOGICAL SURVEY PUBLICATIONS.** **REVISED LISTS FORWARDED ON REQUEST**

**Charters Towers School of Mines.**

SUBJECTS AND INSTRUCTORS:

Geology, Mining Geology, and Mineralogy. The Director, H. I. McGillivray, M.A. (Melb.).

Chemistry, Assaying, and Metallurgy.—J. A. Hughes, F.C.S.; W. H. Bowater, F.C.S.; P. Harvey, A.C.T.S.M.

Mechanics, Materials and Structures, and Physics.—A. R. Wright, F.S.A.S.M.

Mining, Ore Dressing, Surveying, and Mechanical Drawing.—E. C. B. Heden, B.A., B.E., B.Sc. (Syd.).

Mathematics.—G. F. Clinton, A.C.T.S.M.

Secretary.—J. F. Horrigan

**Candidates prepared for Associateship in Mining and Metallurgy, Diploma as Chemist and Assayer, the Mine Managers' Examination, and in all branches** of Metallurgical Work, such as Cyaniding, Chlorination, etc.

Scale of Fees: 15s. per class per term (three terms of three months each per year), or £2 per class per year. A full course of six or more classes for £10 10s. per annum. Full particulars on application to the Director.

**Managers of Mines, Mills, and Smelters requiring trained Assistants are** invited to communicate with the Director.

**Queensl'd Government Mining Journal**

**A Monthly Publication Issued under the Authority of the MINES DEPARTMENT.**

Containing Official Reports, Statistical Tables, and other Authentic Information relating to

**MINING IN QUEENSLAND.**

SUBSCRIPTION—Per Annum, 6s.; Posted within the Commonwealth, 6s. 6d. To any place beyond, 8s

PUBLISHERS—GORDON & GOTCH, Brisbane, and at 15 St Bride-street, Ludgate Circus, London, E.C.

## CONTENTS

THURSDAY, OCTOBER 2.

EDITORIAL—

The Functions of Government .. .. 271
Corners in Stocks .. .. .. .. .. .. .. .. 272
Leaderettes .. .. .. .. .. .. .. .. .. .. 272
News and Notes .. .. .. .. .. .. .. .. 273
Personal .. .. .. .. .. .. .. .. .. .. .. 274
Brief Comment .. .. .. .. .. .. .. .. 274
The Investors' Column—
North Nuggety Ajax (V.) .. .. .. 275
Met. Board of Works Debentures.. 275
Metal Quotations .. .. .. .. .. .. .. 275
Correspondence .. .. .. .. .. .. .. .. 276
The Non-unionist Strike (V.) .. .. .. 276
The Coal Mining Industry .. .. .. .. 276
Victorian Mining Activities .. .. .. 276
Western Australian Mining .. .. .. 277
Tasmanian Mining .. .. .. .. .. .. .. 278
Mining in New Zealand .. .. .. .. .. 278
Industrial .. .. .. .. .. .. .. .. .. .. 278
New South Wales Mining .. .. .. .. 279
Mine Rescue Stations.. .. .. .. .. .. 279
Oil Notes.. .. .. .. .. .. .. .. .. .. 279
Westons (W.A.) .. .. .. .. .. .. .. .. 280
Prahran-Malvern Tramways (V.) .. 281
N.S.W. Railway Service .. .. .. .. .. 281
"Greater Melbourne" .. .. .. .. .. .. 281
South Australian Railways .. .. .. 282
North Shore Bridge (N.S.W.) and Norton Griffiths Co. .. .. .. .. .. 282
Turbo-Electric Locomotive .. .. .. .. 283
British and European Developments .. 283
General Electric Company .. .. .. .. 284
Miscellaneous .. .. .. .. .. .. .. .. 284
Invited and Accepted Tenders .. .. .. 285
New Zealand Railways .. .. .. .. .. 287
Reports of Companies, etc. .. .. .. .. 290

**FIRE. . BRICK**

**Our Products have proved their superiority.**

**FIRE CLAY GOODS** For Every Purpose.

Darley Fire Bricks will withstand the most intense heat, and will not shrink. Our bricks are made near Bacchus Marsh, Victoria, and we supply all the States.

Specialities

**High-Grade Firebricks & Retorts.**

*Prompt Delivery. For Prices, etc., write to—*

**DARLEY F. B. Co.,**
**Oliver's Lane, Flinders St. Melbourne.**

**COKE!**

**NORTH BULLI COLLIERY**
**Limited**

Supplies best quality hard
SOUTHERN
SMELTING COKE.
(Weekly output 1250 tons.)

H. G. Hyde, Secretary

Royal Insurance Building, 16 Spring-street,
SYDNEY.

**MINING STANDARD.**
PUBLISHED EVERY THURSDAY.
Forwarded Post Free to any Address.

| | Per annum |
|---|---|
| Australasia .. .. .. .. .. .. .. .. .. .. .. .. | 26/- |
| British Possessions .. .. .. .. .. .. .. .. | 32/6 |
| Foreign .. .. .. .. .. .. .. .. .. .. .. .. .. | 34/8 |

Payable half-yearly or yearly, in advance.
All amounts should be made payable to order of "CRITCHLEY PARKER, Bank of Australasia."

| | |
|---|---|
| 12 O'Connell-street, | 376 Flinders-lane, |
| Sydney. | Melbourne. |
| Tel. Central 2703. | Central 7931 & 1838. |
| P.O. Box 331. | P.O. Box 253. |

**BACK NUMBERS OF THE "MINING STANDARD."**

The following is the rate for back copies more than a month old. Applications by post must be accompanied with cash and postage added. In no case can we guarantee to supply copies, as our storage accommodation is limited.

A postcard will be sent if the number required is out of print.

For copies three months old, ninepence; six months, one shilling; and beyond that period, one penny per month per copy.

As there is a regular demand for back copies of the "Mining Standard," newsagents are requested to send back all returns uncut and in good condition, otherwise they will not be accepted.

All Returns from Newsagents must reach us by the end of each month (the whole paper must be sent). No credit will be allowed beyond this term.

Postage British, 1d.; Foreign, 1½d.; Australasia, ½d. per copy.

Stamps will be accepted as pre-payment.

Address communications: Publishing Department "Mining Standard."

**CASUAL ADVERTISEMENTS.**

The rate for this class of advertisement is governed by the position it occupies.

If it appears on leader page or amongst or next to reading matter, the rate is 15s. per inch (nonpareil) per insertion.

Towards end of reading section
Brevier, 16 ems width, 6s. per inch per insertion.
Nonpareil, 8s. per inch per insertion.

For the convenience of advertisers, we might state that Brevier has approximately 7 words to a line, and 8 lines to the inch 6s. Nonpareil has approximately 8 words to the line, and 11 lines to the inch 8s.

**ALTERATION TO ADVERTISEMENTS.**

As our publishing arrangements necessitate the "Mining Standard" being issued simultaneously in Sydney, Melbourne and Adelaide on the same day each week, advertisers wishing to change their advertising matter must supply same ten days in advance of publication.

**ADVERTISEMENT PROOFS.**

Proofs are submitted to advertisers in order to give them an opportunity of going over the advertisements before printing.

Advertising Copy must be typed and so arranged as to clearly indicate the display required for the more important features of the advertisement.

Any departure from the original copy will be charged for. Advertisers are specially requested to instruct their publicity departments to give us clear and definite instructions respecting changes of matter or new copy in order to avoid incurring unnecessary charges.

AUSTRALIAN
**MINING STANDARD.**
PUBLISHED EVERY THURSDAY.
ESTABLISHED 1888

It is requested that all business communications be Addressed to Critchley Parker.

THURSDAY, OCTOBER 2, 1913.

## THE FUNCTIONS OF GOVERNMENT.

In dealing with the proposal of the Federal Government in regard to the Electoral Act, we expressed the intention of dealing later with the proposal to transfer to a High Court or Supreme Court judge the question of electoral redistribution. We greet the proposal as a step in the right direction; in fact, we consider that the Government has made a move which we have long been of opinion should have been made by the Convention which drew up the Constitution under which we live. It is commonly said that there are three main functions of Government—the legislative, the executive, and the judicial—but this hardly states all the facts of the case, and does not fulfil all the requirements of a modern State organisation. In the first place, we have the whole of the people of the Commonwealth (acting partly as a single people, and partly as six separate peoples) forming a constitutive body that has the power of altering the Constitution which it originally brought into being. This is the body to which all proposals for the amendment of the Constitution have to be referred, and it is only with the approval of a majority of the members composing this body politic, and of a majority of the members in a majority of its six sections, that the amendment can become law. Secondly, we have the same public, but differently constituted, forming an elective body to settle the personnel of the legislature of the Commonwealth. (In the United States of America this body elects, not only the legislature, but also, in some cases, the executive and the judiciary.) Thirdly, we have the legislative body whose duty it is (a) to enact laws, (b) to impose taxes, (c) to appropriate revenue and authorise public expenditure, and (d) to unmake administrations. This consists of the two Houses of Parliament—the Senate and the House of Representatives—elected by the people. Fourthly, we have the executive body, which (a) puts the laws into force, (b) summons and dissolves Parliament, (c) calls the people to the exercise of their electoral duties, (d) issues commissions for the formation of administrations, (e) appoints the judiciary and the chief public officers, and (f) has the power to remit sentences imposed by the courts of justice for violation of the laws. The executive consists of the King (or the representative of the King) and a council which, while nominally only advisory, in reality wields all the power. Fifthly, there is the judicative body, whose work is (a) the administering of justice in civil cases, (b) the determination of the constitutionality of the enactments of Parliament, (c) the determination of the applicability of the law to individual cases, (d) the sentencing to punishment for violation of the law, and (e) the settling of the terms and conditions of employment, this last function being one that has appertained to it only of recent years in Australia, and that in most countries does not exist at all. We should dearly like to add to it one other function—that of prohibiting any alteration of the remuneration of members of Parliament, and of Ministers of the Crown, without a direct reference to the electors, so that we might never again be disgraced by seeing our legislators raise their rate of pay after an election at which the possibility of such a procedure was never even hinted at. Sixthly, there is the administrative, which, though often confused with the executive, is, in fact, distinct. Its duty is (a) to conduct public affairs, (b) to enter into contracts on behalf of the State, (c) to carry out the laws, (d) to collect revenue, (e) to pay the public debts, and (f) to inflict punishments imposed by the judiciary. At the head of the administration stands the Government of the day. Now, seventhly, there seems a prospect of our having a body whose duty it will be to perform work which it is out of question for the Legislature to do fairly and honestly; that is to say, to determine and revise the division of the States into electorates. This function has hitherto appertained to the Legislature itself, and has been most unsatisfactorily performed. Nominally, three Commissioners for each State have had the task imposed upon them; but, in actual fact, they have had no authority whatever; they have merely been empowered to recommend to the Legislature what should be the divisions of the State they had to deal with, and it has rested with Parliament to accept or reject their proposals. This is to be altered (if the Opposition will permit) so as to make the determination of this commission (which is to consist of only one man for the entire Commonwealth, instead of three men for each State) practically independent. If neither House pass a resolution, of which notice has been given within 30 days, disapproving of the proposed distribution, the scheme is to take effect. If either House insist upon a reconsideration by the Commissioner, a fresh distribution of electors must be proposed; but this revised proposal becomes law whether it has the approval of Parliament or not. That is the proposal; but though it is eminently right and reasonable, we doubt if there is much prospect of its becoming law, because one may be quite certain that the members of Parliament will not be willing to relinquish the power they now hold of gerrymandering the constituencies. The power never ought to have been given to them; but, as they have it, it will be very difficult indeed to take it away from them. As a matter of fact, the body which it is proposed to form should have not merely this one function of determining electoral divisions and boundaries, but should also have the function of supervising the collection of the statistics on which those divisions are legally based. In saying this, we do not propose that the two functions should both be entrusted to the one individual. We only suggest that the Statistical Department should form a branch of this divisive body (if we may so term it) instead of forming, as it does now, one of the departments under the control of a member of the Ministry. Another function of this body should be the determination of all matters in connection with the holding of elections (save the fixing of the date), a duty which now appertains to the Legislature, and is used in a purely party spirit. It would then be for this body, and not for Parliament, to decide whether or no postal votes or absent votes should be admitted. It might further have the revision of the electoral rolls, this duty carrying with it the determination of the right of the individual to have his name thereon. Endowed with these four functions, this body should fill a valuable place in the polity of the Commonwealth, ensuring honesty in the distribution of the voting power of the States, putting gerrymandering out of the question, giving us electoral rolls that would have little danger of being tainted, and securing as fair a representation as possible of the views of the electors.

## CORNERS IN STOCKS.

The Sydney Stock Exchange is to be commended upon its decision to abolish, or, at least, to render more difficult, the cornering of stock. American manipulators in the markets in which industrial commodities are dealt in have accustomed us to the cornering of those commodities; but that is a work of immense difficulty, in which the manipulator has to take risks that call for iron nerve and the most remarkable courage. To corner wheat, to corner wool, to corner copper is a simply tremendous undertaking, as others besides M. Secretan have discovered to their cost, but to corner scrip is often a very easy operation, and one involving comparatively little risk. A man or men holding the bulk of stock in a concern may buy with impunity from speculators, knowing precisely the odds against them. Recognising the undesirability of this class of business, the Sydney Stock Exchange has followed the example of the London body in legislating against it. It has adopted a rule which reads as follows:—"The committee may suspend either indefinitely or for such time as they think fit the buying-in of any debentures, transfers, scrip, or other securities, when circumstances appear to them to make such suspension desirable. The committee may from time to time, either during its continuance, or after the termination of any such suspension, remove, renew, or re-impose such suspension." As we have intimated, we entirely approve of the aim of the committee, for those who corner are poor sportsmen, whose idea of gambling is to play with loaded dice. But whether the rule adopted will prove an unmixed blessing is another matter. Is it not possible that the Exchange's regulation will have the effect of playing into the hands of the bears? Will these not be in a position to run down the value of stock with an impunity which has not been theirs hitherto? These people, whose game is to depreciate in order to frighten holders and so obtain scrip at less than reasonable rates, are no more deserving of sympathy than are the unscrupulous cornerers, and it is to be feared that the action of the Exchange, while doing good in the direction of checking the manipulators of corners, may depreciate the value of many investments by freeing the hands of the bears.

Why is it that arbitration is becoming unpopular? For so it undoubtedly is. Time was, and that not so long ago, that arbitration was looked to as the industrial panacea; now there are influential men on both sides who declare that it has proved a failure. In the ranks of the workers there are, of course, many who hate the very idea of arbitration, voluntary or compulsory, as involving a surrender of the right to strike, and a strike is just the one thing in life worth living for, particularly if one happen to be an official of a union. But even union leaders are not unanimous in this attitude, as Mr. Kavanagh, M.L.C., of New South Wales, showed recently. And there is a wide-spread impression outside the ranks of trade unionism that employees have been the gainers all along the line in their appeals to the Commonwealth Arbitration Court—not gaining all they sought, certainly, but gaining much. Supposing this to be the case (and the supposition implies no reflection upon the absolute independence of the learned President of the Court), it should surely reconcile the industrial classes to a tribunal which has done so much for them. If, on the other hand, that fact were alleged by employers as ground for dissatisfaction with this process of settling labour troubles, there would be some show of logic in their discontent. This, however, is not the case. Mr. Justice Higgins has more than once been able to congratulate himself on the readiness with which employers and employees alike have accepted his awards and abided by them. But when we turn to State arbitration courts the very opposite feeling appears to prevail. Only last week Mr. E. H. Buchanan, president of the Employers' Federation of New South Wales, commented upon the very unsatisfactory position in that State, which he appears to attribute, not to the principle of arbitration, but to the lax manner in which the law is administered. It is for this reason that Mr. Buchanan thinks arbitration a failure. Employers, he says, have always to obey the law and to conform to awards of wages boards and Arbitration Courts, while the workers flout the awards with impunity, and a sympathetic Government has to be appealed to by the employers before penalties are enforced on strikers. Surely it is a mere travesty of sincerity for any Government to allow a law of its own enactment to be flouted by people who do not care to obey it! That Mr. Buchanan should be able to say that his association has been instrumental in inducing the Government of the day to put the penal clauses of the Arbitration Act into force, is a reproach to which no self-respecting Government should allow itself to remain open. Common decency should dictate to Ministers in power to see that the law is obeyed, without having to be asked to do so.

* * *

Mr. Charles Neil, described as an ex-Labour Commissioner, is reported to have stated that the unenviable record of railroad disasters in the United States was due to the system by which officials were encouraged to reduce the cost of working the lines, with a consequent deterioration of equipment. It is not unlikely that there may be an element of truth in this statement, if only Mr. Neil had contented himself with making it less sweeping. During the year ended June 30th, 1912, there were 10,585 persons killed and 169,538 injured by railway accidents in the United States, and in the July number of the "Atlantic Monthly," Mr. S. O. Dunn quotes the annual report of the Interstate Commerce Commission for 1912, as saying that "the most disquieting and perplexing feature in the problem of accident prevention is the large proportion of train accidents caused by dereliction of duty by the employees involved. . . . The gravity of this problem is indicated by the fact that of the 81 accidents investigated by the Commission up to September 1st, 52, or more than 63 per cent. of the whole number, were caused by mistakes on the part of employees," and amongst the "mistakes" enumerated by the Commission are "disobedience to orders, disobedience to signals, failure to keep clear of superior trains, improper flagging, and failure to control speed at dangerous points." Most people will be surprised at these playful little ways of enginedrivers, signalmen and others to whose tender mercies the public entrust their lives, being set down as "mistakes"; but the Commission was in a tender mood when drafting its report, and explains that they are so described because the commission could not believe that employees would deliberately ignore disciplinary measures which they knew to be necessary for their own safety as well as for the safety of the travelling public. Yet in Australia it has been ascertained, on the admission of experienced drivers, that running past signals is (or was, only a few years ago) quite a common practice. Hence the crying need for electrical and other locking devices which shall reduce the human and untrustworthy element to a minimum, and the travelling public must make up its mind to submit to the consequences of the vagaries of that minimum.

* * *

Mr. Goldsmith, P.M., the warden of the Ballarat (V.) goldfield, found himself embarrassed last week when dealing with an application for forfeiture of a lease, and was compelled to leave it to the Minister of Mines to shoulder the praise or blame. Of course, in every case the final decision rests with the Minister; the warden has at most the power to recommend that forfeiture be granted, and that a new lease be accorded to the applicant. But Mr. Goldsmith's difficulty was to decide whether he ought to recommend or not, so he "stated a case." Application had been made by the William's Fancy company, Berringa, for the forfeiture of a lease to the south of them, on the ground that the labour covenants in respect of it had not been observed. The company also asked that the area be granted to it. When the case was being heard, Mr. G. C. Buchanan, one of the directors, showed how assiduously the company's present lease had been worked. They had, he said, 3000ft. in length of ground, and in that area they had done five miles of driving, rising, and crosscutting at various levels, chiefly in the northern end of the mine, and it was only partially proved. This had taken 13 years to do. In his report to the Minister Mr. Goldsmith pointed out that on account of the development in the southern portion of the William's Fancy, the area applied for would be advantageous to them. And he continued:—"I find (1) that a co-operative party subscribed, and that the leases were taken up on behalf of the party; (2) that the attempt to float a company to work the leases was bona fide; (3) that it was through inadvertence an exemption was not applied for; (4) that while it is not certain that if further time be afforded them a company sufficiently strong to work the areas will be formed—it being conceded by both sides that a large sum will be necessary to work them unless gold should be fortunately struck near the surface—it would appear that the chief factor in these applications is whether a company holding a fairly large area of ground, which it is admitted to be working bona fide, should be granted further ground which, it would seem, is not essentially necessary for its immediate pressing requirements, but the non-granting of which, to it, might result in the lease areas not being worked. This, in my opinion, is a question of mining policy, and I therefore make no recommendation in the matter." There the matter now stands, awaiting Mr. Billson's decision.

* * *

In our issue of August 28 we quoted the new scale of brokerage charges agreed upon at a conference of delegates from the Sydney, Melbourne, and Adelaide Stock Exchanges. The scale then drawn up was tentative, but it was expected that on being submitted by the delegates to their respective committees and to the members of the exchanges they would be accepted. Such, however, is not the case, and the question of brokerage is now little nearer to uniformity than before the conference. Sydney and Melbourne have agreed on some of the alterations suggested, but Adelaide rejected them bodily. The Melbourne Exchange will make no alteration in brokerage on investment stocks, provided the companies they represent are on the official list; in the case of companies not on the official list, commission may be charged for both buying and selling, but in the case of companies which are on the list, commission is chargeable by the selling broker alone, and must be divided with the buying broker. And to meet the position of a member of the Melbourne Exchange who buys in other markets, it is provided that he may charge the full rate of brokerage. With respect to dealings in mining scrip, however, some changes in favour of clients are introduced with respect to shares negotiated at between 15s. and 75s., as follows, the new rates being placed first and the old rates following in parentheses. From 1s. to 15s., no change. Over 15s. to 20s., 3d. (4d.); over 20s. to 30s., 4½d. (6d.); over 30s. to 40s., 6d. (6d.); over 40s. to 45s., 6d. (9d.); over 45s. to 60s., 7½d. (9d.); over 60s. to 75s., 9d. (1s.); over 75s. to £5, 1s. (1s.); over £5, 1 per cent. (1 per cent.). Where brokerage on any transaction does not amount to 10s., that amount may be charged. The rules laid down for brokerage on loan flotations are made equally clear, and the concluding words of the regulations are very definite:—"No other rates than those fixed in this rule shall be charged to purchaser or vendor, and no allowance by way of rebate, return commission, or otherwise shall be made except to members of recognised Stock Exchanges, not carrying on business within a radius of 20 miles from the Post-office, Melbourne, or to recognised stock and share brokers in places where no exchange exists." It is a great pity that the three Exchanges could not have come to an agreement.

* * *

It is less than a year since the terribly disastrous fire broke out at the North Mt. Lyell mine, which cost the lives of a large number of miners who had been entrapped and led to the subsequent death of more than one of the gallant band of rescuers. It would have been thought that a vivid recollection of the circumstances of that outbreak would make the men unusually quick to detect and report any incident which even seemed to jeopardise their safety. They will not have forgotten the contumely which was heaped upon the management at the time for imaginary neglect and disregard of human life, contumely so bitter that, even after a most impartial inquiry had utterly destroyed the allegations which gave it birth, it endeavoured to enshrine itself on a tombstone; neither will they have forgotten the vehemence with which their leaders repudiated the suggestion that some of the men themselves were actually responsible for the outbreak—not necessarily with malice aforethought, but possibly by some act of carelessness or neglect. Yet, what do we find? In less than twelve months there is a strike, and then the public learns that in this instance at least the regulations of the management made for safety while the action of one man was exposing the mine and all its workers to a new conflagration. The management had given instructions that on no conditions were fire pots to be lighted at the braces, where the woodwork is exceptionally dry, yet one of the bracemen knew better, and would have a fire there when on duty. He was remonstrated with and forbidden to light the fire; and, as he persisted in disobeying this order, he was dismissed. Then followed a strike; short-lived, it is true, but a strike nevertheless, and all because the company was anxious to protect its servants and its own property from further disaster! The incident shows not only the gross disregard of some men for rudimentary caution, but also the blind, unthinking readiness with which a number of men will suspend operations on the lightest word of complaint, and then commence inquiring whether such complaint is justified or not.

* * *

Is it because Australia is not big enough, or not good enough, as a field for speculation, that more than a fair share of Australian capital is going abroad? It is unpleasant to hear the suggestion that labour legislation is the cause of this state of affairs; but upon investigation there is no doubt some justification for the belief. Something may be said for the possibility that foreign investments are more attractive on the grounds of richer yields, but more for the supposition that it is on the ground of greater profit; there being a pronounced difference between the two things. Of late years Australian mining companies operating on foreign soil have been becoming sufficiently numerous to render the circumstances conspicuous. Why this exodus of capital? Are the mineral resources of Australia exhausted or becoming exhausted, or incomparable with the riches of other countries? Emphatically, no! The mineral resources of Australia have been proved to be so varied in character, and so consistently regular in occurrence over an enormous span of country, as to suggest a potential wealth eclipsing that of almost any other country in the world. Australia is a mineral country first and last, with other forms of primary production sandwiched in between. Obviously, then, dearth of opportunity for speculation in Australia is not the cause, nor one of the causes, of the growing tendency to bestow attention on mining ventures abroad. A lot of Australian capital has gone into Java, amongst other places, and Australian companies now figure prominently in the Malay Peninsula and the Philippines. It is also highly probable that a very large sum of Melbourne money will soon find its way into an oil proposition in Timor. There is some colour in the argument that "distant fields are greenest;" but the chief cause is to be found in Australia itself. It is not because the foreign venture is prospectively richer or more certain, but because the profit is prospectively greater. The cause lies between the extractable value of the mineral and the cost of getting it; and the cost of getting it in Australia includes not only high wages (which are quite justified if the efficiency be there), but innumerable other costly items, such as delays through strikes and high cost of material occasioned again by high wages and delays due to industrial troubles. The worst feature of an enterprise is the anxiety attendant on making it pay in the face of many difficulties. The promoter of it prefers not to have any more anxiety than ordinarily accompanies a somewhat speculative venture, so he goes where a lot of items which swell costs in Australia are conspicuous by their absence.

---

## NEWS AND NOTES.

A correspondent writes as follows:—"It would appear from the reported crushings of the Long Tunnel mines, which show a gradual decrease from 8 dwt. 15 grs. to 5 dwt. 20 grs. per ton, that the old company did not leave much payable stone in the levels opened up. The yields obtained by the old company during the last year of its long life were as follows:—For six months ended July, 1912, 9 dwt. 11 grs.; for six months ended December, 1912, 10 dwt. 14 grs. per ton milled. With this yield, however, while carrying on several ends of development, and in the face of expensive conditions, the company had to cease operations. The position at present is certainly not re-assuring, and it would be interesting and valuable information if the Geological Department could state the depth at which in this and other deep mines in Victoria the reef ceased to be payable, shaft-sinking and other developmental work being allowed for."

The Edna May Central Gold Mines N.L. has been floated, with a nominal capital of £30,000, in shares of 10s. each, to work three leases to the east of the Edna May mine, at Westons (W.A.), including the Myrtle Central lease. The public issue consists of 24,000 shares at 7s. 6d., the balance of 2s. 6d. being callable at the discretion of the directors. The vendors received 24,000 fully-paid shares, and other considerations, and the promoters 2000 fully-paid shares, while 10,000 shares are held in reserve. It is stated that it was through operations at the Myrtle Central mine that the Edna May was first discovered. According to Mr. A. E. Morgans, the Edna May No. 3 shaft was really the prospectors' original shaft, and was put down about 40ft. from the Myrtle Central boundary, with a view of striking the reef already found in that property. From that No. 3 shaft the discovery of the Edna May vein really began. Driving northerly towards the Myrtle Central was started by the prospectors, and the boundary was reached at 38ft., the vein at that point being 7ft. wide, and worth 74s. per ton.

A trial parcel of 9 tons 13 cwt. of ore obtained in development work at the Mt. Bonnie Mining Co.'s property in the Northern Territory, is reported to have given the following assay values:—Lead, 32 per cent.; gold, 1 oz.; silver, 4 oz.; the gross value was £10 5s. per ton, and the net amount received after payment of returning charges, assays, railage, and wharfage, was £3 10s. per ton. The mine manager states that several thousands of tons of ore of similar quality are in sight.

A discovery has been made on private property near Normanville, in the Yankalilla district of South Australia, of what is declared to be a valuable formation of clay, which is identified as alum stone. A sample of the deposit was forwarded to the Adelaide School of Mines for analysis, and the report was most favourable. It is said that the clay is found in only one other part of the Commonwealth. A syndicate is being formed to work the deposit.

The output of the Pioneer Tin Mining Co., Bradshaw's Creek (T.) for the six weeks ended on September 20 was 67 tons of stream tin.

When the Poseidon United G.M. Co., Tarnagulla (V.), recently abandoned what was known as its "Cat" section, the directors little thought that it held some very fine nuggets; but recent events have proved that it is typical Poseidon country. For several months two prospectors, Messrs. Maxfield and Wilkie, have been steadily working away at the "Kitten" claim, with no very satisfactory results until the last week or two. About a fortnight ago they were given fresh heart by unearthing a 14 oz. nugget, and on Tuesday of last week a second nugget, weighing in the rough 281 oz. 13 dwt., and estimated to contain 240 oz. of gold when cleaned up. This addition to the wonders of the Poseidon field has been named the "Little Pos." But even this did not complete their run of luck, for last Saturday, lying close to where the big slug had been found, another nugget, weighing in the rough 25 oz. 15 dwt., was discovered, which gave 23 oz. of smelted gold.

The Kampong Kamunting Tin Dredging Co. some time ago arranged with Mr. J. S. Henry, who designed and erected the Tongkah Compound dredge, to supervise the construction in Australia, shipment to Malaya, and erection of the mine of the two dredges required by the company. Mr. Henry has completed the plans and specifications for the dredges, tenders have been called, and it is expected that the contract for building will be placed at an early date.

The quarterly report of the Tasmanian Secretary for Mines for the term ended on June 30 shows the value of the metals and minerals raised as £350,506, the main items being—Tin ore, £129,835; silver lead ore, £95,966; blister copper (less gold contents), £74,113; and gold, £35,255. During the first quarter of the year the value was £270,154, showing an increase of over £80,352. The principal improvement, however, was £43,673 in blister copper.

Last week the Victorian Executive Council approved of an advance, under the Mining Development Act, of £1000 to the Casley, Red, White and Blue Mining Co., conditional on £2 being spent by the company for every £1 so advanced. Other advances were granted as follows, on the condition in each case that the company spends a like amount:—Cassilis Gold Mining Co., £4000; Goldfields Consolidated Co., £2500; Sebastopol Plateau Co., £1300; Bright District Prospecting and Gold Mining Co., £500.

In our issue of the 18th ult. the total amount Dredging Co., Siam, was stated as £174,000. The figures should have been £187,500.

The Victorian Minister of Public Works, Mr. Hagelthorn, has accepted the tender of the Broken Hill Proprietary Ltd. for the supply of 100 tons of spelter at £22 17s. 6d. per ton. This is required for coating the wire netting manufactured at Pentridge, where about 50 miles of netting is made every month.

The 50,000 preference shares of Caledonian Collieries Limited, recently offered for sale to shareholders in the Howard Smith Co. Ltd., were considerably over applied for.

With the payment on October 1st of a dividend of 1s. per share (£50,000 in the aggregate), the Mt. Morgan G.M. Co. (Q.) brings its total distribution up to £8,179,000.

The Briseis Tin and General Mining Co. (T.), not satisfied with its Tasmanian stanniferous properties and its Wallace gold leases at Yackandandah (V.), has taken an option over a tin lode proposition lying near Germanton (N.S.W.), the leases comprising between 350 and 400 acres.

The directors of the Ajax Central G.M. Co., Daylesford (V.), have voted five guineas to the Ballarat Orphanage and the Daylesford Hospital respectively. The chairman, Mr. George Buchanan, was voted a bonus of 100 guineas at the shareholders' meeting, but declined to accept it.

Not only the mine owners and their representatives are looking forward anxiously for the report of the Dredging Inquiry Board appointed some time ago by the Victorian Government; the miners also are concerned, and last week a large meeting of district representatives of the Political Labour Council and workers was held at Bright, at which the attitude of the Labour members of the State Parliament regarding the dredging industry was discussed. The speakers expressed themselves as well satisfied with the conditions of labour on the dredges, as well as with the hours and the rate of pay, and woodcutters were of the same opinion. Most of the employees, it was pointed out, had built homes near the site of their labours, and abolition of the industry would mean practical ruin to themselves and their families. It was decided to appeal to the Labour members of the State Parliament to protect the gold dredging industry. Similar meetings have been held in other parts of the district, and a monster petition to preserve the dredging industry is talked of.

Dividends paid to date by Cobalt (B.C.) mining companies total £9,688,782, to which 23 companies have contributed, the Nipissing topping the list with over £2,000,000. In proportion of time this is a record, being nearly equal to that established by the great Mt. Morgan mine in Queensland.

Messrs. D. James, T. J. Walters and A. Rehder are the directors of the recently formed Appealinna Copper Mining Co., which is to work 160 acres near Hawker (S.A.). The property is said to be already fairly well developed, and 689 tons of 33 per cent. ore have been won from it and sold to the E. and A. Copper Co., which realised £13,000 after all smelting and other charges were deducted.

## PERSONAL.

Mr. F. W. Morgan, manager of the Bullfinch Propty. Ltd. (W.A.), died suddenly last week in a train while proceeding to Perth. His death will be widely regretted, as Mr. Morgan was extensively and popularly known in W.A. mining circles. Mr. Morgan was appointed manager of the Bullfinch shortly after its flotation, and has been instrumental in introducing into that mine some sound practical methods which bear tribute to his ability.

After nearly 22 years' service under Government in Western Australia, Mr. John Muir, inspector of engineering surveys, applied recently for long-service leave to which he was entitled. In reply, he has been informed by the Minister of Works that at the expiration of this leave, which was granted, his position would become vacant. Mr. Muir's connection with the railways of that State covered the most critical period of their history, and the sudden intimation that his services are no longer required came as a great surprise to him, especially as no cause was assigned. Mr. Muir does not hesitate to ascribe his dismissal to his attitude towards Mr. O'Malley and Mr. Chinn in connection with the claim that the latter had saved the Commonwealth Government £55,000 by changing the railway route near Kalgoorlie, which claim Mr. Muir openly contradicted. "I have had charge of all railway surveys during the expansive years of Western Australia," he says, "and now, because I am not a valuable member of 'our party,' I am treated in this scurvy way."

For the third time in succession, Mr. Phillip Cohen, chief clerk in the Victorian Mines Department, has been elected president of the Melbourne Hebrew congregation.

Mr. A. G. Brown, assistant Parliamentary draftsman for Victoria, has been selected from amongst 180 applicants for the position of secretary to the Interstate Commission. Mr. Brown, who is a qualified barrister and solicitor, is 48 years of age, and has had experience in the Postal Department, on the staff of the Public Library, in the Chief Secretary's Department, in the Lands Department, and subsequently on the staff of the Federal Attorney-General. Of late he has acted as secretary to the Ministerial members of the Senate. Mr. Brown's new position carries a salary commencing at £700 and rising to £800 a year.

Mr. D. H. Brown, who is well known in connection with alluvial mining in Victoria, has been appointed mine manager to the Cathcart Central G.M. Co., Ararat (V.), in succession to Mr. R. Roberts, resigned.

The distinction of being the first Australian to pass the Commonwealth examination in wireless telegraphy, as both ship and land telegraphist, is Mr. Augustus Hart, of Watchem, who has just secured both certificates.

Mr. F. Monk, lately engineer with Messrs. W. G. Watson and Co. Ltd., of Sydney, has severed his connection with the firm, and joined Mr. R. C. Cliff, consulting electrical and mechanical engineer, 4 Castlereagh-street, Sydney, and that business will now be carried on under the name of R. C. Cliff and Monk.

Mr. W. T. Hanley, of Harrietville (V.), master of the Smoko dredge, is suffering from blood-poisoning which followed the drawing of a tooth.

## BRIEF COMMENT.

The report of Dr. R. Logan Jack on the Carpathia Tin Mining Co., Ardlethan (N.S.W.), rather fails to enlighten shareholders on those points which are of importance to them in regard to mining as a practical business. It is clear that development work has not yet reached that stage wherein it is possible to give definite information as to the nature of the ore occurrence, or a safe estimate of the value of the ore in sight. The fact that the irregular occurrence of the ore bodies so far disclosed has necessitated irregular development work, has no doubt rendered Dr. Jack's task a somewhat difficult one, and he definitely quotes the fact that no ore has been exposed on three sides as a reason for not being able to furnish an estimate of ore reserve. He qualifies this omission by stating that in his opinion the mines will, from what is already known, easily repay in dividends the balance of the capital subscribed. Fortunately, as Dr. Jack states, the Carpathia ore is rich, and it seems indisputable that the sampling might have been done in 2ft. sections from end to end of development work, and still show the average result to be a highly gratifying one. Though there is some optimism in Dr. Jack's conclusion, that the "Carpathia promises to become a great mine," he is doubtless inspired by the belief that there exists in the property a main stanniferous lode, outside of and in the vicinity of which there will always be found the rich masses of ore which have so far characterised the mine, and have yielded such handsome returns.

We regret that in our issue of September 18th the report of the first meeting of the Ardlethan Options Co. was inadvertantly attributed to the Carpathia Tin Mining Co. The mistake is the more regrettable by reason of the fact that the chairman of the Ardlethan Options Co. considers the failure of his company to locate substantial bodies of ore a distinct reflection on the rest of the field.

The vague rumours which are in circulation regarding the Mount Oxide Mines Ltd. (Q.) can have very little foundation in fact, and for the most part may be regarded as rubbish. It is quite likely that, although registered, no attempt has yet been made to float the company in London. The flotation, however, may be regarded as a foregone conclusion if the London group, into whose hands the property is said to have passed, is definitely committed to it. There has been far too much secrecy connected with the transaction to make it savour well, and statements to the effect that large sums of money have been handed over in connection with the property are better treated with suspicion than with credence. Authentic information is given out to the effect that shareholders in the old company are to receive from the new company share for share, and it is extremely probable that this is the arrangement under which the new company was registered; therefore very little reliance need be placed on any statement regarding a monetary consideration, until it is officially announced, and has the unmistakable seal of authority. The agreement with the Fanti Consolidated is probably a financial one, whereby that concern undertakes to help the flotation through for the usual considerations. When the float does happen, applicants for or buyers of shares may rest assured of one thing—that any increase in the market value of the shares will be merely temporary, as the long wait involved in getting adequate returns from the mine is bound to affect shares adversely in the long run.

The announcement that the Lacmalac Gold Mining Company, N.L., has been formed to develop a long-abandoned property near Tumut (N.S.W.), indicates how precarious is the chance of any prospecting show attaining the distinction of being a producer. That abandonment of a property is prima facie evidence of its worthlessness is by no means a logical inference when the difficulties to be surmounted in the prospecting stages are taken into consideration. The values said to have been proved in the Lacmalac are no doubt traditional, and therefore unreliable; but, if they are to be credited, it is very extraordinary that the property should have been so long neglected. The capital of the company is £6250, which should be more than ample for the purpose, as there has been 600ft. of development work done, and the deepest point is only 70ft. This represents a considerable saving in capital expenditure, as the cost of reaching and redeeming the working faces should not be excessive.

Another property to be conditionally restored to activity after a long period of idleness is the Mount Hope Copper mine, which lies 80 miles west of Condobolin (N.S.W.), on the route of the projected railway from Condobolin to Broken Hill. The condition is that nothing will be done until it is definitely known that the Government intends to start the railway. If the promoters are well advised, they will not do anything until the railway is actually within reach of the mine. One of the most important factors in successful and economic mining is situation, and one which, unhappily, is the most frequently ignored. The record of the Mount Hope mine itself is evidence enough of this, as it has produced nearly three-quarters of a million pounds worth of copper, and has undergone all the vicissitudes of a mine badly situated in regard to railway facilities. A property must be exceptionally rich to bear the burden of extra cost involved in 80 miles of transport by the most primitive methods, and as the Mount Hope could not stand it the moral is obvious. £700,000 of copper, sporadically produced, and then six years of neglect!

Considering that gem production in Australia is infinitesimal, the result of operations in the Mt. Ross diamond mine (N.S.W.) must necessarily always be of exceptional interest. At the last general meeting of shareholders the manager of the mine stated that some new ground had been opened up and proved to carry diamonds, the largest of which weighed 2¾ carats. At the meeting it was decided to adopt the recommendation of Mr. A. E. Brown, who had made an inspection of the mine on behalf of the company, to sink a shaft in the crater formation which exists on the leases. In order to carry out this work and instal a washing plant, a call of 6d. per share (contributing) was decided on.

If the reports regarding values in the Mount Oxide district are reliable the uninitiated may perhaps be led to regard the field as a veritable Eldorado. The manager of Oxide Creek Ltd. wires that "the winze is now down 70ft. below the adit, bulk sampling 40 per cent." Bulk sampling of what? The whole of the material taken out of the 70ft. of winzing? In a letter the same gentleman is reported to state that "the seam of glance on the footwall averages (averages!) 60 per cent., the balance of the winze of unknown width, 25 per cent. The statements are clearly contradictory and misleading. If it is intended to convey the intelligence that the winze—sides, ends, and bottom—bulks 40 per cent., then the sink has been entirely in ore, and the information is something to go on. But the information supplied is too meagre to permit much credence being placed upon it.

# THE INVESTOR'S COLUMN.

## Some Companies Attracting Attention To-day.

(By Our Exchange Reporter.)

### North Nuggety Ajax (V.)

About six months ago this stock, which had suffered severely in public estimation through the circumstances connected with the sensational collapse in price (which had followed on a steady rise to 87s.), began to recover again, every share which was offered from 11s. to 15s. being quietly accepted, although some heavy parcels were placed on the market. Sellers became scarce, but as it was generally stated by experts who visited the mine that it was only looking middling well—if that—there was a good deal of enquiry as to the cause of the strong demand, and the commonest answer was an assumption that the buyer, having got in rather heavily, was holding up prices in order to make a market and get out. Later on it began to dawn on these dealers who take an interest in Daylesford stocks that the two payable reefs now being worked by the Ajax Central Company were apparently pitching southward towards the North Nuggety, which had therefore a good chance of picking up their extension. This belief soon after seemed well founded when the Ajax Central No. 6 level on the western vertical was driven right up to the boundary in payable stone all the way, the width in the face being 4ft. The drive on the Ajax or eastern reef at the same level is also up to the boundary, the stone at this point being 5ft. thick and of good payable quality. As these facts became generally known further enquiry for the shares set in, and after a fairly heavy turnover the quotations improved until a firm price of 18s. was established. A little later it was announced that Mr. George Buchanan, chairman of directors of the Central, was about to take a seat on the Board, and also that arrangements were being made whereby the North Nuggety Company would be permitted to continue southward the levels which had been driven to the boundary by their neighbours. It will be remembered that the latter company had itself some 18 months ago obtained a very similar permission from the Ajax Company, and had so followed northward the western vertical which the Ajax had proved. It is not surprising that when these circumstances and conditions became realised that a confident feeling sprung up regarding the future of the mine, and when after a few feet had been driven from the boundary, on the eastern lode, the management telegraphed to the Exchange that payable gold was showing in a reef three feet wide, the shares were bought up to 22s. 6d. A quick reaction to 19s. ensued, and the shareholders were disappointed to learn that the subsequent developments were not up to expectations, the reef a little further on having split up and become poorer. Other development work confirmed the above disappointing result. This work had been carried on by means of a crosscut put in at the No. 6 level, from a long northern drive and at a point apparently about 120ft. from the boundary. This crosscut at 89ft. intersected a big mullocky lode which was driven on to the boundary, near which it split in two, one-half going to the west of the drive and the other, which went very flat, to the east, apparently not rising to the height of the drive, which is about 30ft. above that of the Ajax Central No. 6. The main north drive at this level had been continued to about 50 or 60ft. from the boundary, and from this point a crosscut was put out west in the hope of meeting the continuation of the Ajax Central western vertical, a development which it was expected would occur at a distance of between 90 and 100ft.

The lode track was duly intersected, but unfortunately it did not appear to carry anything of much value; the crosscut was then continued another 30ft., when the welcome lode was met. This was found to be 3ft. wide, and carrying a little gold; a rise has since been put up upon it, but without anything payable having so far been discovered.

It will be gathered from this brief account that the development work had so far been attended with decidedly discouraging results, and although it was thought that the crosscuts at this level (No. 6), which as stated are 30ft. above the No. 6 in the Ajax Central, were perhaps too high to meet the continuation of the payable stone, yet the outlook was certainly much less promising than it appeared when the crosscuts were first put in. Under the influence of the two disappointments the supporters of the stock became less confident and prices declined.

While these operations were being carried on at the northern end of the mine and at the No. 6 level, where the drive is much farther advanced than at the No. 7 shaft, sinking had been continued and a depth of 708ft. attained, this being the No. 8 level. A crosscut was then put out east and the Ajax lode track intersected; as expected, it was poor at this point. A drive is now being put in northward on this track, and the distance from the crosscut is now 120ft.; at a rough guess this may be about 300ft. from the boundary. The material in the track, which at first was about 5ft. wide and broken up, has during the last ten days or so become more mineralised, and lately a little gold has been seen. Such an improvement is a matter of considerable importance, for if payable gold should be met with at this depth, and in the Ajax lode, then the future of the mine might fairly be regarded as assured.

The market conditions at present are not very favourable, as far as mining companies are concerned, and the above development did not affect the price of the shares, as on Thursday sales took place at 14s. It is possible, however, that the favourable change was not generally known. On Saturday sales took place up to 17s., the closing quotation being 16s. 6d. buyer, 18s. seller, and the question for improvement is as follows. As already stated, the western crosscut at the No. 6 level, although it had failed to discover anything of value, had passed through a lode track which was evidently the western vertical: this was nearly three months ago. This week this track has been driven on north and south, and the work is disclosing a payable reef. At the same time at the No. 6 of the Central Ajax mine, which is 30ft. deeper, the drive is being continued from the boundary into the North Nuggety ground, and on Friday the mining manager reported that there was here three feet of stone which was prospecting well. Briefly summarised, the company has got payable stone in the western vertical, coming in from the Central boundary and also 30ft. higher up, at a point 50ft. farther south, while in the north drive on the Ajax lode at the No. 8 level there is a full face of stone carrying a little gold.

In addition to the possibilities disclosed by the above developments, there is a considerable amount of crushing dirt of fairly payable quality opened up in other parts of the mine, from which sufficient gold is being won to pay expenses and carry on the development work. Judging from the last progress report, the working faces are looking about the same, although a slightly lower average return is expected for the month.

These ore reserves are by no means sufficient to justify a price of 15s. or 20s. per share, especially as the mining expenses are unusually heavy, as may be seen from the last balance-sheet. In justice to the management, however, some allowance must be made for the amount of development work which is being carried on. It is probable also that it is more expensive to mine flat makes of stone than vertical reefs, and hitherto the gold has been won almost entirely from the former; in fact, it was from one of these makes or wings of stone that the company paid in a period of about twelve months £48,000, equal to 32s. per share in dividends.

As already mentioned, the position of the mine is somewhat similar to that of the Ajax Central prior to the two payable reefs being opened up, and it is quite possible that the North Nuggety has another successful era of operations in store. But it must be remembered that the chute of gold, as proved in the adjoining mine, is already a long one. There is also a natural break in the country close to the boundary between the two mines, and this may disturb the reefs. Under these circumstances it is evident that those persons who buy an interest in an attractive proposition are nevertheless taking a fair amount of the risk incidental to mining investments.

### Metropolitan Board of Works Debentures.

It is only a few weeks ago that these gilt-edged securities were obtainable at what may be described as winter bargain rates; the four per cents., long and short dated, with one exception, being offered at £98, with but few reasonable buying offers. This dullness of enquiry had lasted for some considerable time, and was generally regarded as owing to a continuance of the financial stringency which set in a little more than a year ago. The scarcity of money had during that period been so severe that it had raised rate of interest materially, both on mortgages and debentures, in the former case probably to the extent of 2 per cent. Even now 6 per cent. is obtainable on loans of this description. And not only were the rates raised, but in many instances it was difficult to get financial accommodation from the great banking institutions, even on undoubted securities.

There can be little doubt that this conservative policy was justfiied by the conditions of the period—the most serious of which was the severe drought, more particularly in Riverina, which is usually one of our greatest wool producing districts. There was also a very heavy trading account, for business had been exceptionally buoyant, and a mild land and building boom was also in the making. And worst of all, for the first time in the history of the Commonwealth, the volume of our exports was lower than that of our imports, although for ten years there had been an average surplus of nearly fifteen millions sterling per annum the other way. The balance of trade was against us, and the interest on our public debt, amounting to ten millions sterling, had to be made up in gold.

There are few greater dangers to a producing and debtor country than to be denuded of the great standard money substance, which, owing to its general acceptability, performs such important functions on behalf of the human race. The period was one of financial stress, but a change for the better took place with the break up of the drought, and since then the improvement has been steady and continuance. It is only quite recently that Stock Exchange investments have begun to improve in sympathy, in fact, as far as they are generally concerned, there is very little change in this respect. Debentures and Stock have, however, quite lately been in much better demand, and a good advance in price has taken place—in the case of the Metropolitan Board of Works amounting to £2 per £100.

This rise in price was taken advantage of in order to raise another £50,000, debentures for that amount being sold over the counter, according to priority of application, instead of by tender, which is the usual method followed by the Finance Committee of the Board.

Two parcels of £25,000 each were available—one falling due in 1918, and the other in 1931, the prices being £99 10s. and £99 respectively.

The whole of the issue was immediately applied for, so that the transaction may be described as an unqualified success.

Although a keen enquiry for high-class debentures is not always a matter for congratulation, indicating, as it sometimes does, unsafe or unsettled trade conditions, yet in this instance it has been a pleasant feature of the week's business, for it appears to have been caused by the accumulation of trust and other funds requiring investment.

---

# METAL QUOTATIONS.

(From Our Correspondent.)

## By Cable.

### London, Tuesday.

There was little activity in the metal markets during the week, consequently low prices ruled almost every day. On only one day did copper bring as good a price as at the close of the previous week, except in the case of electrolytic, which well sustained its previous advances. The same general remark applies to tin, the nearest approach to the previous Friday's rate being shown on Thursday, but even this late rise was only temporary. Lead went further and further downwards every day, and spelter was stationary at its reduced price. Silver, however, was fairly strong and continued the rise of the previous week, the average price being about 28 7-16d.

COPPER.—The week opened with a fall of 22s. 6d. per ton for spot, the quotation being £72 15s., but on Tuesday £74 was obtained, later prices being £72 15s., £72 17s. 6d., and £72 7s. 6d.

The rates for three months were £72 12s. 6d. (a fall of 21s. 3d.), £73 15s., £72 10s., £72 17s. 6d., and £72 7s. 6d.

Electrolytic brought £78 and £77 15s., yesterday's rate being £77 5s.

TIN.—Monday's quotations for spot lots was £191 15s., or 20s. lower than on the previous Friday, and later prices were £190 15s., £191 10s., £192 10s., and £190 10s.

For three months' delivery the prices were £191 10s. (2 days), £192, £193, and £190 15s.

LEAD, which at the week-end had been quoted at £20 12s. 6d. to £20 17s. 6d., brought £20 15s. on Monday, followed by £20 10s., £20 7s. 6d. to £20 10s., £20 5s., and £20.

SPELTER was unchanged at £21.

SILVER brought 28 11-16d. (a rise of 3-8d.), 28 9-16d., 28 3-16d., 28 7-16d., 28 9-16d., and 28 5-16d.

ANTIMONY.—"Star" brand rose 20s. per ton above the price for the previous fortnight, changing hands at £29 10s., while 50 per cent. ore was sold at £6 10s., or 10s. per ton better.

WOLFRAM (70 per cent. ore) was firm at 33s. 6d. per unit, equal to £117 5s. per ton.

MOLYBDENITE showed no change from 2s. 8d. per lb., equal to £298 14s. per ton.

MANGANESE (50 per cent. ore) brought 10½d. per unit, equal to 43s. 9d. per ton, as compared with 10d. per unit, and 41s. 8d. per ton as last week.

## CORRESPONDENCE.

### MULTIPLICATION OF VOLTAGES.

To the Editor.

Sir,—In view of the proposed adoption of a new voltage, 385 V. 50 periods, for the 3-phase system in Hobart, it might be as well for you to consider issuing a warning in your valuable journal against this multiplication of electrical systems which is going on in Australia. Quite a large proportion of concerns installing an alternating current system instal plants of a new voltage or periodicity which has no special advantage, and is simply singular in being different from any other system in Australia. The result is, of course, naturally bad for the consumer. He either becomes tied to the original supplier of the goods who has knowledge and foresight enough to stock against his future requirements, and who also requires to be paid heavily for such forethought, or he has to indent his supplies. As it takes three to four months to obtain anything ordinary from European stock, and anything up to 12 months to obtain supplies which are extraordinary, it will be at once seen what a distinct clog is placed upon Australian electrical business by the adoption of a special system. We urge that the Australian trade should be impressed with the advisability of, so far as possible, installing alternating current systems which are already standard, such as that adopted by the Sydney City Council. The example of the Council has been followed by the Electric Supply Corporation of Balmain, the Newcastle City Council, a few mines outside Sydney, in Brisbane by the Queensland Meat Export Co., and, quite recently, by the Port Melbourne municipality. The voltage 415 is sufficiently high for efficient transmission of current, whilst it is not too high to allow of perfectly safe motors and control apparatus.

Yours, etc.,
UNION ELECTRIC CO. OF AUSTRALIA LTD.
Sydney, Sept. 19.

### A QUERY.

Sir,—Can you advise me as to the following:—Is it a workable proposition for two pumps of different capacities and driven by two separate engines of different B.H.P., say 400 and 200 respectively, to pump water into one main column against a 110ft. lift direct to the nozzle? Would not the whole of the pressure of the greater pump nullify the action of the smaller one?

Yours, etc.,
"CENTRIFUGAL."
Melbourne, Sept. 23.

[Yes. It would be an advantage providing the main column were large enough to take the increased pressure and the runners of the pumps are run at the same peripheral speed.—Ed. "A.M.S."]

## THE NON-UNIONIST STRIKE (V.).

At a meeting of strikers held at Eaglehawk (V.) last Thursday, Mr. J. R. Little, general secretary of the F.M.E.A., assured the men that most, if not all, of them would be able to find work at other mining centres, specially mentioning Cobar (N.S.W.), and Mt. Lyell (T.). Later in the day, however, Mr. J. Ennor, manager of the Virginia mine (which is one of three from which unionists have been called out) said that the men would not be employed on other fields, as their names had already been sent to the various mining companies. They might as well stay in Bendigo. To this Mr. Little has replied that he has received from certain companies in other States railway fares for Bendigo miners.

The Bendigo branch of the F.M.E.A. received a deputation from the strike committee last week, which asked that a voluntary levy equal to one shift per member be invited towards the strike fund. One member said he failed to see why the local miners should be taxed any more than members of other branches. If they all paid their levies promptly there would be no necessity to make such a proposal. The matter was about to be considered in private when the president, Mr. Harris, asked the reporters to contradict statements which had been made (he did not say by whom) reflecting on the Bendigo branch, to the effect that it never rendered any financial support to strikers in other parts of Australia. The branch secretary, with a view to refuting this slanderous statement, had prepared a return which would surprise everybody. This showed that the Bendigo branch had contributed no less than £12,279 to strikes and lockouts throughout Australia and in other parts of the world. Not one penny of that sum had been expended in Bendigo.

The branch secretary, Mr. Williams, said:—"It was mean and contemptible for Mr. Little to have spoken of Bendigo miners as he had done." Mr. Little explained that he had only repeated at Eaglehawk what he had been told in Western Australia. After some warm exchanges between the branch secretary and the general secretary, and after the latter had declared that he was not going to put up with the abuse which had been heaped on him, the reporters were allowed to retire, and business was continued in private.

It was left to the secretary of the Ballarat branch of the association (Mr. J. Kean) to discover and declare that a man who refused to join a union is a law-breaker, for the simple reason that it was only possible to have arbitration by collective bargaining, which necessitated unions of employees and employers. The same speaker said that no sane man would have conscientious objections to becoming a member of a union, and a refusal to join should show that a man was a "rotter." There can, therefore, be nothing reprehensible in being a "rotter," however ugly the epithet may look, and however offensively it may be employed, for, clearly, it only means "insane."

## THE COAL MINING INDUSTRY.

### Southern District.

(From Our Correspondent.)
Wollongong, Sept. 27.

It is anticipated that, when the public jetty building at Port Kembla is ready and there is railway accommodation to carry the coal, the trade will increase. Whether the basis of this expectation is quite sound is a question. At present coal shipments at Port Kembla average about 1½ cargoes per week.

### Western District.

(From Our Correspondent.)
Lithgow, Sept. 27.

It is reported that a change is pending which will materially benefit the trade of the Cullen Bullen colliery, near Lithgow. The statement is to the effect that the company's capital is to be increased to over £100,000, and that a big shipping company will hold a large parcel of shares. Further, that this will mean a new trade, equal to at least twice the existing trade at the colliery, as well as a new equipment and a good deal of development work. The arrangements, it is added, have been pending for some time, and will be publicly announced very soon. Recent rumours from Cullen Bullen seem to confirm this rumour to some extent. Assuming that the statements are substantially correct, it would, it is estimated, require several months of development work to render it possible to treble the output of the mine.

### Victoria.

### Korumburra District.

(From Our Correspondent.)

The output of the collieries in this district has decreased during the last two or three months, and there does not appear to be any likelihood of an improvement in production during the next few months. In July 8,925½ tons were forwarded by rail from the mines, and in August 8,132 tons. The quantity supplied to the Railway Department in July was 2,880½ tons, and in August 2,371½ tons, the balance being consigned to private consumers. The output of the Jumbunna coal mine is now about 3,200 tons per month, which is a substantial decrease on the production in June, when 4160 tons were won. This falling off is due to a great extent to the fact that the miners are working 11 shifts per fortnight instead of 12 as formerly. The mine is looking well, and development work is in progress with the object of tapping a new area of coal proved by bores. The Outtrim, Howitt and British Consolidated company accounts for about 1500 tons monthly. This company applied some months ago for leases in the vicinity of the bore put down by the Mines Department about three miles from Outtrim, near the Inverloch road, and application is now being made for two leases, comprising over 700 acres, in the parish of Korumburra. No definite announcement has yet been made as to whether the Government has abandoned the policy of refusing applications for fresh coal-mining leases.

Work has been proceeding smoothly at the Austral Colliery (Korumburra), and the output of about 3000 tons monthly is maintained. Additional machinery was recently installed. A large proportion of the coal produced from this mine is consigned to the Railway Department.

Parties at work on the Coal Creek leases are forwarding about 700 tons of coal per month. The aggregate output of the district collieries from January 1st to August 31st this year was 68,752¾ tons.

The Mines Department's drill now boring on the Inverloch road, some three miles southward from the township of Outtrim, has struck two feet of hard coal at 398ft. This is eleven chains westward from a bore in which three feet of coal at 225ft. was recently proved. It is intended to further prospect this locality.

### New Zealand.

The Ngakawau correspondent of the "Westport News" (N.Z.) states that work in connection with the development of a new seam of coal situated in the new eastern field of the Stockton mine was commenced on the 1st ult., when the company drove on the seam for a distance of 6ft., producing some 14 or 15 tons of clean, hard bituminous coal. The seam is 12 to 18ft. in height, and is in direct connection with the main haulage ropes. It is anticipated by the company that this seam will swell the present output to over 800 tons per day. The coal is equal, if not superior, to any previously produced in the district. So far there is only two men engaged on this property, but in a very short time the seam will be sufficiently developed to enable as many hands to be employed as are needed for the market. The people in the district are naturally in good heart over what promises to give a much-desired fillip to the Westport mining industry. In the last annual report of the Dominion Mines Department, after reference to the decline in the annual output of the Westport-Stockton Coal Co. and the "rapidly approaching exhaustion" of the seams eastward of the company's Millerton lease, the statement is made that a workable area of coal had been proved near the company's eastern boundary, and the report adds:—"It is sincerely to be hoped that they will now be rewarded for their enterprise." This mine is equipped with the most complete electrical mining outfit in the Dominion, and this is being continually added to. All other appointments on the property are equally up-to-date."

## VICTORIAN MINING ACTIVITIES

### Bendigo and District.

(From Our Correspondent.)

The gold production for the week ending September 27, 1913, amounted to 3045 oz. The principal producers were Central Red, White and Blue, 325 oz 13 dwt.; Golden Pyke, 261 oz. 17 dwt.; Bendigo Dredge, 165 oz.; Great Northern, 139 oz. 17 dwt.; Carlisle, 115 oz. 18 dwt.; Spring Gully, 97 oz. 3 dwt. Two dividends were announced totalling £3800; viz.:—Central Red. White and Blue, (2s.), £3200, total to date £134,400; North Bendigo, (6d.), £600, total to date, £6600.

Princess Dagmar 867ft. south intermediate level continues in a full face of spurry quartz, containing a few colors of gold. This stone is still associated with the synclinal fold, but about 25ft. deeper than where the auriferous east back folded up in rising overhead some time ago. The gold-bearing character of these spurs is reassuring, very little stone having at first been anticipated after passing through the inverted portion of the original east back. As there is yet 220ft. of the trough to open up to the south boundary, where the Johnson's reef have also proved the quartz auriferous, the outlook along the lower portion of this formation is by no means discouraging. At a short distance from the end of the level, a crosscut has been put out 20ft. east, traversing a number of spurs, several showing a little gold close to the syncline. The objective is an old rise on the bottom fault, which should be reached early in October. After connecting these workings, the company will be able to draw more extensively on the trough spurs. Up to the present most of the auriferous quartz has been found associated with the western portion of the trough. Over the level there are two stopes south of the rise going up at 170ft. from the north boundary. These stopes take up to 2ft. of bedded quartz and are operating for a length of 50ft., the large diagonal spur showing in the forward workings. Fair gold was seen for a day or two last week. North of the rise the prospects are similar. These stopes will be carried through to the first workings, off the rise near the Golden Age boundary. The latter have not been drawn upon for several weeks, and should produce payable stone later on, as the portion of the formation is identical with that in the Golden Age top stopes above 853ft. The re-erection of the machinery is expected to be completed within three months. Meanwhile the present reef is being worked quite as economically through the Johnson's reef No. 2 shaft.

Golden Age were less successful with the second milling from the footwall quartz in the 655ft. north level at the north shaft, the reduced yield of 9 oz. 14 dwt. resulting from 47 tons. The crushing was broken from 10in. of reef in driving; a little gold showing, and in stoping close to the level. It is estimated that there is still 120ft. or 130ft. of ground beyond the face before reaching the Golden Pyke boundary. The rise having previously been extended to fully 70ft. over the main crosscut, more stopes could be brought into operation at very short notice in the event of a richer shoot of stone being found. In driving south the reef is still of lower value, and it is not proposed to start stoping this way till more favourable indications are disclosed in the level. From the main stopes over 853ft. at the south shaft, 120 tons produced 50 oz. 2 dwt. This output came from five stopes south of the crosscut and three operating from the Princess Dagmar boundary, and an average width of 1ft. of reef is available. In the two top stopes nearest to the shaft the stone is of inferior quality, but an improvement is anticipated as they advance southward. On the Paddy's Gully line the 1581ft. crosscut has passed through a fault that may enhance prospects in the next 100ft. of shaft sinking. There is irregular quartz allied to the slide going underfoot toward centre. Under similar conditions reefs are often found immediately below the faulting. Above the break there is a formation of apparently small dimensions, the west leg of which is being sought for in the extension of the 1581ft. crosscut.

New Golden Fleece will have started the new milling plant before this appears in print. Though prospects are not as satisfactory as anticipated from the favourable indications of the 500ft. reef some months ago, the management is hopeful of payable results under the more economical working conditions. A fair sample of gold was seen in the 500ft. stopes at one time, and subsequently in side stoping at 535ft. Later the north pitch of the formation brought it into the 585ft. intermediate level, where the favourable outlook was maintained for a few weeks. There is still a good quantity of crushing material at these depths, and the extension of stoping to keep the new mill employed is likely to reveal other pay shoots. At [illegible]ft. the main north level is advanced to 360ft., traversing the same spurry quartz of late. As yet nothing of value has been discovered, but the highly mineralised character of the stone promises better results eventually. Between this depth and 585ft., an intermediate crosscut off the connecting rise opened up stone for 27ft. in width, a few colours of gold showing on a couple of occasions. As the quartz is still going underfoot, it will be necessary to drive north at a deeper level to follow the reef to the Stafford Reef Company's boundary. At 400ft. a rise is going up over the south level to intersect the Altona reef, quartz that formerly gave fair returns to a depth of 320ft. This formation is expected to be reached during October. The 300ft. west crosscut is also in course of extension in search of the Comet "back," along which auriferous quartz was extensively worked nearer the surface. This "back" is a fault in the New Golden Fleece ground, cutting the beds at an acute angle in striking northward.

Carlisle 1149ft. south level is in nearly 290ft., a little gold still showing in a full width of spurs also containing galena and blackjack. In side stoping east and west at 40ft. from the end the quartz is of lower value. At 170ft. back from the face there is 27ft. of crushing material of payable quality in the stope above the timber. Closer to the shaft the other overhead stope is in the "mullocky" portion of the reef nearer the top fault. Immediately under the break the irregular quartz has hitherto been of good quality. The 1200ft. north intermediate is not revealing the favourable prospects looked for along the north pitch of the faulting as yet. At 285ft. in, the end shows all crushing stone without disclosing much gold, only one or two colours having been seen in the last 50ft. Operations are now close to the descending slide, and the outlook should therefore improve. It is quite possible that the gold will be found further west from the Victory back than at 1140ft.; and a good deal of interest therefore attaches to the advancement of the side stopes, located at 125ft. from the face. These stopes extend to 27ft. west of the Victory east back. At 1264ft. the main north level is advanced to 57ft., opening up small spurs of no value. Though averages will probably be of low grade, there is evidently several years' work on this extensive system of irregular quartz allied to the faulting of the east back of the old Victory saddle reef.

Ulster United have cried enough of operations at 2005ft., where the reef is small and the averages low. There was the added disability of coping with a heavy flow of water, chiefly owing to the Great Southern mine closing down some time ago. Latterly a crosscut has also been in progress eastward at 1700ft., in search of a reef now being worked by the Garden Gully Company further north, at 1552ft. As the end is beyond the position of the back sought for, this work is also likely to be suspended shortly. The backs of the reef underlie the formation from which the company paid a large sum in dividends, and are showing in the 1700ft. crosscut with a spread of about 60ft. They are only "pug" backs, and the reef, if any, exists at their turnover, is evidently small. More attention is being paid to the shallow ground, where a reef appears to have been missed between the 430ft. and 500ft. crosscuts. At 300ft., also, it is proposed to drive on 4ft. to 5ft. of irregular stone associated with the fault. At 400ft. there is an easterly dipping fault carrying quartz under the crosscut, crossing centre. The 500ft. west crosscut shows a 2in. west back, which is evidently connected with a regular reef below the 400ft. slide. Inside the back are several bedded veins and a few spurs east and west of the folding, indicating more quartz in centre overhead. The strata carry a good percentage of mineral, and the conditions generally are favourable. A rise is to be put up on this west back, and a winze started on the sliding quartz at 400ft. This work may lead to more encouraging results at an early date. At 300ft. the fault is away in the western beds, the quartz containing a little mineral. Nothing is known of either deposit in the workings from this shaft, though they may have been tested north and south from other shafts in the early reefing days.

Constellation reported payable gold in the 622ft. south level and stope on the Golden Pyke reef. This is the first payable stone found at 622ft., where the level is in about 100ft. Owing to an overlap, the lease is longer by several hundred feet at this depth than at 525ft. The stope is 60ft. off the crosscut, and as it increases in height something of the lower portion of the Golden Pyke richer shoot may be entered closer to the boundary. In driving north a few colours of gold have also been disclosed at the same depth, the reef varying from a few inches to 3ft. of crushing material.

Great Extended Hustler's 1053ft. east crosscut reached the downward continuation of the Little reef on Saturday, exposing a few colours of gold in 6in. of good looking quartz. Vertically the crosscut is about 80ft. deeper than where the same formation is being followed underfoot by the winze from 777ft. Owing to the rapid dip of the back between these depths, there will probably be fully 110ft. of ground to work before connecting. In the winze the reef is being under stoped for a length of 20ft. till the connection is effected, varying from a few inches to 2ft. in width, and carrying gold. The best results are usually from a roll in the wall, and in the vicinity of a couple of rapidly pitching faults. On the new reef at 1053ft., closer to the shaft, there is a winze going down to meet a level at 1326ft. This formation is up to 3ft. thick, and shows gold in sinking. Prospects have recently improved in driving south toward the winze at the deeper level. There is plenty of scope for profitable stone to exist on these eastern backs at shallow level, many of which have not been tested to any extent.

United Devonshire many years ago obtained some very rich yields from a reef at 590ft., and of late attention has been turnel to the western limits of this formation, a rise being extended on a small vein of bedded stone, dipping west. At 55ft. up there is now a full width of spurs, a couple of which have shown several colours of gold. There is about the same height of ground intact overhead, and in the event of prospects proving payable, a good extent of crushing material may be available.

Suffolk United are expecting better results from the exploration of the east leg southward at 350ft. shortly. The stone is small, but formerly proved of very fair quality in this direction. At 1104ft. the rise on the west back is up 46ft. and above the faulting, without, however, disclosing anything of value in the 6in. of stone. At 1364ft. another intermediate level is to be started on Brown's back, approaching the New Moon boundary. Fair gold is seen in this reef occasionally in the north intermediate stope.

Johnson's Reef met with an interesting development at 1225ft., which may have an important bearing on future, prospects of payable gold showing in 4ft. of reef in rising on the west back. The rise is extended to 60ft., starting on 4in. of stone. There was little of interest in the first 50ft. of rising, beyond passing through the lava; but the formation has recently increased rapidly in width, showing a little gold for the first time about a week ago. The back is gaining fast to the east, and the vertical height of the rise is probably less than 48ft., which leaves nearly 30ft. of solid ground through to the 1150ft. crosscut. The upper portion of the cap was traversed in the latter crosscut several months since, and a level driven a short distance north on 10ft. of crushing material. Very little gold was seen and averages were of low grade. As the more auriferous quartz is seldom found in the higher limits of a centre reef very little importance is attached to these results. The saddle and legs are as yet unprospected, the 1225ft. crosscut stopping on the west side of the fold. The cap promises to be of good dimensions, and the improvement having been met in approaching the turnover, augurs well for the quality of the stone across the saddle. Being the deepest reef yet found on the Derby line, the discovery is attracting considerable attention. On the "Pyke" fold the company have started driving south in the "Dagmar" inverted reef, which has shown a little gold. The Collmann reef on the Paddy's Gully line has not revealed as much gold since passing through a footwall spur.

## Castlemaine and District.

(From Our Correspondent.)

A claim adjoining the McDonald's Reef Co., owned and worked by Delmenico Bros., of Guildford, has broken out some rich gold-bearing stone at 100ft. They have been working for some time, and profess to be sanguine that a payable body of ore is in sight.

The New Year reef has again been taken up. Mr. H. S. Archdall has applied for a lease. This is a show to the east of the Nuggety reef at Campbell's Creek. It has not been developed to any extent, but some good stone has been taken out at intervals, a miner named Mudge having a rich run by himself some years ago.

Spring Gully confined their ore-extracting energies during last week chiefly to the stopes north at 170ft., where the stone is from 3ft. to 5ft. in thickness. The stone was not reckoned to be of very great value, and the average yield, 93 oz. 3 dwt. from 210 tons, must be regarded as satisfactory. It will be another two weeks at least before the rich stone at 200ft. will be opened up sufficiently to allow crushing dirt to be broken down. The rich spur that yielded the recent high averages is dipping very fast, and seems likely to cut out. Another spur has come in on top of it, carrying shotty gold, and seems of equal value to the other one.

The Spring Gully No. 1 has begun a crosscut from the rise over 300ft.

South Wattle Gully has presented its half-yearly report. It shows that from the 230ft. level the stone met in driving on the west leg of the saddle was sent to the Spring Gully battery, and it yielded 11 dwt. per ton for 68 tons treated, exclusive of pyrites. At the 300ft. level the drive has been extended to 307ft., and two rises have been put up in payable stone. The manager computes that he has now in sight enough crush-dirt to keep a 10-head battery going for 12 months. In view of the prospects, and because it costs 10s. per ton to crush at the Spring Gully battery, the directors decided to at once get a battery of their own. A number of shares fell into the hands of the company, and as the mine looked so well a syndicate of Melbourne investors offered to take them up. The offer was accepted, and the cash went to pay for the purchase and erection of the plant. Messrs. John Archbold (chairman), M. Bell (mine manager), and Harry Wilson (consulting engineer) went to Ballarat to view a plant that was on offer. It consisted of a 10-head battery, with Wilfley concentrating tables and all accessories, 14in. horizontal engine, and boiler 26ft. x 6½ft. The price and terms were duly agreed upon, and tenders are now being called for its erection. The retiring directors (Messrs. Archbold, P. R. Sutherland, P. S. Sheppard, John Roberts, and Dr. J. P. Teague, and Mr. Bernard Bradley (auditor), were not opposed. The latest report from the manager is that in three places payable stone is waiting for the battery, and that a few more feet of driving should reveal the saddle.

At Mopoke Gully, Yapeen, Mr. Charles Reid has taken up a lease of 30 acres, and intends to sink a shaft and prospect it. The locality has been famous for rich pockets, and has beggared many a syndicate who have exhibited faith in a permanent matrix being in existence, which they have unsuccessfully tried to locate.

Blow Reef (Newstead) held its half-yearly meeting last Friday. Mr. John Callahan presided, and said that the sinking of the shaft to 372ft. had been completed, and a new level opened at 360ft. Of the two shoots intersected in driving north on the east lode at 280ft. one had given a battery test of 30 dwt., and the other 1 oz. to the ton. These shoots were widening and lengthening as they went underfoot. The rise from the 280ft. level, which had carried payable stone to 25ft., was being continued, the east and west reef having junctioned there. The gold account was £65. Working expenses amounted to £1303, and a small credit balance remained. Mr. T. Langdon seconded the motion for adoption, and it was carried.

Campbell's Creek bucket dredge had a payable run for the week, viz., 52 oz. 6 dwt. from the double plant.

---

## WESTERN AUSTRALIAN MINING.

(From Our Correspondent.)

Kalgoorlie, Sept. 22.

The Ridgway vacuum filters on the Corinthian North are practically completed, and will be in operation within a week. The plant is designed to treat 6000 tons monthly, and was expected to make a profit of £2000 to £3000 monthly, but, since the estimate of ore values was made, much better material has been developed below water level, and the original estimates are likely to be exceeded. Up to date 10,983 tons of ore have been treated for a return of £7245, or 13s. 10d. per ton, and the residues assay £11,376, or 20s. 8d. per ton, making a total value of 33s. 10d. per ton. Prior to the company being floated, Mr. F. W. Morgan estimated the value of the reserves above 100ft. at 24s. 8d., and Mr. R. Hamilton at 26s. 2d. per ton, but, at that time, it was stated that the sulphide ore in a winze below 100ft. had ranged from 42s. up to 89s. per ton. Since the mill started, in April, deeper developments have been pushed ahead both to open up more ore reserves and to secure an ample supply of water for the mill. Hitherto only up to 2000 tons monthly have been treated, as the supply of water from the Government 5in. pipe, which supplies the Bullfinch with Scheme water, was insufficient for both mines.

His sudden death in the train to Perth came as a great shock to the many friends of Mr. F. W. Morgan, manager of the Bullfinch Propty. mine. Mr. Morgan had a paralytic stroke about a year ago, but he attended the Kalgoorlie races only a fortnight before his death, and looked the picture of health. Mr. Morgan's successor has not been named, but whoever he may prove to be, he will have a difficult job to fill. For the first time on these fields, Mr. Morgan introduced square-set timbering on the Bullfinch, with the result that he has been taking out stopes 60ft. wide without any danger of creeps such as occurred in the Victorious. Then, recently, in Kalgoorlie, Mr. Morgan told the writer he had not left the mine for the previous 2½ months, and had been hard at work all the time. He had just got the mine and plant into first rate shape at the time of his untimely death, and his successor will reap the benefit. The company should shortly join the dividend payers.

Up to date, the Kyarra has produced 7673 tons of ore for a return of £29,432, or 76s. 8d. per ton, and the residues contain £9,392, or 24s. 6d. per ton, a total of 101s. 2d. per ton. It is impossible to gauge the real value of the mine, as the ore shoots are comparatively short, and vary in value from 10s. to 420s. per ton. The main shaft is down 320ft., and in addition to the 30ft. level driven by the original owners, levels have been driven at 100ft. and 200ft., and one is about to be started at 300ft.

Mr. Jutson, Government Geologist, in his official report on the Yuin district, includes the Royal Standard mine in his remarks. With regard to the granite intrusion, Mr. Jutson says: "This rock has been followed down for close on 40ft. at an angle of the underlay of the reef, and a little crosscutting a few feet below the junction has been done. The reef has, however, not yet been found again. There is no lode channel, nor any defined plane in continuation of the planes of the reef fissure through the granite, and the latter is hard, massive and jointed in various directions. The rock is practically similar in character from the junction to the bottom." It is fair to point out that Mr. Jutson states "that he does not think that any importance need be placed on this intrusion unless more can be seen." Progress on the mine has been particularly slow. The 20-head mill was landed on the mine nearly a year ago, and is not running yet. Re-timbering the shaft has occupied six months, and sinking has been suspended since March. Shareholders in Bullrush Estates are wondering when crushing and sinking will be resumed.

In addition to opening up the Golden Horseshoe mine at 2480, 2630, and 2780ft. levels, where bore holes and crosscuts from the Great Boulder shafts indicated high values, Mr. J. H. Sutherland is pushing on developments at the south end of the property towards Chaffers. The outlook above the 1000ft. level in this direction was so poor that No. 2 shaft, at the end of 1911, was only down 1291ft., but, by the end of 1912, it had reached 1552ft., and is now down nearly 1800ft., and is being sunk at the rate of 30 to 40ft. a month. This No. 2 shaft is 730ft. south of the main shaft, and 370ft. from Chaffers boundary, and drives at 1200ft. to 1500ft. are now being pushed out to Chaffers boundary on No. 2 and 3 levels in payable ore. Judging from results obtained, the Horseshoe ore reserves by the end of the year will show a substantial increase, and augur well for the ultimate future of Chaffers.

---

## INDUSTRIAL.

The Australian Metal Co. has forwarded new A.E.G. illustrated and priced catalogues of Household Electric Appliances and Electrical Machinery.

* * *

Messrs. McMicking and Co., agents for mining explosives, notify, on another page, that they will shortly be removing from their present premises at 381 Little Collins-street, Melbourne, to more commodious offices at No. 362, in the same street.

* * *

The Western Electric Co. (Australia) Ltd., of Hoffnung's Chambers, Pitt-street, Sydney, inform us that they have removed to new and more commodious premises at Hardt Building, Wynyard-square. Their telephone and post-office box numbers will be unaltered.

* * *

From the Union Electric Co. of Australia Ltd., whose head office is in Sydney, but which has branches in all the other mainland States and in New Zealand, we have received a copy of its current price list of electric fans, of which considerable stocks have been put down at the various branches to meet the requirements of the forthcoming season. Copies of the catalogue may be had on application at any of the branches of the company's business.

---

## TASMANIAN MINING.

### Mount Lyell District.

(From Our Correspondent.)

Queenstown, Friday, Sept. 27.

The even tenor of operations at the Mount Lyell Company's mines has been slightly interfered with this week by the action of the strike "microbe," which appears to have taken up a permanent residence in the heads or bodies of a small section of the company's employees. The trouble has arisen over the dismissal of the braceman employed at the main brace of the North Lyell mine, who, in defiance of strict orders which had been issued to the contrary, persisted in using a firepot in the main brace chamber during night shift. This chamber contains the ore bins, and is immediately above the 200ft. tunnel level, along which the ore is delivered to the station yard. It is of large size, and contains a lot of very dry timber, and owing to the experience gained by the terrible disaster in October last, every precaution has since been taken to prevent a recurrence of such a calamity, and the use of a firepot (which prior to the disaster had been sanctioned) is now rigidly prohibited. In spite of this, it was ascertained that the firepot was being surreptitiously used during night shift, and a watch was set, with the result that on Tuesday night last the shift boss paid an unexpected visit to the brace chamber and found the braceman in charge, and some other men sitting round a pot, in which a strong fire was in full blast. The braceman was promptly discharged, and next morning, when the day shift came on, they went below at 8 o'clock as usual, and an hour afterwards, to the complete surprise of the management, practically every man, to the number of about 150, returned to the surface, stating that they had knocked off out of sympathy with the dismissed employee, and would not resume work until he had been reinstated. The executive of the F.M.E.A. was communicated with, and the President and Secretary, together with the braceman, waited upon the engineer-in-charge, Mr. R. M. Murray. The matter was fully discussed, with the result that the union executive called a meeting of the members for 8 o'clock that night (Wednesday). The meeting was short and sharp, and after the officials of the association had treated the malcontents to some very plain talk, and pointed out to them what a foolish and injustifiable act they had been guilty of, a resolution was carried that all men return to work on the ensuing shifts. This they did, and work is now again in full swing, after the mine being idle for two shifts.

The trouble did not extend to either the Mount Lyell mine or the Reduction Works, but was confined solely to the underground men at the North Lyell, and it may be mentioned that the men employed at the Big Mine and the smelters (80 per cent. of whom are members of the union), strongly denounced the action of their fellow-workers at the North mine. And, further, it is only fair to mention that the union executive to a man emphatically and outspokenly condemned the men for ceasing work without the semblance of a reason. In regard to the dismissed man, the management firmly declined to reinstate him in his billet as braceman, but it is understood that his dismissal will not be allowed to prejudice his obtaining employment in some other capacity about the mine.

Barring the little interruption referred to, operations at the company's mines are going along "real good." The output from the North Lyell mine continues at about 400 tons a day, along with approximately 700 tons a day from the Mount Lyell mine. At the North mine ore breaking keeps in progress at the 400, 700, 850, 1000, and 1100ft. levels, and some excellent grade ore is being won from the ground floor of the 1100ft. level.

Three furnaces continue in commission at the Reduction Works, and in spite of the little trouble at the North Lyell mine, it is pretty certain they will be able to keep them going till the end of this month, which closes another half-yearly period of the company's operations. The results for the half-year will be quite up to expectations, and when the unfavourable nature of the outlook at the commencement of the term is remembered, they must certainly be accepted as being highly satisfactory. The copper production for the six months ending September 3rd will naturally show a very large increase over that for the previous period, which covered the interruption to operations caused by the North Lyell mine disaster. The output of copper for the term ending on March 31st last was only 813 tons, while the total tonnage of ore treated was only 84,833 tons. For the current half-year from April 1st to September 3rd, the output was about 1870 tons, and, estimating an additional 600 from the last four-weekly run of the term, the output for the current half-year should approximate 2500 tons. With the improved price of copper ruling throughout the six months, the company should now have a fairly good margin to work on, and it is pretty certain that the payment of dividends will be resumed between now and the end of this year.

---

## MINING IN NEW ZEALAND.

The annual report of the Minister of Mines, Mr. Fraser, presented to the Dominion Parliament last Thursday, states that the value of the mineral output for 1912-13 amounted to £3,042,224, as against £3,492,403 during 1911-12, being a decrease of £450,179. The decrease was due to strikes, by which the mines at Waihi, Reefton, and Black water—the most productive quartz-mining fields—were rendered idle from May to November. The shortage in the value of bullion from the mines affected is estimated at £450,000. The most important developments during the past year were in connection with drilling operations in search of petroleum in the North Island, where six companies, equipped with modern rotary drills, are now engaged. The output of coal amounted to 2,177,615 tons, an increase of 111,542 tons over the figures for 1911-12. The most important development in connection with the coal-mining industry was at the new State mine, near Greymouth, where a colliery is being laid down to deal with an estimated output of 2,000 tons of bituminous coal per day. The new mine will be known, by permission of His Excellency the Governor, as Point Elizabeth (Liverpool) colliery.

During the four weeks ended with August 30 the Waihi Gold Mining Company crushed and treated 14,721 tons of ore for a return of bullion valued at £26,089. No comparison can be made with the same period of last year, because of the strike. This return shows an increase of £143 over that of the previous month. The total amount won from the mine to date is £10,332,823. Dividends, bonuses, etc., paid to date amount to £4,557,411.

At the Crown mine 1355 tons of stone was crushed during August, and gave a yield of bullion worth £2285, as compared with 1998 tons crushed in August, 1912, for a return of £3055. The value of total bullion won to date is £863,067.

The preliminary prospectus of the Waihi Reefs Gigantic Consolidation (Ltd.) has been issued, says the "Otago Witness," together with a plan of the property, which also shows the workings of the adjoining mines (Waihi and Waihi Grand Junction) and the estimated strike going east of two of the mine lodes (Martha and Empire) of the Waihi reef system. The total area is 799 acres, and includes the Waihi Reefs property (formerly Waihi Consolidated) and several adjoining blocks going east (now known as the Gigantic Consolidation). On the Waihi Reefs property the main shaft is already down rather over 900ft., and is in what is known as the older andesite country, but having regard to the dip of the country going east from the Waihi mine it is intended, subject to the flotation of a company, to carry the shaft to a depth of 1200ft. before throwing out crosscuts for the purpose of intersecting the reef system. In the opinion of competent persons with a wide knowledge of the geological and other conditions affecting mining on the Waihi field, the depth mentioned (1200ft.) should be sufficient to give a good idea of the future prospects of the property, both in the matter of the extension of the reef system east and the values of the ore bodies. According to the plans accompanying the prospectus, both the Martha and Empire reefs should be met with, provided they live in this direction and the estimated strike is maintained, and the Royal reef should also run in the property. Only time can determine the value of the area being offered, but the block carries decided possibilities. The vendors' proposal provides for a company of 150,000 shares of £1 each, and the provision of adequate working capital.

The directors of the Worksop Dredging Co. are able to congratulate the shareholders on another very prosperous year. The amount of gold won was 4472 oz. (4110 fine oz.), valued at £17,460, and during the 12 months the amount paid to shareholders in dividends was £9900, or 33s. per share. Since the balance sheet was made out a further dividend of 2s. per share has been paid, making a total of £5 per share to date. The dredge is now operating on a special claim of 80 acres, and, in addition, prospecting licenses are held for another 160 acres. This had not been bored at date of the directors' report, but it was intended to test the ground as soon as the boring plant was put in order.

# NEW SOUTH WALES MINING.

## Broken Hill.

(From Our Correspondent.)

Broken Hill, Sept. 26.

Broken Hill mining has been overlapped lately by another strike, that of the shop assistants. This silly, absurd dispute has disorganised and demoralised all local business, and kept attention where it ought not to be.

Things from a mining point have been interesting, though not exciting—the uncertain mining market has prevented excitement.

The British, as indicated last week, has cut the lode at the 1100ft. level, Thompson section. It hit it in the main crosscut, about 130ft. from the plat. This determination will help to improve the value of the mine in the public eye. Although it has made good long ago, "bears" have been prone to belittle it, and the only answer the mine can give is to show and produce. This it is doing.

Another mine improving its position is Block 10, per medium of the 615ft. western lode. This drive is still carrying good ore; and though the lower levels have proved so disappointing, the new proving above will put years on to the life of the mine. And all hopes of depth have not yet disappeared.

The thing to watch for a time is not so much the underground workings as the surface. When Broken Hill achieved a payable treatment of the tailings dumps it did a great thing; now brains have worked out a scheme for getting the metal contents from the slimes. Several schemes, in fact. These will be, it is almost certain, incorporated, and the finality of several systems will be the evolution of a genuine success.

Theoretically now about 90 to 95 per cent. of the metal contents of Broken Hill crudes is recovered in a couple of cases actually; almost immediately all the mines will be able to chronicle a like recovery.

This prediction covers all the mines that are worked systematically and properly. The achievements of metallurgists in this connection is, of course, known to the workers, and a section of them promise to make trouble at the end of the year. They argue (or the fools that rule them do) that the extra recoveries are due to the workers, and that the workers should get a bigger percentage of the profits. They will, I believe, seek an increase of wages, at the end of the current 12 months, defying the agreement.

The perpetual strike troubles in Broken Hill injure the field with investors. Had it not been for the past couple of disputes, the big mines in work would have been supplemented ere this. But industrial warfare kills speculation.

At the present time there are about 9000 men in work on the Broken Hill mines, without including the chief staff officers, and the weekly wage-list runs to £30,000 to £35,000.

It is little use talking of individual mines at the present time. The Junction alone is not on the profit-making list, though hard endeavours are being made to put it on a straight basis. But a horseowner could not necessarily conduct a cool-drink shop.

## Bathurst District.

(From Our Correspondent.)

Bathurst, Sept. 26.

At the Mountain Run copper mine, near Back Creek, the lode is opening up in a very encouraging manner. The returns from a parcel of 16 tons sent to the smelting works gave a return of a little over 12 per cent. Another lot of 20 tons is following, and is expected to yield equally as good values. At present only 8 or 9 men are employed at the mine.

From Mount Conqueror mine, Peel, a shipment of 15 tons of good quality silver lead ore has been despatched.

At Kempfield, near Trunkey, Mackellar Bros. are sinking on their new reef, and they have another large parcel ready to be put through the battery as soon as teams are available. They have further discovered on their lease a parallel reef that prospects an ounce to the ton, and contains a fair amount of mineral. A large area on the line of reef is taken up by speculators; and several miners who went there with the intention of taking up ground have returned, as they state all the available ground on this line is already taken up.

Important developments are taking place at the Hawkins Hill Reward mine, Hill End. The northern drive at the 320ft. level is making excellent progress towards its objective, namely, the intersection of the Robert Emmett cross course, and when this is reached will unwater the northern end of the field, when work can be proceeded with for another 200 or 300 ft. below the present workings, and in dry ground. The reef in this northern drive has been gradually increasing in value, and at the present time highly payable stone is being broken, all of which is intact overhead. The finishing touches are almost completed at the Exhibition shaft, some delay having occurred through the non-delivery of the mine cages. Shareholders have had to exercise a little patience while this important work was in progress, but may now look forward to continuous crushings from their 20-head mill, and dividends may be reasonably looked forward to at an early date.

Splendid gold, reminiscent of the olden days, has been struck in the low level tunnel of the Amalgamated Hill End, at a depth of 650ft. from surface. It is on what is known as the mica vein, and is in close proximity to the old Star of Peace shaft. This is the deepest level at which gold has been found on the field, and is conclusive evidence against the views of the many detractors of Hill End who deny that the gold will live in depth. As soon as the Star of Peace shaft is pierced, this reef can be worked to the best advantage, whilst ample ventilation will be provided. This find also must greatly enhance the value of the property of the Rowley's Reef G.M. Co., which adjoins the Amalgamated on the north, since the distance to Rowley's boundary is only 300ft. The Amalgamated company has met with very little success since it started operations. Its shareholders were beginning to lose heart, and it was not until this low level tunnel was slewed round, and a course set towards the Star of Peace shaft, that those of them who must be allowed to know most about the ground began to pluck up courage. The opinion of the old hands all along has been that no payable gold would be got in the southern end of the property, where, owing to the hardness of the ground, the veins are pinched and narrow. The country they are now in is of a very kindly character, where the reefs may be expected to live and carry good values. Further developments are being awaited with keen interest.

At Coloola Creek mine they are proving the existence of a large body of ore which should pay well with some additions to the present plant. A clean-up of 60 tons returned 3½ dwt. of gold to the ton over the plates, and it is estimated a further 4 dwt. is in the tailings, and can be recovered by cyanidation. If this mine were put into a company with sufficient capital to work it in a bigger way, it should have a fine future. The facilities for economical handling are there, and a never-failing water supply is a no mean feature in the scheme.

## Lithgow and District.

(From Our Correspondent.)

Lithgow, Sept. 26.

The Ben Bullen Lime Company's works have been closed down, pending the formation of a larger company. It is the intention of the new company to have larger works and open a coal seam near the railway station. The new loop-line and siding will very shortly be made at the station here. Some of the woodwork has already arrived, and an extra gang is expected daily.

The following is the result of the miners' first ballot for two representatives to the annual congress of the Federation of Labour, to be held in Sydney:—Fred Gregory (sec. of the Western District Federation), 573; Wm. H. Delaney (president), 272; Robert Pillans, 246; George Cohen, 114; William Grant, 96; John Thirlwell, 75; John Sullivan, 72. The second and the last ballot will be between Messrs. Gregory, Delaney, and Pillans.

# MINE RESCUE STATIONS.

## Report of the Senior Inspector.

The New South Wales Minister of Mines, Mr. Edden, last March instructed Mr. W. Humble, the Senior Inspector of Collieries for that State, to make inquiries and investigations in Great Britain and on the Continent respecting methods in use for rescuing miners from the results of accident and for restoring those who are suffering from poisonous inhalations. Mr. Humble's report, dated September 11, is now to hand, embodying the results of his research during May, June, and July, during which period he visited Newcastle-on-Tyne, Cowdenbeath (Scotland), Birmingham University, Mansfield (Notts.), Howe Bridge (Lancashire), Porth (South Wales), Bristol, Rhein Preussen (Germany), and the "Meco" manufacturing works (Germany).

At the Newcastle and Durham station, situated at Elswick, of which the upkeep is provided by the coal owners and the Elswick Engineering Works, the means employed consist of liquid air, Proto Fluess dress, Meco dress, and smoke helmet, the first-mentioned being considered the most important. The Cowdenbeath station has the Weg and the smoke helmet. The Birmingham station is a training station for mine officials, who afterwards train the men at their own mines. Several kinds of apparatus are in use—Proto Fluess, Meco, Pneumatogen, Weg, Draeger, and smoke helmet being mentioned—and there is an experimental mine in the University grounds, in which Mr. Humble spent a day underground, wearing first the smoke helmet and afterwards the Fluess dress. It is interesting to learn that similar central instructional stations are being built at Hidnesford and Dudley. The Mansfield station is equipped with Meco only, and two new sub-stations, at Chesterfield and Ilkeston are to be similarly equipped. Howe Bridge station uses the Fluess dress only, and other central stations, similarly equipped, are to be built at Accrington and St. Helens. The Bristol station employs the Draeger; here ten men from each of the five mines which compose the coalfield meet every week for practice, and Draeger dresses are kept at each mine. The Porth station is equipped with the Meco dress, and gives practice to between 130 and 140 men weekly. The station apparatus serves for all the mines within a 10-mile radius, while those beyond have apparatus of their own. Similar stations are being built at Drymanan and Abercynon. The Rhein Preussen colliery is supplied with the Shamrock apparatus. In Germany, Mr. Humble remarks, it is not the practice to have central stations, each mine looking after its own rescue work. Nearly all the stations visited by the inspector have Pulmotors for the treatment of those partially suffocated, and Mr. Humble mentions the valuable portable "Emergency" outfit supplied by both the Meco and the Draeger companies, which consists of an oxygen cylinder connected with a breathing-bag and face-piece by rubber tubing; one "Emergency" is carried with each squad of six men.

In making his recommendations with respect to stations for New South Wales, Mr. Humble writes:—"In the matter of equipment, I am satisfied that the safest plan for us to adopt is to decide for one kind of apparatus only. Practising with more than one type leads to danger, and my opinion is supported by three of the station instructors . . . The liquid air apparatus is good, but costly. The machinery necessary for a reasonable supply costs £1000, and the daily loss by unavoidable evaporation is from 5 to 10 per cent. . . . The total cost of a liquid air plant is £3500. . . . I recommend that the plan of the Porth station in South Wales be adopted for our station in South Maitland, with, of course, freedom to vary in matters which the advice of our architect may show to be advisable. . . . I am further of opinion that the apparatus should be either "liquid air" or "Meco." The Porth station was built and equipped with "Meco" for £6500, and the estimated upkeep for the two years after erection is £2000 per annum; afterwards about £1200 per annum. If liquid air apparatus is provided instead of Meco the plant for the production and storage of air will cost £3500, and there is, in addition, the great loss by evaporation, so that I am constrained to recommend that we adopt the Porth station, with its Meco apparatus and equipment."

Mr. Humble also makes certain suggestions contingent on its being decided to obtain the services of an instructor for the New South Wales stations from the Old Country, and these will be considered in conjunction with the other recommendations.

# OIL NOTES.

## New Discovery in Papua.

The Minister of External Affairs, Mr. Glynn, received a wireless message last Thursday from Mr. Stanley, the Government Geologist in Papua, stating he had found quite unexpected indications of the presence of petroleum at Kerema, in the Ie Hills, 50 or 60 miles from Port Moresby. The signs are considered to be most encouraging, miniature mud volcanoes and bursts of gas disturbing the ground. All the indications that had been shown in the Vailala district, now being investigated, had manifested themselves. The new discovery is outside the area of 100 square miles, between the Purari and Vailala rivers, which has already produced oil of commercial quality. In this area three bores are down, says Mr. Glynn, and all of them are through petroleum-bearing strata, the favourable promise given on the surface being maintained as sinking proceeds. One of the bores is down 324ft. disclosing satisfactory gushes of oil, but it is not unusual that a bore might reach even 1000ft. before commercial supplies are made available. The new discovery is to the east of the Vailala area.

On the following day (Friday) another message was received, this time from Mr. Locke, who is conducting investigations of the oil fields in Papua, stating that he had discovered good indications of oil at 324ft. in the Vailala district, After boring down to 345ft. the shale continued to give off petroleum gas, and the outlook was most promising.

### In Search of Petroleum.

Mr. G. D. Meudell, acting on behalf of the Australian Oil Wells, Co., wrote last month (according to the "Adelaide Chronicle") to the Millicent (S.A.) District Council, asking for the right to bore for oil on the Canunda commonage for 30 years, at a royalty of 5 per cent. on the gross yield of crude oil. "The company," continued the letter, "propose to put down four bores, each of 4000ft., at a cost of £20,000. We shall require an agreement securing our rights to free access to the land, free use of timber and water, the right to draw our casing and tools, and keep our machinery. Also, we must have an easement to the sea for our pipe lines, and the privilege of getting a Crown grant to 100 acres of land for buildings and machinery, at a cost of £5 an acre. As this will be the first attempt to bore for oil in Australia to a proper depth, with modern oil-drilling machinery, controlled by skilled oil-drillers, we appeal to the Council to grant us plenary powers to search for oil in a broad patriotic spirit." The clerk of the Council said he had explained to Mr. Meudell that the commonage lands had been resumed, and that the Council had no power over them. The Council had no objection to prospecting work of any kind, and it was decided to recommend the company to approach the Government. The Council promised to offer every facility for carrying out the operations.

### Admiralty Inquiries.

The importance of the oil industry in Taranaki (N.Z.) has been further emphasised by a fresh visit to New Plymouth of Engineer-Lieutenant H. Ponsonby Mackenzie, R.N., the Admiralty's coal inspector for Australasia. The visitor inspected the oil works in company with the chairman of the Advisory Board, Mr. M. C. Carter. He subsequently expressed surprise at the extent of the development that had taken place during the past year. He appeared to be greatly impressed with the suitability of the oil for fuel purposes. The specific gravity and flash point were right up to standard, he said, and for naval fuel purposes the oil was excellent. The Admiralty, said Lieut. Mackenzie, was keenly interested in the development of oil resources within the Empire, and naturally was following the Taranaki operations with no little interest. Auckland was being made a naval base, and provision for the storage of oil for fuel would be made. Naturally, the Admiralty was desirous of obtaining supplies in the Dominion if they could be obtained.

### Britain's Oilfields.

Students of geology are aware that, scattered throughout the strata of Great Britain, are many beds of bituminous shale, that is of indurated clay, deposited in thin layers that can easily be separated from each other, this clay being rich in the remains of animal or vegetable life. It is from these organic remains that shale-oil is obtained. It is in Scotland, and more particularly in the district stretching from Linlithgowshire through Midlothian to East Fife, that the richest beds of oil-bearing shale are to be found, and from these shale oilfields no less than 400,000 tons of shale oil are produced annually, and this yearly output is capable of considerable increase. In 1847, about 10 years before the great American petroleum deposits were tapped, Mr. James Young struck oil at Alfreton, in Derbyshire, and in such quantity as to keep the market supplied for nearly three years, when the spring dried up, and he had to look elsewhere for his supplies. By heating many kinds of vegetable matter in closed retorts, and collecting in receivers the products of this destructive distillation, Mr. Young at last happed upon boghead coal—a shale rich in organic remains, which yielded a large amount of paraffin oil and solid paraffin wax. This was at Bathgate, in Linlithgow, and the industry has thriven in this neighbourhood until it gives a yield of 400,000 tons per annum.

---

Experiments have been in course of progress since the end of January between the Telefunken station at Nauen, near Berlin, and that of Sayville, on Long Island, belonging to the Atlantic Communication Co., of New York, and wireless messages have been sent across the ocean between Berlin and New York. The distance covered by these messages is about 4040 miles, whereas the distance between Ireland and Canada, where communication by means of the Marconi system has already been established for several years, is only about 2300 miles. The experiments are being continued in order to provide the necessary data for establishing a regular service by wireless.

## WESTONS (W.A.)

(Special for the "Mining Standard.")

Everything goes by comparison, even in mining; and while Westons has no special features to distinguish it generally from other districts on the Yilgarn field, it has one which distinguishes it in particular from the Bullfinch district, which it followed as a sort of aftermath. Over its full span of about five miles gold was found at more points during a few weeks than was found (excepting in the Proprietary mine itself) over the length and breadth of the Bullfinch district during the entire period of the boom. In this respect only is Westons comparatively better than Bullfinch, as it has some prospect of adding a number of producers to the list of West Australian mines; whereas it has been conclusively proved that the Bullfinch district is incapable of contributing more than one—the Bullfinch Proprietary itself. Indeed, it may be said that the money which was so extravagantly spent in prospecting the Bullfinch district could have been spent with much more justification, and infinitely better results, in exploiting Westons. No doubt the former will rank, on account of its having yielded but a single mine as the result of an extraordinary amount of prospecting and development work, as one of the most expensively proved districts in the State. To put the fact more correctly, the Bullfinch mine is not the actual outcome of this extravagance; it was the cause of it. Another fact is this: The Bullfinch took a great deal more booming than most people are aware of, the object being achieved by much effort and the persistent publication of values—the best the mine was capable of producing in a parcel.

Westons arrived too late to revive the rapidly-waning interest of speculators, otherwise its then prospects might have been definitely proved with the excess of cash which then seemed available. As a matter of fact, the district rather suffered by the reaction, than benefited by being the outcome of the boom; but it's an ill-wind that blows nobody good.

A reference to the geological map of the Yilgarn will show that Westons constitutes part of a small isolated belt of metamorphic rock extending over a length of about twenty miles, commencing about 30 miles west of Southern Cross on the Goldfields railway line, and running in a slightly north of westerly direction to beyond Boodalin Soak, by which name the find was originally known.

Westons ought to have been opened up long ago, as the Soak is right on the old Golden Valley-road, which was traversed by hundreds of gold-seekers in the early days. Fraser, the prospector of the mine at Southern Cross, which bears his name, claims to have found gold near the Soak over twenty years ago, but it is obvious he could not have thought much of the field, or he would have returned, however much later, to follow up his find.

The first leases pegged on this belt by Weston and party were right on the Golden Valley-road, about a mile to the west of the Soak. Immediately afterwards the same party pegged leases at different points from about half-a-mile to the north to about three miles to the south, in the vicinity of the ground that now constitutes Greenfinch, Edna May, Myrtle Central, and other leases which are receiving some attention.

As has been stated earlier, Westons presents no special features which distinguish it from other districts in the Yilgarn. Indeed, it is quite probable that the characteristics for which that field is notorious will be further proved as development work proceeds at Westons, viz., short shoots and vanishing values at depth. In justice to the Yilgarn, however, it may be said that it has never been developed to a depth sufficient to justify the prevailing belief that "surface enrichments" are peculiar to it alone, as, almost without exception, it has been proved in other fields throughout W.A. (the East Coolgardie, Murchison and East Murchison, for example), that values occur in zones. In fact, this characteristic became a stock excuse for a multitude of sins, including mismanagement, in which development work was said to be "unfortunately proceeding in a poor zone."

However, that the Yilgarn suffers from what is called "surface enrichment" in an acute form there can be very little doubt. It is probably a polite way of expressing the fact that values diminish to the vanishing point within a hundred feet or so of sinking, and as far as the Yilgarn is concerned, it is certain that the exception to this rule yet remains to be found. Even at Westons the Greenfinch people have found it convenient to suspend "vigorous development at depth," and the reason is not far to seek. Where exposed on the surface the reef (composed of a white, weathered quartz) showed gold freely, and assayed particularly well. The stone dollied handsomely also, but in some instances a minute examination of the tail would reveal a substantial proportion of what the prospector calls "new chum" gold. When opened up at a depth of only 100ft. it was found that the reef had a much altered appearance, was much poorer, and had comparatively little length. The disparity between the values here and those proved to exist at the surface left very little room for any but one conclusion, and more development work, both lateral and vertical, ought to be done on these leases to "lay the ghost" for ever. As it stands now, there is no definite justification for an impression that the mine has no prospects; but the drift is such as to inspire one with very little hope in the mine and less faith in its management.

The appearance of the neighbouring leases, such as the Edna May and the Myrtle Central, is more encouraging, and certainly such as to make the outlook for the district much brighter. To the Myrtle Central owners belongs the distinction of having discovered what is known as the Edna May reef. As an indication that mining is half-sister to blind chance, the discovery of this reef reflects no particular credit on anyone. During a rush about one or less per cent. of pegging is on gold, the remaining ninety-nine or more per cent. is of "position blocks." The Myrtle Central was one of these. A more forlorn-looking gold-mining lease could hardly be imagined; there wasn't a floater on it. Perhaps some credit may be awarded the machine called the Mining Act. Anyway, this uncompromisingly states that leases must be manned (which means they might just as well be worked) within thirty days of publication of grant under pain of forfeiture. The Myrtle Central adjoins the Edna May on the east, and the only tangible thing its owners had a chance of picking up was the underlay of a reef on which the owner of the Edna May had sunk a shaft. As this reef was situate on the western boundary of the Edna May, and nearly the full width of that lease separated it from the Myrtle Central, it looked like a clear job of a thousand feet. Nothing daunted by this prospect, however, the owners of the Myrtle Central selected a spot as near to the eastern boundary of the Edna May as they could conveniently get, and commenced sinking. Within twenty feet they struck the cap of what is now known as the Edna May reef. Upon being opened up this reef was found to be about 18ft. wide (chiefly spread), and was reported to average about an ounce. This find caused the owner of the Edna May to immediately sink for the same reef on his side of the boundary, with the result that both shafts, within a few yards of each other, went down almost simultaneously. At 80ft. down both parties opened out, the owner of the Edna May to the west and the owners of the Myrtle Central to the East. The net result of this admirable form of co-operation was about 250ft. of reef, of an average width of about 10ft., and showing gold rather freely. Of the length of this the Myrtle Central has the lion's share, comprising about 150ft., and as the reef pitches to the east and underlies to the north the outlook is not too cheerful for the Edna May, as far as its retention in depth is concerned. At about 150ft. in from the Myrtle Central shaft the reef narrowed down and disappeared altogether; but, on continuing the drive, a further make of quartz was encountered, which goes to show that the ore bodies at Westons are lenticular and identical with the prevailing features of the Yilgarn.

There are marked discrepancies between the results obtained by crushings from both these properties, which are rather hard to account for. The crushings from the Edna May are reported to have yielded a couple of ounces; those from the Myrtle Central much less. The first from the Central, a parcel of 300 tons, netted about 9 dwt. per ton, being 8 dwt. over the plates and payment for one of the four dwt. remaining in the tailings. As the owners claim that grab samples from Kibbles showed them a gross value of 22 dwt., they naturally wondered where the odd 10 dwt. got to. A second crushing (400 tons) gave them practically the same results, with the expectancy of the same gross showing being discernible somewhere. As the slimes are run off to a dam without any record of their value being returned, it is probable that the difference, if there is any, may occur here. The owners, however, very sensibly claim the Myrtle Central to be a 12 dwt. show, which, on the actual figures, is the gross, and not the extractable value of the ore.

A crosscut from the 80ft. level of the Myrtle opened up a parallel body of ore near the southern boundary, and this showed fair values. But there is much to be done before any one of this group of leases can be said to have more than the makings of a mine. A promising feature, however, is the strong, well-defined nature of the ore-bodies; and, although the Edna May reef is in kaolin, there is every prospect of the excessive weathering apparent at this level having penetrated to considerably greater depth. The thing to be feared, however, is that history will repeat itself, and a repetition of the historical characteristics of the Yilgarn is not very desirable. On the appearance of these leases, and the fact that gold has been opened up at different points right up to near the Soak, and to the north and west of it, the district has some claim to attention, which, however, should be bestowed with considerable caution.

# ENGINEERING AND ELECTRICAL SECTION

Australian
General Electric Co.
217 Clarence Street, Sydney.
Tel.—Central, 3405, 4397; City, 2381.
"Penfold House," Cr. Queen and Little Collins Sts., Melbourne.
Tel.—Central, 2647.
Representing—
GENERAL ELECTRIC CO., U.S.A.
The
BRITISH THOMSON-HOUSTON CO. LTD., of Rugby, England.
The GUARANTEE of EXCELLENCE on GOODS ELECTRICAL

## PRAHRAN-MALVERN TRAMWAYS (V.).

### Enlargement of the Trust.

The following is the scheme agreed upon between the Prahran and Malvern municipal councils for enlarging the sphere of the Trust which constructed and has managed the original tramways between those suburbs, and has since undertaken the same task for so many new ventures in contiguous districts, that enlargement was no longer unavoidable. The scheme provides as follows:—

The trust to be enlarged so as to include the councils of Hawthorn and Kew, with representation thereon. All existing tramways in operation, or in the course of construction, to be taken over, or constructed as trust lines. The tramway from St. Kilda-road, Melbourne, to Burke-road, Malvern, via Commercial and Malvern roads, to be constructed and ready for operation before the end of 1914. If requested by the St. Kilda and Caulfield councils, a tramway from the intersection of Glenhuntly-road and Brighton-road to Barkly-street, St. Kilda (Point Ormond extension), to be constructed.

The trust to endeavour to obtain and electrify the existing Kew horse tramway, and, if desired by the Hawthorn council, to consider the question of obtaining and electrifying the Riversdale-road horse tramway. Span poles to be substituted for centre poles in High-street, Prahran, and Malvern, from St. Kilda-road to Glenferrie-road, Malvern, at the expense of the trust, also in Glenferrie-road, Malvern.

All existing agreements and arrangements in connection with the construction and operation of extensions (with the exception of the agreement with the Melbourne City Council with respect to the extension of the High-street line from Punt-road to St. Kilda-road) to be rescinded. The tramways constructed by the trust on account of the municipalities of Hawthorn and Kew to be taken over by the trust, the necessary financial adjustments to be made by these municipalities.

Years ending September 30, 1914, 1915, and 1916: All profits to be divided amongst the six councils named on a car mileage basis. The Prahran City Council shall receive the sum of £2000 out of the profits each year before any distribution is made amongst the councils. A distribution shall then be made amongst the other five councils, on a car mileage basis, in the proportion that the amount of £2000 paid to the Prahran Council bears to the car mileage run in that city. The surplus remaining (if any) shall be divided amongst the six councils on a car mileage basis. For the purpose of calculating the distribution the car miles run on the "Caulfield extension" and "Point Ormond extension" to be excluded. After September 30, 1916, the profits to be divided between the six councils in proportion to the car miles run in each municipality.

For the years ending September 30, 1914, 1915, 1916, or until taken over by some statutory authority, the St. Kilda and Caulfield Councils to indemnify the trust against any annual loss in connection with the tramways known as the "Caulfield" and "Point Ormond extension," which shall be treated as one extension. Such contribution as between the last-mentioned councils to be contributed on the basis of the car miles run in each municipality. For this purpose the Point Ormond extension shall be considered as being wholly within the municipality of St. Kilda. Any loss in operating the combined system between October 1, 1913, and September 30, 1916, to be borne by the six councils on a car mileage basis—the car miles run on the "Caulfield" and "Point Ormond" extensions to be excluded in calculating the contribution by each council.

Future extensions to be constructed as trust lines on such terms as may be arranged between the trust and the municipalities concerned, subject to the consent of a majority of the constituent councils being obtained.

The scheme to come into operation as from October 1, 1913. The trust to take immediate steps to obtain an amendment of the Act in order to provide for the Prahran and Malvern Councils being represented on the trust by two delegates each.

Albert Park Tramway.—The trust, in conjunction with the Albert Park committee, to endeavour to obtain legislative authority for the construction and operation of the proposed Albert Park tramway, from the corner of High-street and St. Kilda-road to the St. Kilda Esplanade.

---

## N.S.W. RAILWAY SERVICE.

In giving his decision in connection with the appeal made by the Chief Commissioner of Railways against the award of No. 4 Board of the Government Railways Group, Mr. Justice Heydon closed his arguments by saying that in view of the heavy and continuous additional expenditure with which the Department was faced, he could not wonder that the Chief Commissioner had considered it his duty to bring the matter before the Industrial Court.

After having modified the clause which constituted the first ground of appeal, and which provided for shifts, whether straight or broken, being completed within 12 hours, and dismissing the second and third objections, his Honour referred to the matter of the award in respect to wages, which would increase the expenses of the Department by over £60,000 per annum. Looking at all the facts, his Honour thought it must be admitted that since the minute of December, 1892, partly by the action of the Chief Commissioner and partly by the provisions of this award, the conditions of the locomotive drivers and firemen had been very substantially improved. The question was whether, in all the circumstances, the board was justified in giving an increase of as much as one shilling a day each all round. He could not help feeling that the increase in the size of the locomotives and in the length and weight of the trains must make itself felt in the work. The consequences of a mistake were more serious, and in that sense the responsibility was greater.

In connection with the increased cost of living, his Honour thought that it would be fair to give an increase in the rates of pay to firemen and drivers, but £60,000 a year was no small sum to require from the public to place in the pockets of one small class of public employees, who were already getting much more than the living wage. It involved a consideration of the degree to which effect should be given to the increase in the cost of living.

"I have laid down, and adhere to my ruling," said his Honour, "that where the cost of living increases, it gives no absolute right in the worker to a corresponding increase in his wage, if he is getting more than the living wage, but that is a material circumstance for a board to consider. In this case, I think that the board must have rested the wage really upon this. The railways have one chairman for all the boards, who has been dealing with other branches of the service, and is in a good position to take a bird's-eye view of it and of the relative claims of the various classes. That is an important consideration, and one which the operations of arbitration are daily accentuating."

If, in the orginal classification of the workers, Class A was given 1s. a day more than Class B, and Class B thereafter got an award increase of 1s. equalising the two wages, Class A would at once think that the former distance should be preserved, and that it also should receive at least another shilling. Here recently the traffic workers had received increases. The locomotive engine-drivers naturally said at once, "If they, why not we also?" He was afraid this fact—that the industrial world now vibrates in all its parts in response to an interference with any of its parts—was not, under the present system, sufficiently provided for. It made consistency in awards a matter of importance, and it was difficult to maintain consistency with so many independent boards. With regard to what increases should be given, his Honour said he must attach importance to the opinion of the Board, and that after deep consideration he could not see that the Board was wrong, except in one particular, viz., that relative to the wages of firemen for the first year, which he would alter to 9s. per day. The other increases would remain.

An application, on behalf of the employees concerned, for costs was not allowed.

---

## "GREATER MELBOURNE."

### The Metropolitan Council Bill.

### Tramways, Lighting and Electric Supply.

In the Victorian Legislative Assembly on the 23rd September the Premier, Mr. Watt, moved the second reading of the long-promised Bill "to create and equip a new municipal organism within the metropolis for the discharge and development of many important functions at present either dormant or in the hands of various local governing bodies." The Bill, as printed for circulation, covers 228 quarto pages, and the "explanatory memorandum" sent out with it occupies 14 similar pages. In moving the second reading, Mr. Watt closely read a carefully prepared exposition of the measure, and his "speech," as reported in Hansard, occupies over 30 pages. The Bill proposes to create a new municipal council, which will consist at first of thirty members, but may in time be increased to forty, elected for three years, and who will retire simultaneously; the council will elect one of their number as chairman, whose allowance will be limited to £1000 a year. The general principle of the scheme is a federation of municipalities rather than their unification, but several municipalities have in some instances been grouped together for the purposes of the Bill. The present municipalities are not to be abolished, but are to be left with certain distinctly local functions. "We do not propose," said Mr. Watt, "to do anything more to the municipalities of the metropolitan area than to take certain functions from them, and give them to the Metropolitan Council." The basis of representation will be population, not property valuation, but the present municipal franchise will be retained, and women will be entitled not only to enrolment but also to election to the council. The area under the control of the council will have a radius of 10 miles from the G.P.O., and will comprise in 15 districts the areas now controlled by 27 local councils, and Mr. Watt gave the following table showing how that area compares with other great municipal areas in Great Britain and with the Greater New York of 1910:—

| | Acres. | Population per Acre. | Valuation. |
|---|---|---|---|
| London . . . . . . . . | 75,000 | 60 | £41,088,000 |
| New York (1910) . . | 183,000 | 18 | – |
| Glasgow . . . . . . . | 19,000 | 52 | 7,307,000 |
| Manchester . . . . | 21,000 | 19 | 4,656,000 |
| Liverpool . . . . . . | 19,000 | 38 | 4,798,000 |
| Birmingham . . . . | 43,000 | 33 | 4,325,000 |
| Melbourne . . . . . . | 92,000 | 6.6 | 6,215,000 |

The total populations were:—New York, 4,766,000; London, 4,536,000; Glasgow, 1,010,000; Birmingham, 840,000; Liverpool, 746,000; Manchester, 714,000; Melbourne, 617,000.

The municipal districts will be represented as follows:—Melbourne, five members; South Melbourne and Port Melbourne, three members; Prahran and Malvern, three members; Footscray and Williamstown, two members; Northcote, Coburg, Preston, and part of Heidelberg, two members; Hawthorn and Kew, two members; Brunswick, two members; Collingwood, two members; Fitzroy, two members; Richmond, two members; Essendon, one member; St. Kilda, one member; Caulfield and part of Oakleigh, one member; Camberwell and part of Nunawading, one member; Brighton and part of Moorabbin, one member.

The council will be allowed to borrow up to £5,000,000 on debentures; sinking funds are to be provided for all loans; compensation to municipalities will be paid in inscribed stock, and there is to be an annual audit. Amongst existing public bodies, whose functions will be taken over and exercised by the Metropolitan Council, are the Melbourne and Metropolitan Board of Works and the Fire Brigades Board, and the following provisions are made respecting tramways and lighting.

Part XVI. of the Bill relates to tramways within or partly within and partly without the Metropolis, and the Premier said that the construction and control of tramways was perhaps the greatest function which the council would undertake. Perhaps the most pressing necessity for the creation of the council lay in the question of tramway management. The Bill provides that no Order-in-Council is to be passed after the council's first meeting day for the construction of any tramways within the metropolitan area. The council is to have the exclusive right to construct and operate within the municipal area such tramways as would be authorised by Parliament. It is to be empowered, with the consent of the Governor in Council, to acquire tramway undertakings, either by agreement or compulsorily. Under clause 325 of the Bill, the Melbourne Tramway Company is to go out of business whenever it is bought out, or whenever its lease expires. The Government felt confident in advising the House that when the Melbourne Tramway and Omnibus Company's full time has run the end of the company will have arrived. The council will then also absorb the Melbourne Tramway Trust, taking over all its assets and liabilities, but no municipality can claim compensation for good-will or loss of any profits from the tramways, though those profits will be divided amongst the people of the whole metropolitan area. Arrangements are also to be made with the Railway Commissioners to take over the St. Kilda-Brighton tramway. Mr. Watt declared himself strongly in favour of municipalising rather than nationalising the tramways, and there was difficulty in separating the metropolitan from national interests. Tramways are intimately related to the railways in the matter of competition, and as long as the Government has control of the metropoiltan railway system it is necessary that there should be no competition between the municipal and State authorities. Under Part XXI., which relates to hackney carriages, etc., power is given to the council to control motor 'bus traffic; it would have the right to prescribe the routes and areas in which motor 'buses might not run. If not properly controlled the motor 'bus traffic would be a serious menace to the tramway interests of Melbourne. Whatever service the community required the Bill gave the council power to provide it.

Part XVII. deals with electric light and power. The council is to be empowered to construct works and supply electricity for public and private purposes within the metropolis, and it will be entitled to obtain Orders under the Electric Light and Power Acts for any part of the metropolis not already covered by an Order. Unallotted areas will be taken over at once, and existing franchises may be taken over from time to time, while no new Orders in Council will be granted without the council's consent. "We want," said Mr. Watt, "to make this council the sole electric light and power undertaker for the metropolitan area." Power is given to the council to purchase electric current, and the Premier suggested that in this way the Government would be able to dispose of surplus electric power from the electrified suburban railways. In the case of the principal private electric franchises now in force, the date of expiry is November 13, 1925, but these may be taken over at any time, compensation being paid as ordered by a Court of Arbitration.

Part XVIII. deals with gas. The council is empowered to construct gas works and supply gas in the metropolis. It will also have the right to acquire, with the consent of the Governor in Council, any existing gas undertakings. The purchase of the Metropolitan Gas Company's undertakings could be made in accordance with section 249 of the Companies Act, or, if an amendment to be submitted were adopted, in accordance with any amending legislation. The existing duties of the gas conference will not be transferred to the larger council. The conference really represents the area served by the metropolitan company. In regard to both gas and electric lighting the council will have power to instal fittings, but is not given general trading powers. Municipal gas concerns may be taken over on the same terms as electric light undertakings, and the amount of compensation will be in the discretion of the Court.

The House listened with marked attention to the Premier's lucid exposition of the principles of the Bill, and, at its close, complimented members on their undivided attention. "It is a somewhat rare experience in our parliamentary life," he said, "for a speech that extends over three and a-half hours to be received in that way. I appreciate it very highly.'' The debate on the Bill was adjourned until October 7.

## SOUTH AUSTRALIAN RAILWAYS.

There is a strong agitation at Port Augusta (S. Aus.) against sanction being given by the State Government to the proposal of the Broken Hill Proprietary Co. to change the route of its present railway between Iron Knob and False Bay, so that its terminus will be at Backy Bay. It was not without meeting with much opposition that the concession was granted to the company permitting it to lay a private line for the transport of its iron-ore from Iron Knob, yet in those days the material was simply being moved within the State; that is, from Iron Knob to the Port Pirie smelters. Now, however, it is proposed to make Backy Bay the port of shipment for the ore to Newcastle, for use in the company's iron and steel works now in course of erection, so that a substantial reason can be put forward against a fresh concession to the company. Obviously the revenue which a State railway would derive from the transportation of the millions of tons of iron-ore, which the company will in the course of a very few years convey to New South Wales, would be a very handsome one, even if the line were expressly built, and it would be an almost incredible act of folly for the Government to hand this over to a private company. Moreover, the Eyre's Peninsula Railway Commission recommended years ago, before the scheme for the Newcastle steel works was made known, that a railway should be built from Port Lincoln up the east side of the Peninsula to Port Augusta, and this has been taken northwards as far as Darke's Peak, from which to Port Augusta a railway could pass through the Iron Knob district, and would serve to open up the whole of the eastern coast country, besides forming a connecting link between the railways to the east and west of Spencer's Gulf. To make Port Augusta the port of departure for the iron-ore would also prevent the competition of new private wharves at Backy Bay with the public wharves already in existence, and capable of extension to meet requirements.

An alteration of great importance to the quick handling of goods traffic is now nearing completion at Adelaide, the cost of which has already reached £340,000, and will probably go to £500,000. Last Monday the whole of the goods traffic was transferred from the Central station to extensive new premises at Mile End. Preparations for this change have been in progress since 1909, when the urgent demands of the growing goods traffic made it necessary in the first place to lay down two sidings to deal with firewood and similar bulk stuff, after which the work of establishing a general goods depot at Mile End was taken in hand. Acting on the advice of the Railway Commissioner, Mr. A. B. Moncrieff, the Government secured a spacious block of land which will admit of considerable extension of the present buildings when the need arises. This had to be levelled at a cost of much time and money, but when the whole has been completed everything will be on one level. The new yards are equipped with many time-saving appliances. To the north of the Hilton Bridge are a long line of coal straiths and wood sidings, where clever engineering devices and time-saving machines combine in providing a much more economical handling of these fuels. In the case of the latter the wood is passed from the trucks over saw benches, and is then raised by elevators to large hoppers, under which lorries and drays are backed for delivery direct to the consumer. There is only the one handling, and the price of firewood has been reduced in consequence from 28s. to 22s. a ton. For the carriage of coal to private firms and the loco. department hopper trucks, each of 15 tons capacity, are used, and can be unloaded in a few minutes, and can be put in commission again without delay. The antiquated method of loading and unloading coal with shovels is done away with. Large steam cranes lower buckets with strong steel jaws into the black mass of fuel, and when they return they deposit half a ton of coal in the tender at a time, so that a six-ton load is rapidly shipped and the engine is away again in a few minutes. The whole of the yards has been planned with a rigid regard to utility, time-saving, and other economies. Whereas in Adelaide there was only one set of rails to take all the goods and live stock traffic for the whole of the metropolitan area, in addition to the through traffic passing north of Adelaide, here there are the equivalent of three arriving and three departing roadways. This will all tend to the rapid handling of the traffic, and prevent delays. For outward bound goods two sheds have been constructed, 600ft. in length, and the platforms are 12ft. wide, so that there is a total covering of 1200ft. by 24ft. for the reception of consignments. A short distance away on the western side are the shelters for incoming goods, and these cover an area of 600ft. by 40ft. Some idea of the improvement will be gained when it is stated that the old shed on North terrace was 300ft. in length, and it was used for both outward and inward traffic. Along the outward shed there are also 16 electric jib cranes, each with a capacity of lifting 30 cwt., and each of the 16 sections is provided with a 42 cwt. weighing machine, sunk to the floor level of the platform. At the ends of both the inward and outward sheds there is a total of 2000ft. of uncovered platform, where hand cranes have been installed to handle machinery and other heavy goods which are beyond the capacity of the others. Sheds will also be built for the sole use of carrying firms having large business with the railways, and will be leased; one of these is already completed. The whole of the sheds and yards are being provided with an electric light supply, and 100 burners are being installed, each of 2000 candle power. For the accommodation of the goods traffic there is a total of 15 miles of sidings, apart from six miles in the locomotive department.

Of course the transfer of the goods traffic will leave ample space at the Central station for a rearrangement of passenger traffic, and this has already been commenced, but the way is now clear for more rapid steps in this direction.

The following new regulation with respect to insurance of railway employees was passed at a meeting of the Executive Council last week:—"Any person, before confirmation of his appointment in the railway service, must either become a subscriber to the Public Service Superannuation Fund or effect in some life insurance office carrying on business in South Australia, and approved by the South Australian Railways Commissioner, an insurance of £200 on his life. Any employee who has complied with the insurance regulations in force up to September 30th, 1913, shall not be required to insure for an additional amount until his salary or wages exceeds £170 per annum; when this occurs the insurance provision must be increased to £200.''

## NORTH SHORE BRIDGE (N.S.W.) AND NORTON GRIFFITHS CO.

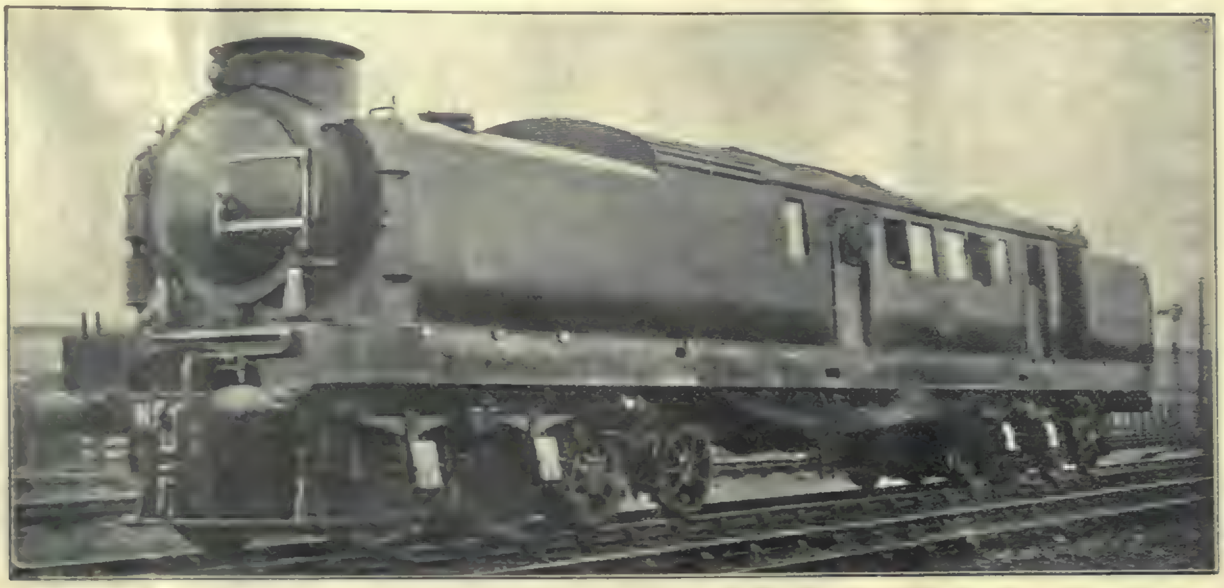
It seems inevitable that the public works programme of the present New South Wales Government should have the name of Norton Griffiths coupled with it. No doubt the Minister of Works is wise in refraining from submitting the latest offer of that firm to the Cabinet, viz., to construct the North Shore Bridge, and find all the money for it. There is no more justification for allowing that firm to undertake one public work than another, and, as the Minister says, it will be time enough to submit the proposal regarding the bridge when that in connection with railway construction is found to be palatable. Briefly, the company's offer is to construct the bridge at once, and finance it on the same system as was done in the case of the Assouan dam in Egypt. The constructors would find the money, and carry out the work, spreading payment over 30 years, and charging 6 per cent. altogether—4 per cent. interest, and 2 per cent. sinking fund. By this means the bridge would be paid for in something under 30 years.

In connection with this work, there is something to support Mr. Wade's contention that a tunnel should be constructed meantime, to relieve the congestion. To quote an extract from Mr. Wade's letter to the chairman of a meeting of the Chatswood residents: — "Suppose the bridge were authorised to-morrow, it would not be open for traffic for at least nine years, or probably ten years, afterwards. In the meantime population is growing, traffic increasing, the congestion on the water at Circular Quay is becoming more dangerous every day. How is this growing congestion to be dealt with in the meantime? Extra boats upon the fairway only add to the danger. The public will be driven, therefore, even with a bridge actually sanctioned, to build a subway for railway traffic to relieve the congestion in the meantime. This work can be done for something like half a million of money, can be built in 18 months, and it would afford means of relief for years to come. In the meantime, as the money market becomes easier, and other competing claims less severe, the work of the bridge construction could be gone on with. It seems to me that this position is unavoidable in the near future." This practically puts the position in a nutshell, and it remains a debatable point whether the work of constructing the bridge, even if some such proposal as Mr. Wade's be not adopted as an expedient, will be authorised for some time to come, on account of the almost equal strength of the opposing parties, causing vexatious and, probably, unnecessary delays in the progress of the country's business.

---

Those anxious to obtain positions as junior mechanics in the Postal Department are informed that a competitive examination for appointment to vacancies will be held on Saturday, December 13. Ages of candidates must be between 18 and 50 years. The salary at commencement is from £84 to £144 per annum, according to age at appointment. Full particulars are contained in the "Commonwealth Gazette" of September 27, or may be obtained by written or personal request from the secretary to the Commonwealth Public Service Commissioner, Custom House, Melbourne, with whom applications close on November 1.

## TURBO-ELECTRIC LOCOMOTIVE.



The steam turbo-electric locomotive constructed by the North British Locomotive Co. Ltd., of Glasgow in 1910, has had a long series of trial runs on the railways in the neighbourhood of Glasgow, continued until quite recently. These appear to have proved highly satisfactory, so much so that, it is said, many railway companies intend placing orders with the manufacturers. For the use of the accompanying illustration of the engine we are indebted to the managing editor of the "Victorian Railway Institute Review," and the description is from "The Railway News" (London):

"Steam is generated in a boiler of the ordinary locomotive type, which is fitted with a superheater, and the coal and water supplies are carried in the side bunkers and in the side water tanks at both sides of the boiler. The steam from the boiler is led to a turbine of the impulse type running at a speed of 3000 revolutions per minute, to which is directly coupled a continuous-current variable voltage dynamo. The dynamo supplies current and pressures varying from 200 to 600 volts to four series-wound traction motors, the armatures of which are built on the four main or driving axles of the locomotive. The exhaust steam from the turbine passes into an ejector condenser, and is, together with the circulating condensing water, delivered eventually to the hotwell.

"The condensation of the exhaust steam deprives the locomotive boiler of the usual exhaust blast which induces the draught through the firebox and boiler tubes. In the experimental locomotive the induced draught is replaced by forced draught provided by means of a small turbine-driven fan. The fan is placed within the cooler, so that it will deliver hot air to the boiler fire, and at the same time assist the current of air through the cooler. The small switchboard and the instruments required, the controller for grouping the four motors in series—series-parallel and parallel, according to the draw-bar pull to be exerted—and the regulator for controlling the voltage in the electrical circuit, and consequently the speed of the train, are all placed on the driver's platform within easy ready."

---

## BRITISH AND EUROPEAN DEVELOPMENTS.

(From Our Correspondent.)

London, August 29.

On Tuesday last, August 26, a demonstration of the Prentice automatic system of wireless train control was given in the presence of railway and press representatives on the Hampton Court line of the London and South-Western Railway. In this system there is no direct electrical communication between the engine or train and the track. A high frequency wave wire, an insulated conductor, is laid for about 6000 or 7000ft., and beneath the engine is a large (antennae) to receive from the wave wire. The running rails are used for part of the track circuit; they are divided into signalling sections by insulated points. The low voltage current is taken from the supply current, through a small transforming device, and operates through a relay.

Various electrical apparatus on the engine ensure that so long as the high-tension current is undisturbed a signal light on the locomotive shows the line to be clear. When, however, the section ahead is occupied by another train, short-circuiting of the track relay causes a cessation of the high frequency current through the "wave wire." Instantly the signal light changes to "danger," an audible warning is sounded on the engine, and the brakes are applied.

The "Daily Telegraph," in giving an account of the demonstration of Tuesday last, says that in each instance the system worked exceedingly well. The special train, drawn by an engine adapted for the purpose, and driven by steam, stopped on the branch line, clear of Hampton-court Junction, at one end of the specially prepared track. A pilot engine was run to the other end of the section, and then the engine of the "special," with several of the officials and journalists in its cab, started off towards the pilot. It soon attained a speed of about twenty-five miles an hour, and headed straight for the stationary locomotive. Above the head of the driver a green light showed for safety. On entering the blocked section immediately behind that occupied by the pilot engine, this light changed to red for danger. Instantly a "buzzer" sounded loudly on the engine, and the brakes were applied automatically. The engine at once slowed down, and, without any action on the part of the driver, and with steam still full on, it came to a standstill at a considerable distance from the obstruction in front.

Afterwards a similar test was carried out with the whole special train and it worked equally successfully. The danger signal again flashed on, the "buzzer" gave its warning, and the train pulled up without the least discomfort, in perfect safety. Afterwards the party examined the complex apparatus with considerable interest.

Amongst other advantages of the Prentice system is the persistent warning given to the driver of danger ahead, in combination with initial brake application. Whilst subsequent action is left to the discretion of the driver, is is only permitted in conjunction with such warning. By means of a push button, however, the driver can release the brakes whilst in the blocked section, and, having been apprised of the danger, can control the running of his engine as is necessary. In order to remind him of the obstruction ahead, the "buzzer" continues to sound, and the red light to be displayed, until the section is clear. Then the fact that "line clear" conditions are restored is indicated by the cessation of the "buzzer" and the return of the signal light and brakes to their normal condition.

The automatic character of the installation enables a line to be worked to its full traffic capacity, as any loss of time by the transmission of bell signals and the operation of levers is avoided. In case of fog, also, a driver is given all necessary information as to the conditions ahead, even if he is unable to see the fixed signals. In circumstances where, owing to the "lay out" of the line, it is difficult to give a good look-out ahead, the same advantages are realised. In practice, also, fixed signals can be entirely dispensed with, as the signalling is entirely automatic and directly governs the movements of the train.

A return issued in London in August gives figures relating to the progress of the trunk telephone service in the United Kingdom. Between 1903 and 1913 the number of such lines in use advanced from 1363 to 3180. The other figures are:—

| | 1903-4. | 1912-13. |
|---|---|---|
| Total mileage | 49,000 | 117,900 |
| Average calls per trunk circuit per day .. .. | 34.1 | 38.8 |
| Receipts | £325,525 | £912,342 |

The average cost of operation was 1.26d. per call in 1912-13, as compared with 1.27d. in 1907-8—the figure for 1903-4 is not available.

The annual report of the Chief Inspector of Mines and Quarries shows a decrease of 9,207,772 tons of coal output in the United Kingdom. This is partly due to the national coal strike. The result would have been different, remembering the length of the strike and the area affected, had not the collieries been worked very hard in most districts before the strike began. The total output for eight inspection districts was 262,684,127 tons. The number of persons employed in or about all mines in the Kingdom was 1,117,148, an increase of 21,877 as compared to 1911; 79,887 persons were employed at quarries, a decrease of 998.

It is important to note from this report that there is at present a shortage of all labour at nearly all the pits in Scotland. It is considered that this is in a large measure due to the number of mine workers who have emigrated during the past few years to Canada and other colonies. The flourishing condition of other trades and the absence of floating population seeking employment, is also responsible.

The discussion that has occurred periodically during the last few years at Sheffield in regard to the position of the municipal electricity department in respect to electrical installation work and apparatus sales, has now reached another important stage, a report outlining a proposed policy for the future having been prepared by a subcommittee. It is now recommended that a showroom be maintained for the purpose of exhibiting electrical fittings, including those that the Corporation may only sell through a contractor carrying on business independently. In regard to the sale of such fittings, the method adopted is to be as follows:—A list is to be prepared of all such contractors as agree to sell fittings to the Corporation on stated terms. This list will be in the hands of all canvassers and showroom attendants, who will have authority to advise consumers that the Corporation will sell them the fittings that they require, through any of the contractors on the list, if they, the consumers, will arrange accordingly. Electrical contractors on the list, or their customers, will have access to the showroom to inspect and select fittings and to arrange sales or purchases. It is suggested that all the electrical contractors in the city be invited to come on to the said electrical contractors' list.

The scheme of the post office for laying a small electric tube railway to serve certain parts of London at a cost of about a million pounds, of which I gave particulars a few weeks ago, has, after discussion of many points in committee and in both the House of Commons and the Lords, passed through all the necessary stages. A number of amendments have been made, but the part of the whole affair that has given rise to most difference of opinion has been the proposal of the Post Office Department to supply the 490,000 units per annum required to work the railway from its own generating station at Blackfriars. The post office engineers said that they could produce their own supply at 1.077d. per unit, whereas if they bought it from public supply authorities they would have to pay 2.16d. The electric supply companies produced evidence of their officials to show that the latter figure was far from being correct, and one authority went so far as to say that it would supply at ½d. per unit. The result of this and other evidence was that the House of Lords Committee declined to allow the Post Office to supply itself, but in the House of Lords an attempt was made to re-insert the desired authority. It was, however, only after an undertaking was given on behalf of the Postmaster-General that tenders should be invited from the supply authorities, and that the question should be settled on the point of price, and not on account of other considerations, that the attempt was allowed to succeed.

## GENERAL ELECTRIC COMPANY.

### Huge British Works.

By the courtesy of Mr. Edw. E. Hirst, managing director of the British General Electric Co., Magnet House, Sydney, representatives of the electrical industry and others interested were last week afforded a unique opportunity of witnessing the immense English works of this large firm in operation. The occasion was a cinematograph display at the Lyceum Theatre, Sydney, where a most interesting and educative series of films, depicting every department of the manufacture of electric machinery, fittings, Osram lamps, carbons, etc., were thrown on to the screen. To the uninitiated on this side of the world the display was a revelation of the vastness, intricacy, and manifold diversity of electrical manufacture, and was the means of enabling those who have not had an opportunity of visiting such works to more fully comprehend the numerous and complex processes necessary to turn out complete the various articles necessary for the generation and use of electricity. The G.E.C. works are not, as is generally supposed here, situated in the one district, but there are no less than five distinct factories under the direction of the firm. For instance, at the Witton Works, Birmingham, the larger machinery is manufactured, such as dynamos, motors, etc., and the different departments of this factory, comprising conduit works, engineering works, power house, foundry, carbon works, were shown. A huge cupola pouring molten iron into a mould, a big 28ft. boring mill in operation, carbon presses and ovens are a few of many interior views of the Witton Works which were shown. At the Lemington Glass Works the making of raw glass, and subsequent drawing of tubes, is undertaken. Then, at the Osram lamp works at Hammersmith, the various stages of manufacture of lamps was most interesting, including glass blowing, exhausting air from the bulbs, testing, etc. The photometer room and detailed view of photometer attracted considerable attention. All the different operations necessary in the making of telephone wires and cables were included in the pictures illustrating the Peel works, including views of a wonderful automatic screw-making machine, turning out screws by the hundred, apparently without any human attention, also an automatic grinding machine. At the Salford works the firm make the various instruments necessary in electric practice such as circuit breakers, and many kinds of measuring meters, the work of calibrating breakers and meters, which has to be done with great exactitude, being witnessed. The G.E.C. electric light fittings are made at the Heene works, where the very opposite of the large machinery of the Witton works is seen, most of the processes being on the artistic and scientific rather than the large scale. Here, polishing art metal and brass-finishing departments were illustrated, in addition to the work of assembling and fitting together "Magnet" electric irons, of which an immense quantity was shown.

Highly skilled organisation is necessary to successfully run such a large concern, and the pictures were introduced with a photograph of the fountain head of the firm in the person of Mr. H. Hirst, chairman and managing director, followed up by pictures of Mr. Hirst in his office, consulting with and giving directions to his responsible officers. The welfare of the large army of employees, numbering 10,000, is carefully considered, and the various works have attached to them tea rooms, clubs, cricket and tennis grounds, etc., and views of the employees at recreation were interesting. This consideration no doubt accounts for the interest taken by the employees in their work, and is an important factor in maintaining the reliability and excellent workmanship for which the manufactures of this firm are celebrated. The picture of the fire-drill, which is gone through at unexpected times, depicted 2000 workers leaving a building in the short space of 2½ minutes, and the fire-fighting staff attached to the Works ready to combat an outbreak of fire in an incredibly short time. Humorous and other pictures were then shown, and thanks are due to the British General Electric Company for an insight into the methods of electrical manufacture, such as has not been seen in Sydney before.

---

The complete installation of an automatic telephone system at Wellington and Auckland (N.Z.) promises soon to become an accomplished fact. About 500 automatic connections on the Strowger system have been in use for some time on trial, but the company failed to secure the contract for the complete installation, for what reason is not known. The contract was secured by the Western Electric Company (whose system differs in some respects from the Strowger) at a price of £98,000, and it is expected that the work will be completed within two years.

## MISCELLANEOUS.

With the view of carrying out its proposal, announced a week or two ago, to purchase the Goldschmidt wireless patents, the Marconi Wireless Telegraph Company Ltd. is increasing its capital by £500,000. The Goldschmidt system is at present owned and operated by the Anglo-French Wireless Co. Ltd., and some months ago the British Advisory Committee on Wireless Telegraphy reported on it as being successful over short distances, and stated that the "only thing required to make it practicable over long distances was a machine of the necessary power."

* * *

Mr. Justice Burnside, in the Arbitration Court at Perth last week, dismissed the application of the Amalgamated Society of Railway Employees for cancellation of the registration of the Perth Tramways Union. His Honor said, "The purchase of the tramways by the Government did not affect the right or agreements of tram employees, who desired to regulate their own affairs. It had ben urged (he added, ironically) that there should be only one union now that the Railways Commissioner controlled trams, but there were already five unions in the railway service, and a sixth would not make much difference."

* * *

The Sydney Municipal Council has been recommended by its Electric Light Committee to obtain from the Governor-in-Council authority to borrow the sum of £250,000 to be utilised for electric light purposes. The money will be raised on corporation debentures.

* * *

The proposal to divert the main southern railway of New South Wales between Picton and Mittagong has been reported upon by Mr. J. Fraser, Engineer-in-Chief for Existing Lines, who states that a saving of £30,000 a year would be made. The estimate cost of the works, with a double line, he gave, at an official inquiry last week, as £630,353; and of this amount £274,312 would be absorbed by earthworks, £103,082 in tunnels, £146,520 on the permanent way for a double track, and £20,000 for station buildings. The estimates, he pointed out, had had to be raised because of the increased cost of rails. The existing line would continue to be used for local wants, but not for the ordinary main line traffic. Mr. Mr. C. A. Hodgson, Superintendent of Lines, said that the deviation would bring about a saving in mileage run and locomotive power, and quoted figures to show that the total reduction in expenditure would amount to £29,464. The section between Picton and Hilltop was one of the most difficult pieces of railway to work, on account of the grade of 1 in 30.

* * *

At last week's meeting of the Municipal Council of Sydney, the recommendations of the Electric Light Committee, as published in our last issue were, with one exception, adopted. The exception was the proposal to borrow £250,000 for the electric lighting undertaking, which was referred back to the committee for further report.

* * *

A preliminary survey of the route for the proposed railway from Oodnadatta through the Macdonnell Ranges and the Alice Springs district to Burt Plains, a distance of about 330 miles, was received by the Minister of External Affairs from Messrs. Lawrence and Chalmers last week. Mr. Glynn hopes to introduce a Bill shortly authorising a complete survey before construction.

* * *

The public works committee of the Melbourne City Council has been authorised to purchase a Benz petrol watering can, with a street-cleansing attachment, at £1669 10s.; a one-ton electric motor-lorry, at £610; and an Enfield petrol runabout at £425.

* * *

Tenders closed early in September at the Home Affairs Department for the supply of 44,850 tons of 80lb. steel rails and other material for the construction of the Trans-Australian railway. After going fully into these, with the assistance of departmental officers, the honorary Minister in charge of the department, Mr. Kelly, was able to state that he had arranged with George Wills and Co. Ltd. and Elder, Smith and Co. Ltd. (in conjunction), to supply 27,190 tons of 80lb. English rails, and 1797 tons of fishplates, the price for the rails being £7 11s. 8d. per ton, and for the fishplates £9 11s. 8d., delivery to be made at Fremantle. Messrs. C. and G. Hoskins, of Lithgow (N.S.W.), will supply 17,660 tons of rails at £8 16s per ton, and 1191 tons of fishplates at £11 2s., delivery to be at Port Augusta (S. Aus.). The great difference between the cost of the Australian supplies and those from Great Britain is less significant when it is remembered that in the ordinary course a duty of 11 per cent. would be required on the imported article, though supplies for the Commonwealth Government were admitted free. Comparing the Messrs. Hoskins' rates with those of foreign firms for delivery at Port Augusta, the difference was so small that the Ministry decided to give preference to the Australian product. The total amount involved in the contracts just let is £315,220, of which £146,592 will be divided between Wills and Co. and Elder, Smith and Co., and £168,628 will go to C. and G. Hoskins Ltd.

* * *

The Prahran (V.) City Council has approved of the proposal to construct an electric tramway from Prahran to Clifton Hill via Chapel-street, Church-street, Murray-street, Albert-street, Victoria-crescent and Hoddle-street, and authorised the necessary steps being taken to obtain legislation empowering the municipalities interested, or other delegated authority, to undertake the construction and operation of the proposed tramway forthwith. The total estimated cost of the work is £115,270, divided between the municipalities proportionately to their frontages to the line as follows:—Prahran, £9022; Richmond, £40,539; Collingwood, £65,709. The estimated revenue is £28,000, and the estimated expenditure £24,987.

* * *

The seventh general meeting of the Northern Engineering Institute of New South Wales was held in the Council Chambers, Newcastle, on Saturday evening, the 20th September. Mr. J. L. C. Rae (president) occupied the chair, and there was a fair attendance. The following gentlemen were unanimously elected as members of the Institute:—Messrs. N. K. Allanice, G. Albutt, H. M. Beiers, E. Fitzgerald, J. A. Lindsay, S. W. Jones, A. W. Paul and J. D. Smith. The principal business of the evening was a paper by Mr J. Ewing on "The Flow of Water Through Pipes." The paper, which was lengthy and of a somewhat technical nature, dealt with the formulae for calculating the rate of discharge of water through pipes, and explained a new formula evolved by the author specially for the Hunter River water, and which takes into consideration the internal conditions of the pipes. During the reading of his paper the author exhibited different kinds of pipes, and showed some samples that had been in use for a considerable time, in some cases the area being considerably reduced by incrustation, and in others the pipes had been eaten away by the action of acids in the soil in which they had been laid. At the conclusion of the paper a hearty vote of thanks was tendered to the author and the discussion adjourned.

* * *

Our Lithgow (N.S.W.) correspondent writes: —"Some eighteen months ago the Minister for Works, Mr. Griffith, desiring to obtain skilled advice on the use of the Schmatolla process of burning lime, engaged the services of Mr. Herman Laage, an eminent German expert, who had considerable experience in the process in Europe and America, and who was recommended to the Government by the inventor. Mr. Laage has been for some months past engaged in the construction of the Government plants at Taree and Botany. Having completed the work for which he was engaged, Mr. Laage has received his return fare to Germany, in accordance with the terms of his agreement, but has, with the consent of the Minister, undertaken the erection of a new kiln for the North Sydney Lime and Cement Company at Portland. Mr. Griffith is of opinion that the services of Mr. Laage would be of the greatest use to those persons who have the erection of lime-burning plants in contemplation, and has expressed his willingness to extend the time within which Mr. Laage has agreed to return to Germany, in order that his services may be available for any person or firm requiring them. The directors of the North Sydney Lime and Cement Company paid a visit to their works at Portland this week for the purpose of inspecting the progress being made with the erection with new patent kiln. The building of the kiln will require some months, and necessitate the placing of about half-million common bricks, and over a hundred thousand fire bricks. Satisfactory progress is being made with the work.

* * *

The Mt. Pleasant Company are entering upon mine extensions (writes our Wollongong (N.S.W.) correspondent), and the Board have decided, in order to carry out the plans of the manager, Mr. Cook, to instal more electrical plant, which will be of considerably greater power than the colliery is provided with at present. It has been suggested that the Mt. Pleasant colliery should supply current to the council of Wollongong, but whether such a project can be carried out depends upon the site selected for the new plant.

* * *

The State metal-crushing plant installed at the quarry, Port Kembla (N.S.W.), writes our Wollongong correspondent, is to be in full operation next week. For some time additions and alterations have been in progress, and the plant is undergoing trial runs. There are said to be a number of orders for metal waiting, and therefore good trade prospects. Of all the enterprises of the present Minister of Works this one probably had the best prospect. The demand was good, and here, in a quarry, was a heap of stone which was too small for breakwater building and ready for making into road-metal.

# *Invited and Accepted Tenders*

It is particularly requested that the information regarding contracts open, and the successful tenderers, be forwarded to The Editor not later than Monday of each week.

The following contractions are used throughout:—S—supply; D—delivery; M—manufacture; C—construction; E—erection; P—purchase; I—installation; R—removal. Where no contractions appear, supply and delivery is understood. The date at the beginning of each paragraph refers to the closing of tenders.

## INVITED.

### Commonwealth.

**Specifications, tender-forms, etc., for tenders invited for the Postmaster-General's Department of the various States under this heading may be had as follows:—Victoria—Various State G.P.O.'s. New South Wales—Departmental Stores, Sydney, and various G.P.O.'s in other States. South Australia—Adelaide, Melbourne, Sydney and Brisbane G.P.O.'s. Western Australia—Departmental Stores, Perth, and various G.P.O.'s in other States. Queensland—Various State G.P.O.'s. All States—Various G.P.O.'s. If the specifications, etc., may be had elsewhere, in addition, the places will be given in parentheses.**

POSTMASTER-GENERAL'S DEPARTMENT, Melbourne.—7th October.—S. and I. of electrically-driven machinery for operating pneumatic tube services, Central Telegraph Office, Melbourne, as per schedule No. 900.

14th October.—S. and E., at the Telephone Exchange, Melbourne, of a common battery multiple switchboard, as per schedule No. 868.

14th October.—Cable boxes, as per schedule No. 877.

14th October (extended from 16th September).—S., D., E. and I. at the Telephone Exchange, Collingwood, Victoria, of a common battery switchboard, as per schedule No. 860, or an automatic, or semi-automatic, switchboard, as per schedule No. 859.

14th October.—S. and D. of 1000 protectors, as per schedule No. 964. (See advertising columns.)

21st October.—S. and D. of 12 auto re-winding electric clocks for wireless stations, as per schedule No. 969.

5th November.—Galvanised iron piping, as per schedule No. 952.

11th November (extended from 4th November).—D. and E. of eight automatic telephone switchboards at the Ascot, Canterbury, Malvern, Cheltenham, Footscray, Oakleigh, Sandringham, and Williamstown Telephone Exchanges, as per schedule No. 953.

16th December.—S. and D. of one common battery multiple switchboard at the Telephone Exchange, Wills-street, Melbourne, as per schedule No. 968.

POSTMASTER-GENERAL'S DEPARTMENT, Sydney.—8th October.—S. and D. at the Departmental Stores, Sydney, of 5000 strips protectors, single poles, as per stores schedule N.S.W. No. 336.

8th October.—S. and D. at the Departmental Stores, Sydney, of 440 Lodge Arresters, as per stores schedule N.S.W. No. 334.

15th October.—450 fire sheets (asbestos), as per stores schedule N.S.W. No. 326.

15th October.—Measuring instruments, to stores schedule N.S.W. No. 303; telephone parts, to stores schedule N.S.W. No. 314; switchboard parts, to stores schedule N.S.W. No. 315.

15th October.—63,000 insulators (various), as per stores schedule N.S.W. No. 296.

22nd October.—S. and D. of 7 miles copper-clad steel wire, as per schedule No. 335.

22nd October.—S. and D. of 3000 caps for supervisory lamp, schedule No. 338.

22nd October.—4500 cords, 3 steel conductors, schedule No. 328.

22nd October.—500 fuses, 3 ampere, schedule No. 338.

22nd October.—250 telephonometers, schedule No. 338.

22nd October.—S., D. and E. at the Telephone Exchanges, Randwick, Mosman, Parramatta, Ashfield, Burwood, Homebush, and Rookwood, Sydney, of seven (7) automatic switchboards, with associated equipment, as per schedule No. 281.

12th November (extended from 8th October).—S. and D. at the Telephone Exchange, Watson's Bay, Sydney, of 1 automatic switchboard, with all associated equipment as per schedule No. 234.

18th March, 1914.—S., D. and E. at the Telephone Exchanges, Epping, Ryde, Hunter's Hill, Drummoyne, Wahroonga, Paddington and Waverley, Sydney, of seven (7) automatic switchboards, with associated equipment, as per schedule No. 179.

POSTMASTER-GENERAL'S DEPARTMENT, Brisbane.—15th October.—Steel date stamps, as per stores schedule No. 279.

22nd October.—S. and D. of dry cells and battery glassware, as per stores schedule No. 281.

19th November.—Bronze wire, as per schedule No. 273.

17th December.—S. and D. at the Stores Branch, Postmaster-General's Department, Brisbane, of insulators, as per stores schedule No. 280.

31st December.—S. and D. at the Stores Branch, Postmaster-General's Department, Brisbane, of insulators, as per stores schedule No. 282.

POSTMASTER-GENERAL'S DEPARTMENT, Perth.—8th October.—Expansion bolts and shields to schedule No. 297.

8th October.—S. of milliammeters.

8th October.—Telephones, common battery, adjustable bracket sets.

15th October.—S. and D. of switchboard cable, W.A., schedule No. 312.

15th October.—S. and D. of conduits, steel enamelled, and fittings, W.A. schedule No. 313.

19th November.—S. and D. of rectangular dry cells.

10th December.—S. and D. of 60 tons wire (galvanised iron).

POSTMASTER-GENERAL'S DEPARTMENT, Adelaide.—12th November.—One lamp signalling trunk line switchboard, of five sections, one cable turning section, and one cable storing section, one two-position recording desk, and one chief operator's desk, as specified in specification No. 431, etc., delivered at the Telephone Exchange, Adelaide, as per schedule No. 296.

POSTMASTER-GENERAL'S DEPARTMENT, Hobart.—6th October.—Galvanised iron wire, as per schedule No. T.78.

1st December.—S. and D. of dry cells, as per schedule No. T. 84.

DEPARTMENT OF HOME AFFAIRS—Federal Capital.—24th November.—Water supply pumping plant for Canberra.

FEDERAL TERRITORY POWER GENERATING STATION.—27th October.—S. of circulating and exhaust pipes and bends, valves, flanges, etc.

DEPARTMENT OF HOME AFFAIRS—Kalgoorlie-Port Augusta Railway.—2nd December.—600 pairs of wheels and axles (9in. x 4½in. journals).

DEPARTMENT OF DEFENCE—Small Arms Factory, Lithgow, N.S.W.—29th December.—P. of scrap steel, brass, jute bags, whale oil, etc.

### Victoria.

VICTORIAN RAILWAYS.—2nd October.—S. case hardening mixture.

2nd October.—S. cement sheets.

2nd October.—S. spanners.

3rd October.—S. incandescent gas mantles.

3rd October.—S. fuse pots.

6th October.—Continuity conduit elbows.

6th Octboer.—Opal angold globes.

6th October.—S. and D. of steel channel bars for electric motor coaches.

8th October.—M. (from steel which will be sold to contractors), S. and D. of 1in. heel bolts and nuts for 80 lb. and 100 lb. rails.

8th October.—M. (from steel sold to contractors), S. and D. of ⅞in. steel heel bolts and nuts for 60 lb. rails.

8th October.—M. (from steel sold to contractors), S. and D. of ⅞in. chair bolts and nuts for 60 lb. rails.

8th October.—S. and D. motor generator set, 50kw.

8th October.—M. (within the Commonwealth of Australia), S. and D. of 80lb. steel rails and fishplates. Contract No. 25,005.

8th October (extended from 17th September).—Pig iron.

8th October.—M., S. and D. steel castings.

8th October.—P. and R. of about 720 tons of 80 lb. double headed steel rails.

8th October.—P. and R. of brass, iron and steel scrap.

15th October. Portable boring bar.

22nd October.—S. and D. of 30 tons red oxide.

29th October (extended from 8th October).—S. and D. of steel sheet piles for coffer dam. P.D., £10.

5th November.—Copper rod.

5th November.—Locomotive seamless copper tubes.

5th November.—Best Yorkshire iron angle and tees.

5th November.—Best steel boiler plates.

5th November.—Copper plates.

5th November.—100 tons of good machinery cast-iron scrap.

5th November.—S. and D. of mild steel flat bars.

12th November.—Steel channel bars.

12th November.—20 tons steel ingots.

12th November.—Steel blooms, for crank pins.

12th November.—Locomotive boiler tubes.

12th November.—High-speed tool steel.

12th November.—M., S. and D. of one 15-ton electric crane for Ballarat.

12th November.—Flame arc lamps.

12th November.—Insulated copper cable.

12th November.—M. and D. of one 60h.p. electric motor and accessories.

19th November.—M., S. and D. or cast steel wheel centres for A2 engines and new truck stock.

19th November.—Brass locomotive tubes.

19th November.—150 tons pig iron.

19th November.—10 tons sulphate of copper, best quality, for electrical purposes, battery material.

3rd December.—Steel blooms, for piston rods.

3rd December.—S. and D. of vulcanised rubber electric light wire.

P. & O. COMPANY'S ROYAL MAIL STEAMERS

FOR MARSEILLES, PLYMOUTH AND LONDON.

Leave Sydney on the subjoined dates, calling at usual ports.

FIRST AND SECOND SALOON ONLY.

| Steamer, | Tons. | Commander. | Noon. | Melb., 3 p.m. |
|---|---|---|---|---|
| MOREA | 11,000 | Andrews | Oct. 4 | Oct. 7 |
| MARMORA | 10,500 | Lockyer | Oct. 18 | Oct. 21 |
| MOLDAVIA | 10,000 | Gordon | Oct. 29 | Nov. 4 |

PASSAGE MONEY TO LONDON—
Single, £41 16s. to £82 10s.
Return, £69 6s. and £123 4s.

Return Tickets between Inter-State Ports are available for return by Orient, Messageries Maritimes, and N.D.L. steamers having room.

SPECIAL HOLIDAY RETURN TICKETS to COLOMBO are now issued, available for two months. Fares from Sydney, £45 2s. first saloon, and £31 18s. second saloon.

A. GORDON WESCHE, Superintendent IN AUSTRALIA, 63 Pitt-street, Sydney.

The COLONIAL MUTUAL FIRE Insurance Company Limited.

Principal Office: 60 MARKET-ST., MELBOURNE.

Branches in all the States.
Transacts Fire, Guarantee, Employers' Liability, Marine, Burglary, and Plate Glass, Accident, Workers' Compensation and Live Stock Insurances.
Send for Prospectus.
W. TUCKER, General Manager.

Harringtons Ltd

ANALYTICAL & METALLURGICAL DEPT.

Lowest fees for all kinds of Assay, Analytical, and Metallurgical work.

Expert Advice on Ore Treatment, Bullion Refining, Smelting, etc., etc., Directed by a qualified Analyst from Messrs. Johnson and Sons, London: Assayers to Bank of England; H.M. Mint, The Council of India, etc.

HARRINGTONS LTD.
386 George Street, Sydney.

SPECIAL NOTICE !

The Mount Morgan Gold Mining Co. Ltd.

ARE PREPARED TO PURCHASE Ores, Concentrates and Furnace Products, containing Gold and Copper, at most favourable rates.

ALSO TO INSPECT MINING PROPERTIES with a view to Developing, Financing, or Purchasing same.

Address:—MR. B. MAGNUS, GENERAL MANAGER, MOUNT MORGAN, QUEENSLAND.

**A. U. S. N. Co. Ltd.**

*Fast, Regular, and Comfortable Passenger Steamers*

(also carrying cargo) from and to

MELBOURNE, SYDNEY, ADELAIDE, FREMANTLE, BRISBANE, and all QUEENSLAND PORTS.

Passage Tickets interchangeable, with other Inter-State Companies, on certain conditions.

Full Particulars at

**COMPANY'S OFFICES**
**at all principal Australian Ports.**

**The Mount Lyell Mining & Railway**
**CO. LIMITED.**

Purchasers of Ores containing Copper, Gold and silver. Rates obtainable on application to the Secretary

Manufacturers of Coke for Smelting and Foundry Purposes, Acids, Etc.

HEAD OFFICE—
39 QUEEN-STREET, MELBOURNE.
D. G. LUMSDEN,
Secretary.

THE
**-PACIFIC CABLE BOARD-**

Best route to Great Britain, Canada, New Zealand, Germany, etc.

New Direct Cable to Auckland from Board's Sydney Office opened December, 1912.

A Week End rate is now available between Great Britain and Australasia.- Rate 9d. per word, with minimum of 18 - (24 words). Week End Cable Letters are accepted up to midnight on Saturday for delivery in Great Britain on the following Tuesday morning.

TARIFF PER WORD "VIA PACIFIC."

| | Ordinary. | Daily Deferred. |
|---|---|---|
| GREAT BRITAIN .. .. .. .. | 3/- | 1/6 |
| GERMANY .. .. .. .. .. .. .. | 3/- | 1/6 |
| NEW ZEALAND .. .. .. .. .. | 4½d. | |
| CANADA .. .. .. .. .. .. .. | 2/4 | 1/2 |
| U.S.A. .. .. .. .. .. .. .. .. .. | 2/4 to 2/8 | 1/2 to 1/4 |
| ARGENTINE, BRAZIL, CHILI and PERU .. .. .. .. | 5/8½ | 2/10¼ |

West Indies, Central America, and other rates, on application.

Cable forms, Deferred and Week End Regulations, may be obtained at

THE PACIFIC CABLE BOARD,
77 Pitt Street, Sydney. Tel., City 1346 (3 Lines).
408 Collins Street, Melbourne. Tel., 2588.

J. Milward, Manager in the Pacific, 77 Pitt Street, Sydney.

7th January (1914).—S. and D. 10,000 porous pots for batteries.

7th January.—S. and D. of best steel boiler plates.

7th January.—S. and D. copper rod.

7th January.—S. and D. copper plates.

7th January.—S. and D. of cast steel wheel centres.

7th January.—S. and D. of steel blooms for crank pins.

7th Jan.—S. and D. of locomotive brass boiler tubes.

7th January.—S. and D. of best Yorkshire iron angles.

7th January.—S. and D. of locomotive seamless copper tubes.

7th January.—S. and D. of steel channel bars.

VICTORIAN RAILWAY COMMISSIONERS STATE COAL MINE.—6th October.—S. of watt hour meter.

6th October.—S. 15-ampere service fuses.

22nd October.—S. and D. of 2 10h.p. motors. (See advertising columns.)

22nd October.—M., S. and D. of 3000 cast-iron truck pedestals. (See advertising columns.)

22nd October.—M., S. and D. of 2000 steel skip wheels. (See advertising columns.)

12th November (extended from 1st October).—S. of rope haulage engine and electrical equipment for McBride Tunnel.

PUBLIC WORKS DEPARTMENT.—2nd October.—Oil engine and machinery for Lunatic Asylum, Beechworth. Particulars at Police Station, Beechworth.

16th October.—A. and extension pier, Portland.

23rd October.—Extension breakwater, Warrnambool.

MINES DEPARTMENT.—8th October.—Tenders and connections for diamond and other drills and Government crushing batteries. (See advertising columns.)

## New South Wales.

PUBLIC WORKS DEPARTMENT.—7th October.—I. of electric passenger lift in On Chong's Building, George-street North; and I. of two electric goods lifts in Argyle Bond, Argyle-street, Sydney.

7th October.—S. and D. of 500 tons of iron spikes for 60 lb. rails.

7th October.—S. of steel pipes and specials for the reticulation of township and supply to the mines, Water Supply, Broken Hill.

7th October.—M., S. and D. of 15 jib water cranes.

27th October.—M. of steel bridge for Wilson River, Wauchope to Kempsey section, North Coast railway.

8th December.—M., S. and D. of steel bridges for Cooperbung and Piper's Creeks, on fifth section, North Coast Railway, viz., Wauchope to Kempsey.

RAILWAY DEPARTMENT.—15th October.—S. of 13 direct-current motors. (See advertising columns.)

15th October.—S. of forges, tools and shafting for overhead line repair shops, Leichhardt. (See advertising columns.)

26th November.—S. of one 2000 lb. storage battery freight truck. (See advertising columns.)

METROPOLITAN BOARD OF WATER SUPPLY AND SEWERAGE (341 Pitt-street, Sydney).—15th December.—M. and D. of one turbine centrifugal pumping plant for Crown-street Pumping Station.

WATER CONSERVATION AND IRRIGATION COMMISSION, 29 Elizabeth-street, Sydney.—8th October (Fresh tenders).—P. of one pair of cross-compound horizontal, direct-acting reciprocating condensing engines, and two horizontal, double-acting lift and force pumps; also two colonial type tubular boilers, complete, with all mountings and furnace fittings, funnel, etc., and feed pumps. (See advertising columns.)

## Western Australia.

GOVERNMENT TENDER BOARD.—2nd October.—700 brass boiler tubes for Railway Department.

9th October.—25,000 gallon C.I. tanks, for Railway Department.

30th October.—S. moulding machine cupolas and pneumatic hack-saw bench for Railway Department.

## Queensland.

TREASURY DEPARTMENT.—29th October.—C. and E. of central sugar mill at Babinda Creek, North Queensland.

WATER SUPPLY DEPARTMENT.—3rd October.—Sinking artesian bore on reserve in parish of Gaila.

## South Australia.

RAILWAYS DEPARTMENT.—14th October.—S. and D. in trucks on wharf, Port Adelaide, of 800 solid drawn best toughened copper tubes, for locomotive boilers, 10ft. 8¼in. long x 1⅞in. outside diameter x No. 10 I.W.G. thick at the end, gradually tapering to No. 12 I.W.G. at the other end. Customs duty (if any) to be paid by contractor.

14th October.—C. of 20 suburban carriages, 5ft. 3in. gauge.

14th October.—S. of new or s.h. motor boat about 35ft. long, 8ft. 6in. beam, draught 2ft.

14th October.—C., S. and D. of 20 side-tipping trucks.

4th November.—S. and D. 368 tons coloured or white cotton waste.

## New Zealand.

RAILWAYS DEPARTMENT.—31st October.—S. and D. of stores for the period from April 1, 1914, to March 31, 1917.

PUBLIC WORKS DEPARTMENT.—31st October.—S. of telephone instruments and accessories for Lake Coleridge power scheme.

PUBLIC SERVICE STORES TENDER BOARD.—13th October.—S. and D. of 500 cords, mounted, for bell receivers; 300 ear-pieces for receivers; 3000 ear-pieces, vulcanite, with flange; 500,000 envelopes, No. 26; 750,000 envelopes, No. 29; 3000 plugs; 3000 rings; 3000 telephones, B.B. wall.

13th October.—S. and D. of lighting transformers, etc., for use in connection with the Lake Coleridge power scheme.

## General.

CITY OF MELBOURNE.—7th October.—Incandescent electric lamps, and single phase transformers.

8th October.—Insulated copper cables.

THE MELBOURNE HARBOR TRUST.—14th October.—S. of lower tumbler and tumbler shaft for the dredge "Francis Henty." S. of lower tumbler and tumbler shaft for the dredge "La Trobe."

SHIRE OF HEIDELBERG (V.) (H. J. Price, Secretary).—16th October.—S. steam road roller fitted with scarifier.

16th October.—S. portable stone crusher.

SHIRE OF NUNAWADING (V.) (J. R. Kefford, Secretary, Box Hill).—25th October (extended from 18th October).—Electrical equipment.

DUKE AND MAIN LEADS CONSOLS GOLD MINING COMPANY NO LIABILITY (V.) (D. Murray, 430 Little Collins-street, Melbourne).—P. on cash or terms of slimes heap, Bet Bet.

WARBURTON WATER WORKS TRUST (V.) (A. K. T. Sambell, engineer, 60 Market-street, Melbourne).—2nd October.—S. and D. of cast-iron pipes; S. and D. of cast-iron fire plugs, valves, etc.; S. and D. of galvanised W.I. pipes, valves, specials, etc.; S. and D. of wood pipes; C. of settling basins; cartage of pipes, excavating and refilling pipe trenches, laying and jointing C.I. pipes and G.W.I. pipes.

AUSTRALIAN EXPLOSIVES COMPANY.—P. of one Clarke mill and spares; one 8 x 9 Tangye vertical engine; one 4 x 5 Tangye vertical engine; one 4 x 5 Tangye vertical engine; one 6 x 7½ Tangye vertical engine; one 6 x 6½ Robinson compressor; one 16 x 30 horizontal engine; one 4ft. x 8in. dia. x 22in. face, 3½in. bore pulley.

NORTH WOAH HAWP G.M. CO. (W. D. Thompson, manager, A.M.P. Buildings, Ballarat).—2nd October.—S. of one wire rope Largs Lay, 1750ft. 6/7 1in. dia., delivered on the mine.

THE JOHNSON'S REEF GOLD MINES CO. N.L., California Gully (John Veale, mine manager).—4th October.—P. and R. of old machinery at Nos. 1, 2 and 3 mines.

QUARRYMEN AND BUILDERS (estate of Robert Brown, c/o. J. V. Wood, 34 Queen-street, Melbourne).—P. of 1 quarryman's crane, 2 spring carts.

MUNICIPAL COUNCIL OF SYDNEY.—13th October.—S. and D. of stoneware bridges; black iron cable clips and pins; coal trimming chutes; wood troughing; gangways, ladders, etc. (See advertising columns.)

27th October.—S. and D. of curve drawing ammeters. (See advertising columns.)

SAMPSON AND MONTGOMERY, EMMAVILLE, N.S.W.—Wanted to enter into contract for the supply and erection of centrifugal gravel pump plant, consisting of 16 horse-power portable engine and 6in. gravel pump, 25ft. delivery, 30ft. wrought iron piping, 6in. with spiral riveted flanged joints, also deflecting nozzle, 1½in. bit, 300ft. of hose, 120ft. of sheet iron, boxes 4ft. wide and 8ft. long.

THURSDAY ISLAND TOWN COUNCIL.—31st October.—S. of a suitable gas lighting plant for street, house, and cooking purposes.

SHIRE OF TINTENBAR, Alstonville (N.S.W.).—C., etc., of an oil-driven timber punt for the Richmond River at Burn's Point.

BRISBANE—THE METROPOLITAN WATER AND SEWERAGE BOARD (Albert-street).—13th January, 1914.—M. and D. of material for aerial ropeway.

MACKAY HARBOUR BOARD (Q.) (H. F.

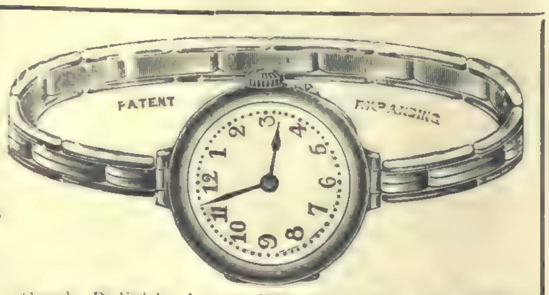
Dunlop Mining Goods
Are now used with satisfaction in most of the Leading Mines of Australasia – Their QUALITY & WEAR are UNSURPASSED
Tenders & Samples submitted
Correspondence Invited
Send for Illustrated Catalogue

The DUNLOP RUBBER Co. of Aus. Ltd
108 Flinders St. MELBOURNE.
& ALL STATES

Dunlop Rubber Belting
Is more efficient than Leather belting for Outdoor & Wet Work.
Sample & Price on application

Note this on every belt.

Be sure you get
"DICK'S"
We know there are numerous imitations. Dick's maintains its high reputation for strength and efficiency. Every belt guaranteed. Sole agents
JAMES HARDIE & CO.
Melbourne and Sydney.



WRISTLET WATCHES

They have come to stay. Why?
Fashion's decree of "no" pocket calls for some safe way to carry a watch.
They have a very handsome appearance.
They are distinguished looking.
We make the bracelets.
We set them with diamonds, with pearls, with turquoise, and stock them in plain gold.
We sell only reliable watches at bedrock prices.
See our large stock of watches.
Write for watch pamphlet.

Good, Reliable Lever Watches, fully jewelled, from £5/5/-; set with pearls, from £11/11/- upwards; with diamonds, £25, are the rage.

Plain figures—Cash.

FAIRFAX and ROBERTS LTD.,
The Oldest Jewellery House in Sydney, 23 and 25 HUNTER STREET.

McDonnell, secretary).—15th October.—S. of mild steel round bars and steel wire.

15th October.—S. of such plant and material, or any portion thereof, as is contained in the Mackay Harbour Board's specified list, open for inspection at the office of the Engineer for Harbours and Rivers, Brisbane.

29th October.—S. of Portland cement.

ELDERSLIE STATION, Winton, W. Q'land.—19th November.—Sinking and completion of an artesian bore, maximum depth 4500 feet.

CITY OF LAUNCESTON (T.) (F. W. Rocher, Town Clerk).—27th October.—S. of electrical fittings, incandescent lamps, wire and cable.

24th November (extended from 13th October).—Section i., S. and D. of transformers, etc.; section ii., S. and D. of feeder cable, etc.; section iii., S., D. and E. of high tension switchboard, etc.

DOMINION PORTLAND CEMENT CO. LTD., Wellington (N.Z.).—Wairua Electric Power Scheme.—31st October.—Section 10, high-tension insulators for 22,000 volt service.

CHRISTCHURCH CITY COUNCIL (H. R. Smith, town clerk).—5th January, 1914.—S. and D. of series street lighting plant and accessories. Specifications may be seen Town Clerk's office, Melbourne.

CITY OF BRUNSWICK (V.) (R. McGregor Dawson, Town Clerk).—13th October.—One 12½ ton steam roller, with scarifier attached.

## ACCEPTED.

### Commonwealth.

POSTMASTER-GENERAL'S DEPARTMENT. Tenders—Correction.—12,000 leads for Meidinger main battery 2½d. each, should read 2¼d. each.—British Insulated and Helsby Cables Ltd.

DEPARTMENT OF HOME AFFAIRS.—S. and D. of power generating plant, North Head Quarantine Station, £2161.—G. Weymouth Propy. Ltd.

DEPARTMENT OF HOME AFFAIRS.—Kalgoorlie-Port Augusta Railway.—17,660 tons 80 lb. rails, £8 10s.; ships' slings, Port Augusta, £150,100; 1191 tons 80 lb. fish plates, £11 2s.; ships' slings, Port Augusta, £13,220 2s.—G. and C. Hoskins Ltd.

37,100 tons 80 lb. rails, £7 11s. 8d.; ships' slings, Fremantle, £280,100 16s. 8d.; 1797 tons fish plates, £9 11s. 8d.; ships' slings, Fremantle, £17,221 5s.—Geo. Wills and Co. and Elder, Smith and Co.

### Victoria.

VICTORIAN RAILWAYS.—Purchase of a quantity of Pintsch gas material, £151 14s. 8d.—Pintsch Patent Lighting Co. Ltd.

M., S. and D. of W.I. forgings for 15-ton trucks, Louvre trucks, etc.—Item No. 7, brake take up nut, tapped, 1⅛in. Whitworth, at 7s. 3d. each; item No. 34, brake Fulcrum lever, at 5s. each; item No. 40, brake shaft brackets (inside), at 1s. 6d. each; item No. 49, door hook studs (pattern 1), at 9d. each; item No. 50, door hook studs and washers (pattern 2), at 9d. each; item No. 51, door hook studs and washers (pattern 3), at 9d. each; item No. 55, knuckle joints (71ft. car alteration to vestibule face plate), at 10s. 3d. each.

M., S. and D. of W.I. forgings for 15-ton trucks, Louvre trucks, etc.—Item No. 3, hand brake shaft (complete), at 17s. 6d. each; item No. 4, hand brake shaft bracket, at 7s. 9d. each; item No. 6, brake pull rod, short, 1⅛in. diameter, at 10s. 6d. each; item No. 23, shunting hook, at 3s. 9d. each; item No. 24, body brackets (door), at 3s. 6d. each; item No. 43, brake take up Nuts, at 3s. 2d. each.—F. Long and Co.

M., S. and D. of W.I. forgings for 15-ton trucks, Louvre trucks, etc.—Item No. 54, draw bar face plates, at 9s. each.—Johnson and Sons Pty. Ltd.

M., S. and D. of W.I. forgings for 15-ton trucks, Louvre trucks, etc.—Item 13, brake link, long, 1s. 11d. each; item 14, brake link, short, 1s. 8d. each; item 18, brake truss bar swing links, medium, 9½d. each; item 19, brake truss bar swing links, short, 6½d. each; item 35, door hinges, long, 2s. 11d. each; item 36, door hinges, short, 2s. 8½d. each; item 44, brake swing links.—Trembath and Co.

M., S. and D. of W.I. forgings for 15-ton trucks, Louvre trucks, etc.—Item 15, brake hanger, 1s. 8¾d. each; item 17, brake truss, swing bar, long, 1s. 3d. each.—Sewell and Gaskell.

M., S. and D. of W.I. forgings for 15-ton trucks, Louvre trucks, etc.—Item 20, scroll iron, at 6s. 5½d. each; item 47, brake Fulcrum lever brackets, 3s. 10½d. each.—H. Davis and Sons Pty. Ltd.

M., S. and D. of W.I. forgings for 15-ton trucks, Louvre trucks, etc.—Item 56, narrow gauge buffers, £2 18s. 6d. each; item 57, buffer tips, Tait car, £1 0s. 11d.—Mephan, Ferguson Ltd.

M., S. and D. of W.I. forgings for 15-ton trucks, Louvre trucks, etc.—Item 16, brake truss bar, at £1 each; item 22, shunters' chain eye bolt and nut, 1s. 2d. each; item 28, door bolt handle and gudgeon, complete, 3s. 9d. each; item 29, door bolt French key ring and chain, complete, 1s. 8d. each; item 37, door hinge butts, 1s. 6d.; item 41, brake shaft pull rod, 6s. each; item 42, brake shaft pull rod, 2s. 2d. each; item 45, brake truss bars, 17s. each; item 48, door hooks, complete, 1s. 8d. each.—G. T. Brown.

M., S. and D. of W.I. forgings for 15-ton trucks, Louvre trucks.—Item No. 1, brake shaft, £4 4s. each; item 2, brake shaft bracket, 9s. 6d. each; item 8, brake rod joint end, 4s. each; item 21, spring adjusting screws and nuts, 4s. each.—A. Roberts and Sons.

M., S. and D. of metal carriage fittings for new cars and passenger vans.—Item 3, quarter light racks, 1s. 1d. each; item 4, quarter light racks, 1s. 1d. each; item 5, door light racks, 1s. 11d. each; item 8, bar lifts, 5½d. each; item 9, Louvre bolts, 11d. each; item 10, light catches, 11½d. each; item 11, light catches, 11½d. each; item 19, ventilator openers, 6½d. each.—John Dixon.

M., S. and D. of metal carriage fittings for new cars and passenger vans.—Item 15, ventilator spring swivels, 9d. each; item 16, soap vases, 8s. each.—Boehme and Owen.

M., S. and D. of metal carriage fittings for new cars and passenger vans—Item No. 6, "Moss" catches, right hand, at 1s. each; item No. 7, "Moss" catches, left hand, at 1s. each.—Melbourne Plating Works Pty. Ltd.

M., S. and D. of metal carriage fittings for new cars and passenger vans—Item No. 21, Busby locks, right hand, and plates (no patterns, mild steel, or springs supplied), at 8s. 5d. each.—W. S. Busby.

M., S. and D. of metal carriage fittings for new cars and passenger vans.—Item No. 1, quarter light racks, right hand, long, at 2s. 7d. each; item No. 2, quarter light racks, left hand, long, at 2s. 7d. each.—Trimble and Hayles.

M., S. and D. of bricks, building (Australian), at £2 5s. per 1000, delivered on the site of the works at the Flinders-street viaduct.—Co-operative Brick Co. Pty. Ltd.

S. and D. of 1 railway and cable tramway crossing, including girders, for Plenty-road crossing, Queen's-parade, North Fitzroy, for £462.—Sewell and Gaskell.

M., S. and D. of ⅝in. pins for 60 lb. "T" rails, at £14 19s. per ton.—McPherson's Pty. Ltd.

M., S. and D. of special leather butts, at 2s. 8d. per lb.—Thos. Broadhurst.

S. of automatic circuit breakers, 24 No., at £5 10s. 10d. each.—Australian General Electric Co.

M. (on the premises of the contractor within the Commonwealth), S. and D. of 15-ton steel trucks, "I" class, at £119 8s. each.—Gray Bros.

M. (on the premises of the contractor within the Commonwealth), S. and D. of 15-ton steel trucks, "I" class, at £122 9s. each.—Cowley's Eureka Ironworks Pty. Ltd.

M. (on the premises of the contractor within the Commonwealth), S. and D. of 15-ton steel trucks, "I" class, at £121 each.—A. Challingsworth Pty. Ltd.

M., S. and D. of cast-steel wheel centres, at £3 10s. 6d. each, delivered at Spencer-street railway station.—Charles Ruwolt Pty. Ltd.

S. and D. of pig iron, at £111 per ton, delivered at Spencer-street railway station.—Elders' Metal and Mercantile Pty. Ltd.

S. and D. of cast-iron scrap, at £4 2s. 3d. per ton.—Thomas McPherson and Son.

M., S. and D. of 2 boring plants and equipments, for £1529.—Goldfields Diamond Drilling Co. Pty. Ltd.

## NEW ZEALAND RAILWAYS.

The Dominion Minister of Railways tabled his annual statement in the House of Representatives last week, which shows that the net earnings of the railways during the last financial year amounted to £445 per mile for the average number of miles open, and gave a return of 4.04 per cent. on the capital cost. This return is the highest but one ever earned by the railways. Last year it was 3.98 per cent. The net profit on working expenses was £1,265,393, as against £1,210,613 in 1912. The estimated revenue for the year ending March 31, 1914, is £4,200,000, and the expenditure £2,931,250. The percentage of working costs to earnings is 68.14, as against 67.07 for the previous year. The actual earnings have exceeded the estimated earnings by £226,002 and the earnings of the preceding year by £294,493. Instructions have been given by the Minister for the designing of automatic signals for use on railway crossings. The earnings per train mile in the North Island declined from 8s. 4d. to 8s. 1½d.; those of the South Island increased from 8s. 9¼d. to 9s. 2¾d. Opportunity is to be afforded men in the second division to qualify for promotion to the first division.

Early in September the Minister, in response to a request made in the House, tabled a return showing the increased expenditure of the Department during the year ended March 31, 1913, caused by the increases of salaries and wages provided for in the Railways Amendment Act, 1912. The return states that as the provisions of the Government Railways Amendment Act, 1912, did not come into operation until April 1 of the present year, the increased expenditure due to the increases provided therein for the year ended March 31 last was nil. It goes on to say, however, that in January, 1912, an allowance was granted to members in receipt of a wage of less than 9s. per day to bring their pay up to that amount and to give a number of those in receipt of more than 9s. per day a relatively higher remuneration, also to increase the minimum pay of married members from £133 to £140 17s. per annum. The Railways Amendment Act of 1912 made these allowances, which increased the working expenses by £44,316 per annum, statutory rates. To this extent, therefore, the Act of 1912 may be said to have increased the expenditure for the financial year 1912-1913.

In connection with the appointment of Mr. E. H. Hiley as general manager in New Zealand, the following particulars have been supplied to the House of Representatives:—In response to its advertisements, the Government received 104 applications for the position. Of those domiciled outside of New Zealand at the time, 58 applicants were in the United Kingdom, three in Canada, four in India, one in Australia, nine in the United States, two in Egypt, and two in South Africa. The number of applications from persons at present employed by the New Zealand Railway Department was 25.

---

Yet another by-product of coal has been found convertible to the requirements of the day, and at a time when its utilisation for motors promises to prove a vast commercial success as a substitute for petrol at a greatly reduced price. The committee appointed some time ago to inquire into the possibility of finding such a substitute has announced that successful preliminary tests have been made of a process by which it is estimated that 40,000,000 gallons of British motor spirit will be available annually. The spirit is obtained by treating a by-product of coal. A large plant is being erected, and it is expected that the spirit will be sold at 14d. a gallon. Within the last four years the cost of petrol has more than doubled in Great Britain, the rise being from 10d. to 1s. 9d. per gallon. This was so serious a matter to both motor manufacturers and those who used their engines that the Society of Motor Manufacturers and Traders offered a reward of £2000 to the firm which should place on the market a home-produced motor fuel, which would compete in price and quality with petrol. As something like 100,000,000 gallons of petrol are at present required annually, there is no doubt about a ready market for the newcomer should further tests prove its suitability for the purpose. This would effectually break up the "ring" which is said to exist in petrol, and to which, in part, is attributed its present high price; and competition will again justify itself as a cheapener of manufactures, instead of being a discredited principle and inimical to progress.

## DIVIDENDS.

The following dividends and bonuses of mining companies in Australia have been declared, and are payable on the dates noted:—

October.

2nd.—Llanberris No. 1 Co., Ballarat (V.), 6d., £600.

4th.—Kalgurli Gold Mines, Kalgoorlie (W.A.), 4/-, £24,000.

7th.—Cathcart Gold Mines, Ararat (V.), 1s., £2637.

8th.—William's Fancy G.M. Co., Berringa (V.), 6d., £600.

8th.—Tongio Dredging Co., Tongio West (V.), 1s., £350.

8th.—South Kalgurli G.M., Kalgoorlie (W.A.), second and final cash return of 8d., £10,000.

13th.—Porepunkah Gold Dredging Co., Bright (V.), 1s., £250.

15th.—Broken Hill Propy. Block 14 (N.S.W.), pref. and ord. 1/-, and pref. interest at rate of 10 per cent. per annum, £11,500.

16th.—Tongkah Compound Tin Dredging Co., Siam, 1s., £2500.

21st.—Campbell's Creek Dredging Co., Castlemaine (V.), 6d., £800.

22nd.—Tongkah Harbour T.D. Co., Siam, 2/-, £15,000.

29th.—Ivanhoe Gold Corporation, Kalgoorlie (W.A.), 3s. 6d., £35,000

## BANK CLEARINGS.

The report of the Melbourne Clearing House for the week ended 29th Sept. (5 days) was:—

| | | |
|---|---|---|
| Total Clearance .. .. .. .. .. .. .. | | £4,607,612 |
| Balances— | | |
| Settled by certificates .. .. | £261,000 | |
| Settled in coin .. .. .. .. | 262,284 | |
| | | 523,284 |
| Total clearance for the corresponding week, 1912 .. .. .. .. .. .. .. .. | | £6,686,179 |

## MIXED MEMS.

The engine-shed at the Hope mine, Beaufort (V.), was destroyed by fire last Friday night. The Hope mine is one of those which were closed down by the directors when the men were called out on the non-unionist dispute. The fire extinguishing apparatus was destroyed before the fire itself was discovered. The disaster disabled the pumps which were keeping the water down, but an effort will be made to resume that operation as soon as possible. Detective Sergeant Rogerson is investigating the cause of the outbreak.

The Queensland Parliament, at the instance of the Minister of Public Instruction, Mr. Grant, has rescinded a resolution recently passed to insert a clause in the Companies Bill fixing the stamp duty on share warrants at three times the normal value of the shares concerned. The Minister explained that it was proposed to substitute a clause paid in dividends by the Tongkah Harbour Tin to provide that the stamp duty on share warrants be three times the nominal value or three times the market value of the shares, whichever was the greater, so that the revenue would be safeguarded.

The balance-sheet of the Bank of Australasia to April 14, published in London last week, shows deposits amounting to £18,515,034, as compared with £18,196,527 at the same date last year and with £17,906,493 for the intermediate term ended October 14, 1912. cash and public securities amounting to £8,570,770, as against £7,882,298 in April and £7,321,274 in October, 1912, and bills receivable and advances amounting to £17,192,666, as against £17,065,355 and £17,225,792 for the same dates respectively. Some further particulars of the bank's position were given in these columns a fortnight ago.

John Binks was fined £50 last week at the Boulder (W.A.) Police Court, with the option of four months' imprisonment, for having had in his possession gold-bearing ore suspected of having been unlawfully obtained. Accused, who pleaded guilty, said he got the ore at the 800ft. level in the Ivanhoe mine.

John Stanley Dale, 22 years of age, was sentenced by Judge Moule at the Bendigo (V.) General Sessions, last Friday, to two years' imprisonment for stealing gold specimens from the South New Moon mine, Eaglehawk, the judge remarking that this offence could only be put down by the imposition of a sentence which would act as a deterrent to other miners. Another youth, Alfred Arthur Priest, 19, was last week remanded on a similar charge of robbing the same mine.

The West Australian Parliament is considering a Bill which proposes to make the amalgamation of the metropolitan water, sewerage, and the goldfields water supply departments permanent. During the debate on the second reading a Government supporter, Mr. Turvey, twitted the Minister of Works, Mr. Johnson, with having let a contract to a German firm for new pipes. Mr. Johnson replied that he had to place the order with a German firm because otherwise he could not obtain the pipes, which were urgently needed. He had received one Australian tender, but it was higher than the German. Mr. Turvey remarked further that the corrosion of the pipes on the goldfields' main was so extensive that the whole 300 miles of pipes would have to be replaced. The diameters of some pipes had been reduced from 30 inches to 22 inches. Owing to the ringbarking of trees in the catchment area of the Mundaring reservoir, from which water is pumped to the goldfields, salt was accumulating, and the reservoir was estimated to contain 7000 tons of salt.

The latest Victorian returns on the cost of living show the following figures for the principal mining fields of the State as compared with 20s. 7d. for Melbourne; Ballarat, 16s. 6d.; Bendigo, 17s. 6d.; Castlemaine, 17s. 8d.

In pursuance of the Victorian Government's outer ports (decentralisation) scheme, the Minister for Public Works, Mr. F. Hagelthorn, has accepted the tender of Messrs. Younger and McDonald, for £5635, for cutting off the bend opposite Martin's Point, in the River Moyne, Port Fairy, in order to facilitate the navigation of the river. Tenders have been invited for large works at Portland and Warrnambool, returnable on October 16th and 23rd respectively.

A scheme for generating electricity at Collee (W.A.) for the purpose of supplying current to Perth over a distance of 130 miles has been submitted to the local Institute of Engineers by Mr. Edmiston, a Perth engineer. Mr. Edmiston estimates the scheme will cost £1,776,000 to instal, and thereafter £200,000 per annum to maintain, producing 60,000,000 units at an average cost of four-fifths of a penny per unit. The project of providing electricity wholsesale is not new to W.A. Some years ago a Mr. Archibald submitted a scheme for supplying the whole of the State by utilising the high fall of the tide which occurs along the N.W. coast. Mr. Archibald's idea was to impound a big volume of water in a natural lagoon, and regulate the inward and outward flow of the tide. The principal object was to furnish the goldfields with electricity for power purposes.

## MUNICIPAL COUNCIL OF SYDNEY.

TO CONTRACTORS.

SEALED AND ENDORSED TENDERS will be received by the undersigned until 3 o'clock on MONDAY, 27th October, 1913, for the SUPPLY AND DELIVERY OF CURVE DRAWING AMMETERS. Copies of specifications, etc., may be seen or obtained upon application at the office of the City Electrical Engineer, Town Hall, Sydney, upon payment of the sum of 10s. 6d. The lowest tender or any tender not necessarily accepted. TENDERERS please note that they must pay their cash deposits direct into the City Treasury, and NOT enclose the same with their tenders; otherwise their tenders will be rejected as informal.

THOMAS H. NESBITT,
Town Clerk.

Town Hall, Sydney.
19th September, 1913.

## MUNICIPAL COUNCIL OF SYDNEY.

TO CONTRACTORS.

SEALED AND ENDORSED TENDERS will be received by the undersigned until 3 o'clock on MONDAY, the 13th OCTOBER, 1913, for the following:—

(a) THE SUPPLY AND DELIVERY OF STONEWARE BRIDGES.
(b) THE SUPPLY AND DELIVERY OF BLACK IRON CABLE CLIPS AND PINS.
(c) THE SUPPLY AND DELIVERY OF COAL TRIMMING CHUTES.
(d) THE SUPPLY AND DELIVERY OF WOOD TROUGHING.
(e) THE SUPPLY, DELIVERY, AND ERECTION OF GANGWAYS, LADDERS, ETC.

Copies of specification may be seen or obtained upon application at the office of the City Electrical Engineer, Town Hall, Sydney, upon payment of the sum of 10s. 6d. in each case.

The lowest or any tender not necessarily accepted.

TENDERERS please note that they must pay their CASH DEPOSITS direct into the City Treasury, and NOT enclose the same with their tenders; otherwise their tenders will be rejected as informal.

THOMAS H. NESBITT.
Town Clerk.

Town Hall, Sydney.
26th September, 1913.

SECONDHAND Machines for Sale, in good order, Mandre Saw, Rack Feed, Circular Saw Bench, Lathe Mill, Planer, 4-sided; 8 h.p. Portable Engine, Boring Machine, Overhead Travelling Cranes, Pulleys, Shafting, Plummer Blocks, Bearings. Call and inspect, Moore's Timber Yards, South Melb.

## Commonwealth of Australia.

### KALGOORLIE TO PORT AUGUSTA RAILWAY.

### APPLICATIONS FOR POSITION OF SUPERVISING ENGINEER AT KALGOORLIE.

Applications are invited from persons competent to fill the position of Supervising Engineer at the Kalgoorlie end of the Kalgoorlie to Port Augusta Railway.

Applicants must have a thorough knowledge of Railway Construction in all its branches, and capable of handling large bodies of men. The successful applicant will be immediately responsible to the Engineer-in-Chief for Commonwealth Railways. The salary will be at the rate of £750 per annum.

Applications, accompanied by copies of testimonials, and addressed to the Secretary, Department of Home Affairs, will be received until noon on Monday, 6th October, 1913.

JOSEPH COOK,
Minister of State for Home Affairs

Melbourne, August 28, 1913.

### KALGOORLIE TO PORT AUGUSTA RAILWAY.

### TENDERS FOR WHEELS AND AXLES.

Tenders, addressed to the Secretary, Department of Home Affairs, Melbourne, will be received up to 11 a.m. on Tuesday, December 2, 1913, for—

600 Pairs of Wheels and Axles (9in. x 4½in. journals).

Specifications and plans will be on view on and after September 9, at the undermentioned offices:—Commonwealth Railways, 84 William-street, Melbourne; Commonwealth Works Director, Customs House, Sydney; Commonwealth Works Registrars, Brisbane, Adelaide, Perth and Hobart, and at the office of the High Commissioner, London, a month later.

The charge for each copy of specification will be £1/1/-, and for each plan 5/-, which must be paid before the documents can be issued.

Tenders are to be endorsed "Tender for Wheels and Axles," and are to be accompanied by the deposit mentioned in the form of tender.

JOSEPH COOK,
Minister of State for Home Affairs.

### COMMONWEALTH PUBLIC SERVICE.

### VACANCIES FOR SENIOR MECHANICS, TELEGRAPH WORKSHOP, POSTMASTER-GENERAL'S DEPARTMENT.

A competitive examination for appointment to the above vacancies will be held on SATURDAY, the 20th DECEMBER, and later dates. Ages of candidates, 21 to 50 years. Salary, £198 to £216 per annum, the latter to be attained by annual increments of £6. Full particulars regarding the examination and the method of submitting applications are contained in the "Commonwealth Gazette" of the 27th September, or may be obtained, upon written or personal request, from the Secretary, Commonwealth Public Service Commissioner, Melbourne, with whom applications close on the 1st November.

D. C. McLACHLAN, Commissioner.
W. J. CLEMENS, Secretary.

### COMMONWEALTH PUBLIC SERVICE.

### VACANCIES FOR MECHANICS, POSTMASTER-GENERAL'S DEPARTMENT.

A competitive examination for appointment to the above vacancies will be held on SATURDAY, the 20th DECEMBER, and later dates. Ages of candidates, 21 to 50 years. Salary, £168 to £186 per annum, the latter to be attained by annual increments of £6. Full particulars regarding the examination and the method of submitting applications are contained in the "Commonwealth Gazette" of the 27th September, or may be obtained, upon written or personal request from the Secretary, Commonwealth Public Service Commissioner, Melbourne, with whom applications close on the 1st November.

D. C. McLACHLAN, Commissioner.
W. J. CLEMENS, Secretary.

## COMMONWEALTH PUBLIC SERVICE.

### VACANCIES FOR JUNIOR MECHANICS, POSTMASTER-GENERAL'S DEPARTMENT.

A COMPETITIVE Examination for appointment to the above vacancies will be held on SATURDAY, 13th DECEMBER, and later dates. Ages of candidates, 18 to 50 years. The commencing salary is from £84 to £144 per annum, according to age at appointment. Full particulars regarding the examination and method of submitting applications are contained in the Commonwealth Gazette of the 27th inst., or may be obtained by written or personal request from the Commonwealth Public Service Inspector.

Applications close with the Secretary, Commonwealth Public Service Commissioner, Melbourne, on 1st November.

D. C. McLACHLAN, Commissioner.
W. J. CLEMENS, Secretary.

---

## Government Notices (V.).

### TENDERS AND CONNECTIONS FOR DIAMOND AND OTHER DRILLS AND GOVERNMENT CRUSHING BATTERIES.

Tenders will be received up to 12 noon Wednesday, 5th prox., from persons willing to supply the above as per schedule to be seen at this office to 30th June, 1916.

**Deposit, £10; security, £100.** Printed forms of tender and full particulars may be obtained from the Secretary for Mines, Melbourne.

Samples on view at the Drill Stores, Grant Street, South Melbourne.

The Lowest or any tender not necessarily accepted.

Tenders must be enclosed in a separate envelope marked "Tenders for Fittings for Diamond Drills, etc.," and be deposited in the Mines Department Tender Box at the Government Offices, Treasury Buildings, Melbourne, or, if sent by post, must be addressed to the Secretary for Mines, Melbourne.

A. A. BILLSON,
Minister of Mines.

Department of Mines,
Melbourne, 24th September, 1913.

---

## VICTORIAN RAILWAYS COMMISSIONERS.

### STATE COAL MINES.

Separate tenders are invited for the undermentioned works, etc. Tenders, endorsed "Tender for ——," must be addressed to the General Manager, State Coal Mines, Wonthaggi, and delivered with the preliminary deposit, at his office at Wonthaggi, not later than 12 noon of the date specified. Particulars and forms of tender at the Melbourne Office of the State Coal Mines, Robb's Buildings, Collins Street, and at the Office of the General Manager, Wonthaggi.

### MOTORS, Etc.

Monday, 22nd October—Supply and delivery of two 10 h.p. Motors, etc. P.D., £2.

### TRUCK PEDESTALS.

Monday, 22nd October—Manufacture, supply and delivery of 3000 Cast Iron Truck Pedestals. P.D., £2

### STEEL SKIP WHEELS.

Monday, 22nd October—Manufacture, supply and delivery of 2000 Steel Skip Wheels. P.D., £2.

No tender will necessarily be accepted.

G. H. BROOME,
General Manager.

---

## THE UNION TRUSTEE CO. OF AUSTRALIA LTD.

A DIVIDEND (the 10th) at the rate of 6 per cent. per annum has been declared, and is now PAYABLE at the offices of the Company, 333 Collins-street, Melbourne.

SAMUEL COOKE, Manager.

24th September, 1913.

---

## PORT SWETTENHAM RUBBER CO. Limited.

Notice is hereby given that the Third Ordinary General MEETING of this Company will be held at the registered office, No. 375 Collins-street, on Tuesday, the 7th October, 1913, at 12 o'clock noon. Business: General. By order of the Board.

S. J. WARNOCK, Secretary.

Melbourne, 27th September, 1913.

---

## Government Notices (Q.).

QUEENSLAND.

APPLICATIONS, with testimonials of training and experience, are invited for the position of Assistant Geologist, at a salary of £300 per annum. Applications to be forwarded to the undersigned on or before the 31st October, 1913.

A. R. MACDONALD,
Under Secretary for Mines, Brisbane.

---

## Government Notices (N.S.W.).

Chief Secretary's Department,
Sydney, 15th September, 1913.

WHEREAS, by the 11th section of the "Fisheries Act, 1902," it is enacted (inter alia) that the Board of Fisheries for New South Wales may, by notice in the Gazette from time to time, declare that any specified tidal or inland water, or portion thereof, shall be closed against fishing generally, and by any method of capture, during any specified time in any year: Provided that the Board may, in like manner, rescind or vary any such notice: And whereas by the "Fisheries (Amendment) Act, 1910," the Board of Fisheries was dissolved, and the powers, duties, and authorities of such Board were vested in the Minister, and the words "the Board" and "such Board," wherever appearing in the said "Fisheries Act, 1902," are to be read as "the Minister": Now, therefore, the Minister, in pursuance and in exercise of the powers conferred by the said Acts, does hereby declare that the waters of the rivers as specified in Schedule "A" hereto, shall be closed against fishing generally and by any method of capture, except by rod and line or hand-line with not more than two hooks attached, from the 1st day of October to the 30th day of November, 1913, inclusive: Provided that it shall not be lawful to capture trout by such methods: And provided that the waters specified in Schedule "B" hereto shall not be closed against the taking of trout by means of rods and lines with artificial flies and landing-nets during the month of November next.

FRED. FLOWERS,
Minister.

### SCHEDULE "A."

The whole of the waters of that part of the Murray River, together with all its lakes, lagoons, creeks, inlets, billabongs, and tributaries, within the State of New South Wales, including the Darling, Edward, or Kyalite, Barwon, Murrumbidgee, Lachlan, Bogan, Macquarie, Castlereagh, Namoi, Gwydir, MacIntyre, and Severn Rivers, together with the whole of their lakes, lagoons, inlets, creeks, billabongs, and tributaries; and also the whole of the inland lakes, lagoons, and billabongs, whether connected by flow or disconnected with any one of the herein specified waters lying west of the Great Dividing Range, in the State of New South Wales.

### SCHEDULE "B."

The head waters of Murray, Murrumbidgee, Namoi, Lachlan, Macquarie, Castlereagh, Gwydir, Severn, and MacIntyre Rivers, together with the whole of their tributaries.

"Head waters" shall mean and include such portions only of the waters specified in Schedule "B" as trout may be found to exist in.

(1h 16)

---

"Penzance Chambers,"
29 Elizabeth-street,
Sydney, 16th Sept., 1913.

### SALE OF OLD PUMPING PLANT, HAY IRRIGATION PUMPING STATION.

The Commissioner invites FRESH TENDERS for the Purchase of:—

- (I.) One pair of Cross-compound, Horizontal, Direct-acting Reciprocating Condensing Engines, and two Horizontal, Double-acting Lift and Force Pumps.
- (II.) Two Colonial Type Tubular Boilers, complete with all mountings and furnace fittings, funnel, etc., and Feed Pumps.

Tenders, which should be endorsed "Tender for Purchase of Plant, Hay," and addressed to the undersigned, will be received up to 2 p.m. WEDNESDAY, 8th October, 1913.

Full particulars will be supplied upon application to this office, or to the Superintendent, Irrigation Area, Hay.

By order of the Commissioner.

GEO. J. EVATT, Secretary.

(9c-15)

---

New South Wales Government Railways,
Office of the Chief Commissioner,
Sydney, 27th September, 1913.

TENDERS will be received at his Office until 12 o'clock noon on the dates specified for the undermentioned Works, etc., viz.:—

WEDNESDAY, 15th OCTOBER, 1913.

The Supply of Thirteen Direct Current Motors, to Specification No. 412 (price 2s. 6d. each).

The Supply of Forges, Tools and Shafting for Overhead Line Repair Shops at Leichhardt to Specification No. 428 (price 2s. 6d.).

WEDNESDAY, 26th NOVEMBER, 1913.

The Supply of One 2000lb. Storage Freight Truck, Specification No. 426 (price 2s. 6d.). All Specifications are obtainable at the Electrical Engineer's Office, 61 Hunter-street, Sydney.

Tenders are to be endorsed, "Tender for Purchase and Removal of Cottage, etc.," or as the case may be.

The Chief Commissioner does not bind himself to accept the lowest or any tender.

By order,
J. S. SPURWAY,
Secretary.

---

## TOWN OF WILLIAMSTOWN.

COMPETITIVE Designs for a Town Hall and Municipal Offices will be received at the Council Chambers, Thompson Street, Williamstown, until December 1st, 1913. Particulars will be forwarded on application to the undersigned. Premium for selected design, £50. By order,

F. J. OGDEN, Town Clerk.
Council Chambers, Williamstown, Sept. 26, 1913.

---

## WILLIAMS FANCY GOLD MINING Co. (Berringa), No Liability.

A DIVIDEND (the 43rd) of Sixpence a share has this day been declared, PAYABLE at the office of the Company, Lydiard-street, Ballarat, on Wednesday, the 8th day of October, 1913. Transfer books close on Saturday, the 4th, at 12.30 o'clock p.m.

S. STRETCH, Manager.

Ballarat, 26th September, 1913.

---

## BOURKE'S HILL TIN SLUICING Co. No Liability, Emmaville, N.S.W.

Notice is hereby given that the Half Yearly General MEETING of shareholders will be held at the registered office of the Company, National Trustees Building, 125 Queen-street, Melbourne, on Tuesday, 7th October, 1913, at 2.45 o'clock p.m. Business:—1. To receive and adopt balance sheet, statements of accounts and reports. 2. To elect directors and auditor. 3. To transact any other general business that may be lawfully brought forward. By order of the board.

JAMES MACKAY, Manager.

---

## "FLY-FIRE" SYNDICATE LTD.

The above Company has started a factory for the manufacture of its goods at Guildford-lane, Melbourne, and will shortly be in a position to supply all demands.

The powder which goes under the name of "Fly-Fire" is dissolved in water, and all goods immersed in the solution are rendered absolutely non-inflammable and fire proof. Paints, oils, etc., may also be treated in the same way and with equally good results. There is no need to expatiate upon the utility of such an article, and there is no doubt but that the Company will have the success it deserves.

The registered office of the Company is situated at 47 Queen-street, Melbourne.

F. HARVIE-LINKLATER, Sec.

---

## THE JOHNSON'S REEF GOLD Mines Co. N.L., California Gully.

Tenders for Purchase and Removal of OLD MACHINERY at Nos. 1, 2 and 3 Mines. Tenders close 4th October, 1913. All information supplied at mine personally or by letter.

JOHN VEALE, Mine Manager.

---

## ARTHUR H. HASELL,

GYPSUM, PHOSPHATE, GUANOS, MAGNESIA,
WHITING, DOLOMITE, INFUSORIAL EARTH,
TIMBER, HEMP, SULPHUR, Etc.
ANALYSES MADE FREE.

HEAD OFFICE: Lombard Buildings, 17 Queen-street, Melbourne.

Branches: 2 Bridge-street, Sydney. 1 Lipson-street, Port Adelaide. Factories: Pt. Adelaide, S.A.; Newport, Vic.; Newcastle, N.S.W. Mines: Kapunda and Marion Bay, Daly Head, S.A.; Boort, Vic.; Cooma, N.S.W.

## REPORTS OF COMPANIES, CORPORATIONS, ETC.

### Broken Hill Proprietary Block 10.

The output of the Broken Hill Block 10 Co. Ltd. (N.S.W.) for the last two four-weekly periods was as follows:—

| | Four weeks ended | |
|---|---|---|
| | Aug. 20 | Sept. 17. |
| Ore treated, tons .. .. .. | 7,781 | 8,378 |
| Assaying | | |
| Silver, oz .. .. .. .. .. | 9.3 | 9.8 |
| Lead, per cent. .. .. .. | 12.0 | 12.1 |
| Zinc, per cent. .. .. .. | 14.1 | 13.4 |
| Concentrates, tons .. .. .. | 1,037 | 1,157 |
| Assaying | | |
| Silver, oz. .. .. .. .. | 32.8 | 32.9 |
| Lead, per cent. .. .. .. | 64.8 | 64.4 |
| Zinc, per cent. .. .. .. | 7.0 | 6.7 |

### Chillagoe Ltd. (Q.).

The smelting returns of Chillagoe Ltd. for the last two four-weekly periods was as follows:—

| | Four weeks ended | |
|---|---|---|
| | Aug. 15 | Sept. 12. |
| Ore treated, tons .. .. .. | 2,594 | 3,404 |
| Recoveries— | | |
| Copper, tons .. .. .. .. | *113 | †46 |
| Lead, tons .. .. .. .. | *104 | †313 |
| Silver, oz .. .. .. .. .. | 11,999 | 26,172 |
| Gold, oz .. .. .. .. .. | 179 | 359 |

*Copper and lead furnaces ran respectively 12 and 7 days.

†Copper and lead furnaces ran respectively 5 and 22 days.

### Mount Morgan G.M. Co. (Q.).

The smelting returns of the Mt. Morgan G.M. Co. for the last four-weekly periods were:—

| | Four weeks ended | |
|---|---|---|
| | Aug. 24 | Sept. 21. |
| Smelters— | | |
| Copper ore, tons.. .. .. | 20,508 | 20,089 |
| Many Peaks ore, tons .. | 2,970 | 2.578 |
| Blister copper, tons .. .. | 730 | 700 |
| Copper contents, tons .. .. | 723 | 694 |
| Gold contents, oz. .. .. .. | 8,942 | 8,827 |
| Proportion Many Peaks ore (approx.)— | | |
| Copper, tons.. .. .. .. | 33 | 30 |
| Gold, oz. .. .. .. .. .. | 23 | 18 |
| Secondary products (appx.)— | | |
| Copper, tons .. .. .. .. | 31 | 25 |
| Gold, oz. .. .. .. .. .. | 433 | 298 |
| Working time, days .. .. .. | 28 | 28 |
| Estimated value, blister (copper at £60) .. .. .. | £81,008 | £78,784 |

### Sulphide Corporation (N.S.W.).

During the last two four-weekly periods the output of the Sulphide Corporation was as stated below, the figures for the earlier term, ended on August 23, being quoted in parentheses:—During the four weeks ended September 20 there were treated at the Central mine, Brokn Hill, 15,905 (16,697) tons of crude ore, producing 2864 (3061) tons leady concentrates and 5390 (5395) tons zinc concentrates. At the Cockle Creek works during the same period 3871 (3200) tons leady concentrates and purchased ore, etc., were treated, yielding 1,251 (1289) tons lead, containing 3226 (2195) oz. gold and 109,435 (103,607) oz. silver.

### South Wattle Gully G.M. Co.

The report of the South Wattle Gully G.M. Co., Chewton (V.), for the half-year ended on September 2, states that from the 230ft. level 68 tons of stone, won in driving on the west leg of the saddle, was crushed at the Spring Gully battery, and yielded 11 dwt. per ton, exclusive of pyrites. At the 300ft. level the mine manager computes that he is now in sight of sufficient payable crushing material to keep a 10-head mill employed for 12 months. The board consider the mine sufficiently opened up to be equipped with a battery, as it costs 10s. per ton for every ton sent to the Spring Gully battery. An offer made by a strong Melbourne syndicate to take up a number of shares in the company, which had fallen into the hands of the directors, had been accepted, which amounted to over £619, and this sum would go towards purchasing and erecting the plant required. The directors also state that a 10-head battery with all accessories, including Wilfley concentrating tables, etc., 14-inch horizontal engine and boiler, 26ft. x 6½ft., which was on offer at Ballarat, has been secured, and tenders for erection of plant are now being called. The receipts, amounting to £1671, were made up of balance brought forward, £50; calls, £853; gold, £148; and forfeited shares, £619; and the total expenditure was £1042, leaving a balance of £629, besides which there is a sum of over £60 for outstanding calls.

### Blow Reef G.M. Co. (V.)

Good progress is reported by the directors to have been made during the half-year ended on September 16, at the Blow Reef mine, Newstead, with the result that what appears to be an entirely new make of stone has been met with at the 280ft. level north. The north drive is on the east reef, and at 220ft. from the shaft a crosscut west intersected the west reef at 12ft., when a rise was put up 23ft. in payable stone all the way; at the date of the mine manager's report (Sept. 18) the formation was proved for a width of 2ft. and was showing nice gold. The manager expected shortly to reach the junction of the east and west reefs, which are expected to form a strong body of stone, rising probably to near the surface. Mr. McKay is of opinion that these two reefs are really one split by a large horse of mullock, and that they will come together again at a greater depth. He adds: "As good gold went under foot on the eastern reef at the 280ft. level, and there is now payable gold going up 60ft. north of anything previously known, I consider your prospects very bright." The directors add: "The prospects of the mine are unquestionably good, and there is every reason to expect profitable returns in the near future." The receipts for the half-year, amounting to £1142, comprised:—calls, £922; forfeited shares, £155; gold, £65. The total gold won to date is put down at £411.

### Mt. Murphy Wolfram (V.).

The report presented at the first general meeting of the Mt. Murphy Wolfram Mining Co., Benambra (V.), last Monday, stated that during the seven months since operations commenced the late mining manager, Mr. Jas. Muirson, has proved that the wolfram deposits extend and go into the mountain beyond the lode worked in No. 1 tunnel, proving the existence of a deposit of wolfram with unthought-of and unknown possibilities. After getting out a trial lot of ore, which proved to be of equal value to that previously mined, the directors decided to concentrate attention on cutting the No. 2 tunnel, although ore to the value of £1000 is already exposed in No. 1 tunnel. It is also stated that of the 166 shares offered to the public, 109 have been actually taken up, and the directors express the hope that present shareholders will take up the balance at £7 10s. each, in order to avoid the necessity for making calls. The present mine manager, who succeeded on Mr. Muirson's resignation, is Mr. Henry Varley, formerly of the Walhalla Deep Lead gold mine. The total number of shares already issued or awaiting purchasers is 300, while 100 are held in reserve.

Commonwealth Bank of Australia
HEAD OFFICE SYDNEY

**Branches** are open for the transaction of **GENERAL BANKING BUSINESS** at **New South Wales** - Sydney. **Federal Capital** — Canberra. **Victoria** — Melbourne. **Queensland** Brisbane, Rockhampton, and Townsville. **South Australia** Adelaide. **Western Australia** – Perth **Tasmania** – Hobart. And at 36-38 NEW BROAD STREET. **London.** Cable remittances made to, and drafts drawn on foreign places direct. Foreign bills negotiated and collected. Letters of credit and circular notes issued to any part of the world. Bills negotiated or forwarded for collection. Banking and Exchange Business of every description transacted within the Commonwealth, United Kingdom and abroad. Interest paid on fixed deposits

SAVINGS BANK DEPARTMENT

**Branches** are open at 3 Moore Street, **Sydney;** 317 Collins Street, **Melbourne;** Queen Street, **Brisbane;** Royal Exchange, 96 King William Street, **Adelaide;** St. George's Terrace, **Perth;** Elizabeth Street, **Hobart;** and **Canberra** (Federal Capital); and **1900 Agencies** at **Post Offices** which issue Money Orders in the **Australian Commonwealth and Papua,** from 9 a.m. to 5 p.m. daily, and noon Saturday.

All Branch Offices are open for **deposits** and **withdrawals** on Friday 7 to 9 p.m.

**Withdrawals on demand** may be effected at any office within the Commonwealth.

**1/- Minimum Deposit. 3% Rate of Interest on all Deposits up to £300**

JAMES KELL, Deputy Governor. August, 1913 DENISON MILLER, Governor

SOUTH YARRA

THE AUSTRALIAN GAS RETORT & FIRE BRICK MANUFACTURING CO., TOORAK ROAD, SOUTH YARRA—

For Fire Clay goods for all purposes.

Send for Catalogue.

SHAW'S Steel Wire Ropes

FOR ALL MINING PURPOSES.

Large Stocks always on hand at HEAD AUSTRALASIAN DEPOT

JOHN SHAW Australia, Limited,

445 KENT STREET, SYDNEY.

*Victorian Agents: Welch, Perrin and Co., and Inglis, Smith and Co.*

*Brisbane: Engineering Supply Co. of Australia Ltd.*

GREAT COBAR LIMITED,

COBAR, N.S.W.

MINE OWNERS, SMELTERS, COLLIERY PROPRIETORS, PURCHASERS OF COPPER ORES AND MATTES.

VACANCIES FOR COMPETENT MACHINE MINERS.

SYDNEY: Australasia Chambers, Martin Place, And at Lithgow and Singleton. LONDON: 65 New Broad Street, E.C.

## PUBLISHERS' ANNOUNCEMENTS.

Critchley C·P Parker

## Publications

**Past and Present Metal Markets.** W. E. Figgis. Book and 2 Charts, 15/-. Posted, 16/3; foreign, 16/5.

**Coalfields and Collieries of Australia.** F. Danvers Power. 440 pages, 229 illustrations, demy octavo. 25/- nett. Posted, 25/3; foreign, 26/8. (Size, 9 x 6.)

**High Explosives.** W. R. Quinan. 224 pages, royal octavo, 21/-. Posted, 21/3; foreign, 22/4. Size, 10 x 7.)

**Power.**
*(Issued under authority Sydney Municipal Council.)*
2/6 nett; post free.

**Australian Mining and Metallurgy.** Donald Clark 600 pages, royal octavo. 21/- nett Posted, 21/4; foreign, 22/9 (Size 10 x 7.)

**Gold Refining.** Donald Clark. 134 pages (plates), demy octavo 12/6 nett Posted, 12/7; foreign, 13/1. Size, 9 x 6

**West Australian Mining Industry.**
*(By authority W.A. Government.)*
250 pages, crown folio. 10/- nett Posted, 10/2; foreign, 10/8 (Size, 14½ x 10.

**New South Wales Mines and Minerals.** 250 pages, crown quarto 5/- nett Posted, 5/1; foreign, 5/7. (Size, 10 x 7½.

**Victoria, and its Mining Resources.**
*(By authority Victorian Government.)*
84 pages, crown quarto 3/- nett; post free

**Mining and Railway Map of Australia.** (In preparation.) Cloth, 21/-.

**Ventilation of Mines.** Johann Sarvaas. 60 pages 2/7 post free.

**Australasian Joint Stock Coy's Year Book.** R. L. Nash (Financial Editor, "Daily Telegraph," Sydney). 500 pages, demy octavo. 10/6 nett. Posted, 10/8; foreign, 11/9 (Size, 9 x 6.)

**Australian Mining Standard, Engineering and Electrical Record.** Issued every Thursday 26/- per annum British possessions, 32/6; foreign, 34/8; post free

Size stated in inches

Order through your Bookseller, or

***AUSTRALIAN MINING STANDARD,***

**Sydney: 12-14 O'Connell-street.**
**Melbourne: 376 Flinders Lane.**
**London:** Hill Publishing Co., 6 Bouverie St., Fleet St.

*Also published by us, but now out of print.*

**Tasmania and its Mineral Wealth.**
*(By authority Tasmanian Government.)*

**Metallurgy of Tin.** P. J. Thibault. Demy octavo 12/6

**Resourceful Queensland.**
*(By authority Queensland Government.)*

**New South Wales Mines and Minerals.**

ESTABLISHED 1860.

## BONDHOLDERS' REGISTER

Publishes the Actual Numbers of all Drawn Bonds Throughout the World.

PUBLISHED FORTNIGHTLY.

**10s. PER ANNUM.**

73 FARRINGTON ST., LONDON, E.C.

Australian Offices,
376 FLINDERS LANE, MELBOURNE.

## PROFESSIONAL CARDS.

**G. H. BLAKEMORE,**
CONSULTING METALLURGIST
For Copper and Lead.
MINING ENGINEER,
CASTLEREAGH CHAMBERS, 10 CASTLEREAGH ST
Telegraph Codes: Bedford McNeill 1908 Edition.
Moreing & Neal.
A.B.C. 5th Edition.
Cable Address. Radgarn. Telephone 7124 City

**MATTHEW C. COATES, A.M.I.E.E.**
CONSULTING MECHANICAL and ELECTRICAL ENGINEER Expert Reports given for Power Generating Plants, Factory Installations, Steam, Gas and Electric.
99 QUEEN-STREET, MELBOURNE.

**VALENTINE J. CROWLEY,**
CONSULTING ELECTRICAL ENGINEER.
Hydro-Electric Plants and Transmission Lines Designed and Supervised.
Austral Chambers, Telephone 7736.
97-99 QUEEN STREET, MELBOURNE.

**GOYDER & HALLETT,**
ASSAYERS AND ANALYSTS.
110 Gawler Place, Adelaide.
Telephone 169.
Metallurgical and Chemical Processes Investigated.
Ores Sampled and Assayed

**T. J. GREENWAY, M.I.M.M., F.I.C.**
MINING AND METALLURGICAL ENGINEER
60 QUEEN STREET, MELBOURNE.

**KAY, MACNICOL & CO.,**
Mechanical, Mining & Electrical Engineers.
BROKEN HILL CHAMBERS
31 QUEEN STREET, MELBOURNE.
Cable Address: "Engineer," Melbourne.
Telephone, No. 4883

**McCARTY, UNDERWOOD & CO.,**
CONSULTING ELECTRICAL AND MECHANICAL ENGINEERS.
31 QUEEN STREET, MELBOURNE
Telephone, 7096

**J. D. AUDLEY SMITH,**
MINING ENGINEER,
9 Bridge-street, Sydney
Telegraphic Address–Audley Smith, Mining Engineer, Sydney
Telephone No.–City 2677.

**WALTER F. SMITH,**
MANAGER FLOATER G.M.
Ravensthorpe, W.A.
Mines Sampled, Valued, and Reported on.
ASSAYS MADE.
Code: Bedford McNeil.
Reliable Information Furnished on the Phillips River Gold and Copper Field.

**E. A. WEINBERG,**
MINING AND METALLURGICAL ENGINEER,
19 QUEEN STREET, MELBOURNE.

**FRANKLIN WHITE,**
MINING ENGINEER.
CITY MUTUAL CHAMBERS,
62 HUNTER ST., SYDNEY.
G.P.O., Box 1498.
Code: Broomhall Imperial Combination.

## BALLARAT School of Mines

**DEPARTMENTS:**
CHEMISTRY and METALLURGY,
ENGINEERING and SURVEYING
ELECTRICAL ENGINEERING,
GEOLOGY and MINING
MATHEMATICS and PHYSICS.

**Prospectus on Application.**
**F. J. MARTELL, Director.**

The agreement between the Premiers of New South Wales and Victoria respecting the proposed railway extensions across the Murray, from the Mildura line to Wentworth, and from the Chillingollah line to Euston and thence northward into the Riverina, has at last been signed by both. The proposals for the extension from Moama to Moulamein will be embodied in a special agreement, which is now in course of preparation. The agreement relating to the Euston and Wentworth extensions having been completed, the Victorian Premier proposes to introduce into the Legislative Assembly a Bill providing for ratification as soon as a similar measure has been submitted to the New South Wales Parliament. Mr. Nielsen, formerly Minister of Lands in New South Wales, has spoken very favourably of the prospects of settlement along the proposed lines into the Riverina territory.

## "INGREY"

**PATENT WEIGHING & RECORDING MACHINES**

ARE

**Installed in H.M Dockyards.**
**Certified by the Board of Trade.**
**Accurate and Reliable.**
**Automatic in action and**
**Pay for themselves in a year!**

**H. A. HARVEY & CO. LIMITED, LONDON.**

Australian Representative — LASCELLES PARRINGTON & BRACHÉ.
London House, 97 Elizabeth Street, Melbourne.
New Zealand Buildings, Pitt Street, Sydney.

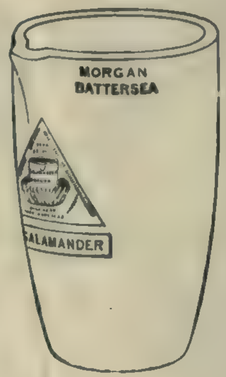
ASSAYING AND ANALYTICAL APPARATUS.

A large assortment of Assay Furnaces, Muffles, Crucibles, Roasting Dishes, Scorifiers; and Cupels of all sizes and makes kept in stock. . . . . .

All apparatus required by Assayers, Metallurgists & Mineralogists supplied. .

**Chemical Glass Ware a Specialty.**

Write for Quotations before ordering elsewhere.



ELLIOTT BROTHERS LTD.

*O'CONNELL STREET, SYDNEY.*

LAMPS

WIRE DRAWN.

If your light costs too much, it is because you do not use Westinghouse Metal Filament Lamps.

These Lamps only use ¼th as much current as ordinary incandescent lamps, or give 3 times as much light.

MAIN POINTS—

HIGH EFFICIENCY.
LONG LIFE.

UNIFORM BRILLIANCY DURING LIFE.
STRENGTH OF FILAMENT.

*Prices on Application.*

*Special Quotations for Quantities.*

**NOYES BROS.** (Melb.) Pty. Ltd. 499 Bourke St.
(Sydney) Ltd. 115 Clarence St.

S.A. SELLING AGENTS—STEELE & BAKER, ADELAIDE.

20.

## CONTENTS

### THURSDAY, OCTOBER 9.

EDITORIAL—

The Revision of Acts of Parliament .. 291
Leaderettes .. .. .. .. .. .. .. .. .. 292
Brief Comment .. .. .. .. .. .. .. .. 293
News and Notes .. .. .. .. .. .. .. .. 294
Personal .. .. .. .. .. .. .. .. .. .. 294

The Investor's Column—

Marshall Shoe Ltd. .. .. .. .. .. .. 295
Radium Hill .. .. .. .. .. .. .. .. 295
Constellation .. .. .. .. .. .. .. 295
Metal Quotations .. .. .. .. .. .. .. 295
The Coal Mining Industry .. .. .. .. 296
North Queensland Fields .. .. .. .. .. 297
Victorian Mining Activities .. .. .. 298
New South Wales Mining .. .. .. .. .. 299
Alaska Mining .. .. .. .. .. .. .. .. 299
American Mining Notes .. .. .. .. .. 299
Reports of Companies, etc. .. .. .. .. 299
Golden Pyke Co. (V.) .. .. .. .. .. .. 300
Treating Selenite Ores .. .. .. .. .. 300
Books Reviewed .. .. .. .. .. .. .. .. 300
Royal Mint Returns .. .. .. .. .. .. 301
Mineral Returns .. .. .. .. .. .. .. 301
Stone Dusting in Collieries .. .. .. 301
The South African Coalfields .. .. .. 302
Australian Railways .. .. .. .. .. .. 303
Melbourne Tramways .. .. .. .. .. .. 304
The Trans-Australian Railway .. .. 304
British Association .. .. .. .. .. .. 304
Sydney Electrical Supply .. .. .. .. 306
Hydro-Electric Scheme (T.).. .. .. 306
Enginedrivers' Certificates (V.) .. .. 306
Electric Smelting of Tin and Zinc Ores 306
Miscellaneous .. .. .. .. .. .. .. .. 307
Invited and Accepted Tenders .. .. 308
Western Australian Mining .. .. .. 310
Mixed Mems. .. .. .. .. .. .. .. .. 311
From Foreign Sources .. .. .. .. .. 313
Bore Holes .. .. .. .. .. .. .. .. .. 314

HENLEY'S
Electric Wires and Cables
AND INSULATING TAPES
ARE THE BEST.
W. T. HENLEY'S Telegraph Works Co. Ltd.
546 COLLINS ST., MELBOURNE.
61 YORK ST., SYDNEY.

BELTING!
Largest stock of all kinds of Machine Belting in the Commonwealth.
Conveyor and Elevator Belting for all purposes.
HOPKINS BROS. & ODLUM PY. LTD.
LEICESTER ST., CARLTON, MELBOURNE.
'Phone, Central 754 and 5202. Box 377 G.P.O.

COKE!
NORTH BULLI COLLIERY
Limited
Supplies best quality hard
SOUTHERN
SMELTING COKE.
(Weekly output 1250 tons.)
H. G. Hyde, Secretary
Royal Insurance Building, 16 Spring-street,
SYDNEY.

MINING STANDARD.
PUBLISHED EVERY THURSDAY.
Forwarded Post Free to any Address.

| | Per annum. |
|---|---|
| Australasia .. .. .. .. .. .. .. .. .. .. | 26/- |
| British Possessions .. .. .. .. .. .. .. | 32/6 |
| Foreign .. .. .. .. .. .. .. .. .. .. .. | 34/8 |

Payable half-yearly or yearly, in advance.
All amounts should be made payable to order of "CRITCHLEY PARKER, Bank of Australasia."

| | |
|---|---|
| 12 O'Connell-street,<br>Sydney. | 376 Flinders-lane,<br>Melbourne. |
| Tel. Central 2703. | Central 7931 & 1838. |
| P.O. Box 331. | P.O. Box 253. |

CASUAL ADVERTISEMENTS.

The rate for this class of advertisement is governed by the position it occupies.

If it appears on leader page or amongst or next to reading matter, the rate is 15s. per inch (nonpareil) per insertion.

Towards end of reading section—
Brevier, 16 ems width, 6s. per inch per insertion.
Nonpareil, 8s. per inch per insertion.

For the convenuience of advertisers, we might state that—Brevier has approximately 7 words to a line, and 8 lines to the inch—6s. Nonpareil has approximately 8 words to the line, and 11 lines to the inch—8s.

ALTERATION TO ADVERTISEMENTS.

As our publishing arrangements necessitate the "Mining Standard" being issued simultaneously in Sydney, Melbourne and Adelaide on the same day each week, advertisers wishing to change their advertising matter must supply same ten days in advance of publication.

ADVERTISEMENT PROOFS.

Proofs are submitted to advertisers in order to give them an opportunity of going over the advertisements before printing.

Advertising Copy must be typed and so arranged as to clearly indicate the display required for the more important features of the advertisement.

Any departure from the original copy will be charged for. Advertisers are specially requested to instruct their publicity departments to give us clear and definite instructions respecting changes of matter or new copy in order to avoid incurring unnecessary charges.

AUSTRALIAN
MINING STANDARD.
PUBLISHED EVERY THURSDAY.
ESTABLISHED 1888.

It is requested that all business communications be Addressed to Critchley Parker.

THURSDAY, OCTOBER 9, 1913.

# THE REVISION OF ACTS OF PARLIAMENT.

In a recent article on the "Functions of the Government" we dealt with the various branches of the body politic. In dealing with the judicative body, we spoke of one of its main duties being the determination of the constitutionality of the enactments of Parliament. So indeed it is, but so we hold it ought not to be. Let one consider the modus operandi of bringing this power of the judiciary into effect, and the stupidity of it, to say nothing of its unfairness to the individual, becomes at once apparent. Parliament passes an Act which, or one section of which, is in violation of the Constitution; and, unconstitutional as it is, everyone is bound by it until it has been decided by the judicial authorities that the Legislature has exceeded its powers. Then, and not till then, the law becomes null and void; but this has only been accomplished at the expense of those who relied upon the constitutionality of the law. What we wish to propose, and we think it will appeal to common-sense people as a common-sense proposal, is that, instead of the constitutionality of Parliamentary enactments being determinable by the judiciary only after they have been put in force, a new body, which we may perhaps term "statutive," should be constituted to come in between the legislative and the executive bodies, to determine these very questions, not after they have become law, but before they become law. If this body, which naturally would have to be constituted of men of the highest legal attainments, decided a measure to be unconstitutional, they would have the power to "turn it down"; but, if they decided it to be within the powers of Parliament to enact, they would pass it on to the Executive for approval; and thereafter there would be no power on the part of anyone to question its constitutionality.

There are four other functions which such a body might very usefully fulfil. Firstly, it might determine disputes as to the powers of the Judiciary. Such disputes are now settled by the Judiciary itself; but that is not as it should be. There is always the danger of a tendency on the part of any Court to magnify its authority and to increase its power; and it is, therefore, not always the best judge of the extent of its jurisdiction. That danger would be entirely obviated by the reference of all such matters to the body we have suggested; but, more important still, and, indeed, the chief reason to be adduced for the establishment of a statutive body, is the opportunity that it would afford for a proper revision of all Parliamentary enactments before they became law. It would be the duty of this body to see that every Act which had passed the Legislature fulfilled the ideas of the Legislature, that its meaning was clear, that it was not inconsistent with itself, and that it did not clash with existing laws. What happens now is that a measure, however carefully it may have been drawn up by a Parliamentary draftsman, is so cut and hacked about in the Houses of Parliament that it very often entirely fails to convey the idea that it is intended to convey. Our legislators are not infrequently ignorant men, of, as an intelligent Japanese remarked, "the coolie class," and they are not to be expected, however much intelligence they may have, to be able to word their amendments to bills they are discussing in such a way as to make their meaning unquestionably clear; nor are they to be expected to have such a knowledge of the law of the land as to know when their proposals clash with measures already on the statute book. In fact, they are very often so ignorant of the very measure they are criticising and desiring to amend as to be unaware that their amendments contradict other clauses of the Act itself. Consequently, many of our laws (in fact, it is not too much to say, most of our laws—and we may go further, and say, most of the laws in every section of the British Empire) emerge from this process an incomprehensible heap of absurdities and contradictions, and have to await interpretations by the Courts before anyone can say definitely what is intended by them. How much better would it not be if every measure, after its passage through Parliament, had also to pass successfully through the Council Chamber of an unprejudiced, non-political, deliberative body of sound judgment and complete legal knowledge, that would have power either to clarify it, where necessary, and send it on to the Executive, or to return it to the Legislature with suggestions for its amendment in such a way as to convey the apparent intentions of Parliament, or with a message pointing out its inconsistencies or showing in what way it would run counter to other Acts not repealed by it. The saving to the public would be enormous; and everyone would feel that he could look upon a measure that had passed this body with a confidence with which no one can now regard any law until its various clauses have come before the Courts.

Similarly, this body might have the power to secure that any reference to the people should be put clearly and fairly, and in such a way as to obtain a distinct and unquestionable answer. That is to say, if Parliament decided upon a referendum, the form in which that referendum should be put and the exact working of it would be the work of this proposed body; and there would thus be a reasonable chance of the question not being put in such a way as to deceive a very large proportion of those called upon to express an opinion of its merits. And one other matter, also, might be included within the powers of this body: it might have the power to determine the exact customs duties desired to be imposed by the

Legislature and the exact degree of taxation necessary to bring in the amount of revenue which Parliament desires to see raised. With that power in its possession, it would not be possible for a Treasurer of the Lloyd-George stamp to play the game of issuing entirely fictitious estimates of the sums to be raised by the imposition of new taxes with a view to posing subsequently as a heaven-born financier, because the money raised proved to be more than he had pretended to anticipate. If a Treasurer announced what form he wished his taxation to take, and what amount of money he wished it to bring in, he might put before Parliament the estimate of the amount of taxation required, but he would know that this body we are suggesting would revise that taxation so as to make it bring in as nearly as possible the exact amount that the Government required. Were this power to be added to the other powers of this statutive body, it would need to number amongst its members sound financiers as well as sound lawyers, but it would not need to be a large body: perhaps three lawyers and two financiers would be quite sufficient, and it would be quite certain that the financial element would not interfere in the main portion of the Council's business.

That such a proposal as this which we have outlined is at all likely to meet with favour we do not believe. Parliaments are always loth to let go any fraction of their power of meddling; and it is undoubted that the more incompetent a man is the more he loves to legislate for his fellow men. There may, perhaps, be some better way than we have suggested for doing away with the evils which we have pointed out or hinted at; but, anyway, whether this plan or some other, better or not so good, be adopted, it is certainly desirable that something should be done to make our legislation something other and better than the hotch potch of contradictions and absurdities that it is at present.

---

Mr. N. K. Ewing, M.H.A., one of the representatives of the Franklin district in the Tasmanian Parliament, has introduced a Bill in the House of Assembly, which has for its object the prohibition of preference to unionists. However much Mr. Ewing's intention may be agreed with, it must be confessed that he is a very sanguine man if he expects to get much support for his Bill. No doubt, it was a realisation of the growing power, the unblushing effrontery, and the constant aggressiveness of unionism that led to the drafting of the measure, and that realisation must, of itself, have suggested to its author that the task he had set himself was a very unpromising one. The fact that opposition will be strong should not, of course, be made a reason for abandoning the field to it, and great courage is demanded of the man who will lead a forlorn hope. It is to be feared that Mr. Ewing will find himself without support in several quarters where he might naturally have looked for it, for there is a large savouring of human nature and human weakness in the average politician, and he is not at all times prepared to risk his privileges without some prospect of retaining them. If there were a prospect of carrying the Bill, more support might be forthcoming. And such a prospect is rendered even more remote than it otherwise would have been by the extreme proposals of the Bill. Mr. Ewing apparently overlooked the fact that to prohibit a man showing and acting upon his personal preference to unionists is every whit as tyrannical as to say that he shall employ none but unionists, when these are available. If this were amended so as to make it ultra vires for any State Court to order preference to unionists in its award or judgment, Mr. Ewing would have a somewhat better chance of success.

* * *

It is not often that Mr. Justice Higgins, as President of the Commonwealth Court of Conciliation and Arbitration, has found it necessary to make an award which effected a reduction of the earnings of employees, but he did so, in dealing with the claims of Postal electricians, and the consequence was that a strike was very narrowly averted, and may take place even yet. Now, no one cares to see wages cut down, and Mr. Justice Higgins' award was given after his usual very careful consideration of all the facts put before him. Apparently, the attitude of the public servants concerned is the same as that which His Honour has so frequently disallowed when employees in private enterprises have appeared before him, showing a disposition to accept his award if it happened to suit them, but to ignore it should it go against them. More than once His Honour has declined to proceed to an award until counsel, or other representative of a union, has given an undertaking that the award will be accepted, and acted upon. In the present instance, the Postal electricians turned their backs upon their own Public Service Commissioner, thinking that they would gain more by an appeal to Cæsar, and now they are seeking to escape from the consequences of their appeal. According to the statement of the case by the Postmaster-General, in reply to Mr. Howe (N.S.W.), in the House of Representatives, the award provided that junior mechanics should receive a salary of £144 per annum and senior mechanics £166 per annum. He had been informed that in Sydney 156 men were affected by the award, and that 138 of them would suffer reduction. Of those who were now receiving 9s. 6d. per day 115 would be reduced to the position of junior mechanics, and would receive from 5s. 4d. to 9s. 2d. a day, according to their age, in the terms of the Arbitration Court award. Those who were over 21 years of age could receive a higher wage by passing the examination as fixed by the Arbitration Court, ample facilities for which had already been afforded. There were nine other men who would be reduced from 4s. 8d. to 4s. 3d. a day. The balance of the men had been engaged on work in the telephone and telegraph shops, and five in the telegraph shop were being reduced from 11s. to 10s. 8d. a day. The cases of the other nine were being looked into in order to see if they were not entitled to higher wages under the award. As far as Melbourne was concerned, 109 employees would suffer reduction, 106 being reduced from £148 13s. 6d. per annum to £144 per annum, and the balance from £148 to £132. Twenty men in Sydney had ceased work that morning because of the reduction in pay, but had again resumed. The following circular regarding the wages to be paid had been forwarded to the Deputy Postmasters-General in all States:—"Commissioner advises that in any case where permanent officer is receiving higher salary than provisions of award, he may continue to be paid his present salary. Wages of temporary employees are to be adjusted to award rates. Please act accordingly, and state how many men affected adversely your State." Mr. Howe was not satisfied that the Public Service Commissioner was not over-riding the award of the Court, but this the Minister said it was impossible for him to do. It was the Public Service Commissioner who was overridden by the public servants. Mr. McLachlan's position is exactly that of the judge of old in similar case—"Dost thou appeal unto Cæsar? Unto Cæsar shalt thou go." From Cæsar there is no appeal.

The sad occurrence at Broken Hill (N.S.W.) last week, when a young miner of twenty-two, named Bailey, was blinded and mangled, dying afterwards from injuries caused by unsuspectingly boring into an unexploded shot which had been left in the rock-face, draws attention once more to a common hazard of the mining occupation, and to the imperative necessity of something being done to reduce that risk if its total extinction is out of the question. Quite recently the Broken Hill men themselves asked the Parliament of New South Wales to include a clause in the Mining Act Amendment Bill making it compulsory for all shotfirers to carry chalk with which to mark the places where charges have been put into the face. The suggestion is one which could easily be carried into practice; and there is nothing, so far as we are aware, to prevent the men carrying it out on their own initiative. But the risk is not restricted to the men underground, and something is required which shall make the explosive itself easily distinguishable from the rock or the coal in connection with which it is used. It will be remembered that only a year, or perhaps two years, ago the discovery was made that explosives were very nearly put into a ship's bunkers in New South Wales, having been carelessly left on a truck load of coal. In metalliferous mining, again, the explosives employed are to a large extent almost stone coloured, and not easily distinguished from much of the material in which operations are carried on, so that there is continual danger of their being fed with ore into a battery, only to be discovered when a serious explosion announces their presence. Once more, the annual report of the South African Mines Department for 1912 states that during the year, of the explosions recorded in stoves or fire-places in private houses, five were attributed to explosives being left in the coal to the risk of unsuspecting householders and others. This is a very serious matter, and appeals more loudly for remedy than the risks run every day by miners underground. The question arises, Cannot something be found which will give a distinctive colour to mining explosives, thus rendering them easily identifiable? So far as we have been able to ascertain very little has been done in this direction. There is certainly a red dynamite, produced by the admixture of ochre with the other materials, but there appears to be a doubt whether anything of the kind can be done with the more modern explosives. Yet, surely this should be well within the reach of modern chemistry! Four years ago Mr. J. Moir, vice-president of the Chemical, Mining and Metallurgical Society of South Africa, expressed the opinion that there should be no difficulty in finding an unsulphonated red azo-dye which would mix perfectly with the nitro-glycerine without in any way inpairing the efficiency of the explosive. But we have no recollection of anything definite being accomplished, and inquiries have failed to disclose any serious attempt in the direction indicated.

* * *

The absurdity of trying to regulate the amount of interest to which Party legislators seem to think landlords are entitled, was apparently obvious to a majority of members of the New South Wales Legislative Council when they rejected the Fair Rents Bill on the second reading. It is probable that the Bill would directly affect many members of the Upper House, but the utter impracticability of such a measure should suffice as the sole ground for its condemnation. No amount of legislation will remedy any evils which people may feel they suffer under this particular social condition, and that high rents are levied because the demand for houses is greater than the supply, is only one of the phases of progress which may wear a totally different complexion in a year's time. It is safe to assume that for some time to come the population will go on increasing much more rapidly than houses can be built, but there is always the possibility (and the experience is not new to us) that at some time or other there will be more houses than tenants; when it will be just as difficult to devise legislation to fill them. As a rule the landlord is not a suffering individual, but he, too, can submit some just grievances. By the time such an enactment as the Fair Rents Bill, if it passed into law, became fully operative, it would be found that the trouble it sought to adjust had adjusted itself. There are so many reasons for apposing the Bill that even the members of the Legislative Council could not find them all. In connection with the Daceyville housing scheme, the Government, itself the landlord, is in a quandary, and the outcry for reduced rents is not meeting with the hearty agreement of Mr. Cann, who admits the scheme presents a very tough problem. In response to the deputation which waited upon him last week in connection with a proposal to erect cheaper houses in order to enable lower rents to be charged, Mr. Cann put the position in a nutshell when he said, "If the carpenter, the plumber and the labourer will work for less money we will be able to meet you." In saying this he also put up rather a strong argument for landlords generally.

* * *

Mr. Amery, a member of the British Parliamentary Party, who remained to see more of Australia than was possible in the mere carrying out of the Party's itinerary, has visited such remote spots as Ungarie and Lake Cudgellico (N.S.W.), where he was accorded a hearty reception, and said things to the residents about Australia which were very much to the point and of consequence to all its people. He said one thing that Australia needed was capital. It was a great mistake to suggest that a new country had no use for capital, or to quibble regarding the interest. Any new country always had to pay greater interest for its money, and whilst that in one sense was a loss, it was nothing to the loss of neglected cultivation. Every acre that was not bearing the crop it might have been was a heavy financial loss to its country. Mr. Amery concluded, "You must remember you are not alone on the planet. Other human beings exist. You have got to fill this great continent before the nations of Asia, who are developing at a remarkable rate, dispute your right to possess it. No nation can claim in the long run the right to possess a territory which it has not developed to the fullest extent of its resources. It is against the welfare of mankind that any land should be locked up in that way, or that a country should be only developed at leisure. You have got to develop Australia quickly, making it strong and its people ready to stand up in its defence. You have made a splendid beginning in that matter, and as Englishmen we are proud of the way Australia is realising the first duties of citizenship. We have our difficulties in England; we have our dense populations, and our long standing traditions, but we are endeavouring to deal with our problems effectively and successfully, for old as the Old-country is the vigorous blood of youths still pulses through her veins."

---

The Ajax Central mine, Daylesford (V.), will pay a dividend of 2s. per share on October 23, amounting to £[illegible]. Last month's production was [illegible] oz of gold (including mineral) from 1498 tons of stone, or a little over 17½ dwt. per ton, as compared with 1300 oz. from 1400 tons a month earlier, when the average was over 18 dwt. 13 gr.

## BRIEF COMMENT.

The Edna May Central G.M. Co., Westons (W.A.), has been successfully floated without invitation for public subscription. By this the average speculator may conclude that when really good things are going he isn't wanted. This is a truism which should afford the scrip buyer some food for reflection. In last week's issue we directed attention to the fact that the appearance of the Myrtle Central lease (which now constitutes the main lease in the Edna May Central mines) was such as to make the outlook for the field much more encouraging than was apparent from developments in other properties along the line. Mr. A. E. Morgans, in addressing shareholders at the preliminary meeting of the company, stated emphatically that the country in which the Edna May Central leases were situated was porphyritic, and not granitic; and further, that so far as developments had proceeded in those blocks, not a trace of granite had been encountered. This augurs well for the property; but, irrespective of that, there has been such a splendid run of ore opened up that the reserves must be pretty substantial, although no official estimate of the quantity of ore in sight has been submitted. Taking all things into consideration, the capitalisation of the company is fair, and should place it beyond the possibility of trouble, while affording shareholders a guarantee that their money has been safely invested. The situation of the mine should make for low working costs, while the free milling nature of the ore should help materially in this direction. Timber is plentiful, the mine being situated in one of the State Forest reserves, and ample water is available from a main directly connected with the Goldfields water scheme. The mine is sufficiently developed to warrant a plant, which it is intended to erect almost immediately. The treatment will be in the direction of sliming, or fine grinding, and the gold will be recovered in amalgamating machines. All the indications are favourable for a highly prosperous career for the company, and its prospects of having a great mine lie with deeper development. For the present let it suffice that ample ore has been developed to warrant the capital subscribed and the policy outlined. As to the permanency of the ore body, shareholders must be content with Mr. Morgan's opinion, which certainly has had many years of experience to support it.

Advices from Hill End (N.S.W.) with regard to developments which have occurred certainly indicate excellent values, but patchy results do not provide a standard to go on. In connection with the Amalgamated Hill End, the general conviction forced on one is that a run of values is not likely to be very extensive. Those which have been disclosed are undoubtedly good enough to average over a considerable width; but, to quote the management: "Development work is now in a zone of country where other rich veins may at any time be struck." Rich veins don't always make a mine, and frequently they have to be very rich to pay for the handling of a bulk of valueless material

Full details of the case of Minerals Separation Ltd. v. James M. Hyde, in which De Bavay's and other processes of minerals concentration were involved, are now available. Upon the finding it is quite clear that De Bavay's process is distinct from the others quoted, and is, as the chairman of the Amalgamated Zinc Co. remarked at the last half-yearly meeting of that company, indefeasible. The decision was of vital consequence to Amalgamated Zinc on account of its holding of 45 per cent. of the Minerals Separation Co. The finding of the judge, in addition to clearly defining the processes involved, also throws some light on the soundness of patent right generally, by which it must be obvious to patent holders of all classes that faithful description to a detail in a final specification is essential. In drawing comparisons between Froment's and De Bavay's, the following distinctions appear:— Froment's requires more oil than does De Bavay's, and in the former process the ore is crushed in two operations and deslimed before treatment; while in the latter the ore is subjected to one crushing and the slime is advantageous. In Froment's carbonate of lime is used, and acid is necessary in greater quantity for a different function; while in De Bavay's the quantity, or use of acid at all, is optional. The veriest detail is defined, as in the point that in Froment's process flotation is the result of gas generated in situ; and in De Bavay's of air introduced by vigorous agitation. Many similar distinctions are made; but one, which is rather unusual in its bearing on the validity of a patent, deserves special notice. This distinction is briefly expressed: "Froment's process is costly, while De Bavay's is cheap." It may be assumed, however, that this would never, in any circumstances, stand solely as an argument. A very important point, however, is that, in the judge's opinion, Froment's would fail in practical application, whereas De Bavay's has indisputably succeeded. The foregoing constitutes the principal differences on which the finding is based, they being so obvious, numerous, radical, and, in many respects, vital as to clearly constitute two different processes. In the opinion of the court, the Minerals Separation Co.'s patent is valid in respect of all claims in issue, and enough appears in the evidence to prove that the defendants were using complainant's process, and thereby committing an infringement.

The second general half-yearly meeting of shareholders of the Lord Roberts G.M. Co. N.L., Daylesford (V.), was held at 60 Queen-st., Melbourne, on the 27th September. The balance-sheet as at 30th August last showed an amount of £2894 1s. 3d. to the credit of profit and loss account, so that the company should have ample funds with which to erect adequate treatment facilities upon completion of the development work now proceeding. It is regrettable that in his report the manager of the mine gives no values other than those realised from the trial crushing of 16 loads, which yielded 10½ oz., and augmented the receipts of the company by £40 7s. 10d. The mine being only in the development stage, there is some excuse for no definite statement being made as to the reserves of ore, but there has certainly been sufficient work done to enable an approximate estimate to be submitted.

The values reported to have been disclosed by the main west crosscut at No. 10 level of the Chaffers mine, Kalgoorlie (W.A.), are not comforting. Unless a distinct improvement occurs in driving on the lode the development is practically worthless to the company. The average of 17s. over the first 19ft. is below average cost, and the next 6ft., averaging 25s. 6d., can hardly be regarded as likely to give anything but a narrow margin of profit, at best. The drive on a branch of the No. 3 lode has opened up an excellent run of values, but the importance of this development is largely discounted by the short length of it which will be retained in the Chaffers lease. There has always been entertained the hope that this property would find salvation in the deeper levels by picking up the lodes proved in the surrounding blocks; and it is certainly remarkable, in view of its situation (in direct relation to three of the greatest mines in the Kalgoorlie belt), that it has not been more fortunate. A factor which should afford the Chaffers Co. some food for consideration is that its prospects are not so much dependent on finding ore bodies as on the margin of profit there is in those ore bodies in relation to the depth at which they must be worked. After a certain point the cost of mine development ceases to be a capital charge, and the mine itself must produce the wherewithal to carry on in every particular, otherwise it ceases to become a practical business proposition.

At the meeting of shareholders of the Guinea Gold Co. (P.), held in Sydney on the 26th September, some tall estimates were submitted, on which shareholders were assured that the total capital of the proposed company would be repaid in one year—in which year of the company's future existence is not stated. A total area of about 300 acres had been tested by shafts, etc., under the supervision of Messrs. Clark and Hungerford, the whole of it, including over-burden, being estimated to be worth 1s. per yard, and to cost 4d. per yard to treat. The average value of 1s. per yard, we take it, is that of the entire 300 acres, and in that case the prospects look remarkably good. It would be interesting to learn on what basis the estimate of costs is arrived at, however, as it is not apparent that sufficient experience has been gained in Papua to justify such an estimate being made. The total area held by the company in the Yodda Valley is 721 acres, and it is presumed that if the balance of this area gives values corresponding with those proved in the 300 acres it will take 15 years to work out. The company has also secured the whole of the Monai river, which has been placed on option with the North Australian Exploration Co., on what are said to be satisfactory terms. In addition, the company has acquired an option over 12 miles of the Tamata creek, which, if tests warrant it, will be floated into a separate company later on. It will be seen from this that the Guinea Gold Co., aided and abetted by the enthusiasm of Messrs. Clark and Hungerford, has its hands pretty full.

The Y-Water (Emmaville, N.S.W.) Tin Company's annual meeting of shareholders was held on the 30th ult., and passed off satisfactorily. The directors' report for the half-year's operations was submitted, and showed very little variation from the previous half-year. The quantity treated —258,000 cubic yards—was less by 6000 yards, and yielded a lower average of tin than in the previous period. The difference—1.259 lb. of tin per cubic yard as against 1.336 lb.—is not important, as the latter was presumed to be higher than the average. In the balance-sheet a profit of £8545 5s. 11d. is shown, as against £11,698 13s. 11d. for the previous half-year. Dividends of £8000 were paid during the period, making the total shareholders have received during the 12 months £18,000. In both cases dividends have closely approximated to the profit made. The total distribution to date amounts to £44,000, and there is every prospect of the company's very excellent record of dividends being maintained for some time to come. The necessity for breaking up the ground with explosives added materially to the expenditure during the period. No reference, however, is made to the likelihood of this expenditure being rendered unnecessary by kindlier ground being met with. As a matter of fact, the hard ground seems to continue. Otherwise the operations of the company and its prospects may be regarded as very satisfactory. The amount carried forward is £5593 3s. 2d., and is not so good as that brought into the period, the fact being accounted for by the four dividends and the amount written off for depreciation exceeding the profit made. The reserve fund still stands at £5000, and shareholders are to be congratulated upon having a directorate farseeing enough to fortify their position with sound methods of finance.

The directors' report of the Bourke's Hill Tin Sluicing Co., of Emmaville (N.S.W.), with statement of accounts for half-year ended 31st August last, is available, and shows a satisfactory state of affairs. The total proceeds of tin ore sold amounted to £15,888 4s. 3d., on which, after deducting all expenses and charges, a profit of £7861 12s. 5d. is shown. Out of this five dividends of 6d. per share, accounting for £5625, were paid. Among assets, the chief items are ''tin ore on hand and in transit,'' totalling £3795, while £1500 has been banked to form the nucleus of a reserve fund. Hard ground, necessitating the use of explosives, was responsible for increased costs; but, in the case of this company, softer ground is now being encountered. A comparison of the work of both plants shows how appreciably the hard ground affects costs, in that No. 1 plant treated 48,100 cubic yards at a cost of 1s. 1.383d. per yard, as against 6.410d. per yard for 134,600 yards treated by the No. 2 plant. Matters were helped by the average quantity of tin won by the No. 1 plant being fairly high, viz., 1.817 lb., while the average won by the No. 2 plant was 1.309 lb. per cubic yard.

According to report, the Ardlethan field has a strong rival for sensation in the Conapaira, which lies about 50 miles from Wyalong (N.S.W.). There is, however, a slight difference between the two fields in that the actual state of affairs at Ardlethan has been disclosed by reliable authority, and Conapaira is merely in the stage of "hot air" and ungratified desire. It wants a battery. As cartage to Wyalong consumes fifty miles of space, the prospectors on the field consider themselves entitled to this consideration. They further submit the plea that a large number of them have fair quantities of good ore at grass. The statement that the Carluthian lode is about 60ft. wide and has yielded rich samples naturally leaves room for some scepticism.

The development reported to have occurred in the Mt. David (N.S.W.) mine is very much discounted by the fact that the width of the vein is only about 4in. wide. The development having occurred in driving renders it rather difficult for the management to judge as to its importance, and there is nothing for it but to follow the vein in order to determine its ultimate value and width. Where exposed, the vein assayed by amalgam 3 oz. 5 dwt. per ton.

## NEWS AND NOTES.

Residents of Maldon (V.) intend to petition the Victorian Government to erect a battery in a central position in the district. It is said that large numbers would go out prospecting if there were any place to crush small parcels, and if such a battery were erected in a central position it would prove a great boon to the community.

The manager of the Philippine Dredging Co. under date September 1 reported that good progress was being made with the frames for No. 2 pontoon, all the machinery for which was on the ground. Timber for No. 3 pontoon was being delivered. The old dredge had been overhauled and was working satisfactorily. No further trouble with this plant is anticipated until it is stopped to be remodelled in about three months. No. 1 new dredge was working in ground over 40ft. deep. A few buckets touched bottom on the day of reporting, the wash in the buckets showing good prospects. It was expected that dredging on the bottom right across the face would be in progress within the next fortnight.

The Bullfinch Proprietary (W.A.) Ltd. was registered on November 2, 1910, and next month, or just three years afterwards, its first dividend, 1s. per share, is to be paid. Most of the crop of new companies which sprang up like mushrooms while the boom lasted have either died out or sought fortune in other localities, and this is actually the first dividend ever paid from that field. Certainly the total dividend is a large amount, £23,800 is required, but the percentage on 20s. shares paid up three years ago is very small, considering the flourish of trumpets which heralded the flotation. In his last report on the Yilgarn goldfield the Inspector of Mines spoke rather apologetically of even this mine, when he said it was "undoubtedly showing signs of developing into a rather big mine."

The September clean-up at the Tasmania mine, Beaconsfield (T.), gave the following result:—Crushed 1014 tons quartz for a yield of 826 oz.; 1840 tons treated by cyanide plant for a yield of 71 oz.; 409 tons concentrates, 111 tons accumulated concentrates, and 854 tons chlorination tailings treated for a yield of 574 oz. Total, 1582 oz. gross, or 1471 oz. zinc, valued at £6250.

Very satisfactory results are being obtained from the Murphy and Geary wolfram mine, at Wolfram (N.Q.). The ore body at the bottom of the main straight shaft is exceedingly rich in wolfram and molybdenite. The Larkin and Wade, the adjoining mine, is also looking exceptionally well.

Good prospects are stated to be in store for the Ruby Well Options Syndicate N.L. and Ruby Well Development Syndicate N.L., which hold respectively 36 acres of Davey's and Whitaker's and 40 acres of Marriott, Duploe and Holtzman's on the new field in W.A. They embody an east and west reef and a north and south, and prospects taken on the outcrop yield from 8 to 12 dwt. Mr. J. S. Scott, of Adelaide, is the secretary pro tem., and the shares of both syndicates have been fully subscribed.

The Hansel Mundy Co., of Bendigo (V.), has secured the grant sought from the Government to enable it to prospect in deep ground. It will be remembered that on account of this company not being registered in Victoria under the no liability provisions of the Companies Act, the Department had no authority to inspect its books and determine the direction of expenditure. The difficulty has been overcome by the lease being transferred to an agent in Melbourne, who will be responsible, on behalf of the Hansel Mundy Co., to the Mines Department. There will now be available for deep development on the Hansel Mundy Company's property a total sum of £5000, and it is understood that shaft sinking will be resumed immediately.

At Y-Creek (N.S.W.) tin sluicing operations have been commenced by the Great Britain Company's plant. An area comprising about 80 acres, situated below Y-Water and Bourke's Hill, is to be worked. The plant is one previously in use in the vicinity, and has been converted from a portable into a pontoon plant.

The New South Wales Mines Department has received from the Warden's clerk at Hill End an intimation that some of the richest stone found during the past thirty years has been struck in the lower tunnel. This, it is thought, proves conclusively that there is a second "make" of gold. Some of the ore knocked out in the presence of the directors of the company two or three days ago was put through the battery, but the result is not yet known. The Hawkins' Hill Reward have also been lucky enough to get on to some good stone. They are working the face in the Frenchman's in the main unwatering level 350ft. from the surface, and have come on to 5 oz. stone. They are 150ft. north of the Old Exhibition shaft, which is the deepest in which gold has been found on the northern end of the Hill.

Our Lithgow (N.S.W.) correspondent writes that the residents of the town and surrounding country-side are only now beginning to realise what the suspension of operations by the Commonwealth Oil Co. means. It represents practically the wiping out of four industrial towns in the district — Newnes, Airly, Torbane, and Hartley Vale. Over 1000 men here had to leave the district to look for work, and this means that labour as well as capital has lost much by the closing of this big industry. But, while the district has thus suffered heavily from the temporary collapse of one industry, there is hope in other directions. The new contract for steel rails for the Transcontinental Railway should help to restore some degree of activity at the Lithgow Ironworks, though it may take a long time to get back to the position attained before the strike and cancellation of the State contracts nearly two years ago. In any event, there must be some improvement when the second blast furnace is in operation. Then, too, comes official announcement that funds have been authorised for extension of buildings at the Commonwealth Small Arms Factory. Though the precise significance of this statement is not yet publicly known, there is in it hope of expansion early next year. The coal trade of the district, despite truck troubles, remains fairly steady, and were it not for the factory, the troubles of the last couple of years would have been felt much more severely.

The litigation between Broken Hill (N.S.W.) mining companies with respect to ventilation rights, which was commenced before the Hight Court on September 25, has not yet been completed. Last Saturday Mr. Justice Barton said that members of the Court were convinced that an amicable settlement was advisable; the expense must have already been very heavy, and it was quite possible that the present appeal would not settle all the issues between the parties.

## PERSONAL.

Mr. James Nash, who first discovered gold at Gympie (Q.), died at the beginning of this week in the Gympie Hospital, from asthma and bronchitis, at the age of 79 years.

Mr. Matthew C. Coates, C.E., a well-known engineer of Melbourne, who has been on a visit to Great Britain, and is now on his way back to Australia, was accorded a hearty farewell at the Holborn Restaurant, London, in the first week of September, his uncle, Mr. John Coates, C.E., being the host. A score of representative business men assembled, including Mr. David Thompson, of the Castlemaine Foundry; Mr. Robert Corney, of the Geelong and Broadford Paper Mills; Mr. R. T. Phillips, managing engineer of the Westinghouse Company in England (which Mr. M. C. Coates represents in Melbourne); Mr. W. Harvey, engineer to the Tasmanian Government; Mr. Fred Coates; Lieut.-Colonel Reay, and Mr. Arthur Howard, M.A. (son of the Rev. H. Howard, of Adelaide). The health of the chief guest and that of the host (who was for many years in Melbourne) were honoured. Several of the speakers dwelt upon the value to Australian industry of visits to the old country by practical Australians engaged in manufactures, the machinery and appurtenances of which were continually developing improvements. Mr. Coates is a passenger by the R.M.S. "Otranto," which left London on September 12, and may be expected to arrive in about 10 days' time.

Information has been received by cablegram dated London, October 1, to the effect that Herr Rudolf Diesel, the inventor of the Diesel oil-engine, disappeared mysteriously while crossing the North Sea in the steamer "Dresden," en route from Antwerp to London with the object of attending the statutory meeting of the Consolidated Diesel Engine Manufacturers, Ltd., held on the 2nd inst. On the journey Herr Diesel was accompanied by Messrs. Carles (a director of the company) and Luckmann (the company's engineer). The three separated to go to their cabins, but it was found later that Diesel had not occupied his bed, and the impression is that, as he suffered at times from insomnia, he had remained walking the deck until he accidentally fell overboard and was drowned. The Board of Trade shared the public anxiety, and has commenced an investigation. It appears, however, that although the other two gentlemen named state that Diesel was with them, his name was not in the passenger list, and an employee of the steamship company has declared that Herr Diesel boarded the steamer at Antwerp, but disembarked on hearing that the vessel would not sail for two and a half hours. Herr Rudolf Diesel was a native of Munich, and was born in 1858. He came prominently before the engineering world for the first time in 1897, when his invention was announced, and it was not until five years later that, after continuous experimental work, his first marine engine was built in France, the inventor collaborating with two French engineers. Since then some hundreds of vessels of all kinds have been equipped with Diesel engines, some of the ships being up to 9000 tons gross register, and the invention is recognised as the creator of a new era in marine engineering, by making use of oil fuel.

Mr. E. D. Dobbie, chairman of the Tasmanian Mining Board, recently resigned that position on accepting appointment as Acting-Judge of the Supreme Court of that State. Mr. W. A. B. Birchall, being the senior member of the board, has now been appointed its chairman.

Mr. E. P. Groves, electrical engineer, who will represent Messrs. Merz and M'Lellan in Melbourne while the electrification of the suburban railways is being carried out, was a passenger by the R.M.S. "Otway," which reached Melbourne last Monday.

The death has just occurred at Hill End of Thos. Trevetick, at the age of 79. Deceased crushed some of the richest stones in the seventies from the famous Hawkins' Hill claim, and turned out the largest cakes of gold sent from the field. He has left six daughters and one son, 47 grandchildren, and 65 great-grandchildren.

Mr. C. Fenner, of the Mansfield (V.) Agricultural High School, has been appointed lecturer in geology, mineralogy, and physics at the Ballarat School of Mines.

Mr. Gerard Williams, who was recently appointed manager of the new Mt. Oxide Mines Ltd. (Q.), passed through Melbourne last week on his way to London.

# THE INVESTOR'S COLUMN.

## Some Companies Attracting Attention To-day.

(By Our Exchange Reporter.)

### Marshall Shoe Ltd.

During the prosperous period of 1911-1912 the opportunity was taken by the owners of several successful industrial concerns to transform them into joint stock companies, and it may be said that the results of the operations since have in most of the cases justified the promoters. The demand for investment stocks was so strong during the period referred to that the shares in these new companies, without exception, went to a very fair premium immediately after registration had been completed, some of the more noticeable instances in this respect being Beath Schiess and Co., John Sharp and Co., Huddart Parker, London Stores and Henry Jones. Prosperity makes friends, but adversity tries them. This saying is applicable to companies as well as to individuals, and it is rather interesting to study how these different stocks have come through the financial stringency of 1912 and the improved conditions since.

Although it may seem invidious to make the statement, it will probably be found that those enterprises which were floated on the soundest and fairest terms have stood best the test of time—that is if the market quotations are any guidance in forming an opinion. The shares in several of these new concerns are now, despite the improved financial position, obtainable at several points below par, and it may fairly be assumed that in these instances there is some inherent weakness in the stock in one way or another which accounts for the lower valuation. It is not, of course, to be inferred from the above statement that because the shares in a stock are below par that they are necessarily unsound—any person with the most elementary knowledge of Stock Exchange prices would ridicule such an assumption—but many perfectly sound companies may be, and often are, over capitalised; its assets may have been taken at the vendor's valuation without actuarial examination, or the item "goodwill" may have been assessed at too high a figure. All of these are matters for the careful consideration of persons inclined to make an investment in the shares of a new industrial or trading company, for, in the case of long-established stocks, the earning power and its proportionate relation to the capitalisation has become well known from the actual results. The shares in the Marshall Shoe Company, although not at the prices ruling during the prosperous conditions of fifteen or eighteen months ago, are nevertheless still slightly above par, and may be said to have fairly well maintained their strength and justified their flotation. It was generally impossible at one time for any person not closely connected with the inner workings of such industrial concerns to express a reliable opinion upon the value of the different items in the annual statement of assets and liabilities, but, under the safe-guarding legislation of the present day a valuation certificate from duly qualified auditors is necessary upon this important point, and a shareholder is therefore relieved of some anxiety or doubt. In the case of this particular company, the plant, fittings and rolling stock at factories and branches are valued at their cost price of just about £41,000, and if there was once a weakness in the balance-sheet it might have been here. If so, the directors have been careful to remedy it, for the plant renewal account now stands at £13,000, £3000 having just been added to this reserve. This is a very respectable amount, for, with a moderate capitalisation of £125,000 there is also a further sum of £15,000 of undivided profits, so that the reserves and credit balances now amount to £15,649. Last year £500 was written off "goodwill" and £2000 this year, so that this asset is now valued at £5000. It will be gathered from these figures and appropriations that a conservative policy is being adopted, and it can be said with confidence also, that the business of the company appears to be increasing, the nett profit for the year being £14,475 (approximately). Out of this amount, after adding to the reserves as above, a dividend for the quarter at the rate of 8 per cent. on both classes of shares has just been paid, the amount required at such a rate for the year being £9720. The paid-up capital is made up as follows:—97,500 ordinary shares and 21,000 8 per cent. cumulative preference £1 shares. Although subject to the usual vicissitudes of business undertakings, and dependent largely on expert management (the latter essential being one which may be regarded generally as a deterrent in trading concerns), yet this stock appears to be a sound and improving one, and the shares should continue to give a good return on present prices.

### Radium Hill.

Towards the end of the week there was a fair amount of business in small parcels of these shares, although at lower prices than those ruling some months ago, the paid-up shares being sold at £8, but closing worth £9. This increased enquiry may be ascribed to recent press reports making known the strong demand which has set in for radium, a recent cable stating that German agents had been recently buying up all available supplies.

The original holding of this company, which is situated at Olary (S.A.), consisted of five square miles held under a license to search, but this was afterwards changed into 25 leases of 40 acres each, 12 of which were afterwards connverted into mineral leases of 40 acres each, held along the line of lode.

Several shafts have been sunk, and a considerable amount of work done in opening up the orebody, which contains carnotite, rado-active iron ore, quartz and biotite. Mr. Radcliff, of the Bairnsdale School of Mines, who is the scientific adviser of the company, estimates that the radium deposit of the company is the most extensive in the world known at the present time, one block alone containing more than twice the world's existing stock of pure radium bromide. The difficulty is to obtain the precious substance from the crude ore, and this appears to be done by first fusing the ore and then dissolving the resultant product with the object of extracting the radium contents. This seems to be a most troublesome and tedious business, as may be gathered from the fact that the process of extracting radium from barium originally involved 20,000 distinct operations, and even now some 5000 or 6000 are required. The British Radium Corporation, despite great resources, requires about two months' time to produce radium ten per cent. pure. Under these circumstances it will be understood what difficulties this company has bad in its endeavours to produce radium bromide, which is the marketable form of the substance; but, as it has already sold some of its product to an expert, and at a satisfactory price, it may be regarded as having accomplished the task. The next trouble to be overcome is the obtaining of a market for its goods, for the substance is so rare and so little known that some certificate of the purity of the piece or parcel offered for sale is necessary before a purchaser will consider it safe to complete the transaction, and the obtaining of such a guarantee requires time.

This company should have the good wishes of the public, for there seems good reason to believe that the substance which it is endeavouring to produce will play a most important part in alleviating suffering and disease. Several increases of capital have been necessary since the original flotation, and the latest of these has caused some trouble On 'Change. On or about the middle of July the whole of the shares in the company became paid up, there having been prior to that date 3148 fully paid up and 592 contributing. On July 24th this year the capital was increased by the creation of 4000 new shares of £10 each, which the old shareholders had the option of taking up on payment of £2 per share, the amount to which they were paid up. As the stock is not much dealt in here, the registered office being in Sydney, most of the brokers were unaware either that the former contributing shares had become paid up or that there were new contributing shares in existence, although on this latter point it was the duty of the company, under the Stock Exchange regulations, to have notified that association at once.

Buyers of the contributing (former issue) continued to offer £7 or £8 for them, not knowing that they had become fully paid. Some of the shareholders who had the right of taking up the new issue, seeing that there were buyers of contributing shares at £7 or £8, applied for the new shares at £2, and instructed their brokers to sell contributing shares at about the market price of £7. It was not until the shares were delivered that the mistake was discovered, but the dealings have fortunately not been numerous, and the trouble will probably be settled without recourse to the committee. The incident shows how easily an oversight may cause considerable inconvenience and loss.

### Constellation.

One of the pleasing features of the market during the winter months has been the encouragings results obtained from the operations of a number of the Bendigo (V.) mines, and if a comparison of the transactions "On 'Change" could conveniently be made it would probably be found that they have been of greater volume than has been the case for a fairly long period. Although the dealing has been fairly general, the portion of the field receiving the greatest amount of attention has certainly been that in close contiguity to the Golden Pyke lease, a popularity for which the successful operations of that company will easily account. Constellations, Golden Ages, Princess Dagmars, Great Northerns and Golden Pykes are located closely together in this neighbourhood, which contains some of the most successful gold producers of Bendigo. The dividends from the last named mine have been of a substantial character, and it is steadily winning its way towards inclusion among those companies which have returned their shareholders £100,000 or over, its total now being about £80,000.

Among the neighbouring concerns which have lately received increased attention through the success of the Golden Pykes is the Constellation, and the shares are now receiving strong support from those members of the Exchange who are best acquainted with Bendigo mines. Last month they were worth about 8s. 6d., but the latest quotations, after touching 12s., are at about 11s. 6d. This improvement has been made after some very pronounced fluctuations, these being usually an evidence of nervous market conditions. At one time there were unsupplied buyers at 12s., owing to an impression that an important development had taken place. This was not established, and the rise brought out sellers, for on the following day several transactions were recorded down to 10s. 2d. Towards the end of the week, and after a fairly large number of sales, some ground was gained, and the closing quotation was at 11s. 3d. The position of affairs at the mine has been discussed several times in the letters of our Bendigo correspondent, and it will be sufficient now to say that the company's prospects are in a large measure dependent on those of their neighbour, the Golden Pyke, and as the latter is achieving a substantial success the chances of the Constellation must be regarded as decidedly good. Entering into brief details, it may be stated that the "Pykes" are getting very payable stone from two or three different levels, namely, at 447, 543 and 643 feet, and these are coming in close proximity to the boundary between the two properties. So far the crushings from the Constellation have been taken from the 625ft. level, which is underneath the depth where the Golden Pyke reef was good, but the output will presently be increased, as stone will be mined from the 420ft. level as well as from the stopes at 525ft. and 625ft. The neighbouring company is also putting in a crosscut at 800ft. quite close to the boundary, and this will probably be attended with important results. The Constellation holding is a large one, but, like many others in Bendigo, it is somewhat irregular in shape owing to overlapping. There should, however, be about 1200 to 1300 feet in length to operate on at the 625ft. and 800ft. level. It may be mentioned that the recent rise in the price of Golden Pykes was not owing entirely to the good appearance of the mine, but was helped by market operations, some of the dealers having been tempted by the earlier rise into selling a few shares in the hope of buying in cheaper (to supply) later on, but unfortunately for them the quotations, owing to the good returns, went higher, not lower.

When once a Bendigo mine on one of the principal lines gets on to a payable run of gold, it may be expected that sooner or later an adjoining company will benefit thereby, and in this particular instance the shoot which has continued for a length of some 600ft. in the Golden Pyke ground is apparently about to bring success and dividends to the Constellation.

---

# METAL QUOTATIONS.

(From Our Correspondent.)

## By Cable.

### London, Tuesday.

Copper took a turn very favourable to producing companies at the middle of the week, the price going to £74 5s. on Thursday, the day after the publication of statistics of stocks in hand and afloat. Lead also moved upwards after Monday, but the week opened with a decline of 3s. 9d. per ton. Tin was in poor demand, and there was a difference of £3 per ton between last Friday's rate and that of the previous Friday. Spelter showed no change.

COPPER.—The opening quotation for spot delivery was £72 10s., or 2s. 6d. higher than on the previous Friday, but the advance was lost next day, when the price fell to £72 7s. 6d.; Wednesday saw a jump to £74 2s. 6d., and on Thursday £74 5s. was reached, followed next day by a return to £74 2s. 6d.

Three months' parcels were stationary at the previous Friday's rate, £72 7s. 6d., until Wednesday, when there was a rise to £74.

Electrolytic found a ready and rising market, opening at £77 5s., and rising to £77 15s. and £78. Yesterday's quotation was again £77 5s., as last Monday.

Copper Statistics.—The total supplies for September were 46,478 tons. Total deliveries (including Chilian and North American for all Europe), 52,704 tons. Stocks in England and France and afloat (including quantity advised from Chili and

Australia, 22,523 tons. The quantity advised from Australia by mail and cable is 3450 tons. The total European visible supply is 27,819.

TIN.—Spot lines opened at £190, that is, with a fall of 10s., and later rates were £188 12s. 6d., £187, £188 5s. and £187 10s.

Three months' parcels brought only £188 17s. 6d. on Tuesday, showing a decline, as compared with the previous Friday, of 37s. 6d. per ton, and later quotations were £187 10s., £188 17s. 6d. and £187 15s.

Tin Statistics.—The total stocks (including those in America and quantity afloat) amount to 14,673 tons. The quantity of Straits and Australian on spot and landing is 1921 tons. and the quantity afloat 2727 tons. Deliveries in London and Holland during the month were 3873 tons.

LEAD.—Monday's price was £19 16s. 3d., or 3s. 9d. below the previous Friday's, but the subsequent daily quotes were £20 2s. 6d., £20 5s., £20 10s. and £20 5s.

SPELTER still showed no change, the quotation being £21 per ton.

SILVER.—A fall of ⅛d. brought Monday's price to 28½d., and later quotations showed a still further decline, viz., 28 5-16d., 28 3-8d., 28 7-16d. and 28 5-16d.

ANTIMONY.—"Star" brand fell back to £29, while 50 per cent. ore was again sold at £6 10s.

WOLFRAM (70 per cent. ore) was firm at 33s. 6d. per unit, equal to £117 5s. per ton.

MOLYBDENITE showed no change from 2s. 8d. per lb., equal to £298 14s. per ton.

MANGANESE (50 per cent. ore) brought 10½d. per unit, equal to 43s. 9d. per ton, as last week.

---

We are in position to state that within a short time osmiridium, which has for some years steadily maintained a high price in the world's markets, thus exciting a very large amount of interest in Tasmania and other parts of Australia, will return to its normal value.

Messrs. Henry R. Merton and Co. Ltd., London, in their circular of September 5, when writing of the market for copper, say.—"The inherent strength of the situation has of late become such that the market is now fully able to dissociate itself from outside influences, and to go to its natural course quite irrespective of general sentiment or of share markets. The speculative element which had been estranged from the copper market by an unexpectedly bad experience in the earlier part of the year is gradually returning. and evinces renewed interest in this commodity since it offers once more such great possibilities. The statistical developments during recent months have been watched with growing interest, and now that it has become evident, that, owing to an ever-increasing consumption on the one hand and to constant troubles at the various sources of production—especially in the United States and Mexico, and to some extent in Australia also—we are drifting towards a critical situation with regard to supplies, the speculative operators are again taking a hand in the market.

---

# THE COAL MINING INDUSTRY.

## New South Wales.

### Northern District.

(From Our Correspondent.)

Newcastle, Oct. 4.

Everyone in the Newcastle and Maitland districts interested in the coal trade, or whose livelihood depends upon it in any way, was very much concerned during the last fortnight at the action of the machine-men in the Pelaw Main colliery, in striking over what they claimed to be grievances, and then refusing to listen to their officers, or to any one else who counselled them to return to work and have their trouble dealt with in a proper manner. As the result of their action, the mine was idle for nearly a fortnight, and the whole of the men and boys engaged in the pit—about 800—lost a large sum in wages. The owners of the pit were also put to great inconvenience and loss, for the average output of the mine is 3500 tons per day when in full work. Now, after causing all this trouble, and after the owners of the pit had taken out summonses against over 70 of the men, they have returned to work. If their conduct is good, and they do the work expected of them, the management will consider the question of withdrawing the summonses, and not ask the men to pay the cost of them. Pelaw Main, which is in the Maitland district, has been a source of trouble to the owners and to the Miners' Federation for the past eight years, and in that time there have been scores of stoppages of the miners, the machine-men, or the wheelers, and the amount lost in wages by the employees, and the loss to the owners of the mine, has been enormous. Of late years reference has frequently been made to the weak financial position of the Colliery Employees' Federation; but the chief reason is that strikes which occurred at the Pelaw Main and Hebburn collieries about eight years ago swallowed up several thousands of pounds of the federation's funds, and it has never been able to recover itself since. In the case of Pelaw Main, the men at that time struck without the consent of the federation, and for a time it looked as though they would get no strike pay, but Mr. Peter Bowling placed certain proposals before Mr. John Brown, and he refused to entertain them, and at once the Pelaw Main men had the sympathy of the other members of the federation, and it followed, as a matter of course, that they got strike pay. Since then the same colliery has cost the federation a good round sum, and apparently the same spirit of rashness still prevails amongst a large section of the men. In the present case, as mentioned, the men would not listen to their officers, and the settlement of the trouble was brought about by Inspector Gregory, of the Labour and Industry Department, who was formerly a miner, and who told the men very plainly that they had made a mistake, and that they were playing into the hands of those who say that the miners will not act fairly towards anyone. It is to be hoped that the fairness which has been shown towards them will have a good effect, and that they will see how dishonourable it is to throw down tools at a moment's notice, and lay a big concern like a colliery idle.

The dispute between the machine men at Pelaw Main colliery and the management of that mine has been referred to the wages board as a matter of urgency. It had been intended that the dispute at Stockton-Borehole colliery should be taken as soon as the addresses on the small coal claim were over, but the possibility of trouble occurring among the machine-men of the Maitland district has determined those concerned for the industrial peace of the district to bring forward first the dispute at Pelaw Main.

The wages board, which has been considering the claim of the Northern miners for payment for small coal, has been engaged during the past week in going into certain claims of the Colliery Mechanics' Union. However, the presentation of the claims and the answer of the employers has not taken up much time, and the board will shortly be back again at the work which the Colliery Employees' Federation is finding for it to do. At one time it appeared as if an ugly situation would arise through the stoppage by the Pelaw Main machine-men, for it is known that the colliery proprietors were not in a mood to continue before the board while men were on strike. It appeared likely, too, that the trouble might spread amongst the machine-men of the Maitland district. Fortunately, that difficulty was not reached.

The one-shift system of working came into operation at the Abermain collieries on September 29. These pits have been working two shifts, and the result of the adoption of one shift has been the throwing out of work of a considerable number of men. However, it is anticipated that places will soon be found for them, as the mines are opening out, and as other pits in the Maitland district will also be able to take a few of the men. The Aberdare and Abermain collieries are now working on the one-shift system, and eventually, as it seems at present, the other mines in that district will have to fall into line. In the Newcastle district, there has been no afternoon or night shift in operation for many years, except in special circumstances; and the Maitland men, who managed to get rid of the night-shift in 1906-7, are constantly agitating for the abolition of the afternoon shift. They have now been successful in the case of the collieries mentioned, and they are hopeful that the shift will go in the other mines in that district before long.

The collieries of the Newcastle and Maitland districts, as a whole, are working well, and the output of coal for the past fortnight was very good. The quantity put out for the three months was also satisfactory; and the total amount for the nine months is in excess of that for the first nine months of last year.

Reference was made recently to the trouble which arose at the Burwood colliery over the screening of coal, and the complaint of the men that they were losing by the distance at which the weighing was done from the mouth of the pit. The company is now installing new weighing appliances, and these will be ready for use at the commencement of 1914. The work will take some time, as alterations will have to be effected to the general surroundings of the pit top.

### Southern District.

(From Our Correspondent.)

Wollongong, Oct. 4.

The Progress Association of Robertson, which, for some years, has been agitating the Government to do something towards opening up the coal seams of the district, has a long-standing promise that the Under-Secretary for Mines, Mr. Pittman, would inspect, which has not yet been fulfilled, but the association has authentic information that a certain Illawarra company are about to have an examination made, and have £30,000 for development, if they deem the mineral to have enough commercial value. Their object is stated to be the supply of the southern railway. Shallow coal has been raised hereabouts by primitive means, and sold locally. The seam in this district, which is a plateau behind Illawarra, would be just an extension of that on the coastal side. The seams in this part of the Illawarra district, that is, south of Kembla, are estimated as of less commercial value than that now worked, viz., the Bulli seam, in the northern part of Illawarra. The coal behind this part of the district is as good as that at the front; just the same, in fact. As the Robertson district is behind the southern part of Illawarra, presumably the coal seam corresponds with that of the front likewise. The coal consumption of the southern railway and branches should now provide a fair amount of trade for a colliery, and one situated in the Robertson district would have but 14 miles, or even less, of carriage to the southern main line.

It is stated in the annual report of the Public Works Department that a scheme of electric power generation is in preparation, which includes a station on the south coast at a locality where coal in quantity has been proved. Apparently, this location would be in the Shoalhaven district, as the station is to form a part of a scheme, the base of which is the Burrunjuck dam. All the way down the coastal side of the range to beyond Milton the existence of coal has been proved. Indeed, in places an outcrop is visible. Not a few prospecting enterprises have been started, but all came to a standstill. A year or so ago a considerable area in the vicinity of Jervis Bay was applied for as a coal mining lease, Mr. Austin Chapman, M.H.R., being mentioned as the chief party in the application. Not a stone has been turned so far.

### Western District.

(From Our Correspondent.)

Lithgow, Oct. 5.

The New South Wales Cement, Lime and Coal Co. Ltd., with a capital of £200,000, has gone to the allotment on the first issue of 160,000 shares. The capital has been subscribed privately, and the directors are making arrangements for the purchase of plant and machinery, so that they may be in a position to be on the market about the end of next year. The services of Mr. Frank Oakden have been secured as general manager, who, for the past twenty-five years, has been manager of the Milburn Cement and Lime Co. of Dunedin, New Zealand.

It is reported that a change is pending, which will materially benefit the trade of the Cullen Bullen colliery (near Lithgow). The statement is made that the capital is to be increased to over £100,000, and that a big shipping company will hold a large parcel of shares; that this will mean a new trade equal to at least twice the existing trade at the colliery, and that a new equipment is to be installed, and a good deal of development work proceeded with. The arrangements have been pending for some time, and will be publicly announced very soon.

At Cullen Bullen some trouble has occurred over deficient places, and work has, for the time being, been suspended. Mr. F. Gregory, miners' generaly secretary, was in attendance at Cullen Bullen to make inquiry, and endeavour, if possible, to facilitate a settlement.

## Tasmania.

In the Legislative Assembly a fortnight ago Sir Elliott Lewis moved that, under section 63 of the Mining Act 1905, a special lease should be granted to F. C. Howard, to mine for coal, shale, slate, freestone, and limestone, of an area not exceeding 2250 acres, in the vicinity of the Catamaran River. He said that this was the first occasion when a special lease had been applied for in the House under the Mining Act of 1905. Coal had been known to exist for many years, and it had been worked spasmodically, but from want of capital, the development had not been so rapid as it should have been. At the present time a syndicate had obtained six coal-mining leases there, and it was now desired to consolidate them, so as to work them as one. These leases or blocks were each of 320 acres, and to work them as separate mining propositions would be not only uneconomical, but almost impracticable. Under the Act of 1905, there was no restriction at all as to the number of mining leases that could be amalgamated, but under the Act of 1911, Parliament had limited the number of leases that could be consolidated to a total area of 320 acres in the case of gold and other minerals, and in the case of alluvial deposits to an area of 640 acres. If the same number of coal mining leases could be consolidated as was allowed in the case of mineral leases, it would give an area of 2560 acres. When the 1911 Act was passed, however, coal mining leases were evidently not considered, because there was no power given to consolidate leases of this nature. One block of 320 acres could be held for coal mining, and no more. This syndicate was now asking for the right to consolidate areas which they held upon lease or application, with a small additional piece of land between the leases and some private property, and in all respects the lease would be identical with a coal mining lease. In New South Wales, 640 acres could be taken up as a coal mining lease, and there was no limit as to the extent to which the leases could be consolidated. In West Australia, the blocks were 320 acres, and there was no limit to the number of blocks which could be consolidated. The Minister of Mines, Mr. Mulcahy, supported the resolution, and asked the House to pass it. Mr. Earle agreed that every ligitimate encouragement should be given to bona fide companies who wanted to develop the industries of the State. The company in question had already four leases, and he proposed to amend the resolution by cutting out the figures 2250, and inserting 1274. This was an ample area for the company, and would give them the right to consolidate the four leases they now had. The block applied for under the resolution was nearly two miles square. Surely that was too much to give to the company. This amendment was agreed to, and the resolution, as amended, was passed and ordered to be transmitted to the Legislative Council.

## Queensland.

Some time ago a coal deposit was discovered on the property of Mr. E. Broad, at Esk, 43 miles from Ipswich, and 67 from Brisbane, and a committee of local gentlemen was appointed to deal with the matter of leasing the land. A meeting was held at Esk, on September 22, at which an agreement was read, and received the approval of those interested. The agreement dates from September 11, and holds good for a period of two years, to search for and prove all mines. There is no liability for the two years, and at any time during those two years the lessees may demand a coal mining lease for five years, subject to renewal up to 21 years, at a weekly rental of £1. If marketable coal is found, the lessor to be paid royalty at the rate of 6d. per ton for 40 tons or over mined per week. It was decided to request the Government to send a geologist to inspect and report, and if the report is favourable, a boring plant is to be procured, and operations started immediately. A preliminary call of 1s. was made at the meeting. Messrs. J. M. Chaille and M. Callaghan were appointed trustees, and Messrs. W. Gillmeister, Martin, Dare, Chaille and Callaghan a provisional committee.

## New Zealand.

In connection with the discovery of a new and valuable coal seam at the Stockton mine, Ngakawau, mentioned in our last issue, we are informed that the proving of this seam, which is situated from a few feet to over 100ft. below the main coal seam, is the result of boring done by the Westport Stockton Coal Co., acting under the advice of Mr. Sidney Fry, mining engineer, who claimed that a coal seam of the most excellent quality very probably existed throughout the greater portion of the company's area. The amount of coal proved for this seam by the bores is reckoned at 6,000,000 tons up to the present.

---

## NORTH QUEENSLAND FIELDS.

(From Our Correspondent.)

Mareeba, Sept. 19.

I stated in my notes last week that the Gilmore Tin Mine was far from defunct, as many people imagined. Recent reports to hand from the mine more than confirm my statements. At the West Midas the management now have ore at both ends of the shaft. There is 1ft. of stone in the east end, and in the west end the lode is 2ft. wide, and will average 10 per cent. for tin. Up to the 11th September the management had 15 tons of ore at grass from this shaft. At the Dolly Gray mine, the other property comprising the Gilmore Tin Mines, irregular patches of tin are occurring in kaolinised formation. From this lode three tons of 14 per cent. ore were obtained. More men are being put on to work at this point in view of the above development. The tributers in the No. 3 Dolly Gray are working a shoot of ore worth about 30 per cent. tin. Another party of tributers are stoping out a good seam of tin in the East Midas, which is estimated to go 35 per cent. These developments have caused keen enquiry for shares, and buyers are quoting freely.

Notwithstanding the splendid developments in the Vulcan tin mine, shares are still quoted at a low figure, but there are not too many Vulcan shares floating about.

Encouraging reports come to hand from the Mt. Windsor tin field, where the Almissa Tin Syndicate is conducting operations. The manager reports that 4½ chains of race have been cut through the solid granite. Substantial huts have been erected, and the pit sawyers have been kept busy. Owing to its inaccessible position, transport difficulties are inevitable, and the delivery of material at the mine is very slow. The Woothakata Shire Council is now improving the roads, and this will lessen transport difficulties.

Adjoining the Almissa Syndicate, Mr. Rex has a valuable sluicing proposition from which by primitive methods he is getting very handsome returns. If worked on up-to-date lines this property would be a large producer of tin.

Latest reports from the New Minnie Moxham gold mine, Northcote, are to the effect that the level being driven from the bottom of the shaft in a westerly direction showed the reef to be increasing in size and carrying free gold both in the seams and in the white quartz. Every foot of driving in this level enhances considerably the value of the mine.

The Handicap mine at Heberton is opening up exceptionally well, and promises to be one of the big things of the district. The owners are very pleased with latest developments.

There is nothing new to report regarding the Sunnymount district, both the Tommy Burns and Prince Alfred shares being very quiet.

The Railway Commissioner returns from his visit to the Etheridge to-morrow, when it might be possible to obtain from him further information regarding the suggested "Percyville" line.

The line to Mt. Mulligan coal mine is being rapidly pushed ahead under the capable supervision of District Engineer Hannam. At the coal mine, Mr. Watson is not idle, having a large gang of men engaged in driving tunnels to the seams of coal. There should be no delay in the shipment of coal when once the railway line is through to Mt. Mulligan, as development work by that time will be well advanced.

Mareeba, September 26.

The present price of tin is being taken advantage of by the miners in this part of the world, as the crushings in the Heberton district for August show. For the month 3890 tons of stone were crushed for a return of 167½ tons of concentrates, value £14,815. The Vulcan mine, which is looking exceptionally well at present, and is showing continual improvements, had an exceptionally good crushing. During the month 1062¾ tons gave a return of 47 tons of tin, value £3900. This crushing was followed by another good one, as during the first fortnight in September 850 tons of stone gave a return of 40 tons of concentrates which realised over £3000. It is safe to predict that the Vulcan mine will pay a dividend very shortly, and a substantial one at that. Although shares have not taken a large jump, still there is a strong buying market, and shares are now being acquired by local residents.

A nice little crushing was put through the Loudon mill, Irvinebank, last week from the Carpathia mine, N.S.W. This crushing of 10 tons gave a return of £717 worth of tin.

For the month of August the Governor Norman mine, which is owned by the Irvinebank Co., crushed 753 tons of stone for 14 tons of concentrates, value £746. On paper it would appear that this ore is not profitable, but with the small transport charges, the ore being carried by means of an aerial tramway, this mine returns a profit to the company.

The Lass O'Gowrie mine at Sannary Hills, which is owned by an Adelaide and Queensland syndicate, crushed 115 tons of stone for a return of 17 tons of concentrates, value £934. The Stella mine, another of the Irvinebank Mining Co.'s properties, crushed 128 tons for 4 tons 18cwt. of tin, value £468.

At the Great Northern mill, Herberton, the principal crushing for the month came from the Handicap mine, 131 tons of ore yielding 9 tons of tin, value £1078. This mine, from reports to hand this week, is looking specially well, and promises to be one of the best mines ever opened in the Herberton district. However, the devlopmnts are not yet sufficient to predict beyond the promise. The crushing from the Rainbow mine at Herberton, which was started at the Great Northern mill early this month, is not yet through, but by the tin already bagged, the return is going to be something out of the ordinary, and it is anticipated that the two owners, Messrs. Forrester and Thompson, will nett £5000 each. The mine is looking well again, and this crushing should be followed by many similar ones. For a time the mine did not look too well, but the lode is again containing good tin contents. A smaller crushing frm the St. Patrick at Herberton, 11 tons giving a return of £262, shows that this mine has lost none of its old-time sweetness. From the Good-Enough mine 11 tons yielded 3 tons of tin, value £412. At the Perseverance mill, Watsonville, W. J. Ludlow crushed 11½ tons of stone for 3 tons 6 cwt. of tin, value £382.

At Messrs. John Darling and Sons' Rocky Bluffs mill at Stannary Hills, the total returns for the month were 292 tons from the Dead Finish and Extended mines, for a return of £470.

In the Herberton district during August 37 tons 18 cwt. stream tin to the value of £4283 were won. 1762 tons of wolfram ore were crushed for 21 tons 6 cwt. of metal, value £2082. 166 tons of copper ore were treated for 26 tons 6 cwt. of metal, value £1708. 47½ tons 8 cwt. of lead ore returned 18 tons 8 cwt. of metal, value £308. Silver ores yielded 3605 oz., value £393.

At the Loudon mill, Irvinebank, last week, Messrs. Robinson Bros. crushed 13 tons of ore for a return of 4 tons 3 cwt. of tin, value £498. Messrs. Murdoch and Henderson put through 12 tons, which realised £274. There were many individual crushings of note which show that the tin districts are in a fairly prosperous state, and Irvinebank and Herberton are exceptionally sound at the present time.

Some attention is being paid to tin mining in the Croydon district, and Messrs. Henwood, Donohue and Mayfield are working a very promising proposition not far from the town of Croydon. This mine was discovered some years ago, but the Croydon people did not recognise its value. It remained to the above mentioned party from the Herberton district to prove to the Croydonites that tin, as well as gold, is worth attention. They have a shaft down 50ft., and the lode is from 9ft. to 10ft. wide in the face. Mr. Donohue, who was for nine years manager of the Lass O'Gowrie mine at Stannary Hills, has stated that the show is one of the best he has ever seen, and he can't make out why the people of Croydon have overlooked the possibilities of their tin field. If, with the sinking of the shaft the lode continues in size and value, it will mean a big thing for Croydon, and will no doubt lead to further prospecting of the mine. There are crushing facilities not far from the mine, the Richmond battery being only five miles away.

As predicted previously, the Gilmore tin mine has once again come into prominence. In the West Midas shaft they have a face of ore 2ft. wide carrying 10 per cent. of tin. The tributers are also on good ore, some of it being worth 35 per cent. The crushing of the dumps is being proceeded with at the Gurrumbah mill, and it is stated that the second lot will give an even better return than the first lot put through.

With regard to gold mining, outside of the New Minnie, Moxham and Mareeba gold fields, not much interest is being displayed. The Kidston field is still under a cloud, the only company pursuing operations at the present time being the Thompson's Oaks Co., and there is nothing in this mine at the present time likely to cause a sensation. In pleasing contrast is the report from the New Minnie Moxham gold mine. The level from the bottom of the shaft has been driven 30ft., and the reef has increased in size to a width of 2ft., and the rich gold values are being maintained. Gold is plainly visible in the stone right from the shaft to the face. The directors now deem the mine worthy of a battery, and are issuing the reserve shares at par to the present shareholders. The construction of a dam will be proceded with at once, so that it will be in readiness by next wet season. There is no doubt but that this mine has a good future in front of it.

Work has been commenced on the Minnie Boxham East, an adjoining mine. Here a reef 4ft. wide of 12dwt. stone is available right from the surface. With crushing facilities such as will prevail at the Minnie Moxham mine this stone should be payable, and should provide a source of revenue for the Minnie Moxham shareholders.

A few weeks ago a new find of gold was reported from the Hodgkinson field. It is stated that a reef 5ft. wide and carrying 10 oz. of gold to the ton had been struck. Later reports, however, show that there are two reefs, one 2ft. and the other 3ft. wide, and these will bulk about 1 oz. to the ton.

At the Tyrconnel mine, Hodgkinson goldfield, the crosscut has so far failed to strike the reef. The manager is, however, full of hope, despite the pessimism of the shareholders. It was rumoured in town yesterday that the reef had been struck, but so far the rumour has not been confirmed.

The railway to Mt. Mulligan is being pushed ahead, and there is a big camp of men near Thornborough. A number of these men do a little prospecting in their spare time, so it is more than likely that new discoveries may be found.

It is generally understood here that the plant at the O.K. mine has been purchased by Mr. A. T. Linedale and Mr. John Newell. It is probable that portion of the plant will be erected at the Ortona Copper Mine.

The Commissioner for Railways returned to the coast last Monday after spending about a fortnight in the Percyville district. It is evident that he has gone thoroughly into the question of the construction of a railway from Forsayth to the Percy, and his report will be awaited with interest.

The Mines Department instructed the Inspector of Mines of Herberton district to visit the Mt. Amos and Hartley's Creek tin fields and report on the possibility of cutting a track through the scrub, and thus making access to the coast much easier. At Mt. Amos he found a short route to the head of the Daintree River. It is probable that the department will subsidise the miners at Mt. Amos, and that this route will shortly be available.

The tin and goods can then be carried to and from Pt. Douglas by means of motor boat. This will effect a big saving in freights, and will lead to increased settlement and further prospecting. At Hartley's Creek, a trafficable route was found from Double Island, near Cairns.

Advices from Mt. Windsor state that the field is assuming a very busy aspect. An option has been secured over a fine alluvial proposition, and a syndicate will be formed at an early date, if inspection is favourable, to work the ground on up-to-date lines.

---

## VICTORIAN MINING ACTIVITIES.

### Bendigo and District.

(From Our Correspondent.)

The gold production for the week ending October 4, 1913, amounted to 2895 oz. 2 dwt. The principal producers were:—Central Red, White and Blue, 319 oz. 6 dwt.; Golden Pyke, 290 oz. 18 dwt.; Victoria Proprietary tributers, 173 oz. 3 dwt.; Williams' United, 112 oz. 6 dwt.; Ironbark, 93 oz. 10 dwt. Two dividends, aggregrating £2267 10s. 6d., were announced, viz.:—Golden Pyke (1s.), £1372 10s., total to date £82,175 7s.; Carlisle (6d.), £895 0s. 6d., total to date £59,345 5s. 6d.

Central Red, White and Blue completed shaft sinking, and will form plats at 800ft. and 880ft., preparatory to driving north at the former depth. This level is to intersect the saddle reef showing at the 720ft. plat, and later pick up the pitch of the 670ft. formation now being stoped over the 720ft. north level. The opening up of these two formations is expected to reveal better prospects in the northern portion of the lease. On the completion of the new winding plant early next year, shaft sinking will be resumed to test the reef channel under the two faults recently passed through. At 400ft. the north level is advanced to 689ft. and within 30ft. of the Little No. 180 boundary. The reef is less regular in the end, but shows a little gold. The two stopes running up to the intermediate show payable gold in 8ft. of crushing material. Stoping off the No. 5 winze has again been suspended in order to conserve this higher grade stone till the stoping is carried through from the main level. Meanwhile the very profitable quartz under the rails at 318ft. is being drawn upon near the No. 1 winze and at 350ft. north of the shaft, keeping the gold production at a very remunerative standard.

Great Extended Hustler's met with a more favourable development in the stopes over 1326ft. The company are stoping at 522ft. north of the shaft, on the back of the new reef, being followed with the winze from 1053ft. This back is not prospected between these depths. At 1053ft. there is 2ft. of bedded quartz of payable quality at a depth of 45ft. in the winze, and it has been assumed that the auriferous quartz in the 1326ft. stopes represents the north pitch of this stone. It is more likely, however, that the stone now showing more gold is allied to a couple of faults which intersect the back in the north crosscut. There is 8ft. to 10ft. of quartz exposed, with the best prospects along the footwall. Another crosscut is expected to reach the back in a few days off the same level, but at 230ft. further south and directly under the winze. These operations will determine if the bedded quartz continues so far below the 1053ft. level. A crosscut is also to be driven 90ft. to the same reef off the 1226ft. level. The formation promises to prove productive when these workings are connected and stoping general. At 1053ft. the company have a level going north on the Little reef which has shown a few fine colours of gold in 6in. of quartz. After driving 40ft. a rise will be put through to the 777ft. winze, where the same formation has been payable in following it on the underlie to a depth of 220ft. The last crushing from the winze on Saturday yielded a profitable average. The reef is here taken out for a length of 25ft., and varies from 4in. to 3ft. 6in. about a roll in the wall. This roll appears to be the beginning of the trough which divides the Hustler's line into two anticlines over a lengthy section. At 717ft. the same reef is being driven on at 650ft. north of the shaft, in anticipation of locating a shoot of payable stone formerly worked at 50ft. overhead.

Golden Age return of 68 oz. 12 dwt. from 133 tons was up to expectations and profitable. The crushing was entirely from the seven stopes above the 853ft. south level, where the reef is more productive near the hanging wall break. Another stope has been started off the 700ft. winze at about 90ft. above the 853ft. main level, but the stone is expected to be of low grade till operations progress 80ft. southward. At the north shaft there is better looking stone coming up underfoot in the 655ft. north level, showing a little gold. On the Paddy's Gully line the west back should be reached shortly, and the new reef further tested by rising. Later it is proposed to sink a winze for a few feet, on what looks like the neck of a deeper reef exposed along the bottom of the 1581ft. crosscut.

New Golden Fleece will have their first clean up from the new mill on Saturday next, but a profitable yield is not looked for. The striking of a 6d. call for the current month has given scrip values a set back. As the stopes are extended at 585ft. there is a likelihood of better results attending milling. At 650ft. the north level traversed a lot of highly mineralised quartz, revealing a couple of colours of gold. This stone is being further tested by breaking over west from the end, and though the attractive character of the spurry formation is maintained no gold is yet visible.

New Nil trial crushing from the reef passed through in shaft sinking below 710ft. yielded a little over 3½ dwt. per ton. The stone was 6ft. thick, and will be further prospected at an early date from an intermediate plat to be cut in the formation. The south level at 620ft. is still in country rock. Tributers had a fair return from the shallower levels.

Johnson's Reef prospects on the Derby line continued very flattering for two or three breakings in the 1225ft. rise, payable gold showing for a height of about 12ft. in 4ft. of stone along the west back. Toward the close of the term the quality of the leg fell away, though the quartz otherwise showed little alteration. On reaching the cap a crosscut will be driven through it to the east back, which may lead to payable stone of greater permanency. The winze from 1150ft. to meet the rise will be started during the week, in a full width of stone; the top of the cap. The return from the old stopes was very disappointing. On the Paddy's Gully line the 1730ft. level off the No. 2 shaft holed through to the old stopes from the No. 1 shaft, disclosing fair prospects in the west leg. It will now be possible to greatly increase the output here. At 100ft. from the point of connection there is fair gold overhead, where a spur runs into the leg stone, and the enrichment may extend to the cap.

Carlisle return showed a considerable improvement, and was much above expectations. It was due to the stopes over the 1140ft. south level producing better stone than for some weeks past. The more advanced stope is in fairly consolidated crushing material, the other operating on the spurs running up to the fault quartz along the top slide. The latter will again be drawn upon this month. It formerly yielded satisfactorily in the north workings. The intermediate north level is in the mullocky portion of the deposit at a few feet under this larger fault, and the outlook is therefore shortly expected to brighten in this end. The 1140ft. main south level still shows gold in a full face of spurs.

New Chum Goldfields 1067ft. north intermediate level on the east leg has traversed better grade stone of late, leading to a larger gold production and a margin over working expenses. The prospects are the best for some time, but the shortness of the shoots generally makes it difficult to estimate the value of the improvement. As the stope advances there should also be payable stone for a few feet above the level. There is about £500 in hand.

Lansell's South Blue sent in the payable yield of 58 oz. 17 dwt. from 190 tons from the west leg of the reef previously discarded at 437ft. A good length of ground is available, and the favourable prospects seem likely to lead to more activity in the shallow ground in the adjoining leases.

### Castlemaine and District.

(From Our Correspondent.)

The directors of the Little Nuggety mine at Campbell's Creek ratified their promise of engagement of Mr. Harry Leverington to manage the mine, and he commenced work on the 6th inst. Active operations were to begin on the following day, and thus another mine saw the fructification of hopes and labours long drawn out. A plant has been purchased and arrangements made for its erection.

Spring Gully had a poor week. The clean up at the end of it, from 170 tons, only contained 80 oz. of amalgam, which retorted 56 oz. 17 dwt. The week's work did not disclose any valuable stone at any of the points of operation. There is less gold than usual showing in the rich spur which yielded so well a few weeks ago. It has pitched fast and got smaller. The north stopes at 170ft. show two small spurs in the face, carrying gold. There is a lot of stone being opened up in the faulting, the east back having been cut above it. It is reckoned to be of rather low grade. The east back at 240ft. discloses sandstone and small seams of slate, with a 2in. spur. At 120ft. in the crosscut passed through indicator slate, and later on a rise will be put up through that slate to prove if spurs have gone overhead. In crosscutting east off the 318ft. south level a 2ft. make of stone was found, and it will be further tested.

Spring Gully No. 1 has commenced a crosscut to the east in a rise 30ft. up from the 300ft. level, where there are two highly-mineralised flat spurs of promising appearance. As they are supposed to be in the same belt of country as the big mine they will be further prospected.

South Wattle Gully report continued prospects of a favourable nature. In the 300ft. level the west drive is out 80ft., with a 12in. reef showing gold. Within another 40ft. good gold is expected to be tapped, although it has nothing to do with the saddle. The No. 3 rise has got up 40ft. The last 20ft. has shown stone varying from 18in. to 6ft., and the turnover of the saddle is very close. Gold has been seen in breaking down for the whole 20ft. At the 350ft. level a rise is being put up on a new make of stone 3ft. wide.

### Maldon.

(From Our Correspondent.)

A meeting has been held to discuss the matter of approaching the Government for a grant towards putting up a public crushing battery. There is an idea prevalent that the erection of such a crushing battery will solve the problem of how to improve Maldon's gold yield. How it will do so does not seem very clear. There are many efficient plants in the various localities on the field, and their owners are only too anxious to crush stone. Mr. A. Cook has evidently not much faith in such a consummation taking place in the vicinity of Brewer's Reef. He has put up a 10-head battery on that reef, and he expects to get ore enough from it to keep his battery going, while he intends to do crushing for prospectors at the lowest possible cost.

Maloney's Red, White and Blue Co. crushed 41 tons for 7¾ oz. The outlook at Gowar is not over-promising, and very little prospecting is being done.

South German has not yet returned to the list of probable dividend payers. The prospects are not improving in any way, and all chances of any permanent improvement from the recent boom seem to have fled. The intermediate level north below 1750ft. has been extended 175ft., showing a reef 3ft. wide with a loose splice of stone making its appearance on the west wall. It is expected that this will take the place of the present barren stone as driving proceeds. Not much work has been done at the 2000ft. level. Crosscutting has been done for a few feet both east and west. In the latter improved stone has been met with. To the north of the same level a contract has been let to a party for extending the level and crosscutting. Best and party sent 45 tons to the battery and got 8 oz.

Oswald's Gold Mine the 400ft. level has been risen from for 51ft., and a crosscut has been put out 17ft. from the top of the rise, where 2ft. of stone was cut showing gold. This is now being followed to the south. A stope is being taken off the back of 500ft. level, the reef being 4ft. wide and worth about 30 dwt. to the ton. The stopes at 500ft. are worth half an ounce. All the payable stone seems to have been worked out of the north stope, as well as from Tabletop. In crosscutting east at 600ft. a small reef was cut 25ft. in, and it merged into the big reef in the end, carrying traces of gold. At 1100ft. the reef is up to 3ft. wide, and crosscutting has been discontinued in favour of driving to the south. For the term 360 tons were crushed for the fine return of 238 oz. 7 dwt., and 840 tons cyanided for 106 oz. 16 dwt.

New Day Dawn have the 90ft. level north in 72ft., and it assays payable for the full width of the drive, while in the east crosscut mineralised spurs are seen, and they carry gold. In the prospecting shaft the stone appears to be payable.

Derby United Co. has extended the crosscut above 825ft. to 41ft., and expect to cut the run of gold-bearing spurs within a few days. At the 680ft. level the west crosscut has been extended in clean country, a small formation having been passed through. A crosscut is being cut from the top of rise to deal with the same formation, and a rise is being put up on the stone in the east crosscut.

South British Syndicate, near Oswald's, is rising to the 150ft. level from the old shaft on a nice body of stone carrying a little gold all the way. Stoping is being done from the south side of the rise on payable stone.

Blow Reef (Newstead) is crushing dirt from the stopes at the south end of the rise over the east reef at 280ft. It is a little broken, but of fair quality. At the 360ft. level the crosscut has been extended for 21ft., showing sandstone and quartz leaders.

## NEW SOUTH WALES MINING.

### Broken Hill.

(From Our Correspondent.)

Broken Hill, Oct. 3.

The Broken Hill shop assistants' strike was "declared off" on Sunday last, and its possible extension to the mines was smudged out; but no sooner was one matter settled than another trouble arose. One of the pumps at the Stephens Creek reservoir broke down, the main leading to Broken Hill burst, and, for want of water, the mills of most of the mines of some of the companies had to cease work. There are three pumping plants at Stephens Creek, but the two that were left could only keep the town supplied and some of the mines. The town was the companies' first consideration. Repairs to the main were speedily effected, and the Eight Hours holiday intervening gave the mines a chance. Most of the mines and treatment plants were able to resume work to-day, the exceptions being the South, South Blocks, and Zinc Corporation. They, however, are almost certain to have all the water they want by to-morrow (Saturday) morning. If it had not been for Eight Hours Day all the mines would have suffered a severe loss; as it is, the loss to most of the companies will be slight.

Broken rods in the pumping plant was the cause of the water stoppage. New rods have been put in, and the service to the mines, as well as to the city householders, will be complete again before this is in print.

The accident was one which could occur to any plant, and Broken Hill has reason to be thankful that the disadvantages were not greater. The intervention by the holiday was providential.

The British, as forecasted, has cut the lode at No. 11 level, and at the moment of writing the crosscut carries 23ft. of low grade ore. The diamond drill bore, however, showed more low-grade than this before it entered the better portion of the lode, so there is no reason yet to be dissatisfied.

Block 10's 615ft. level keeps strong, and the ore body here, going westward, is very satisfactory. The striking of this body has been, or will be, a good thing for "Ten," which wanted an addition to its reserves.

Block 14 keep up a steady output—380 tons carbonate ore and 800 tons sulphides was not bad for this allegedly played-out property.

Apropos outputs, the Junction North mill last week treated—

1919 tons crudes.
1111 .. purchased ore.
117 .. tailings.
971 .. slimes.

4118 tons in all.

The Junction mill treated 1418 tons of crude for 175 tons of concentrates, a ratio of 8.10 tons to 1. This, of course, will never do. The erection of the new slimes treatment plant is progressing satisfactorily.

The litigation between the Junction and Junction North companies, now before the High Court, is providing the lawyers with more than the "living wage." Shareholders should interfere in a matter of this kind.

The North is still going for the lode at its longest level. The ore will be found all right, but not just yet.

Amalgamated Zinc (De Bavay's) last month returned a profit of £10,324 (basing spelter at £22). As it did not average that price, the profit was lower.

South mine development work is very extensive, and is proving everything, and more, that the management looked for.

### Bathurst District.

(From Our Correspondent.)

Bathurst, Oct. 3.

Very keen interest is evinced in the developments at the 650ft. level at the Amalgamated Hill End, as this is the deepest point at which gold has been found, and clearly shows a second series of gold-bearing stone. Had the drive been 20ft. higher the probabilities are it would have been missed altogether. The vein is from 2 to 4 inches wide, and is driven on for 30ft. north, and the face is better defined and carrying the best values yet found. It is pretty much of a jeweller's shop at present, and its value may be put down as in the neighbourhood of 50 oz. to the ton, and those who know their Hill End will not be at all surprised if it increased to 1000 oz., as it is immediately beneath where the richest gold was got in the early days. What impresses one most is the occurrence of the same ruling indicator, such as they had in the upper level, and no doubt this is the cause of the enrichment. A crosscut is going out east, and will intersect in a short distance four other old rich reefs. Looked at from any point of view, the discovery of very rich values at this depth is most gratifying, and augurs well for the future success of the field.

Hawkins' Hill Reward is opening up splendidly. In the main north drive, towards the Robert Emmett crosscut at a depth of 350ft., they have been on payable ore all the way, and the values have continued to improve, until the present face is worth over 4 oz. to the ton, and a good sized reef at that, with the ground all intact overhead. Owing to the cages for the Exhibition shaft taking about six weeks to come by boat from Melbourne to Sydney, the battery has been hung up, except for the treatment of a 20-ton lot, which yielded 42 oz. The delay is a most vexatious one to shareholders, who are expecting dividends when the battery is in full swing. This company has a few years of work ahead of it, from stone already in sight, without sinking a foot.

The adjoining property on the north, The Golden Key, formerly known as the Scandinavian, is about to form into a large company with ample working capital to develop the mine. In a few months' time the Hawkins' Hill Reward drive will be up to the Robert Emmett crosscourse, and liberate the water held back by it, which will enable The Golden Key and Golden Mile companies to sink to a good depth free of water troubles.

One of the most productive private reefings on the far south coast, writes our Wollongong (N.S.W.) correspondent, is the New Venture at Mt. Momsen, Wolumla. Two men have worked it for the past four years, and it has paid for the labour and given £250 a share in dividends. The stone is treated at Cockle Creek. Two more men are now being put on.

## ALASKA MINING.

### New Alluvial Field.

Glowing accounts are given of the new placer diggings on the Sushanna River in South-western Alaska. A stampede (the equivalent of the Australian "rush") has started, which promises to assume some proportions. It would seem, however, that access to finds in the interior of Alaska is attended with much more variety, danger and difficulty than in Australia, where the risk of a "perish" is now confined to only a few unexplored localities. The Sushanna river find is 260 miles south-west from Dawson, on the Canadian side, and is 90 miles north-east from Kennecott, the terminus of the railway from Cordova on the coast in the United States' territory. To give some idea of the difficulties attending the passage from Dawson City, horses are required for the first stage, canoes (poling up stream) for another stage, and the last stage of the 260 miles is "mushed," or walked. Some prospectors are said to be working on material yielding as high as 5 and 6 dwt. of gold to the dish, and two are panning off a fortune at the rate of £600 per day. These, however, may be regarded as the usual "rush" stories, although the values are not out of the way for placer mining while it lasts. Labourers are said to be receiving £4 per day, and probably a day's work under the conditions as they are at present is worth it.

At Nome hydraulic work is practically finished for this season through shortage of water. Dredging is still active in Alaska and Yukon. At Fairbanks there are 16 small batteries at work, and at Juneau the Alaskan G.M. Co. has started work on the site for its 6000 tons per day mill, consisting of rolls and crushers, which is a departure from the practice of using stamp batteries, as prevails at Treadwell.

## AMERICAN MINING NOTES.

(From Our Correspondent.)

San Francisco, Aug 23.

Flotation experiments are under way at the large copper mines in Nevada.

Labour, which mostly means the Western Federation of Miners, has been quite arrogant during the past few weeks, and there is trouble at the great copper mines in Michigan, the lead and zinc mines in Missouri, a smelter in Utah, the coal mines on Vancouver Island, Canada, and several other lesser centres, while the I.W.W. (I won't work!) has been responsible for much trouble in rioting and shooting affrays.

The International Geological Congress has had a good time at Toronto, Sudbury, Cobalt, and other interesting places in Canada. Metallurgy at the two latter places is highly interesting. In Cobalt precipitating of silver from cyanide solutions on aluminium dust has been brought to a state of high efficiency. The A.M.I.M.E. is at present holding an intensely active meeting at Butte, Montana. Fifty or so papers on geology, mining, concentration and smelting are to be presented. Butte is a modern centre with 75,000 people.

In San Francisco, since April, 1906, 50,000 building permits have been issued to erect a total worth 225,000,000 dollars. Large steel and concrete buildings are still under construction. In California there are about 75,000 automobiles running (115,000 licenses issued), consuming 150,000 gallons of gasoline daily, at 15 to 20 c. per gallon.

## REPORTS OF COMPANIES, CORPORATIONS, ETC.

### Hampden-Cloncurry Copper (Q.).

The smelting return of the Hampden-Cloncurry copper mines for the last two months is as under:—

| | August. | Sept.* |
|---|---|---|
| Ore treated, tons .. .. | 6,126 | 5,160 |
| Blister copper, tons .. | 575 | 509 |
| Fine copper, tons .. .. | 568 | 503 |
| Gold, oz. .. .. .. .. .. | 155 | 141 |
| Silver, oz. .. .. .. .. .. | 4,988 | 4,336 |

*Furnace ran 24 days. Closed down Sept. 29 to put in new jackets.

### Mt. Elliott Ltd. (Q.).

The smelting returns of Mt. Elliott Ltd. for the last two months were as follows:—

| | *August. | Sept. |
|---|---|---|
| Ore treated, tons .. .. .. | 3,596 | 4,212 |
| Blister copper produced, tons | 386 | 500 |
| Contents— | | |
| Copper, tons .. .. .. .. .. | 382 3-5 | 495 3-5 |
| Gold, oz. .. .. .. .. .. .. | 649 | 814 4-5 |
| Silver, oz. .. .. .. .. .. .. | 1,006 | 1,160 |

*25 days.

### Amalgamated Zinc (De Bavay's).

The returns showing the production, receipts, working expenses and estimated profits of the Amalgamated Zinc (De Bavay's) Ltd. for the last two four-weekly periods were as follows:—

| | Four weeks ended Aug. 23, 1913. | Sept. 20, 1913. |
|---|---|---|
| Tailings treated, tons .. .. | 44,454 | 39,649 |
| Zinc concentrates, tons .. .. | 12,248 | 11,385 |
| Assaying— | | |
| Zinc, per cent. .. .. .. .. | 49.4 | 49.2 |
| Silver, oz. .. .. .. .. .. | 8.5 | 9.1 |
| Lead, per cent. .. .. .. | 6.0 | 6.2 |
| Lead concentrates produced, tons .. .. .. .. .. .. .. | 135 | 126 |
| Assaying— | | |
| Lead, per cent. .. .. .. .. | 52.1 | 51.3 |
| Silver, oz. .. .. .. .. .. | 34.6 | 35.0 |
| Zinc, per cent. .. .. .. .. | 18.9 | 19.4 |
| Estimated income (spelter at £22 per ton) .. .. .. .. | £35,585 | £32,984 |
| Total working expenditure (including cost tailings treated) .. .. .. .. .. | £17,368 | £16,168 |
| Estimated profit on working account (spelter at £22), after deducting amount due to Broken Hill South Co., under partnership agreement .. .. .. .. .. | £12,506 | £11,747 |
| Provision for royalty .. .. | £1,531 | £1,423 |
| Net profit on working account .. .. .. .. .. .. | £10,975 | £10,324 |

No credit is taken in these figures for interest on investments or dividends on shares in other companies.

### Broken Hill Proprietary (N.S.W.).

The report of the Broken Hill Proprietray Company for the four weeks ending September 24 states that 24,963 tons of crude ore were raised during the term. In the ore-dressing mills 23,111 tons of crude ore were milled, and 19,542 tons of dump tailings reground, producing 5094 tons of lead concentrates and 4400 tons of slimes. Owing to the increased quantity of jig tailings available for regrinding from the ore-dressing mill, and improvements introduced in the delivery of dump tailings to the regrinding plant, the requisite quantity of dump material is being obtained by working the steam shovel one shift daily, instead of two shifts, as formerly. The zinc separation plant treated 6750 tons of zinc concentrates, assaying 45.87 per cent. zinc, 7.46 per cent. lead, and 12.86 oz. silver per ton. Sulphuric Acid Plant.—484 tons of sulphuric acid (strong) were produced. Three zinc roasters were in commission throughout the period, but work was somewhat interfered with by the shortage of labour. Aerial Ropeway.—8096 tons of tailings were handled by this means to the various underground chutes, including 1463 tons sold to the Block 10 Company. At Port Pirie a fourth lead smelter has been blown in, and is being supplied with air from the spare low-pressure blowers. At the zinc plant the Hegeler roaster and from eight to nine distillation furnaces were in operation, according to the labour available. At the close of the period eight furnaces were in commission. The erection of the two new Babcock and Wilcox boilers is practically completed, and two more boilers of the same class are being brought down from the mine as a further addition to the power-house. Further good progress is reported with respect to preparatory work for the steel works at Newcastle, and it is mentioned that the complete ironwork for the blast furnace and the blowing and hoisting engines are now in course of shipment from America.

The tonnage of ore treated by the Broken Hill Propty., and the recoveries therefrom for the last two four-weekly periods, were as follows:—

| | Four weeks ended | |
|---|---|---|
| | Aug. 27 | Sept. 24. |
| Company's ores, silver, oz. | 181,954 | 118,660 |
| Company's ores, lead, tons | 2,806 | 1,737 |
| Purchased ores, silver, oz. | 197,978 | 195,604 |
| Purchased ores, lead, tons | 4,097 | 5,188 |
| Antimonial lead tons (est.) | 66 | 58 |
| Zinc concentrates, tons .. | 6,520 | 6,750 |
| Contg. silver, oz. .. .. .. | 82,960 | 86,797 |
| Contg. lead, tons .. .. .. | 472 | 504 |
| Contg. zinc, tons .. .. .. .. | 3,014 | 3,096 |

## GOLDEN PYKE CO. (V.).

(From Our Bendigo Correspondent.)

The entering of a much richer shoot of stone in the 447ft. level, at 45ft. from the Constellation boundary, was primarily responsible for the recent strong forward movement in this company's scrip values. In itself the enrichment would be considered to have enhanced the value of the mine to any great extent, as the level is so close to the end of the lease, but the development practically assures a continuity in the good shoot passed through in the 543ft. rise some time ago at 160ft. further south. This view is supported by the enrichment being found under one of the two main faults, which have had such an important influence on the deposition of the auriferous quartz so far below the cap along this east back. The other fault is from 70ft. to 100ft. deeper in the beds, and the most productive stone so far is unquestionably more closely allied to these breaks. There is also a series of minor faults, supplementary fracturing from the more pronounced slides, and the whole of the faulting shows a consistent south pitch over the greater part of the lease. Nearing the north boundary the lower of the two big breaks reverses its pitch near the north boundary, and to this circumstance the irregularity of the gold deposition and the generally lower value of the reef in the Constellation Company's 522ft. workings is apparently due. The upper break is showing at over 50ft. from the face of the 447ft. north level, and is traceable throughout the stopes southward from between the Nos. 1 and 3 rises. It will be remembered that good stone has been extracted from these stopes, while a richer shoot was traversed for several firings in the 543ft. No. 3 rise, above the stoping. This rise is something like 200ft. from the boundary, and the enrichment appears to have been found at a similar position in relation to the top fault, as in the 447ft. north level last week. The development was the one thing necessary to clinch the future of the block of ground between 447ft. and 543ft. for an average height of 60ft. and a length of 400ft. north of the shaft. As yet the stopes in the vicinity of the No. 3 rise are not high enough to draw on this better quality stone, but it may be reached during the next three months. There are only three stopes operating north above 543ft., the most advanced workings being on 6in. to 10in. of good stone at 50ft. or 60ft. from the end of the lease, or directly under the rich shoot in the 447ft. level. The top of this stope is still 65ft. under the 447ft. workings. Southward from the shaft a couple of stopes are working in a lower grade portion of the east back, but there is a good length of profitable stone still available in this direction. Between 643ft. and 543ft. operations are approaching one of the most interesting stages of the work on this productive east back. The last 50ft. of rising to connect these levels opposite the shaft revealed the second rich shoot of stone, which was subsequently opened up for several hundred feet in length in driving the 543ft. north level to the boundary. It is associated with the bottom fault, and rises steadily north for some distance. The stopes off this rise are just above the faulting, but will need to extend about 15ft. higher to enter the lower portion of the more auriferous quartz. In this 50ft. there is some of the best stone along the footwall, and the reef is up to 3ft. wide. The gold is coarse, and the stone well mineralised. This lower break passed underfoot in extending the main level to the Golden Age boundary, and anticipations of the gold following the inclination of the larger fault in this direction have not been realised, as the reef was of low value to the end in the level. Carrying stopes to 150ft. south and 40ft. from the level, a second rise was extended 60ft. through to 543ft. at this point. In rising, no less than five minor slides were encountered, and the stone was reported payable for the full height. From the No. 2 rise a stope is going south, where the reef is smaller and of inferior value. Northward the stope has been taken back to within a few feet of the No. 1 rise, and, when beaten through to the latter, the next stope should dislodge good payable stone. To sum up the position between 447ft. and 643ft., the company, in addition to present stoping, will shortly be able to bring four stopes into operation on richer stone than anything disclosed at present, with the exception of the shoot in the 447ft. north level, and in each instance there will be an increased width of stone available. At 447ft. the improved quality of the reef in the north end assures some good stoping ground over head in the vicinity of the boundary. There are two backs exposed in this end, the rich shoot existing on the more easterly back. Evidently there is stone associated with this back for a fair length southward, running parallel to the level beyond where the latter was diverted eastward through spurs showing in the hanging wall. The leading stope is fully 100ft. from the face, and the third stope another 150ft. closer to the shaft; only three stopes working northward. The highest workings here are still 50ft. under the cap, and show fair gold in a greater width of stone than exposed in the front stopes. The south stopes extend to the face of the level at 80ft. from the Golden Age lease, where the turnover of the reef channel is showing, stone continuing downward along the west dip. The main hanging wall carries quartz overhead, and there is a fair quantity of crushing material of payable quality above the present stopes in this end. Instead of driving the level to the boundary and stoping this portion of the reef out from 447ft., it is proposed to extract the stone by the upward extension of the 543ft. stopes. From the top of the 447ft. stopes to the 643ft. level rather less than one-half of the available crushing material of this main reef has been taken out between the boundaries. There is no reason to assume that equally good results will not attend the beating out of the remaining portion. At 730ft. the crosscut is going out to tap the same back at 90ft. deeper than the present workings. The fact of the back being intersected by the 643ft. fault and another slide lower down enhances the chances of meeting payable stone. On the outer reef, known as "Chadwick's," a stope is being started off the rise near the north boundary. The stone is 12in. to 18in. thick close to a fault, and of a very promising appearance. This reef is opened up for a length of 145ft., but has not yet proved very remunerative. Prospects are expected to improve as the stoping extends above the faulting. The company contemplate the resumption of operations on a reef at 830ft., formerly discarded after a superficial testing. It is gold bearing and the stone of an attractive appearance. A progressive policy is also being shown at shallower levels, where the east back of the first productive reef is to be reopened shortly. The directors have to increase the milling capacity by another 20 head of stamps. The present steam power for milling is also to be superseded by the installation of a suction gas plant, of a similar type to that working the compressed air service.

## TREATING SELENITE ORE.

### Niemann Process at Chewton (V.).

Important results are to hand, says the "Bendigo Advertiser," from a test just concluded by Mr. J. H. Niemann, of the Federal Ore Co., on selenite ores from the leases of the Broken Hill Gold and Copper Co.'s mine, Silverton, near Broken Hill, now in the course of flotation. Some days ago arrangements were made by the legal managers of this company (Messrs. North and Stanfield) to have a bag of ore from their leases treated under bulk conditions by the Niemann process method. This company has at different periods had trial crushings made of its ore under the various known methods for treatment of pyritic ores with unsatisfactory results, the returns in all cases being out of all proportion to the amount of gold shown by assay to be in the stone. Over 12 months ago Mr. E. Foers, of Diamond Hill, Bendigo, a member of the original syndicate, bagged 147 bags of ore on the lease, taking it all from the surface, off three of the lodes. He despatched these to Melbourne, with the exception of seven bags, which were left off at Bendigo to be treated at a local pyrites works. The balance (140 bags) was duly treated by Jacques, Fischer and Co., of Footscray, who gave a return of 5 dwt. 9 gr. to the ton. Of the seven bags left at Bendigo, five were treated at the pyrites works, giving a yield equal to 4 dwt. to the ton, and one of the remaining two was sent to Chewton, and constituted the material used in the test above referred to carried out under the process. This bag, lying at the works, gave a good opportunity of making a drastic test on the quality of the ore, as obviously it could be truly said that no "picking" of the ore had taken place. It was sent direct to Chewton, and was given bulk treatment by the Niemann process method. The gold recovered in this test is equal to 4 oz. 1 dwt. to the ton, and the tailings give an almost barren assay. This result is achieved by one single treatment at a cost of only a fraction more than ordinary battery methods. The good percentage of copper in the ore, averaging 6 per cent., as shown in reports in prospectus, is, after treatment, left in the tailings, and is available for smelting when the time is ripe for doing so. Immediately the balance of unissued shares are placed the company will be able to commence operations to work its leases with almost unlimited material at hand to work upon.

## BOOKS REVIEWED.

Electricity in Mining. By Siemens Bros. Dynamo Works Ltd. Charles Griffin and Co., 196 pp., 10s. 6d. nett.

This book, though written by experts of the well-known firm, and although obviously emphasising the manufacturers' predominant interest, contains so much valuable matter as to merit the close attention of all connected with mining operations. The application of electricity in mining has crept in insiduously, each step in its forward progress has been succeeded by further advances until even at this early date there remains but few operations which do not promise to be superseded by its application. It is difficult to replace the older methods with which the conservative mining men in older fields are fully acquainted with; it is difficult, and in some cases impossible, to persuade the older class of mining men to scrap even obsolete machinery, but every progressive man on a new field should study carefully the merits of electrical machinery and appliances before committing himself to the adoption of types which may be less economical in power and output.

The book is simply written, the advice given as to choice of power, appliances, and machinery is sound, the diagrams are excellent, and the tables showing the comparative results obtained by electrical, steam, and compressed air are reliable. Men who are not electrical experts, but who have a sound and practical knowledge of mining machinery and appliances, will glean a large amount of valuable knowledge from the perusal of this work, and will be able to choose types of electrical appliances most suited to their conditions. The matter covered in the work may be gauged from the following synopsis:—

After some general remarks on the scope of electric mining installations, and data on their application in various parts of the world, the authors deal with the choice of the transmission system and the pressure for various purposes. The advantage of the A.C. for motors which may be subjected to rough usage, the greater safety in fiery and in wet mines is briefly stated, while the increased voltage necessary for long distances is indicated. The chapter on electric power stations is comprehensive and well illustrated, and interesting facts are given concerning turbines, large gas engine plant, Diesel engine, and water-power plants. Switch gear in generating stations is briefly dealt with, and many useful facts given. Under the head of power transmission, transformers, cables, and overhead transmission lines are dealt with. The difficulties to be overcome with electric winding engines are briefly discussed, and some indication is given as to the most suitable type for special cases. The rapid progress made in 13 years towards the perfecting of all types of electrically-driven winding plants is evident from their widespread adoption. The application of electricity to pumping plants, fans, hoists is well known, but the particular types of motors for each class of work are dealt with from a thoroughly practical standpoint. Electric locomotives are well known, but electrically-driven rock drills are not common in Australia. The advantages they possess over the compressed air machines are mainly in the direction of lesser power used, the small cost of installation, and ease in transport. Flame-proof installations, electrical signalling systems, and electric shot firing complete the general information given in the book. The work is quite up to date, and may be recommended to all those interested in progressive mining.

"Official Year Book of New South Wales, 1912." Part X., Agriculture; Part XI., Land Legislation and Settlement; Part XII., Public Finance; Part XIII., Social Condition; Part XIV., Pastoral and Dairying Industries, Forestry and Fisheries. (Government Printer, Sydney, 1913).

* * *

From the United States Geological Survey (Geo. Otis Smith, director), the following reports of mineral production in 1912.—Precious and Semi-Precious Metals in the Central States; do. South Dakota and Wyoming; do. Alaska; Sulphur, Pyrite and Sulphuric Acid; Fuller's Earth; Peat;

Manganese and Manganiferous Ores; Salt and Bromine; Phosphate Rock; Magnesite; Sand and Gravel; Borax; Mineral Paints.

* * *

"Geological Survey of India, Records of," Part 2, 1913. Contains a summary of mineral production of India during 1912, by H. H. Hayden, C.I.E., F.G.S., Director of the Survey, and articles on the Himalaya and the Peninsula, and on Hambergite from Kashmir. (Calcutta, 1913).

* * *

"Blundering Administration of the Income Tax Acts," by William Harding, "Taxation Expert" (9 Bridge-street, Sydney, 1913). The opening sentence of Mr. Harding's pamphlet amply conveys its purpose and spirit. The writer says:—"The disgraceful manner in which the public interests have been involved by the remarkable conduct the Commissioners and the Department of Taxation have resorted to in illogical and futile efforts to struggle out of the clutches of that very inconsistent measure of their own construction, the Income Tax (Management) Act of 1912, combined with their persistently vicious persecution of honest taxpayers, and their constant endeavour to blame everyone but themselves for the abject failure of an unworkable Act, has compelled me to frame a number of questions which were submitted in the Assembly by Mr. Fell and Mr. Levy, and the Colonial Treasurer was asked to answer."

* * *

Royal Colonial Institute Year Book, 1913.—In addition to the information embodied in the first issue (1912) of the year-book, this second issue contains the latest statistical information regarding all parts of the empire. (R. C. Inst., Northumberland Avenue, London, W.C. Price, 2s. 6d.).

---

## ROYAL MINT RETURNS.

### Sydney Branch.

| | September. Fine oz. | Since the 1st January. Fine oz. |
|---|---|---|
| Gold received for coinage— | | |
| New South Wales | 5,781.99 | 73,788.35 |
| Queensland | 18,968.05 | 187,476.49 |
| New Zealand | 27,832.41 | 148,059.34 |
| Victoria | — | 166.12 |
| Northern Territory | 63.43 | 203.90 |
| Tasmania | — | 138.20 |
| Western Australia | 105.41 | 263.90 |
| Papua | 2,208.98 | 11,364.66 |
| Other countries | — | 181.01 |
| Coin | — | 329.10 |
| Total | 55,050.27 | 421,971.07 |
| Gross value of above | £233,838 | £1,792,418 |

### Melbourne Branch.

| | September. Fine oz. | Since the 1st January Fine oz. |
|---|---|---|
| Gold received for coinage— | | |
| Victoria | 34,167.51 | 344,138.70 |
| New South Wales | 315.95 | 3,891.51 |
| New Zealand | 5,353.44 | 46,832.62 |
| Queensland | 314.01 | 1,842.69 |
| South Australia (including Nth Terr.) | 896.86 | 6,849.12 |
| Tasmania | 1,744.63 | 16,587.54 |
| Western Australia | — | 3,613.39 |
| Other countries | | 7.34 |
| Light gold coin | .23 | 1,141.55 |
| Unknown | 284.48 | 2,605.80 |
| Total | 43,077.11 | 427,510.26 |
| Gross value of above | £182,980 | £1,815,947 |

---

## MINERAL RETURNS.

The gold-mining returns of the Transvaal for July and for the first seven months of this year were as follows, the corresponding returns for the same periods last year being added in parentheses:—July—Stone milled 1,931,327 (2,197,933) tons; gold won, 655,260 (766,338) fine oz., valued at £2,782,917 (£3,255,198), the average being 6.78 (6.76) dwt. and 27s. 8d. (28s. 9d.) per ton. The working costs were 19s. 5d. (18s. 10d.) per ton milled, and the total working profits were £929,477 (£1,092,419). Dividends paid amounted to £17,000 (£66,691). Seven months.—Stone milled 13,914,539 (15,045,495) tons; gold won, 5,297,916 (5,309,215) fine oz., valued at £22,495,173 (£22,553,242), averaging 6.60 (6.93) dwt. and 28s. (29s. 5d.) per ton. The working costs were 18s. 2d. (19s.) per ton and the total working profits £7,590,743 (£7,540,409). Dividends amounted to £6,191,243 (£3,903,903).

The Government Mining Engineer's statistics show the following production from mines in the Transvaal during June and the first six months of this year, the corresponding figures in each case for last year being added in parentheses:—June—Coal, 448,781 (375,868) tons; silver, 81,133 (82,147) fine oz.; copper ore, 467 (130) tons; tin ore, 307 (279) tons. Six months.—Coal, 2,564,658 (2,299,530) tons; silver, 504,403 (489,251) fine oz.; copper ore, 2110 (560) tons; tin ore, 1650 (1526) tons.

---

## STONE-DUSTING IN COLLIERIES.

### Prevention of Coal-Dust Explosions.

Mr. A. A. Atkinson, Chief Inspector of Coal Mines in New South Wales, has submitted, for the information of the Minister of Mines, Mr. Edden, extracts from a paper read by Dr. W. E. Garforth, LL.D., president of the Institution of Mining Engineers of Great Britain, at the general meeting of the Institution, held at Burlington House, London, on June 5, 1913, on the Use of Stone-dust for the Prevention of Colliery Explosions. Mr. Atkinson remarks: "Dr. Garforth has for many years endeavoured to obtain a suitable preventive from explosions of coal-dust in collieries, and in this paper he states with certainty that he has at last solved the question by the application of fine stone-dust to the underground roads where coal-dust may accumulate."

Readers of the "Mining Standard" will remember that a paper on the same subject, by Sir Henry Hall, I.S.O., read before the Manchester Geological and Mining Society, was printed in our pages on March 22 and 29, 1911, giving particulars of experiments in Great Britain, the United States, and on the Continent of Europe, special attention being directed to Dr. Garforth's work herein referred to.

Dr. Garforth describes his paper as "an account of the investigations that have been made in connection with the danger of coal-dust in mines during the past five years, or since the experiments that were first undertaken by the Mining Association of Great Britain at the request of the Royal Commission on Mines, and were subsequently continued on the underground roadways of the Altofts Collieries." Though treating mainly of the work of the past five years, Dr. Garforth glances at previous studies in the same direction. The extracts submitted to the Minister by Mr. Atkinson are as follows:—

"With regard to systematic watering, experience had repeatedly proved that when water was applied to the roof and sides of the underground roadways it affected the strata injuriously and caused heavy falls of roof and sides. In the South Wales collieries watering had been generally adopted; and the coal-owners had spent immense sums of money in their efforts to prevent a repetition of certain explosions; but it must be observed that watering could not be carried out to the complete satisfaction of His Majesty's Inspectors of Mines, and that on certain occasions it was not efficacious. Colliery owners in other coalfields of the United Kingdom thought that watering was 'a remedy worse than the disease,' and, in consequence, the method was not generally adopted, except in a few instances, where it was put on the floor for the sake of convenience and comfort. With respect to dustless zones, only a few collieries adopted the principle, as doubts existed as to the best position in the mine in which to lay out the zones, and whether, when completed, they would be of sufficient length to prevent propagation of an explosion. No action to compel colliery-owners to use either watering or dustless zones was taken by the Home Office, even after serious explosions had occurred, and when it was known that coal-dust had greatly increased the death-roll. . . ."

"The finding of a preventive for a coal-dust explosion was an open question. . . On July 18, 1908, a coal-dust flame 170ft. long was produced in the experimental gallery at Altoft's, in the same manner as that whereby it had been repeatedly effected in previous coal-dust experiments. This gallery had been specially lengthened to provide for 300ft. of stone-dust zone, with the dust placed on shelves in imitation of an under-ground roadway, so that the flame instead of showing itself in the open-air, came into contact with the pulverised stone-dust as a cloud in the air. The stone-dust presented to the explosive blast thousands and millions of superficial feet of inert or cooling surface, and extinguished the flame. This was the first occasion on which the principle was adopted of presenting specially prepared stone-dust to the flame of a coal-dust explosion so as to extinguish it, and to prevent the production of those poisonous gases which have hitherto been so fatal in colliery explosions."

". . . The stone-dust used was similar in every respect to that which was found on the underground roads of the Silkstone pit. . . . Briefly, the experiments of the Mining Association were the first to demonstrate:—

(1) That coal-dust was explosive without the presence of inflammable gas (May 30, 1908).

(2) That dustless zones were ineffectual (June 15, 1908).

(3) That fine stone-dust would extinguish an explosive flame (July 18, 1908).

The experiment on May 30, 1908, decided the controversy as to whether coal-dust, per se, was explosive, and thus ended a discussion which had been carried on for 30 years. . ."

"After the experiments in 1908, the writer was so convinced of the efficacy of fine stone-dust that he has felt justified in having stone-dust applied to more than 20 miles of underground road-ways in collieries with which he is connected.

"It may be pointed out that in 1908, or when the coal-dust experiments were first undertaken the position of colliery owners and officials connected with deep and gaseous mines was such as to cause considerable anxiety, and constant dread of a disaster occurring from a coal-dust explosion. For instance, an outburst of gas might be ignited by a defective safety-lamp, the flame of which might reach a quantity of fine coal-dust on a haulage-road, with the result that an explosion would take place similar to those which have occurred during the past 30 or 40 years. Consequently, the colliery-owner had, on the one hand, the fear of an explosion from coal-dust, attended by serious loss of life; and, on the other hand, if watering were adopted, there was the extra risk of accidents from falls of roof and interference with regular output of coal. At the present time those colliery-owners and officials who have witnessed the stone-dust demonstrations, and seen the application of the same inert dust on the underground roadways during the past four years, consider the present position of the mine to be secure from a coal-dust explosion."

". . . At the present time there are roads in coal-mines quite as safe as those in metalliferous mines, since 10 pounds or more of fine stone-dust have been distributed for every pound of coal-dust, resting on the sides of the roadway and on the tops of the timbers—a quantity much in excess of the mixture of 1 pound of stone-dust with 1 pound of coal-dust which experiments in the gallery proved to be sufficient to prevent an explosion. Stone-dust, when properly applied, will prove very advantageous to those mines where the management has introduced or intends to introduce electricity. . ."

"In 1910, Dr. J. S. Haldane stated that 'the dust used at Altoft's for stopping coal-dust explosions is from soft shale, and is certainly not of such a nature as to give rise to any anxiety as to the effects produced by inhaling it, particularly as the amount inhaled would be small.' . ."

"'Which is the best kind of inert dust to use?' The opinion expressed by Dr. Haldane, the investigations by Dr. Beattie, and the microscopical examinations show that the best material, from the physiological standpoint, is soft shale, as free as possible from crystalline silica. Neither coal-dust nor stone-dust affects the general health of the miner, and each may be regarded as equally harmless."

"'What would be the cost of preparing the stone-dust?' Including depreciation, repairs of plant, power, and labour, the cost of pulverising the dust has been ascertained to average about 2s. per ton. Twenty tons of dust per week are sufficient for a large colliery raising over half a million tons of coal a year, working four seams—some of the coal faces 2½ miles distant from the winding shaft—or, say, £2 per week for preparing the dust. The cost of applying 20 tons of stone-dust underground would be 35s. in a flat mine. The total cost, therefore, of keeping such mines efficiently stone-dusted would be less than a tenth of a penny per ton of coal produced, or an annual cost of about 200. During the past four years the cleaning-up of the stone-dust has been done in the ordinary course of keeping the roads clear for haulage purposes, and the stone has been pulverised in an ordinary pug-mill."

Dr. Garforth concludes his paper as follows:—"The time has now arrived to apply in practice what has been successfully proved by experiment. Experience has shown that fine stone-dust possesses those qualities which are essential in a preventive for a coal-dust danger, namely, that it does not introduce any new form of danger, is universally adaptable, can be supplied at a low cost, and has on all occasions proved to be effective. It should be looked upon as a necessary precaution, in the same way that ventilation, when adequately maintained, dilutes and carries off noxious gases, that pumps are maintained to prevent the flooding of the mine and that timbering is carried out to guard against falls of roof. In the process of time precautions against the danger of coal-dust will be looked upon as part of the ordinary routine of the mine."

# THE SOUTH AFRICAN COAL-FIELDS.

(From Our Johannesburg Correspondent.)

In the last report of the geological survey of South Africa a short description is given of the coalfields of South Africa and an estimate of their coal resources. This estimate of the coal resources has been made for the International Geological Congress held this year in Canada, when the coal resources of the world come up for consideration.

### Transvaal.

(1) The Karroo System, General.—The Karroo system is extensively developed in South Africa, particularly in Cape Colony and Natal, where it reaches its greatest development. With the exception of some small occurrences of rocks of Cretaceous age in the coast districts of Cape Colony and Natal, and occasional scattered areas of rocks of comparatively recent origin, the Karroo system represents the youngest system of rocks known in South Africa, and overlies all the other formations. Although, however, including the youngest rocks now present to any extent in South Africa, the Karroo system occupies a position in the geological record corresponding to the close of the carboniferous period of Europe. Judged by the character of its fossils, it does not, however, correspond very closely with any well-defined period in the European sequence, but is homotaxial with rocks extending in range from the later carboniferous through permian to triassic times. Its nearest analogues are found in India, Australia, and South America.

The Karroo system attains its greatest development in Cape Colony, reaching a maximum thickness of over 18,000ft. It is also well developed in Natal, Zululand, the Orange Free State, and along the eastern borders of the Transvaal. Towards the central Transvaal there is a considerable thinning out of the system, and at the same time the large unbroken areas occupied by it, which are found in the south-eastern portions of the Transvaal, give place to more interrupted occurrences and scattered outliers, between which extensive areas of older rocks have been exposed by denudation. Over a large portion of the Transvaal, including those districts where coal has been most extensively mined, the Karroo system is comparatively thin, partly as a result of original conditions of deposition and partly owing to the absence of the uppermost portions of the system which have in many cases been removed by denudation. In the Heidelberg district a thickness of about 600ft. of Karroo strata is met with; in the Witbank coalfield the average thickness is only about 200ft., with a maximum of 450; while in the coal-bearing areas situated about Brakpan, on the Witwatersrand, the thickness of Karroo rocks is still less.

The system consists mainly of shales, sandstones, grits, and conglomerates, and appears to have been deposited largely by fresh water agencies. Its lower portion everywhere includes a series of deposits of glacial origin, known variously as the Dwyka, Ecca, or Glacial conglomerates and shales, the product of a widespread glacial period which prevailed in the South African region in early Karroo times, and which has its counterpart in those portions of the southern hemisphere now occupied by India, Australia, and South America.

(2) The Transvaal Coal Measures.—The strata more particularly associated with the coal seams of the Transvaal include sediments of every degree of coarseness from conglomerates to shales, the intermediate types like grits and sandstones being predominant, there being a comparatively poor development of shales.

"Seat-stones" or underclays below the seams are rare, but are met with in a few cases. The coal seams frequently lie directly on moderately coarse, thick-bedded sandstones, and have a roof of similar material, which is frequently interstratified, especially in the upper portion of the series, with very coarse and massive beds of grit.

Generally speaking, the coal measures occupy the highest portions of the country, over which they extend as a horizontal sheet, and about Middelburg, one of the best known coal-mining districts, the Karroo sandstones and grits, with their coal seams, frequently form the capping of outstanding ridges and hills, the coal seams being then easily accessible by adits in the hillsides, allowing of very easy mining.

Where mined by shafts the depth of the seams is usually less than 200ft., and rarely exceeds 400 in the mines at present working.

(3) Formation of Coal Measures.—The physical conditions under which the Transvaal coal seams were laid down differed very considerably from those characteristic of some of the better known coal occurrences in other parts of the world, and had an important effect upon the distribution and character of the coal seams.

At the time of the formation of the Transvaal seams, there was no vast unbroken expanse of swamp and marsh upon whose level surface could be formed coal seams, uniform in character and constant in thickness over hundreds of square miles.

In some districts the removal by denudation of the thin covering of coal-measure strata has exposed a comparatively irregular and varied land surface of older rocks. This surface was partially covered by extensive sheets of glacial debris, which had undergone a certain amount of denudation and erosion, its materials going to form part of the strata associated with the coal seams.

In some districts at least, the coal seams were laid down in more or less isolated basins, on the margins of which ridges of older rocks rose to a height of some 200ft. above the general level. Owing to these conditions the coal seams are found to thin out and terminate in places against such ridges of older rocks, and the character of the coal shows that during its formation the basins, in which it was formed, were subject to occasional invasion by muddy sediment. The occurrence of numerous stony or shaly bands in the coal seams, the frequent absence of "underclays," and the coarse and thick-bedded character of the accompanying sediments, have led to the idea that all Transvaal coals were entirely of drift origin. That this, however, is not the case is shown by the persistent character of some of the seams or portions of seams with a comparatively low percentage of foreign matter, and the occurrence in connection with the seams of fossil stumps and roots of large coal-measure plants in the position in which they grew.

(4) The Coal Seams and Coals.—In the Transvaal the coal seams occur at no great distance, usually within the first 200ft. above the glacial conglomerate, which generally forms the lowest member of the Karroo system. Owing to the conditions already referred to, under which the seams were formed, these vary considerably in number and thickness in various districts. In the best-known and most-largely-worked coalfield of the Transvaal, that of Witbank or Middelburg, five seams of coal occur ranging from 1 to 20ft. in thickness and with an aggregate of 56ft. Of the total, the average thickness worked is about 10ft., varying in different mines from 6 to 15ft. The remainder is, for the most part, unworkable, chiefly on account of the occurrence in it of numerous stony bands, which cannot at present be economically separated from the better material with which it is interstratified.

### Cape Province.

The coal-bearing formation of the Cape Province is that group of beds known as the Karroo system, correlated with rocks of from late carboniferous to early Jurassic age of foreign countries. The only portion of the Karroo system in this province yet proved to contain workable coal is the Molteno stage of the Stormberg series, an account of which is given below.

The occurrence of lignites in the Uitenhage beds (Neocomian) of the south coast region has led to attempts to find coal in these beds. The lignites are apparently of very limited extent and of no economic value.

In the Knysna district beds of lignite up to 8ft. thick occur in some unconsolidated sandy deposits of probably tertiary age. Though they were opened up in 1908, no further developments have taken place, and the information available is insufficient to allow a useful estimate of quantities to be made.

The Molteno Beds.—In the Cape Province workable seams are confined to the Molteno beds, which form one of the upper sub-divisions of the Karroo system. The associated flora, including Thinnfeldia, Taeniopteris, Baieria, and Schizoneura, indicates that the coal-bearing beds are of Rhaetic age, and the seams are therefore much younger than those of the neighbouring provinces with which Glosopteris is associated.

The Molteno beds appear at the foot of the high ground composing the Stormberg and Drakensberg in the east of the province, and beneath which the formation passes with a very low angle of dip. The coals appear at intervals along the belt of country extending from Aliwal North to Molteno, and then eastwards through the Transkei towards Natal. The strata are penetrated by a vast amount of intrusive dolerite in the form of thick sheets and narrow dykes, by which in a good number of places the coals have been partially or wholly anthracitised, while elsewhere the uncertainty of the absence of dolerite below ground has prevented exploitation. Principally for this reason, therefore, workings are confined to the outcrops, and very little prospecting has been carried out on the higher ground beneath which the Molteno beds extend.

The Cape coals are invariably thin, the thickness of a single layer only occasionally exceeding 2ft. The seams worked are always composite, the coal layers being separated by partings of black shale, which are sometimes inconveniently thick. The general working thickness reaches from 2ft. 6in. to 3ft. 6in. The majority of the outcrops belong to one or other of two horizons separated by a few hundred feet of strata, conspicuous in which is a very prominent and thick bed of coarse pebbly sandstone (Indwe sandstone), but over wide areas the coal on either horizon is absent or represented by impure carbonaceous shale, and not infrequently the upper portion or the whole of a seam is missing through contemporaneous erosion, the roof resting upon the denuded surface of the coal.

The great disadvantages under which the Cape coals labour are, firstly, their very low quality due to their high ash content, which is rarely less than 20 per cent.; and, secondly, to their frequently semi-anthracitic nature. The latter character appears to be in part an original feature, but is more generally due to the effect of igneous intrusions in close proximity; indeed, it is only in rare instances that the coalfields have escaped the action of the ubiquitous dolerite. The large amount of ash is not in itself entirely prejudicial, but taken in conjunction with the semi-anthracitic character of the coal, it leads to the formation of clinker, though this is obviated to a great extent by specially-designed locomotive fireboxes. The Cape coals, it must be noted, are low in sulphur.

### Natal.

The geological features of the coal-measures in Natal, and elsewhere in South Africa, are similar to those of the Cape and the Transvaal.

In Natal the specific feature of the coal seams is the extent to which igneous dykes and sills have been intruded into the coal measures. As a result of this the bituminous coal has frequently been changed into a more or less anthracitic coal, and, moreover, gas has accumulated so as to convert the pits into fiery mines, which have generally to be worked with safety lamps. The general horizontal bedding, common to all South Africa, has, however, not been disturbed. Deep erosion is more frequent than in the Transvaal, dividing the area into separate coal-bearing and non-coal-bearing fields.

### Extent of Coal Resources.

The state of our knowledge regarding the various coalfields of South Africa is so meagre that anything like an accurate estimate of total quantity of coal available is quite impossible. The various coal-bearing areas have not yet all been accurately mapped, nor has the question been investigated whether the coal in these presumably coal-bearing areas is of economic importance.

The reason for this lack of knowledge is not far to seek. The exploitation of coal is of comparatively recent growth, not extending further back than one generation, and even at present the annual output of coal is about 8,000,000 tons, an amount which is perfectly insignificant compared to the total resources of the country. Coal is therefore, comparatively speaking, a drug in the market, and the competition is so keen amongst various producers that the pit's mouth price, in the Transvaal, of about 5s. per ton is as low as it is anywhere in the world. The location of new coalfields or the precise delimitation of those already known is a matter that has therefore little immediate interest either for the private individual, the general public, or the State.

The following data regarding the extent of the coal resources of the various provinces must therefore be looked upon as extremely rough estimates, but it is thought that on the whole they are framed on a conservative basis.

| Square Miles. | Tons. |
|---|---|
| Transvaal, 5000, average 6ft. wide | 36,000.000,000 |
| Natal, 1000, average 7ft. wide | 9.400 000,000 |
| Zululand 1250, average 4ft. wide | 6,000,000,000 |
| *Orange Free State, Cape, Basutoland, Swaziland .. .. .. .. .. .. | 4,800.000.000 |
| Total .. .. .. .. .. .. .. | 55.200,000,000 |

*Impossible to make even a rough estimate, but the total resources will probably be not less than 1000 square miles, average 4ft. wide.

The present methods of exploitation admit of the utilisation of about 55 per cent. of the total coal available. The quality of the coal is extremely variable. The percentage of ash varies from 6 per cent. to 30 per cent. With most of the coal actually used, the variation is from 10 to 15 per cent.

If the above estimate be carefully examined it will be found that it states the gross contents without attempting to indicate what proportion is available, except that on present methods of working nearly one-half the coal is lost.

There are, however, many other drawbacks to be considered when dealing with the available coal in the South African coalfields. Take the Transvaal, for instance, where considerable areas of worthless coal deposits occur, some close to rail, markets and seaport, far too inferior to work. If adequate allowance be made for all these drawbacks to Transvaal coal the available coal will be reduced to about six, instead of thirty-six thousand million tons, and even this includes a large proportion of inferior coal.

In Natal and Zululand the condition of affairs is much worse, for despite the estimate of fifteen thousand million tons, it would be difficult to-day to find a coalfield carrying coal of suitable quality for half-a-dozen collieries to be opened within reach of a railway. The fact is that nearly all the coal in Natal and Zululand has been rendered worthless by dykes.

In the Orange Free State, Cape and Swaziland extensive deposits of inferior coal are found, but little is worked on account of its inferior quality.

Still with all these drawbacks, the coal resources of South Africa are immense, and if only the quality of coal worked to-day is considered with the present output of eight million tons annually, there is sufficient coal to last for considerably over a thousand years.

# ENGINEERING AND ELECTRICAL SECTION

THE FAMOUS
"Brimsdown"
"Wirum"
BRITISH MADE Lamps.
The most popular, reliable and economic lamp on the market.

Sole Agents—
THE
LAWRENCE & HANSON
Electrical Co. Ltd.
403 LONSDALE ST., MELBOURNE.
33 YORK ST., SYDNEY,
and at WELLINGTON, N.Z.

## AUSTRALIAN RAILWAYS.

### Commissioners' Annual Reports.

### South Australia.

The Railways Commissioner of South Australia states the revenue of his department for the last financial year as £2,222,436, as compared with £2,090,563 for the previous year, while working expenses are set down at £1,393,775, against £1,293,987 in the previous year. The revenue therefore, increased by £131,873, the working expenses by £99,788, and the net revenue by £32,085. The net revenue of £828,661 is equal to 5.84 per cent. on a capital expenditure of £14,178,485 on lines open. The rate of interest chargeable to railways by the Government on all loan expenditure has been increased from 3¾ per cent. to 3 7-8 per cent., representing an additional cost of over £16,000 for the year. The interest charge for 1912-13 is £492,907, which, being deducted from the net revenue of £828,661, leaves a surplus of £335,754. At the end of June, 1912, there was a debit balance against the railways, due to general revenue, of £71,596; there has also been a loss of £2057 on the Port Augusta-Oodnadatta railway during the year, and after deducting these amounts there remains a net balance of £262,101. This is the first time in the history of the South Australian railways when they have shown a credit balance at the end of the year, and a handsome start has been made. The capital cost of the lines to date is £14,490,750, being an increase of £1,250,575 for the past year. The mileage open is 1689¼ miles, and the average cost per mile is £8575. The railway from Port Augusta to Oodnadatta, 478 miles, was worked under agreement with the Commonwealth Government, thus giving a total of 2167¼ miles operated. There are 478½ miles of new lines authorised, of which 154½ miles are at present under construction. Writing of developmental railways, the Commissioner has a complaint to make. He says:—"The Acts of Parliament under which several developmental railways are being constructed do not provide the Railways Commissioner with any means by which he, as railway administrator, can meet the yearly loss which will be incurred in interest charges and working expenses in connection with the same, but on which it is yet too early to determine with any accuracy the total loss likely to result. I feel justified in asking that arrangements be made from time to time to recoup any losses which may be due to the construction of these new lines. It is not a justifiable position that the Railways Commissioner should be called upon to carry the burden of developing the country, and not be compensated for the services rendered."

The revenue returns for the first quarter of the present financial year show an increase of revenue from the railways of £570,277, £73,773 more than for the similar period of last year, the increase being due chiefly to new lines.

In April, 1912, the Government let a contract to Mr. S. Perry, of West Adelaide and Mile End, for the construction of 21 boilers of the Rx class, and it was stipulated by the Government that the first boiler should be finished within 12 months. But the first boiler has only just been delivered, and the long delay has at different times caused comment in and out of Parliament. It is explained that special new plant was required, and that when this had been secured in England, industrial troubles hindered its shipment to Australia. Four months ago the plant was installed at the new foundry at Mile End, and the first boiler was completed last week and sent off to the Government workshops at Islington. This type of boiler is the largest used by the railways' department, and from the manufacturer's point of view, the most difficult of construction. Half a dozen other boilers are well under way, and the foreman of the Mile End works expects to complete a boiler a fortnight from now onwards, notwithstanding the fact that the contract time allowed is one month for each. A special staff of about 70 employes has been set apart for their construction, and the undertaking is being pushed on with all despatch. The contract price for the 21 boilers is about £18,000, and the lot must be completed before the end of December, 1914. Another contract now being undertaken by the same firm, and involving a price of about £11,000, is for the building of four overhead bridges on the Hilton Road for the passage of road traffic over the new Mile End goods yards. The firm has 50 men engaged in this work, and although the time fixed for the completion of the bridges is December next, already one is open to traffic, while great progress has been made with the other three. It is now being urged that a fifth overway should be constructed across the Hilton Road at the point where the Glenelg railway line intersects the thoroughfare, to do away with the level crossing.

A large Parliamentary party left by special train last Thursday night for Baringa, on the River Murray, to witness the ceremony of driving the last spike of the railway to Renmark by the Governor.

### Queensland.

The annual report of the Queensland Railways Commissioner for the financial year ended on June 30 shows a continuous rise in both revenue and working expenses as compared with previous years. The earnings last year amounted to £3,321,672, as against £3,032,858 in 1911-12, and £2,730,430 in 1910-11, while the working expenses were £2,150,991, against £1,917,266 in 1911-12 and £1,563,119 in 1910-11. This left a net revenue of £1,170,681 last year, as compared with £1,115,592 in 1911-12 and £1,167,311 in 1910-11. Last year's earnings showed an increase of £288,814, the increase being contributed to by various departments as follows:—Passengers, £60,810; parcels and miscellaneous, £28,160; minerals, £64,588; live stock, £88,720; but, mainly on account of a decline in the sugar-cane crops, agricultural produce traffic declined by £10,615. The net revenue for the year is equal to £3 18s. 5½d. per cent. on capital invested in working lines, or 1s. 11¾d. per cent. less than in the previous year, no allowance being made for depreciation, loan charges, etc. If those charges be included, the percentage on capital will be £3 13s. 7d. The percentage in 1911-12 was £4 0s. 5d., and in 1910-11 £4 10s.

In his report, the Commissioner states that while he is prepared to admit that the revenue earned by the Railway Department should be debited with interest on capital invested on opened lines plus depreciation, he is of opinion that interest on capital invested in works in course of construction should be capitalised, and form part of the cost of such construction, which opinion is strengthened by the practice legalised by the English Companies Consolidated Act of 1908. The interest charge for 1912-13 is £1,253,689, of which £1,170,961 represents interest on capital expended on open lines, and £82,728 interest on unopened lines. The percentage of working expenses to gross earnings is 64.76 per cent., against 63.22 per cent. for 1911-12, and 57.25 per cent. for 1910-11. The opening of new lines in several instances into country hardly developed necessitates additional train services, for which the traffic received is by no means an adequate return. The increase of wages and the higher cost of material, too, largely affect the working expenses, and the commissioner expresses the opinion that the question should be faced, whether the time has not arrived when rates and fares should be correspondingly increased. The capital invested on working lines at the end of June amounted to £32,278,257, compared with £28,208,402 in 1911-12, and there was a further sum of £2,248,656 on lines not yet opened, making a total of £34,076,913, as compared with £30,059,891 in 1911-12. The capital expenditure for the year was £1,947,417, against £2,771,787 during 1911-12.

### Victoria.

Owing mainly to reduced revenue and increased working expenses, the Victorian railways show a surplus of only £22,250 for the last financial year, as compared with £265,791 for 1911-12, a decline uncomfortably near to a quarter of a million sterling. The gross revenue was £5,205,442, or about £13,525 lower than in the previous year, and working expenses amounted to £3,476,957, showing an increase of £166,473; these two items, therefore, account for within 40s. of £190,000, on railways alone, but if the St. Kilda-Brighton tramway be included a further decline of £708 must be added. Then, interest charges have increased by £81,918, though there was a decline of £19,082 in pensions and allowances, leaving a net increase in those liabilities of £62,836. According to the annual report of the Railways Commissions, the passenger, both in town and in country, continues to expand, but, owing to falling-off in goods receipts, there was a net decrease. The Commissioners state that the unfavourable result was due to the concessions in freight charges made in January, 1912; to the improved train facilities which were provided in a greater proportion than the increase in traffic to the higher cost of materials, to the increased interest charges, and to the very appreciable concessions which were made to the staff. The payment of increased wages and of higher prices for materials was not limited to this State, as conditions of a like character had been, and were operative in the other States and in different parts of the world, and these factors were exercising, and would continue to exercise, a material influence on the financial results achieved by the railways.

The occasion was therefore opportune, says the report, to direct attention to the obligations of the current year and to the necessites of the future. The development of business during the past few years had been so marked that it would be essential to continue to incur heavy expenditure at a number of stations in order to increase the accommodation, and so provide facilities for the efficient and economical handling of the growing traffic. The renewal and duplication of the Flinders-street viaduct, the regrading and duplication of the line from South Yarra to Caulfield, the regrading of the line from Richmond to East Camberwell, the provision of a new and larger shipping shed at Montague, the rearrangement and enlargement of the stations at Ararat, Benalla, Bendigo, Castlemaine, Colac, Geelong, Korongvale, and Warragul; the provision of a new locomotive depot at Geelong, the remodelling and practically the reconstruction of Spencer-street station, and the electrification of the suburban lines might be mentioned as some of the principal works which were in progress, or which would require to be undertaken in the near future.

These works would not only entail much capital outlay, but would involve a considerable contribution from the working expenses, and it was probable that both interest charges and working expenses would for some time progress in greater ratio than any increase which could reasonably be anticipated in the revenue. That aspect would have to be borne strongly in mind in the consideration of any question which involved further concessions, in the way of either fares and freights or improved train services.

Although the Commissioners here advise the public not to ask for further concessions, it may be noted that they are not considering any increase in either freights or fares, for Mr. Billson, Minister of Railways, has stated that though the position of the Department was much more unsatisfactory than last year, there was no necessity at present to consider the question of increasing fares and freights. The policy of the Ministry was to make the public charges as light as possible, consequently no increase would be made unless an increase were necessary.

The railway revenue for the first quarter of the current financial year was £1,137,868, against £1,119,051 for the corresponding quarter last year, the increase being £18,817.

## MELBOURNE TRAMWAYS.

### Competition and Threatened Spoliation.

The following motion, put forward by the Coburg Town Council and endorsed by several other local government bodies, is to be considered by the Victorian Municipal Association next week:—"That for the protection of municipalities in which motor buses run for passenger traffic, authority should be given to councils by Act of Parliament to levy a local tax, to be applied towards the maintenance of such roads." In notifying its agreement with the motion, the Prahran City Council added the following memo.:—"The Council points out that these buses may enter into competition with the various tramways when taken over by the trust to be formed, and, under the existing law, the muncipalities will be called upon to too great an extent to maintain the roads on which extensive damage will be caused by such traffic."

Mr. Prendergast, ex-leader of the Opposition in the Victorian Parliament, asked the Premier a series of questions last week respecting the attitude of the Government towards fares charged by the Melbourne Tramway and Omnibus Company and towards the increasing competition of motor buses with tramways. In reply to the first question, whether the Government intended to compel the company to charge reasonable through fares, and to establish penny sections, the Premier said that, as previously announced, the Government proposed to take steps, if necessary, by Act of Parliament, on the lines recommended by the Tramway Fares Commission. The motor bus competition, added Mr. Watt, had been dealt with in his speech on the Greater Melbourne Bill, which speech also indicated the proposals of the Government in respect to the expiration of the company's lease in the year 1916. The Tramways Trust, he intimated, had not made any proposals to deal with the competition of the motor buses.

Proprietors of motor buses who have obtained licenses to ply for hire from the Melbourne City Council have to remember that their licence extends over an area of only eight miles radius from the General Post Office. It does not permit them to compete with licensed cab-drivers beyond that area, and last week the driver and part owner of a motor bus, Edward Withers, of Withers and Sons, 78 Armstrong-street, Middle Park, was charged at the Cheltenham police court with using a stage coach without having first obtained a licence. It appears that Withers has been running his motor bus on race days between the Mentone and Mordialloc railway stations, and the local racecourses, so injuring the business of cabmen specially licensed by the Cheltenham bench. The bench decided that, as Section 3 of the Motor Car Act provided that when a motor vehicle was plied for hire as a stage coach it came under the heading of a stage coach within the meaning of the Carriage Act, an offence had been committed, and inflicted the minimum fine allowed, of £20; costs, 1s. 9d. A stay of fourteen days was granted to allow of appeal.

The effect which the passing of the Metropolitan Council Bill, commonly referred to as the Greater Melbourne Bill, would have upon various interests has, naturally, occupied a great deal of attention during the past fortnight, and the debate in the Legislative Assembly, which commenced last Tuesday, will inevitably reveal many grievances, real and imaginery. Amongst other interests which are intimately affected by the provisions of the Bill are those of the municipalities in the tramways. Last Friday a meeting of representatives of the eleven municipalities connected with the Melbourne Tramway Trust was held at the Melbourne Town Hall, to consider the position of the tramway company's undertakings in relation to the provisions of the Bill. It was decided to request the Premier to postpone the second reading of the Bill, fixed for last Tuesday, to give the Councils interested time to ascertain exactly how the cable tramway system will be affected at the expiration of the company's lease. A committee comprising one representative from each Council, was appointed to prepare a statement for the consideration of the interested Councils showing how the provisions of the Bill bear on the metropolitan system. Last Monday the relation of the Bill to the tramway systems of the metropolis and its suburbs was considered by a conference representing the 26 municipalities within the metropolitan area.

The works committee of the Richmond City Council, at the beginning of last week, declined not to recommend the adoption of the proposal to seek power to construct an electric tramway to connect Clifton Hill, by way of Richmond, with Prahran, but rather that it was desirable to previously ascertain what would be the cost of a motor bus service along the same route. The Council, at its last meeting, decided to further consider the matter before coming to a definite determination. The suggestion of the Progress Association is to seek the power to construct the line, and in the meantime to obtain an emergency motor bus service along a slightly different route.

The traffic returns of the Melbourne Tramway and Omnibus Co. for September show that receipts amounted to £61,969, an increase of £2634 on those for September, 1912; that passengers carried numbered 7,444,227, an increase of 322,669; and that the mileage run was 999,233, an increase of 45,222.

The Prahran-Malvern Tramways Trust's receipts for September amounted to £7006, as against £3265 in September, 1912; the passengers carried numbered 1,047,776, against 514,822, and the car-miles run were 129,795, as compared with 59,222.

Another suburban extension which will almost certainly be carried out ere long will run along Burke-road from Bulleen-road, Kew, to Waverley-road, Malvern, a distance of 5¾ miles, the cost of which (double track) is estimated at £69,000. Omitting the Bulleen-road section, the distance would be 4½ miles and the cost, for double track, £54,000, or for single track, £29,249. Such a line would serve nearly 19,000 residents within half a mile of Burke-road, in Kew, Hawthorn, Camberwell, and Malvern, or over 4000 per mile.

## THE TRANS-AUSTRALIAN RAILWAY.

### Track-layers at Work.

The Honorary Minister in charge of the Department of Home Affairs, Mr. Kelly, has accepted the tenders of C. and G. Hoskins Ltd., of Lithgow (N.S.W.), for the supply of dog spikes, and bolts and nuts for use in connection with the Trans-Australian railway. The material to be supplied comprises 1866 tons of iron dog spikes, to be delivered in equal quantities at Port Augusta and Kalgoorlie, for the sum of £29.482 16s., and 134 tons of steel fishbolts and nuts, for delivery at Kalgoorlie, and 49 tons for delivery at Port Augusta, for the sum of £3966 10s., making a total of £33,449 6s. About a dozen tenders were received, some of them from France and Germany, and the one accepted was not the lowest.

How best to expedite the construction of the line, and how to secure the best results from the labour employed on the work, are questions which have exercised the mind of Mr. Kelly a good deal since he was given charge of the Home Affairs Department. It is rumoured that the appointment of an officer of experience, who will act in behalf of the Department, is at present being considered. If a suitable man can be secured he will probably be able to save a large amount of money for the Commonwealth by exercising a general supervision over the work, and with the view of securing the very best man available it is understood the salary will be made sufficiently large to attract the best men in Australia. When questioned on the matter, Mr. Kelly would not make any statement, but admitted that there was a possibility of some such appointment being made.

Two track-laying machines were purchased by the late Government at the beginning of the year for use at each end of the railway, but up to the present they have been lying idle, awaiting the delivery of hopper trucks, without which they are useless. For some months the track-layer at Port Augusta has been exposed to the weather in the railway yard, and there seemed to be a possibility of its being buried in sandrifts unless expedition were shown in delivering the rolling stock. The Minister in charge of the Department stated last week that he had advice that ten trucks had been delivered at Port Agusta, and were now being assembled. This was a sufficient number to enable the track-layer to be put into action. He expected to be informed at any moment that the rails were being put down at the rate of about a mile a day at the South Australian end.

A telegram received last week from Kalgoorlie (W.A.) stated that fresh water had been struck at Cowarna Rocks, on the Trans-Australian railway line, 60 miles from Kalgoorlie, at a depth of 95ft. This is a matter of importance, not only from a railway construction standpoint, but also because the district is suitable for pastoral purposes, provided permanent fresh water is available. The opinion was previosuly held that only salt water was likely to be obtained by boring in the district.

## BRITISH ASSOCIATION.

### Birmingham Meeting.

(From Our London Correspondent.)

The meeting of the British Association was held in Birmingham this year, beginning on September 10, and concluding on September 17.

On the morning of Thursday, September 11, the Association settled down to proceedings in the various sections. The chairmen first delivered their inaugural addresses. That of Professor H. F. Baker in the Mathematical and Physical Science Section was devoted to the place of pure mathematics, explaining what, as he conceived it, the justification of the pure mathematician was. He said that his experience was that the pure mathematician was apt to be regarded by his friends as a trifler and a visionary, and the consciousness of this became in time a paralysing dead weight. Professor Baker thought that that view was founded on want of knowledge. Among the matters with which pure mathematics is concerned touched upon in the course of the address, were:—Precision of definitions, calculus of variations, non-euclidian geometry, the theory of groups, the theory of algebraic functions, the theory of functions of complex variable: differential equations, and theory of numbers.

The address of Professor Gisbert Kapp to the Engineering Section was devoted to the subject of railway electrification.

The report of the Electrical Standards Committee refers to the completion of the new Lorenz apparatus at the National Physical Laboratory and to the fact that measurements of resistance can be made by means of it with an uncertainty of not more than a few parts in 100,000. During the present year a large number of such measurements have been made, and the results obtained are now being prepared for publication. "A satisfactory feature of the machine is that it can be used at all times for absolute measurements, and the plans adopted for the re-determination of the dimensions of the coils ensure an accuracy in the future as great as that obtained in the recent measurements. The nominal values of the resistances measured are 0.001, 0.002, and 0.01 ohm. As an instance of the care taken, it may be mentioned that the dimensions of the coils have been measured with a current flowing through them, and the radius of a disc 53cm. in diameter has been determined within 0.01mm. when running at 1200 revolutions per minute. Electrical methods of setting the coils parallel and coaxial with the shaft proved to be more sensitive than the usual methods, and a Wheatstone bridge with a condenser in one arm proved to be the most sensitive indicator of constancy of speed. This instrument, together with the Ayrton-Jones current balance, enables the fundamental electrical units to be realised with an accuracy sufficient for all present purposes. It is hoped to re-wind the coils of the current balance and leave them uncovered with paraffin wax, so that their dimensions may be determined at any time."

Mr. W. R. Cooper, M.A., B.Sc., contributed a paper to the Engineering Section on "Short Heat Tests of Electric Machines." He said that tests of dynamo-electric machinery are generally carried out extending over six hours in order to determine the maximum temperature rise. Suggestions had been made that such tests might be considerably shortened by assuming that the curve of temperature rise is a logarithmic curve. Mr. Cooper gave a brief account of the methods that had been proposed, and pointed out that the "thermal time constant," on which the behaviour of a body in heating and cooling largely depends, should be found most easily and under less complex conditions from the cooling curve. In order to test the applicability of the various methods, tests were made upon a 5kw. motor-driven dynamo. The curves of temperature rise were found to be fairly logarithmic. The usual method of running a machine on test is to run on constant output with constant voltage, which necessitates increasing the input to the field coils as their resistance rises. Mr. Cooper says that a truly logarithmic curve can only be expected if the input of heat is at a constant rate, so that a better result would be expected if a machine were tested with constant input to the field coils, the output of the machine being constant but at varying voltage. Actually this method of testing was not found to give an improved result. Graphical methods appear to give better results than formulae, as the latter are very sensitive to small errors in the data. In any case, only certain portions of the temperature-rise curve should be used, and any formulae depending on the initial rate of temperature rise should be avoided, as this is difficult of exact determination. The curve of cooling, it was stated by the author, had certain advantages; only a small portion of it seemed suitable for graphically determining the thermal time constant, but this quantity could be derived much more readily by the time taken for a certain percentage drop of temperature-rise. In the results given there was a better agreement between the values found for the thermal time constant than for the maximum temperature-rise. It was suggested that a fair approximation to the maximum temperature rise could often be obtained by testing for a time equal to, say, 1½ times the thermal time constant, deducing the value of this constant from the cooling curve, and thence the maximum temperature-rise from the heating curve.

Prof. E. W. Marchant, D.Sc., read a paper on the effect of atmospheric conditions on the strength of signals received at Liverpool from Paris, and some other place, and gave an account of the diurnal variations in the energy received. The measurements dealt mainly with observations during the month of July. An Einthoven String galvanometer was employed, by which the strength of signal for each individual spark at Paris could be observed to within ± 5 per cent. There was a maximum variation from 0.6 to 1.3 in strength of the signals received on different days in the same month; the average strength of signal being assumed to be 1.1; the current received on a fine clear night was about 1.7 times as strong as that received in the day-time. The author said that although no certain relationship could yet be regarded as established between the strength of a signal and the weather conditions at the sending and receiving stations, so far observation had shown that rain in Paris always corresponded with a diminution in strength of received signal. In one case wind reduced the signal strength to half its normal value. The most favourable condition for signalling appeared to be a cloudy sky at both sending and receiving stations, the signals being weaker when the sky was clear or covered with light clouds. Rain at the receiving station appeared to have a comparatively small influence on the strength of the received signals. A special set of signals from Eiffel Tower showed that the increase in strength of night signals occurred just after sunset, there being a sudden increase in strength of about 70 per cent. This change was quite sudden, there being comparatively little alteration in signal-strength until the sun had set and no perceptible increase in strength afterwards. There appeared to be some evidence that signals were slightly stronger just after sunset than during normal night conditions.

Dr. W. H. Eccles gave an account of an investigation he had made concerning contracts between electrical conductors. When a current is passed across a "loose contact" the relation between the applied electromotive force and the current produced is, in general, not a linear one, and no sufficient explanation of the observed phenomena had hitherto been offered. Dr. Eccles' investigation was as to whether the behaviour of contacts could be accounted for by purely thermal actions in the matter near the contact.

The Gaseous Explosions Committee presented a brief interim report to the Engineering Section of its proceedings during the past year. They mentioned that the new laboratories of the Imperial College of Science and Technology were approaching completion, and it was intended by the governing authority of the college that these laboratories should be devoted to research. Prof. Dalby was working on a scheme for equipping one bay with internal combustion engines. It was recognised that the Imperial College would be materially assisted in carrying out their ideals if the work of this committee were concentrated in the new laboratories. Owing to a delay in the completion of the laboratories, it was not possible to present a report this year. Work, however, had been carried on with the old plant by Prof. Dalby, with the aid of a research scholar, and some important results obtained will be communicated later. The general work of the committee had gone on steadily during the year.

An interesting communication was submitted in the Physical Science Section by Prof. H. Stansfield, D.Sc., on the sensitiveness of the human skin as a detector of low voltage alternating E.M.F. He showed that an alternating difference of potential of 40 volts, with a frequency of 50 cycles per second, between a piece of metal and the human body, was sufficient to produce a vibration which could be felt when the back of the hand was lightly rubbed against the metal. If the metal was connected to a live wire, the observer should be well insulated from the earth. The alternating E.M.F. acting across the thin badly conducting surface layer of the skin, produced a rapid variation of the frictional force. If the metal was allowed to rub against the ear, instead of the hand, the vibration was heard as a musical note. The human skin might be imitated for this purpose by gilding a rounded lump of jelly with gold leaf, and then covering it with a piece of thin silk. The imitation was not, however, as sensitive as the original.

Follow abridgments of other papers read:—

## Engineering Section.

"Stress Distributions in Thick Cylinders and Rings," by Professor E. G. Coker, M.A.—The difficulty of measuring experimentally the state of stress in thick cylinders and rings is well known, and it is important that the means employed shall give measurements at a point of a material. An optical method of investigation with a transparent material affords a comparatively simple and accurate method of experiment for determining the directions and magnitudes of the principal stresses at any point of a ring constructed from a thick plate. The directions of principal stress at any point are determined from the lines of equal inclination obtained with plane polarised light, and the difference, $p-q$, of the principal stresses at the same point is obtained from observations of the double refraction effects produced when a beam of circularly-polarised light traverses the stressed object. The sum, $p+q$, of the principal stresses is also determined by measurements of the change in the thickness of the stressed object, using a delicate extensometer capable of detecting a change of half-a-millionth of an inch. These latter measurements are compared with the changes produced in the thickness of a simple tension or compression member of the same material as the object, and in this way the sum of the principal stresses is determined without further reference to the physical constants of the material. These measurements of (a) the sum, (b) the difference, and (c) the directions of the principal stresses at a point taken as averages over the thickness of the plate afford a complete experimental solution of the distribution analogous to those obtained mathematically in problems of generalised plane stress. The experimental methods are applicable to very complicated cases, and are described with reference to the stress distributions in thick cylinders and rings of various forms, with and without discontinuities. Special apparatus for applying and measuring loads and fluid pressures applied to rings and cylinders are also described and illustrated.

"Metals for Structures," by A. T. Walmisley, M.Inst.C.E.—Birmingham from an early date has been recognised as one of the chief seats of industries in metals, and hence a paper which presents an opportunity to elicit a discussion upon some of the latest developments of various alloys used as constructive materials appears suitable for a meeting of the Engineering Section. Such alloys are not mere mechanical mixtures, but homogeneous combinations, secured by fusion, possessing distinguishing qualities for special purposes. Copper possesses the element of conductivity. It is always economical to use the purest copper obtainable commercially, especially for electrical purposes. Zinc is applied for coverings. Galvanised sheets can be tested with sulphate of copper, which will adhere to any exposed surface of the iron not coated with zinc. The durability of zinc depends mainly on the spelter from which it is made. Lead has no elasticity, but is useful for girder seatings, where the weight is sufficient to crush the lead so as to produce uniformity of pressure upon the bearing. It is also serviceable for roof coverings and for flashings. Brass, consisting of copper and zinc, is employed for lubricators and pumps, while Muntz's metal—also an alloy of copper and zinc—has superseded copper for sheathing vessels. Manganese bronze, an alloy of copper and ferro-manganese, is serviceable for propeller blades, on account of its toughness; and ordinary bronze—an alloy of copper and tin—is found to possess sufficient fluidity for satisfactory melting, combined with slightness of contraction on solidifying. Phosphor bronze, by the addition of phosphorus, excels ordinary bronze in hardness, density, and tensile strength, and is used for friction bearings, especially when liable to shock; also for sliding surfaces in the case of steel shafts, as a steel or wrought-iron shaft would grip a certain bearing. Gunmetal, another alloy of copper and tin, takes its name from its employment as the metal from which large guns were formerly made, while bell-metal and delta-metal also possess characteristics described in the paper. When one metal less oxidisable than another comes in contact galvanic action may be set up. In the case of mild steel and wrought iron in metallic contact the steel may oxidise at the expense of the iron. Iron rivets have been found to become slack in steel plates without any special wasting in the steel plates, while the iron has wasted somewhat.

"Birmingham, Snow Hill Station Alterations," by F. Gleadow, M.Inst.C.E., and C. E. Shackle, Assoc.M.Inst.C.E.—The railway, station buildings, and platforms recently removed from this site were erected in 1870 on the site of a still older station. It consisted of two principal platforms in direct connection with the streets on either side. The platforms and railway lines between the buildings on either side were covered with an iron roof, with crescent-shaped girders of about 92ft. span. The site of the new station, as well as that of the old, is bounded on the south by Colmore Row, on the east by Snow Hill, and on the west by Livery-street. The building adjoining Colmore Row, formerly an hotel, is now converted into offices, restaurant, etc., and an entrance has been made through it for foot-passengers, leading to the high level booking-hall. Entrances and exits for carriages are provided on the Livery-street and Snow Hill sides. From the above mentioned booking hall stairways lead down to the two main platforms, and lifts are provided for dealing with passengers' luggage. The roof over the main entrance and circulating area consists of steel arched ribs of about 70ft. span, with glazed screens at the east and west sides. Over the main platforms and buildings thereon the roof is of the "ridge and furrow" type, carried on steel girders, and resting on steel columns, cased, for appearance sake, with cast iron. Beyond this length of platform, and where the width of platform becomes much less, the type of roof is again changed to one generally known as the "umbrella" type, on account of it being supported by single steel columns, anchored below platform-level into concrete blocks. The buildings have been freely treated, from an architectural point of view, the material used being principally glazed red bricks, with buff coloured terracotta dressings externally, and Carrara-ware dressings internally. The whole of the steelwork in the roof is designed to withstand a wind-pressure of 40lb. over the whole surface, and any individual portion of it to withstand a local gust of 56lb. to the square foot. Under no conditions can any of the steelwork be stressed to over six tons to the square inch in tension, or five tons in compression. The pressure upon the base of any foundation does not exceed three and three-quarter tons. The whole of the steelwork has been made by an open-hearth process.

"Electrical Conductivity of Aluminium Alloys."—Professor Ernest Wilson reported a continuation of tests upon the influence of exposure in London on the electrical conductivity of light aluminium alloys, reports of which have been made to the British Association from time to time. Each specimen was in the form of wire 0.126in. diameter and 70ft. long; and the figures obtained after two years' experience are:—

| | Per Cent. Increase of Electrical Resistance Taken on Value in 1911 at 15 deg. C. |
|---|---|
| High conductivity copper .. | 2.0 |
| Commercial aluminium .. .. | 4.4 |
| Duralumin .. .. .. .. .. .. | 8.2 |

Prof. Wilson said that Duralumin was a copper-manganese-magnesium alloy of high tensile strength, and exposure had apparently made it more brittle.

"Electro-magnetic Waves."—Among the papers read before the Engineering Section was one by Prof. G. W. O. Howe, M.Sc., in the course of which the author said that a very clear conception of the nature of the electro-magnetic waves employed in radio-telegraphy could be obtained by considering those electro-magnetic waves which existed in the space between the two conductors of a single-phase transmission line. If the conductors are flat, parallel strips, close together, and connected at the sending end to the terminals of an alternator, there is a certain value of the non-inductive load at the receiving end which will absorb the arriving energy without any reflection. Under these conditions the current and voltage are in phase all along the line, and the same is true if the line is assumed to be of infinite length. Line resistance and leakage are assumed to be negligible. It follows from this that the electric and magnetic fields at any point have their maximum values at the same moment. Instead of two parallel strips transmitting energy in one direction, two parallel discs of infinite extent can be imagined with the alternating P.D. applied between their centres. Energy would then be transmitted radially in all directions in the plane between the discs. The earth could take the place of the lower disc, while the upper one could be represented by a conducting horizontal plane some distance above the earth. The waves produced would be truly cylindrical, whereas those employed in radio-telegraphy are spherical. If, now, the upper disc is replaced by an inverted conducting cone of infinite extent, with its apex almost in contact with the earth, the alternating P.D. being applied between the apex and the earth, the electro-magnetic waves will be almost identical with those employed in radio-telegraphy and will vary in the same way with the distance from the sending station. This imaginary multi-directional transmission line, consisting of a lower plaine (the earth) and an inverted cone, lends itself to simple calculation, because, like an ordinary transmission line, and unlike the two parallel discs it has a constant inductance and capacity per mile. It can be shown that if the angle between the cone and the earth is 70 degrees, the relations between the magnetic and electric fields near the earth's surface and the total energy radiated are identical with those existing in the ordinary radio-telegraphic wave. As in the transmission line already considered, the current and P.D. will be in phase at every point, and therefore, contrary to the usually accepted view, the horizontal magnetic field and the vertical electric field due to a sending antenna are not 90 degrees out of phase but are approximately in phase, except in the immediate neighbourhood of the antenna. This also follows from the fundamental equations of a progressive, as distinct from a stationary, electro-magnetic wave.

Mathematical and Physical Science Section

The Committee on Radio-telegraphic Investigations, of which Sir Oliver Lodge is chairman, and Dr. W. H. Eccles is secretary, with the following other members—S. G. Brown, Dr. Erskine Murray, Professors J. A. Fleming, G. W. O. Howe. S. P. Thompson, and H. M. Macdonald, and Captain H. Riall Sankey—reported that at a meeting held in June last, they came to the conclusion that the most urgent and profitable work they could promote was the investigation of the following large scale phenomena:—

(1) The influence of sunrise and sunset, of daylight and darkness, and of meteorological conditions, on the propagation of electric waves over long distances;

(2) The original and the laws of "strays," i.e., natural electric waves.

The committee considered these subjects particularly suitable for the British Association, since they are such as cannot be efficiently pursued by uncoordinated individual effort. In order to promote the necessary widespread observations, they proposed to draw up a simple scheme of instructions which would be circulated to amateurs throughout England, and also with the permission of the companies concerned, to operators on ships. These instructions would include directions for simultaneous observations of, for example, the strength of the time-signals from such stations as the Eiffel Tower, and the average strength and frequency of strays. The observations would subsequently be classified and reduced by the committee. It was felt that this work would at once open up an almost unexplored and exceedingly promising branch of research—one which cannot be entered upon in any other way. It is, of course, essential that the work should be carried out over a very large area, and by very numerous observers. The committee applied for a grant of £200 from the Association to enable the work to be started in a thorough manner.

Mr. W. H. F. Murdoch described a magnetic susceptibility meter. He uses a unipolar method of testing with the addition of a circular coil in series with the magnetising solenoid. This coil acts upon the magnetometer needle, which is lying in a neutral field of force, so that the tangent of the resulting deflection due to the magnetic material plus coil is strictly proportional to magnetic susceptibility. A mirror may be used to read the deflections, and in this case susceptibility = deflection × constant. It follows that such an instrument with tangent scale and pointer can be graduated so as to read directly the value of the susceptibility coefficient in C.G.S. units. To fix the value of H the current is measured and the values multiplied by a constant. The theory of the instrument was given by Mr. Murdoch, also an example of its use for testing iron, together with a diagram of connections and curve of results. The author also briefly discussed the various corrections.

---

## SYDNEY ELECTRICAL SUPPLY.

The demand for electric current in Sydney has necessitated considerable addition to the City Council's power house at Pyrmont. The work is estimated to cost about £16,000, part of it being done by day labour and part by contract. One of the principal works is the construction of the new water conduits, the excavations for which are proceeding through rocky land. Each of the new conduits will consist of an intake and outlet channel, and will provide for millions of gallons of water being drawn from the waters of Darling Harbour by a large turbine engine which is to be installed. The driving of these conduits is being carried out by contract. The length of one of the ducts from the powerhouse to Darling Harbour is over 300ft. The contractors for this portion of the work are Messrs. Stewart and Son, and the cost will be about £10,000. The work was started in October last, and will shortly be completed. From the power house to within 4ft. of the water the work was carried out in concrete, but the remaining few feet were constructed in cast-iron covered in concrete. This was found necessary on account of the flooding by salt water.

The portion of this work to be carried out by day labour will involve a cost of about £1500, and has to be done without the aid of explosives owing to the delicate machinery installed in this portion of the power house. The length of these conduits is about 70ft. This work is nearly completed. The additions to the building include a new engine-house, the contract price for which is about £4000. The contractors, Messrs. Holt and Co., have nearly completed the work of erecting the engine-house. The southern walls and the columns of the building have been built of reinforced concrete, as strength is needed for the overhead travellers, which are to be placed in position. Over 400 tons of blue metal have been used for the foundations of the new work. Mr. J. H. Merriman, of the city architect's department, prepared the plans for the additions, and the work is being carried out under the personal supervision of Mr. Frederick Ridge.

---

## HYDRO-ELECTRIC SCHEME (T.).

Last week the Premier, Mr. Solomon, informed the Tasmanian House of Assembly that a decision had been come to, in view of evident impossibility of passing the original Bill and of the equally evident agreement of the House on the general principle of a Government purchase of the hydro-electric portion of the Hydro-Electric and Metallurgical Company, to withdraw the Bill and the Amendments which had been proposed and spoken of, and to put the issue before the House in a more definite form, and that the House should be practically requested to give its concurrence or otherwise to a concrete proposal which would be submitted after conference between the members of the Government side and the Opposition. This, it may be here said, was entirely in the spirit of the previous debates, which had been conducted on non-party lines—a fact which augured well for an ultimate satisfactory agreement being arrived at between Parliament as a whole and the share and debenture-holders of the company.

The Premier then moved the following resolution:—"That Ministers be authorised to enter into a contract with the Hydro-Electric Power and Metallurgical Company for the purchase of the hydro-electric power branch of the company's undertakings, together with all property and rights incidental thereto, on the following basis:—(1) The purchase price shall be an amount equal to seventeen shillings and sixpence in the pound on the expenditure on the said works, and in connection with the flotation and management of the said company, shown in the schedule laid upon the table of the House, to be verified by audit of the accounts of the said company. (2) The purchase money shall be expended by the company is the erection and operation of carbide and metallurgical works at North-West Bay. (3) The Government will supply, and the company will take, at least 3500 horse-power, delivered at North-West Bay, and reduced to a voltage of 6600, at a price not exceeding the cost of production, plus five per cent. (4) Debenture-holders to receive Government stock at 4½ per cent. on the amount of actual cash advanced by them."

The company had submitted certain statements (said Mr. Solomon) showing the varying expenditure on the head works, land, and canal, the power-station and equipment, transmission lines, poles and telephones, sub-station distribution; in fact, all the actual work that it had done in this State. The total was £257,758. There was an item which did not represent works, which was mainly the subject of discussion, and that was in connection with the expenses of the flotation and management of the company. The various items were set out in a schedule, which would be subject to audit. The total amount was about £28,997, but all items which were not part of the power scheme would be excluded and not taken over by the Government. With regard to the third clause of the resolution, the Premier said it was perfectly clear that if the Government insisted on the money being spent in the erection of certain works, it was under an obligation to ensure that the company would have the power at a price which would enable it to carry on these works properly. The company, which had already staked its existence on its ability to provide power at the price, should carry that responsibility, and a clause was inserted that the Government could only be compelled to supply power at a price which would pay the proportionate cost of its production, plus 5 per cent. If the company's representations were wrong, the company must take the responsibility and pay an increased cost for the power. There were two provisions that would be insisted upon by the Government. One was that, under no circumstances should the company be entitled to claim more than half the power actually produced by the Government. The second provision that it was desired to make was that the company should be given an undertaking by the Government that power would not be supplied to any other carbide or metallurgical works at a lower price than to it. So far as other industries were concerned, the Government was free to supply power at any price it thought fit, even less than that charged to the metallurgical works.

Mr. Earle, leader of the Opposition, said he was glad that some definite proposal was now being considered by the House, as he would be very sorry indeed to see the works discontinued. There were about 50 or 60 men employed, together with a staff of officers and experts organised at considerable cost and trouble, and, he believed, able men for carrying on the work, and it would be a great loss if all those men were disbanded. He was pleased that there was now a possibility of the House deciding to acquire the works and carry them out in the interest of the State in the very near future. When that was accomplished, he felt certain that the scheme would prove of very great advantage in promoting the advancement and prosperity of the State. He had great hopes for the successful utilisation of the enormous water-power available to that end.

On the motion of Sir Elliott Lewis, the House immediately went into committee, and the clauses of the resolution were considered seriatim. Several speeches were made in support of an amendment to obtain a report from the Engineer-in-Chief and a competent hydraulic engineer as to the value of the assets of the company, and others somewhat severely criticising the whole scheme and the resolution before the House, and on a division, the amendment was lost by 19 votes to 6. The only amendment made was proposed by the Premier, viz., to alter the first clause of the resolution to make it read that 17s. 6d. in the £1 should be paid on the shareholders' money expended on the works, and the resolution so amended was agreed to, and ordered to be sent to the Legislative Council.

---

## ENGINEDRIVERS' CERTIFICATES (V.).

At the sittings of the Board of Examiners, recently held in Melbourne, certificates as enginedrivers and boiler attendants were granted to the following:—

First Class Mining.—W. J. Evans, T. A. Tinetti.

Second Class Mining.—J. Tronfaroli, W. T. Crotty, T. Muxworthy, J. H. Trezise, E. C. Fletcher. T. L. Jones, J. T. Frame, B. V. D. Gallagher.

First Class Factory.—H. O. Peterson, H. G. Eggleston, G. H. Daw, W. H. Wisker, R. Rodda. F. H. Fearon, W. G. Roberts, R. W. Evans, G. W. Brown, J. T. Merry, A. A. Maynard, J. P. Fitzpatrick, H. H. Weist, A. Robbie, L. J. Taylor, W. A. Oliver, C. Touzel, A. Gordon, R. Hansen. S. Healey, W. Smith, D. W. Dalton, J. G. Gorrie, J. D. Mounsey, A. N. Simpson, G. Williams, T. Britton, R. L. Fulton, R. Robertson.

Second Class Factory—E. Lynch, C. G. Anderson, T. J. Carson, W. Scott, D. Fitzgerald, V. C. Holmes, C. R. Eklom, A. Riddell, R. H. Powell, L. M. Bentley, L. V. A. G. Clifton, A. J. Chislett, W. D. Ferres, O. C. Green, A. J. Hutchison, J. M. S. Mutimer, J. King, S. H. Stone, C. T. Stanford, C. J. Whitelaw, F. J. Marshall, A. N. Millburn, F. M. Tate, C. M. Arnold, C. T. A. Sward, A. Walkenshaw, A. J. Warren, F. W. Warren, H. F. Ashburn, — Cottrell, J. G. Grant, A. R. Hawkins, A. S. Page, J. J. Peters, J. Rundle, J. T. Redfern, L. H. Hodge, A. R. Itzerott, H. J. S. Hill, A. F. Homann, H. H. West, J. Breheny, A. S. Darby, J. J. Mackay, A. Henley, W. J. Cummins, J. B. Carkeek, F. L. Fincher. D. R. Anson, D. L. Easton, H. McD. Hill, A. J. Dobinson, M. F. W. Kohlman, S. Hehir, T. J. Molphy, M. E. Vause, C. Potts, M. J. Martin, F. Watchorn. F. G. Bourne, P. H. Caspar, C. H. Cross, E. A. Jones, S. Sheldon, W. Shaw, G. Prideaux.

Third Class Factory.—J. Dey.

Boiler Attendants.—W. Sharp, H. W. Catterall, W. Burns, W. J. L. Milligan, H. Whisson, D. Wilcox, W. H. Rosewarne, L. Honeybone, Mrs. M. Lincoln, D. E. Rundle, C. A. Allan, G. Wall, W. P. D. O'Neil, W. T. Paxman, E. L. Marion, F. Saus, A. J. Lawson, T. W. Harrison.

---

## ELECTRIC SMELTING OF TIN AND ZINC ORES.

Advices from Cornwall and France give results of experiments conducted in connection with the treatment of tin and zinc ores in an electric furnace. The experiments were quite independent (although coincidental), but the results in both cases were satisfactory enough to open up many possibilities for electric smelting.

In the case of the tests in France, these were carried out on a new process, and a project is on foot to establish it in conjunction with a hydro-electric scheme, which it is hoped will restore the zinc mines in the vicinity of the Pyrenees to their former level of activity.

The tests on the reduction of tin ore in the electric furnace were extensive, and were carried out by the Groendal-Kjellin Co. of London in Cornwall. The results were favourable, pure ores giving metal of 98 per cent. purity, while Bolivian ores containing 49.5 per cent. of tin and about 15 per cent. of iron yielded metal of 92 per cent. to 97 per cent. purity, which could be further refined to 99.75 per cent. or more by blowing air through the molten mass. The energy consumed amounted to 1700kw.-hours per ton on the average. By working with two furnaces, one to treat the rich slag and the other to produce the metal, the company hopes to reduce this consumption to 1400kw.-

hours, giving an efficiency of 55 per cent. There is a saving of 25 per cent. of labour. It is stated that at mines where hydroelectric power is available the process will be commercially practicable and economical.

---

## MISCELLANEOUS.

The annual report of the Sydney Harbour Trust contains a proposal for remodelling Darling Harbour, and an extensive whartage scheme in Johnston's, Blackwattle, and Rozelle Bays, the estimated cost of which is £6,500,000. By this scheme there will ultimately be provided a wharf frontage of 42,600ft. to give accommodation to 71 600ft. vessels. It is estimated that the project will take ten years to complete. "The Trust has now no further water frontage available," say the Commissioners, "and it will be necessary to at once make resumptions in the neighbourhood indicated; and, indeed, the Commissioners are of opinion that it would be highly desirable to resume the whole of the area fronting these bays as early as possible and while the structures thereon are small and the interests involved comparatively slight."

* * *

In one sitting of the N.S.W. Legislative Assembly last week various works were authorised whereby the State will be run into an expenditure of over a million and a half pounds. No effort was made to explain how or in what way the works were to be carried out. The Bills sanctioned in this long sitting were:—The Craboon to Coolah railway, Coff's Harbour scheme, Dubbo to Werris Creek railway, Coonabarabran to Burren Junction scheme, and the Henty to Billabong Creek railway. In every case the Bills went through all stages without amendment, and practically no debate.

* * *

The sitting of the Royal Commission appointed to inquire into the charges made by Mr. Wade, Leader of the Opposition, against Mr. Griffiths, Minister for Works (N.S.W.), occupied about ten minutes. Mr. Wade had previously expressed his disapproval of the whole of his charges not being included in the scope of the Commission, the omission being that relative to Medlow lands, and upon facing Mr. Justice Pring, Mr. Wade stated that on that account he would not give any evidence relative to the charges specified for inquiry.

* * *

The aldermen of Bathurst (N.S.W.) are not supporters of the day-labour system, and Mr. Griffiths, Minister of Works, informed them, through Mr. J. Davis, the Director of Public Works, that in his opinion the second section of the Bathurst sewerage scheme could be done more cheaply by day labour than by contract. Before taking action, however, the Minister desired the opinion of the Council, which he received in the form of a resolution that the Department be asked to invite tenders for the work and submit them for consideration of the Council.

* * *

Long-distance wireless stations are to be erected by the Marconi Wireless Co. at Sheffield (Eng.) and Buenos Ayres (Argentina), which are about 6250 miles apart. They will be equipped with 18 masts, each 600ft. in length, and tests will be made of the Marconi long-distance machines, and those of the Goldschmidt Company, control of which was recently acquired by the Marconi Company.

* * *

At a meeting of the Launceston (T.) City Council last week the Mayor submitted for approval a Bill to amend the Tramways Act, authorising the Council to run railless trams and motor-omnibuses, and restrict others doing so. The Bill embodied provisions already approved relating to the Gas Company paying the costs of alterations to their mains caused by tramway works, and the borrowing of £30,000 for tramway purposes. There was a further provision for the placing of any surplus moneys from tramways to the credit of a reserve fund. The Bill was approved of, and will be laid before the State Parliament by Mr. R. J. Sadler, M.H.A. The Council also decided to seek an amendment of the Corporation Act giving the Council power to control the motor traffic in the streets of the city.

* * *

A return recently tabled in the New Zealand House of Representatives showed that during the year ended on March 31st, 1913, the amount allocated for road making was £1,070,958, of which £431,501 was spent. The amounts voted and spent in the different classes are shown as follows, the expenditure being placed in parentheses: Roads vote, £629,500 (£209,137); back block roads, £201,573 (£128,418); roads on goldfields, £74,416 (£36,761); opening up Crown lands, £100,000 (£47,351); National Endowment Account, £19,200 (£2689); maintenance £42,000 (£42,248); Lands for Settlement Account, £4267 (£4267).

* * *

Sir Day Bosanquet, the Governor of South Australia, on Friday last drove the last spike on the new railway from Meriba to Paringa. This is the first of the four Murray lands railways to be completed, by which, ultimately, eight and a half million acres of land in the Murray Valley will be opened up. The completed length of lines measures 40¼ miles, and its estimated cost, including rolling stock, was £135,750. The terminus at Paringa is 2½ miles from Renmark, on the opposite bank of the river, and a considerable increase of carrying trade over the existing lines will, it is anticipated, more than recoup an estimated annual net loss of £840 on the new portion.

* * *

An important statement which led to important results, was last week laid before the Honorary Minister in charge of the Home Affairs Department (Mr. Kelly) by Mr. H. A. Hunt, the Federal Meteorologist. Mr. Hunt said:—"Although a large and increasing number of vessels are being equipped with wireless apparatus, and are included in the Meteorolgical Bureau weather-reporting organisation, the efficiency of the service is seriously discounted by the fact that the ships cannot, under the postal regulations, transmit reports while in harbour. If this disability is removed the weather service would be rendered still further independent of the land telegraph lines during the hurricane season, and the Central Meteorological Bureau and the divisional offices in each of the State capitals will by this means be in regular communication with the whole of the coastline of Australia, and shipping equipped with wireless for storm-warning purposes." Mr. Kelly brought the matter before the Postmaster-General without delay, with a view to amendment of the postal regulations, to permit of the despatch and receipt of meteorological information by ships equipped with wireless telegraphic apparatus while in port or in the territorial waters of the Commonwealth, and Mr. Wynne undertook to have the regulations so amended without unnecessary delay.

* * *

Tasmania's railway receipts for September show an increase of £718 when compared with those for September, 1912; and for the first quarter of the current financial year they gave an increase of £3562.

* * *

The income from New South Wales railways for the first quarter of the current year showed an increase of £255,206 as compared with the corresponding period last year, while the tramways gave an increase of £28,686, making a total of £283,892.

* * *

The Federal Treasurer, Sir John Forrest's, Budget proposals include an expenditure of £12,500 during the current financial year on developing the oil-fields of Papua, and Parliament is also to be asked for authority to expend £60,000 from loan funds on the construction of a railway from Port Moresby to Astrolabe, and for the construction of wharfs at Port Moresby and Samarai, in Papua. It is proposed to provide this £60,000 as a loan to Papua, and it believed that this railway will greatly assist agricultural development, as well as the copper mines, which exist in the district to be served. The Treasurer also said:—"The total estimated cost of the Northern Territory this year, with the Oodnadatta railway, is £721,556, but as yet nothing has been done in the direction of making the country productive or in settling people on the land. So far as I can gather, only seven settlers have actually gone to their holdings, and seven others are on their way. In addition to the £721,556 loan, authorisation for £400,000 will be asked for the construction of a railway in the Northern Territory from Pine Creek to Katherine River and southwards, the ultimate object in view being to connect by railway with Oodnadatta, in South Australia, and with Camooweal in Queensland." A large number of new offices are to be created in the Public Service of the Territory, and many increases in salary are proposed, the former adding £5194 to annual expenditure, while the latter amount to £553 per annum. £7500 will go to increasing equipment, and £4000 to boring for water. Amongst the new officers to be appointed are:—Assistant geologist, £336; assistant engineer for railways, £450; and draughtsman for railways, £300. The salary of the manager of the cyanide and crushing plant, who is also warden at Macdonnel Ranges, is to be increased from £340 to £392.

* * *

At a general meeting of the Victorian Institute of Electrical Engineers held last Thursday night, Mr. H. J. Newbegin, President, in the chair, the following members were elected:—A. A. Watkins, M.I.E.E., Normanby Chambers, Little Collins-st., and A. K. Woods, electrician, Melbourne Electric Supply Co., 19 Queen street. The following were elected as associates:—V. M. Dinnery, manager, sale Department, care Lawrence and Hanson Electrical Co., 405 Lonsdale-street; Wm. A. Long, electrical engineer, shire offices, Hopetoun; H. R. S. Penniford, electrical engineer, Kadina, S.A., and J. Gordon Steele, electrician, Melbourne Electric Supply Co., Richmond.

* * *

The Brunswick (V.) Town Council decided to borrow £7000 for the completion of the Council's electric light scheme. The town clerk (Mr. R. Dawson) said £6500 would be sufficient for all the street lighting required. By the time it was connected up the revenue from installations would be sufficient to carry on all further connections. The cost to date is estimated at £18,000, and total final cost is expected to be about £23,000.

* * *

Our Lithgow (N.S.W.) correspondent writes on Oct. 3rd:—"Last week was a period of slackness at the Lithgow ironworks. The 18in. and the 14in. mills worked a few days each, but in the other directions slackness was recorded. The 35-ton steel furnace was idle all the week, the roof having fallen some days ago, since when workmen have been engaged repairing the furnace. In consequence of this mishap, there has been no steel for the 27-in. mill. Excavations are being made for another powerful engine to drive the 27in. mill, and it is expected that this will greatly increase the output. Up to the present, several thousand tons of steel rails have been rolled in this mill. A large number of yard labourers have, it is reported, been put off during the past few days. The two moulding shops (iron and steel) have been exceptionally busy for several weeks past, making castings for the blast-furnace and coke ovens, but, this work having been completed, over a score of hands have been put off temporarily, in fact, one of the moulding shops will be closed up. Mr. Penzer, who has been foreman of the mills for the past seven years, terminated his connection with the works on Saturday, 27th ult. He contemplates returning to England in December next."

* * *

The second water supply dam on the Cordeaux for this district (writes our Wollongong (N.S.W.) correspondent), was mentioned last week, in reply to a question in Parliament, as one of the works exceeding in cost the statutory limit of £20,000, which had been started and carried out without reference to the Public Works Committee or the consent of Parliament. The cost of this dam is given at £116,000. The circumstances in which the work was thus irregularly started were that the water supply of the district was getting very seriously low, with prospects of becoming more so. The Works Department being pressed in urgent terms to provide some relief, got the Councils of the district to agree to endorse the making of this second dam as part of the district supply, and proceeded with the work without any announcement. But the cost is appalling. Surely the figures are in some way mixed. The first dam cost £40,000, and its capacity is only 20 million gallons less. If the district is charged rates on the basis of that outlay, there will be wrath. As a matter of fact, even with this dam the prospective consumption is already so near its capacity that the Department has refused applications from collieries to be supplied.

* * *

A trial is to be made in Melbourne almost immediately of an automatic stamp-selling attachment to postal pillar-boxes. A square will be cut out of the pillar and converted into a door, behind which the automatic machine will be fixed, and penny stamps will be supplied on the penny-in-the-slot principle. Should the device prove efficient for its purpose a great boon will be conferred on the public, and particularly upon that very large section of it which invariably leaves things to the last minute. If it gives satisfaction, similar boxes will be more generally erected.

* * *

The West Australian State undertakings are certainly still in their infancy, as one of her representatives was careful to point out recently when attention was drawn to the monthly loss involved through some of them. It was intended to be inferred that in course of time things will right themselves; business men, as a rule, do not despair because a business fails to show a profit for the first year or so. When losses become chronic, however, business men make some effort to ascertain what is wrong, and how it is to be righted. Western Australia, in July, expended £108,450 on her railways, but the revenue was only £85,198; on her steamship experiment she spent £5171, but the revenue was only £2228; on her hotels she spent £1422 against a revenue of £1314. The Minister of Agriculture, however, was able to announce recently that a profit of £868 had been made by the State butchering business at the Perth market, and Mr. Scaddan, the Premier, has announced that the Government had entered into an agreement with the Bovril Australian Estates Ltd. to purchase cattle from them.

**P. & O.** COMPANY'S ROYAL MAIL STEAMERS
FOR MARSEILLES, PLYMOUTH AND LONDON.

Leave Sydney on the subjoined dates, calling at usual ports.

FIRST AND SECOND SALOON ONLY.

| Steamer, | Tons. | Commander. | Noon. | Melb., 3 p.m. |
|---|---|---|---|---|
| MARMORA | 10,500 | Lockyer | Oct. 18 | Oct. 21 |
| MOLDAVIA | 10,000 | Gordon | Oct. 29 | Nov. 4 |
| MEDINA | 12,500 | Notley | Nov. 15 | Nov. 18 |

PASSAGE MONEY TO LONDON—
Single, £41 16s. to £82 10s.
Return, £69 6s. and £123 4s.

Return Tickets between Inter-State Ports are available for return by Orient, Messageries Maritimes, and N.D.L. steamers having room.

SPECIAL HOLIDAY RETURN TICKETS to COLOMBO are now issued, available for two months. Fares from Sydney, £45 2s. first saloon, and £31 18s. second saloon.

A. GORDON WESCHE, Superintendent IN AUSTRALIA, 63 Pitt-street, Sydney.

**The COLONIAL MUTUAL FIRE Insurance Company Limited.**

Principal Office: 60 MARKET-ST., MELBOURNE.

Branches in all the States.
Transacts Fire, Guarantee, Employers' Liability, Marine, Burglary, and Plate Glass, Accident, Workers' Compensation and Live Stock Insurances.
Send for Prospectus.
W. TUCKER, General Manager.

*Harringtons* LTD.

**ANALYTICAL & METALLURGICAL DEPT.**

Highest prices given for all gold, silver or platinum residues, etc.
Lowest fees for all kinds of Assay, Analytical, and Metallurgical work.
Expert Advice on Ore Treatment, Bullion Refining, Smelting, etc., etc., Directed by a qualified Analyst from Messrs. Johnson and Sons, London: Assayers and Refiners to Bank of England, H.M. Mint, The Council of India, etc.

**HARRINGTONS LTD.**
**386 George Street, Sydney.**

It is announced that the Lower House of the Prussian Diet has passed by 192 votes to 143 a bill which will empower the Government to make, at a cost of £1,250,000, preparations for the electrification of the Berlin City Circular and Suburban Railways, with certain temporary restrictions. The House rejected the Centre Party motion, which proposed merely to spend a sum of £331,000 on improving the railway and £150,000 on carrying out experiments in electric traction. The Prussian Minister of Public Works, Herr von Breitenbach, said that in consequence of the extraordinary increase of traffic—which one speaker estimated to have more than doubled since 1895—the City Railway had practically reached the limit of its capacity, and that in order to cope with the situation electric traction must certainly be installed. It would be £300,000 cheaper a year than steam. With electricity it would be possible to run 40 trains an hour instead of 24, and to increase accommodation for passengers by possibly as much as 100 per cent. Electric trains were in every way more convenient and economical. The steam service would not be altogether abolished, but he regretted that opposition to the scheme had originated from manufacturers of steam locomotives. The opponents of the bill, who denied that they represented the interests of steam locomotives' manufacturers, agreed that a reorganisation of the City Railway was urgent, but thought that the electric installation should be postponed. The statements regarding the increase of traffic and the discomforts of the City Railway had been exaggerated. Further, electric traction might in certain circumstances render mobilisation much less smooth, and it might also have a prejudical effect on the electric current which worked the telegraphs. A representative of the War Office said the Ministry of War had no objections to the electrification of the railway. Very little use could in any case be made of the old steam engines in mobilisation, because they were not adapted to carrying heavy military loads. The supply of engines was so large on the German railways that the War Office would not miss the engines of the City Railway. The Minister of Public Works said that a representative of the postal administration had told the committee that it would be possible to prevent the electric installation from affecting the telegraph system. The supply of power would not be left to private firms.

# *Invited and Accepted Tenders*

It is particularly requested that the information regarding contracts open, and the successful tenderers, be forwarded to The Editor not later than Monday of each week.

The following contractions are used throughout:—S—supply; D—delivery; M—manufacture; C—construction; E—erection; P—purchase; I—installation; R—removal. Where no contractions appear, supply and delivery is understood. The date at the beginning of each paragraph refers to the closing of tenders.

## INVITED.

### Commonwealth.

Specifications, tender-forms, etc., for tenders invited for the Postmaster-General's Department of the various States under this heading may be had as follows:—Victoria—Various State G.P.O.'s. New South Wales—Departmental Stores, Sydney, and various G.P.O.'s in other States. South Australia—Adelaide, Melbourne, Sydney and Brisbane G.P.O.'s. Western Australia—Departmental Stores, Perth, and various G.P.O.'s in other States. Queensland—Various State G.P.O.'s. All States—Various G.P.O.'s. If the specifications, etc., may be had elsewhere, in addition, the places will be given in parentheses.

POSTMASTER-GENERAL'S DEPARTMENT, Melbourne.—14th October.—S. and E., at the Telephone Exchange, Melbourne, of a common battery multiple switchboard, as per schedule No. 868.

14th October.—Cable boxes, as per schedule No. 877.

14th October (extended from 16th September).—S., D., E. and I. at the Telephone Exchange, Collingwood, Victoria, of a common battery switchboard, as per schedule No. 860, or an automatic, or semi-automatic, switchboard, as per schedule No. 859.

14th October.—S. and D. of 1000 protectors, as per schedule No. 964.

21st October.—S. and D. of 12 auto re-winding electric clocks for wireless stations, as per schedule No. 969.

5th November.—Galvanised iron piping, as per schedule No. 952.

11th November (extended from 4th November).—D. and E. of eight automatic telephone switchboards at the Ascot, Canterbury, Malvern, Cheltenham, Footscray, Oakleigh, Sandringham, and Williamstown Telephone Exchanges, as per schedule No. 953.

11th November.—S. and D. of relays, jacks, lamps, etc., as per schedule No. 982. (See advertising columns.)

16th December.—S. and D. of one common battery multiple switchboard at the Telephone Exchange, Wills-street, Melbourne, as per schedule No. 968.

POSTMASTER-GENERAL'S DEPARTMENT, Sydney.—15th October.—450 fire sheets (asbestos), as per stores schedule N.S.W. No. 326.

15th October.—Measuring instruments, to stores schedule N.S.W. No. 303; telephone parts, to stores schedule N.S.W. No. 314; switchboard parts, to stores schedule N.S.W. No. 315.

15th October.—63,000 insulators (various), as per stores schedule N.S.W., No. 296.

22nd October.—S., D. and E. at the Telephone Exchanges, Randwick, Mosman, Parramatta, Ashfield, Burwood, Homebush, and Rookwood, Sydney, of seven (7) automatic switchboards, with associated equipment, as per schedule No. 281.

12th November (extended from 8th October). — S. and D. at the Telephone Exchange, Watson's Bay, Sydney, of 1 automatic switchboard, with all associated equipment as per schedule No. 234.

12th November (extended from 22nd October).—S. and D. of 3000 caps for supervisory lamp, schedule No. 338.

12th November (extended from 22nd October).—4500 cords, 3 steel conductors, schedule No. 328.

12th November (extended from 22nd October).—500 fuses, 3 ampere, schedule No. 338.

12th November (extended from 22nd October).—250 telephonometers, schedule No. 338.

12th November (extended from 22nd October).—S. and D. of 7 miles copper-clad steel wire, as per schedule No. 335.

19th November.—S. and D. of 450 bells, magneto, as per schedule No. 333.

18th March, 1914.—S., D. and E. at the Telephone Exchanges, Epping, Ryde, Hunter's Hill, Drummoyne, Wahroonga, Paddington and Waverley, Sydney, of seven (7) automatic switchboards, with associated equipment, as per schedule No. 179.

POSTMASTER-GENERAL'S DEPARTMENT, Brisbane.—15th October.—Steel date stamps, as per stores schedule No. 279.

22nd October.—S. and D. of dry cells and battery glassware, as per stores schedule No. 281.

19th November.—Bronze wire, as per schedule No. 273.

17th December.—S. and D. at the Stores Branch, Postmaster-General's Department, Brisbane, of insulators, as per stores schedule No. 280.

31st December.—S. and D. at the Stores Branch, Postmaster-General's Department, Brisbane, of insulators, as per stores schedule No. 282.

POSTMASTER-GENERAL'S DEPARTMENT, Perth.—15th October.—S. and D. of switchboard cable, W.A. schedule No. 312.

15th October.—S. and D. of conduits, steel enamelled, and fittings, W.A. schedule No. 313.

29th October.—S. and D. of C.I. pipes, spigot and socket, and split bends, as per schedule No. 309.

19th November.—S. and D. of rectangular dry cells.

10th December.—S. and D. of 60 tons wire (galvanised iron).

POSTMASTER-GENERAL'S DEPARTMENT, Adelaide.—12th November.—One lamp signalling trunk line switchboard, of five sections, one cable turning section, and one cable storing section, one two-position recording desk, and one chief operator's desk, as specified in specification No. 431, etc., delivered at the Telephone Exchange, Adelaide, as per schedule No. 296.

POSTMASTER-GENERAL'S DEPARTMENT, Hobart.—1st December.—S. and D. of dry cells, as per schedule No. T. 84.

DEPARTMENT OF HOME AFFAIRS.—27th October.—S. of circulating and exhaust pipes and bends, valves, flanges, etc., for Federal Territory Power Generating Station.

26th November (extended from 24th November).—Water supply pumping plant for Canberra.

DEPARTMENT OF HOME AFFAIRS.—Kalgoorlie-Port Augusta Railway.—5th November.—M., S., D. and E. of 4 locomotive engines and tenders (N.S.W. "P" type); tender capacity, 4500 gallons of water, and approx. 7½ tons of coal. (See advertising columns.)

5th November.—S. of 100,000 jarrah sleepers (9ft. x 10in. x 5in.).

2nd December.—600 pairs of wheels and axles (9in. x 4½in. journals).

DEPARTMENT OF DEFENCE—Small Arms Factory, Lithgow, N.S.W.—29th December.—P. of scrap steel, brass, jute bags, whale oil, etc.

### Victoria.

RAILWAY DEPARTMENT.—9th October.—S. of red oxide (dry).

9th October.—S. steel side tipping V waggons.

9th October.—S. copper cable, S.W.G.

9th October.—S. of w.i. or m.s. bolts and nuts.

10th October.—Laboratory apparatus and chemicals.

13th October.—S. of fittings for 4 light avenue lamps.

13th October.—S. of gunmetal stand pipe valves.

13th October.—S. of half-round concrete pipes.

15th October.—S. and D. of mild steel plates for A2 engines and tenders.

15th October.—M., S. and D. of 200 metal gates.

15th October.—Portable boring bar.

22nd October.—S. and D. of 30 tons red oxide.

22nd October.—M., S. and D. of 6 sets "C" class jibs, valves, and brackets for combined tanks and cranes.

29th October (extended from 8th October).—S. and D. of steel sheet piles for coffer dam. P.D., £10.

5th November.—Copper rod.

5th November.—Locomotive seamless copper tubes.

5th November.—Best Yorkshire iron angle and tees.

5th November.—Best steel boiler plates.

5th November.—Copper plates.

5th November.—100 tons of good machinery cast-iron scrap.

5th November.—S. and D. of mild steel flat bars.

12th November.—Steel channel bars.

12th November.—20 tons steel ingots.

12th November.—Steel blooms, for crank pins.

12th November.—Locomotive boiler tubes.

12th November.—High-speed tool steel.

12th November.—M., S. and D. of one 15-ton electric crane for Ballarat.

12th November.—Flame arc lamps.

12th November.—Insulated copper cable.

12th November.—M. and D. of one 60h.p. electric motor and accessories.

19th November.—M., S. and D. or, cast steel wheel centres for A2 engines and new truck stock.

19th November.—Brass locomotive tubes.

19th November.—150 tons pig iron.

19th November.—10 tons sulphate of copper, best quality, for electrical purposes, battery material.

3rd December.—Steel blooms, for piston rods.

3rd December.—S. and D. of vulcanised rubber electric light wire.

7th January (1914).—S. and D. 10,000 porous pots for batteries.

7th January.—S. and D. of best steel boiler plates.

7th January.—S. and D. copper rod.

7th January.—S. and D. copper plates.

7th January.—S. and D. of cast steel wheel centres.

7th January.—S. and D. of steel blooms for crank pins.

7th Jan.—S. and D. of locomotive brass boiler tubes.

7th January.—S. and D. of best Yorkshire iron angles.

7th January.—S. and D. of locomotive seamless copper tubes.

7th January.—S. and D. of steel channel bars.

14th January, 1914.—S. and D. of 5 Detroit lubricators.

VICTORIAN RAILWAY COMMISSIONERS STATE COAL MINE.—22nd October.—S. and D. of 2 10-h.p. motors. (See advertising columns.)

22nd October.—M., S. and D. of 3000 cast-iron truck pedestals.

22nd October.—M., S. and D. of 2000 steel skip wheels. (See advertising columns.)

12th November (extended from 1st October).—S. of rope haulage engine and electrical equipment for McBride Tunnel.

PUBLIC WORKS DEPARTMENT.—9th October (extended from 2nd October).—Oil engine and machinery for Lunatic Asylum, Beechworth. Particulars at Police Station, Beechworth.

16th October.—A. and extension pier, Portland.

23rd October.—Extension breakwater, Warrnambool.

## New South Wales.

PUBLIC WORKS DEPARTMENT.—13th October.—S., D. and E. of two 3-ton electric jib cranes for State Brickworks, Homebush Bay. (See advertising columns.)

27th October.—M. of steel bridge for Wilson River, Wauchope to Kempsey section, North Coast railway. (See advertising columns.)

5th December.—M., S. and D. of steel bridges for Cooperabung and Piper's Creeks, on fifth section, North Coast Railway, viz., Wauchope to Kempsey. (See advertising columns.)

RAILWAY DEPARTMENT.—15th October.—S. of 13 direct-current motors. (See advertising columns.)

15th October.—S. of forges, tools and shafting for overhead line repair shops, Leichhardt. (See advertising columns.)

12th November.—S. of three 30-kilowatt motor generator. (See advertising columns.)

26th November.—S. of one 2000 lb. storage battery freight truck. (See advertising columns.)

METROPOLITAN BOARD OF WATER SUPPLY AND SEWERAGE (341 Pitt-street, Sydney).—15th December.—M. and D. of one turbine centrifugal pumping plant for Crown-street Pumping Station.

## Western Australia.

GOVERNMENT TENDER BOARD.—9th October.—25,000 gallon C.I. tanks, for Railway Department.

30th October.—S. moulding machine cupolas and pneumatic back saw bench for Railway Department.

## Queensland.

TREASURY DEPARTMENT.—29th October.—C. and E. of central sugar mill at Babinda Creek, North Queensland.

WATER SUPPLY DEPARTMENT.—3rd October.—Sinking artesian bore on reserve in parish of Gaila.

## South Australia.

RAILWAYS DEPARTMENT.—14th October.—S. and D. in trucks on wharf, Port Adelaide, of 800 solid drawn best toughened copper tubes, for locomotive boilers, 10ft. 8½in. long x 1¾in. outside diameter x No. 10 I.W.G. thick at the end, gradually tapering to No. 12 I.W.G. at the other end. Customs duty (if any) to be paid by contractor.

14th October.—C. of 20 suburban carriages, 5ft. 3in. gauge.

14th October.—S. of new or s.h. motor boat about 35ft. long, 8ft. 6in. beam, draught 2ft.

14th October.—C., S. and D. of 20 side-tipping trucks.

21st October.—S. and D. of 3000 porcelain insulators.

28th October.—C. of Decres Bay Railway.

28th October.—S. and D. of 12,000 gallons kerosene oil.

4th November.—S. and D. 368 tons coloured or white cotton waste.

18th November.—S. and D. of 1137 bars of copper.

## New Zealand.

RAILWAYS DEPARTMENT.—31st October.—S. and D. of stores for the period from April 1, 1914, to March 31, 1917.

PUBLIC WORKS DEPARTMENT.—31st October.—S. of telephone instruments and accessories for Lake Coleridge power scheme.

PUBLIC SERVICE STORES TENDER BOARD.—13th October.—S. and D. of 500 cords, mounted, for bell receivers; 300 ear-pieces for receivers; 3000 ear-pieces, vulcanite, with flange; 500,000 envelopes, No. 26; 750,000 envelopes, No. 29; 3000 plugs; 3000 rings; 3000 telephones, B.B. wall.

13th October.—S. and D. of lighting transformers, etc., for use in connection with the Lake Coleridge power scheme.

## General.

CITY OF MELBOURNE.—17th October.—S. and D. of C.I. and W. steel pipes and bends.

MELBOURNE and METROPOLITAN BOARD OF WORKS.—21st October.—S. and D. of girders for carrying 34in. pipe.

21st October.—S. and D. of 350 tons of 9in. C.I. pipes of Australian manufacture.

THE MELBOURNE HARBOR TRUST.—14th October.—S. of lower tumbler and tumbler shaft for the dredge ''Francis Henty.'' S. of lower tumbler and tumbler shaft for the dredge ''La Trobe.''

SHIRE OF HEIDELBERG (V.) (H. J. Price, Secretary).—16th October.—S. steam road roller fitted with scarifier.

16th October.—S. portable stone crusher.

SHIRE OF NUNAWADING (V.) (J. R. Kefford, Secretary, Box Hill).—25th October (extended from 18th October).—Electrical equipment.

GEELONG WATERWORKS AND SEWERAGE TRUST (Jas. S. Sharland, Secretary).—13th October.—S. of 3in. and 4in. cast iron water pipes.

SHIRE OF NUMURKAH WATERWORKS TRUST (T. S. Lancaster, Secretary).—13th October.—S. of cast iron pipes and fittings; S. of sluice valves, fire plugs and fittings.

BAIRNSDALE WATERWORKS TRUST (A. G. Holt, Secretary).—15th October.—S. of galvanised W.I. pipes and fittings.

DUNOLLY BOROUGH COUNCIL (S. H. Butler, Town Clerk).—S. and D. of 101 chains galganised W.I. tubes, 4in. bore; 191 9ft. lengths C.I. pipes, 3in. bore; 125 9ft. lengths C.I. pipes, 3in. bore.

ORIENTAL TIMBER CORPORATION.—11th October.—Erection brick stack, and S. and D. of sheet iron flues.

WALLABY CONSOLIDATED G.M. CO. (in liquidation) (Arthur Phillips, 60 Queen-street).—P. of lease, plant, tools, etc.

MUNICIPAL COUNCIL OF SYDNEY.—13th October.—S. and D. of stoneware bridges; black iron cable clips and pins; coal trimming chutes; wood troughing; gangways, ladders, etc. (See advertising columns.)

27th October.—S. and D. of curve drawing ammeters. (See advertising columns.)

THURSDAY ISLAND TOWN COUNCIL.—31st October.—S. of a suitable gas lighting plant for street, house, and cooking purposes.

BRISBANE THE METROPOLITAN WATER AND SEWERAGE BOARD (Albert-street).—13th January, 1914.—M. and D. of material for aerial ropeway. (See advertising columns.)

MACKAY HARBOUR BOARD (Q.) (H. F. MacDonnell, secretary).—15th October.—S. of mild steel round bars and steel wire.

15th October.—S. of such plant and material, or any portion thereof, as is contained in the Mackay Harbour Board's specified list, open for inspection at the office of the Engineer for Harbours and Rivers, Brisbane.

29th October.—S. of Portland cement.

ELDERSLIE STATION, Winton, W. Q'land.—19th November.—Sinking and completion of an artesian bore, maximum depth 4500 feet.

CITY OF LAUNCESTON (T.) (C. W. Rocher, Town Clerk).—27th October.—S. of electrical fittings, incandescent lamps, wire and cable.

27th October.—Annual supplies for 1914.

24th November (extended from 13th October).—Section i., S. and D. of transformers, etc.; section ii., S. and D. of feeder cable, etc.: section iii., S., D. and E. of high tension switchboard, etc.

DOMINION PORTLAND CEMENT CO. LTD., Wellington (N.Z.).—Wairua Electric Power Scheme.—31st October.—Section 10, high-tension insulators for 22,000 volt service.

A.U.S.N. Co. Ltd.

*Fast, Regular, and Comfortable Passenger Steamers*

(also carrying cargo) from and to

MELBOURNE, SYDNEY, ADELAIDE, FREMANTLE, BRISBANE, and all QUEENSLAND PORTS.

Passage Tickets interchangeable, with other Inter-State Companies, on certain conditions.

Full Particulars at

COMPANY'S OFFICES

at all principal Australian Ports.

The Mount Lyell Mining & Railway

CO. LIMITED.

Purchasers of Ores containing Copper, Gold and Silver. Rates obtainable on application to the Secretary

Manufacturers of Coke for Smelting and Foundry Purposes, Acids, Etc.

HEAD OFFICE—

39 QUEEN-STREET, MELBOURNE.

D. G. LUMSDEN,
Secretary.

When wages go up cut expenses down!

Dig deep into your power costs. See what that engine is costing you, and if another one would not do the work at less cost. Investigate the

"ATLAS" DIESEL ENGINE.

"Atlas" engines burn the very cheapest fuel, and this, combined with their high efficiency, keeps running expenses very low.

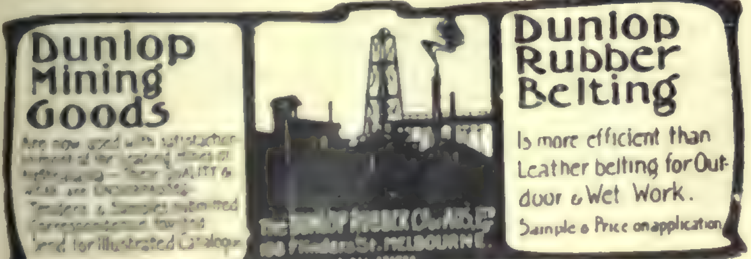
THE CONSUMPTION OF FUEL IS EQUAL TO ABOUT 0.55 LBS. PER B.H.P. HOUR.

Now, if your present engine burns more than this you are losing money. In many other ways "Atlas" Engines are superior. Let us tell you why. Put your Engineering problems up to us.

STAWN LTD.,

Specialists in Mining Machinery and Tools,

343 KENT STREET, SYDNEY.


Dunlop Mining Goods

Send for Illustrated Catalogue

Dunlop Rubber Belting

Is more efficient than Leather belting for Outdoor & Wet Work.

Sample & Price on application

"FIBRO-CEMENT" Fireproofing

Everyone about to build should obtain full particulars of this cool, acid-proof, ant-proof and fire-resisting material. The slates for roofs and the sheets for walls and ceilings are specially suited for the Australian climate. Used by the Federal and State Governments and by all the leading Architects and Builders.

ECONOMICAL AND EVERLASTING.

Full particulars, etc., from Sole Agents and Importers—

JAMES HARDIE & CO. Melbourne & Sydney

**Diamonds Enormously Reduced !**

1 Whole Pearl and Diamonds, set in Platinum. £25.

Fine White Diamonds, set in Platinum. £10 10 -

Fine Whole Pearl and Diamonds, set in Platinum. £15.

Over 12 months ago we secured a Sole Agency that called for an enormous output, and to live up to it we decided to try the experiment of offering Diamonds at merely a commission on landed cost.
The experiment created such an increase in our customers that we have decided to continue it for another 12 months.
We are, therefore, offering Diamonds (unset and set in Jewellery) at prices less than those of London. There is no duty on Diamonds, and our stock is one of great range and best quality.

**FAIRFAX AND ROBERTS LIMITED,** The Oldest Jewellery House in Sydney.
Plain Figures—Cash. **23 and 25 Hunter Street.**

CHRISTCHURCH CITY COUNCIL (H. R. Smith, town clerk).—5th January, 1914.—S. and D. of series street lighting plant and accessories. Specifications may be seen Town Clerk's office, Melbourne.

CITY OF BRUNSWICK (V.) (R. McGregor Dawson, Town Clerk).—13th October.—One 12½ ton steam roller, with scarifier attached.

CITY OF AUCKLAND (N.Z.) (Henry W. Wilson, Town Clerk).—For sale, three 250kw. direct compound steam generators and switchgear. (See advertising columns.)

## ACCEPTED.

### Commonwealth.

POSTMASTER-GENERAL'S DEPARTMENT, Melbourne.—Item 1, 2500 gallons kerosene, Radiotelegraph Station, Mt. Gambier, South Australia, £130 4s. 2d.; item 2, 2500 gallons, Radiotelegraph Station, Townsville, Queensland, £114 11s. 8d.; item 3, 2500 gallons, Radiotelegraph Station, Rockhampton, Queensland, £114 11s. 8d.; item 4, 2500 gallons, on wharf, Cooktown, Queensland, £125; item 5, 2500 gallons, Radiotelegraph Station, Geraldton, Western Australia, £145 16s. 8d.—Vacuum Oil Co.

Item 4, 500 telephones, £1289 11s. 8d.; item 2, 50 keys, closed circuit, £49 15s. 10d.; item 3, 1200 lb. staples, £177 10s.—India Rubber, Gutta Percha and Telegraph Works Co. Ltd.

Item 1, 200 telephones, common battery, table pattern, £1 4s. 9d. each; item 2, 1000 telephones, common battery, wall pattern, £1 10s. each; item 3, 500 telephones, common battery, with generator, £2 16s. 5d. each; item 7, 100 telephonometers, £1 5s. each; item 8, 75 telephone sets, for attendants, £1 5s. each; item 1, 1300 telephones, common battery, table pattern, £1 4s. 8d. each; item 2 (a) 500 telephones, common battery, wall pattern, £1 5s. 3d. each; item 2 (b) 3500 telephones, common battery, wall pattern, £1 9s. 9d. each—Western Electric Co. (Aust.) Ltd.

Item 4, 300 telephones, common battery, table pattern, £2 8s. each; item 5, 150 telephones, magneto, table pattern, £2 10s. each—J. Bartram and Son Pty. Ltd.

Item 2, 25 miles wire, two twisted conductors, £4 9s. 6d. per mile—John C. Fuller and Son Ltd.

Item 2, 100 cells, Obach, 1s. 6d. each; item 3, 6200 cells, dry, 2s. 1d. each—Messrs. A. J. Sage and Co.

Item 8, 5500 cable clamps, pattern A, size No. 1, 2½d. each; item 11, 4000 cable clamps, pattern B, size No. 1, 2½d. each; item 12, 8000 cable clamps, pattern B, size No. 2, 2½d. each; item 13, 5000 cable clamps, pattern B, size No. 3, 2½d. each—Messrs. Boehme and Owen.

Item 1, 7300 lb. screws, coach, 3½d. per lb.; item 2, 7300 lb. screws, 3¼d. per lb.—Messrs. Theodore Zwicker and Co.

Item 1, 650 balloons for Meidinger cells, 5d. each; item 2, 1000 jars for Medinger cells, 8d. each; item 3, 1500 cells, Callaud, 1s. 9d. each; item 4, 600 cups for Meidinger cells, 3d. each—Messrs. Dott and Co.

250 tons wire, hard-drawn copper, 200 lb. per mile, £85 6s. per ton—British Insulated and Helsby Cables Ltd.

Item 9, 9000 cable clamps, pattern A, size No. 2, 2¾d. each; item 10, 7000 cable clamps, pattern A, size, No. 3, 2¾d. each—Sheradising Pty. Ltd.

POSTMASTER-GENERAL'S DEPARTMENT, Sydney.—140 tons bolts, £18 7s. 6d. per ton—Thomas McPherson and Son.

Eight incoming junction switchboards, at £344 each; spare equipment, £276; tools, £6 7s. 6d.; 2 miles 42 wire cable, 1s. 4d. per yard; ½ mile 63 wire cable, 1s. 10d. per yard—Jas Paton and Co.

### Victoria.

VICTORIAN RAILWAYS.—E. of station buildings and ramp at North Fitzroy Railway Station, "down" side, £755 14s. 3d.—H. W. Sutcliffe.

C. and riveting of mild steel girders, etc., for use in the renewal of the Moorabool Viaduct, Geelong to Ballarat line (second section from existing pier No. 4 to existing pier No. 7), £9244 15s. 1d. —Dorman, Long and Co. Ltd.

P. of 1 portable air compressor for State Coal Mine, £105—Australian General Electric Co.

M. and S. of motor-driven centrifugal pump and switchboard for Hopetoun, £146 9s. 6d.—Welch, Perrin and Co.

M., S. and D. of bearing springs for workmen's sleepers and "Z" vans—Item No. 1, bearing springs for workmen's sleepers with 13 plates, finished to sample, as specified, at £1 5s. 6d. each; item No. 2, bearing springs for "Z" vans, canopy end, 9 plates, finished to sample, as specified, £2 12s. 6d. each; item No. 3, bearing springs for "Z" vans, centre and end, with 8 plates, finished to sample, as specified, at £2 7s. 9d. each—Federal Spring Works.

M., S. and D. of forgings for 15-ton steel "I" class and Louvre trucks, etc.,—Item No. 5, hand brake lever end, at 6s. 8¾d. each; item No. 38, brake shaft, at £2 2s. 4d. each; item No. 39, brake shaft brackets (outside), at 10s. 11¼d. each; item No. 46, brake fulcrum levers, at 6s. 8½d. each; item No. 53, ridge pole standards (mild steel and wrought iron), as specified, at 13s. 5d. each—Gray Bros.

C. and riveting of mild steel girders, etc., for use in the renewal of the Moorabool Viaduct, Geelong to Ballarat line (third section from existing pier No. 7 to existing pier No. 11), £11,510 14s. 11d.—Dorman, Long and Co. Ltd.

M., S. and D. of 1in. steel fishbolts with steel nuts for 80lb. and 100lb. rails (from steel which will be sold to the contractor by the corporation), for renewals, at £23 per ton, delivered into railway trucks at Warrnambool—C. C. Wiggs.

M., S. and D. of 1in. steel fishbolts with steel nuts for 80lb. and 100lb. rails (from steel which will be sold to the contractor by the corporation), for renewals, at £24 9s. 6d. per ton, delivered at Spencer-street Railway Station—Victoria Iron Rolling Co. Pty. Ltd.

S. and D. of Victorian coal, suitable for storage purposes, from 1st January, 1913, at 13s. 8d. per ton—The Outtrim, Howitt and British Consolidated Coal Co.

S. and D. of copper scrap, at £64 10s. per ton —The Moreland Smelting Works Pty. Ltd.

S. and D. of block tin, at £193 per ton—The Pioneer Tin Mining Co. Ltd.

M., S. and D. of 1 emergency pumping plant for emergency work, at £135—Orton and Burns.

M., S. and D. of copper water tanks and fittings for new country cars, at £42 13s. 4d. per set —McAuley Bros.

M., S. and D. of rolled steel joists, angle braces, bed-plates, clips, etc., for superstructure of bridge at 160 miles 64 chains 89 links, Serviceton line—Dorman, Long, and Co. Ltd.

M., S. and D. of rolled steel joists, angle braces, bed-plates, clips and bolts for renewal of bridge at 23 miles 24 chains 83 links, John-street, Lilydale—Dorman, Long and Co. Ltd.

### Western Australia.

WATER SUPPLY.—3in. steel pipes, £483 15s. —Strelitz Bros.

Pig lead, f.o.r. Fremantle, £23 3s.—H. T. Wright.

Firewood for Claremont and Fremantle pumping stations, 10s., 12s. 3d. per ton—F. Cunningham.

16,000ft. of 30in. steel pipes, 17s. 6d. lin. foot—Strelitz Bros.

Tuck's hydraulic packing, 2s. 4d. lb.—C. Atkins and Co. (W.A.) Ltd.

RAILWAYS.—Steel angles, plates, tees, etc., items 1932 to 2063—H. J. Skelton and Co. (per Agent-General).

Steel angles, plates, tees, etc., items 2064, 2065 —G. Wills and Co.

PUBLIC WORKS.—2 only vertical steam boilers, £78 18s. each—McLean Bros. and Rigg Ltd.

MINES.—Sodium cyanide, £70 ton—G. Wills and Co.

Granulated Carbide, £14 9s. 6d. ton—Elder, Shenton and Co. Ltd.

### General.

MELBOURNE CITY COUNCIL.—S. of 2 tons steel joists, £25—Dorman, Long and Co.

P. of secondhand machinery at electric light station, £750—George and Hill.

S. and D. of C.I. bases and brackets for arc lamp poles, £101 4s.—John Payne and Sons Pty. Ltd.

TOWN OF NORTHCOTE.—S. of 4 single phase transformers, £372 10s.; fuse and switchgear, £550 —Australian Metal Co.

Rubber covered cables, £239 7s. 6d.—Steffens and Noelle and Henley's Telegraph Works Co.

Metal Filament lamps, cast iron brackets and reflectors, £96 15s.—Noyes Bros.

Flame arc lamps, £192 2s. 8d.—Union Electric Co.

Insulators, iron pole brackets and pins, £236 13s. 9d.—Commonwealth Art Pottery.

House service fuses and A.C. meters, £406 3s.—Australian Metal Co. and Helsby Cables Co.

Bare copper cables, £495 3s. 4d.—British Insulated and Helsby Cables Co.

## WESTERN AUSTRALIAN MINING

(From Our Correspondent.)

Kalgoorlie, Sept. 29.

The Golden Ridge Co. is now pushing on energetically with the development of the Yerilla group of leases, situated 25 miles east of the Kookynie railway station, on which the company holds a six months' option dating from the middle of July. This group comprises four blocks, aggregating 59 acres, and includes the Yerilla King, Viola and Yerilla Queen on the strike of the reef, and 18 acres, pegged by the company, adjoining the nor'-west boundary. The Yerilla King, the principal lease, produced, between 1905 and 1912, £11,500 from 2600 tons. In December, 1912, a shaft was sunk on a new reef in the Yerilla King, and, at a depth of 130ft., or water level, a crosscut, put in 60ft. west, penetrated the reef where it was 2ft wide, and assayed an ounce to the ton. A level was then driven a distance of 400ft., and 734 tons, broken in development, was treated at the Government mill for a return of £3300, exclusive of gold in residues. The sinking of the shaft was then continued, and cut the reef at 187ft., and passed through it at 192ft. At this depth the reef was 24in. wide, worth 170s. per ton. The Viola, adjoining on the south, up to that time had produced £11,850 from 2300 tons, between 1904 and 1912, from a narrow vein. A new shaft was then commenced on the King lease, and at a depth of 130ft. the reef was cut. Since then two crushings, totalling 405 tons, have been treated for a return of £2210, or 110s. per ton. The Yerilla Queen, adjoining the Viola on the south, was pegged in April, after the returns from the King and the Viola were published. After sinking 110ft. a crosscut was put in to test the reef, and proved it to be 12in. wide of an assay value of 85s. per ton. On the north boundary of the Yerilla King, Tom Love then pegged a prospecting area, and cut the same reef carrying fine and coarse gold over a width of 12in. This proves that the reef runs right through the King and Viola leases, a distance of 30 chains, and still continues north and south. The reef consists of quartz 12in. to 24in. wide, and carrying gold of a value of 85s. to 110s. per ton, and underlying east at an angle of 45 degrees. Since taking the option the Golden Ridge Co. has started opening out on the King at 230ft., and the Queen at 130ft. Before acquiring the option the continuity of the ore-shoot in the oxidised zone was abundantly proved, and the values were also well maintained, and in the sulphide zone at 190ft., in the King lease, the width was maintained and the value doubled. The Golden Ridge Co. has a nominal capital of 100,000 shares, and appears to have a good thing, so long as the shares are not overvalued, and the Yerilla group of mines is not forced beyond its capacity. The developments in Chaffers at No. 16 level, which have been recently recorded, are disappointing, considering the position of the mine. The main west crosscut passed through No. 1 lode (Horseshoe No. 4) and No. 2 (Horseshoe No. 3), where they were both unpayable. At 376ft. west No. 3 lode (Horseshoe No. 2) was penetrated, where it was 51in. wide, worth 30s. per ton. After driving 36ft. north on ore assaying 25s. 6d. per ton, work was stopped. At 427ft. west of the shaft a branch of No. 3 lode (Horseshoe No. 2), assaying 32s. per ton for a width of 5ft. was met with. A south drive has followed this lode for a distance of 114ft. on ore assaying 80s. to 127s. 6d. per ton for a width of 5ft. This is the best development recorded, but, unfortunately, this drive is nearing Hannan's Star boundary. This lode does not maintain its value north of the crosscut. At 535ft. west of shaft No. 4 lode (Horseshoe No. 1) was cut, where it was 6ft. wide and worth 25s. 6d. per ton. No work has been done at this point yet, but in another crosscut, 319ft. north, the same lode was cut 576ft. west of the shaft, and a south drive extended 300ft. in ore assaying 29s. per ton for a width of fully 6ft. A west crosscut at No. 15 level has been driven 254ft. without encountering anything of value in either 1 or 2 lodes. The ore shoots in the rich Horseshoe 4 lode, and also No. 3, appear to peter out before reaching Chaffers boundary, and the longest shoot so far proved is in the Horseshoe No. 1 lode, which has practically produced no ore in the Horseshoe. Judging from developments in the Horseshoe, it will be necessary to open up deeper in Chaffer's. However, at Chaffer's deepest level—226ft.—Horseshoe's No. 4 lode has been driven on for a distance of 100ft. in unpayable ore. It is interesting to note that in Mr. John Morgan's report, dated April 4, 1912, he wrote: "Although the ore opened up on No. 1 lode at No. 16 level is not payable, praticcally no work has been done on this lode below No. 16 level, and there remains reasonable prospects of opening up payable ore by further exploratory work at deeper levels." Instead of following Mr. Morgan's advice, Mr. Boyd Aarons, the manager, has continued developing at No. 16 level, and is now proceeding to develop at No. 15. This in spite of the fact that the richest developments in the Horseshoe are at 2480ft., 2630ft. and 2780ft., and also that the ore shoots in all the lodes in the Horseshoe are pitching further and further south below the 1200ft. level.

The first instalment of £1500 in payment of the Comet is due on October 1, and it will be interesting to see whether the option will be exercised in face of the fact that granite was encountered at a depth of 34ft. in the winze below the 202ft. level. Mr. Stuckey appears still to be living in hope that the granite intrusion in the bottom of the Greenfinch is only transitory, and the management of the Royal Standard is under the same delusion. For the sake of the shareholders it is to be hoped that the granite will disappear, but it is rather a vain hope.

## DIVIDENDS.

The following dividends and bonuses of mining companies in Australia have been declared, and are payable on the dates noted:—

October.

10th.—Bellambi Coal Mines (N.S.W.), 1s., £20,000.

13th.—Porepunkah Gold Dredging Co., Bright (V.), 1s., £250.

15th.—Broken Hill Propy. Block 14 (N.S.W.), pref. and ord. 1/-, and pref. interest at rate of 10 per cent. per annum, £11,500.

16th.—Tongkah Compound Tin Dredging Co., Siam, 1s., £2500.

21st.—Campbell's Creek Dredging Co., Castlemaine (V.), 6d., £800.

22nd.—Tongkah Harbour T.D. Co., Siam, 2/-, £15,000.

23rd.—Ajax Central G.M. Co., Daylesford (V.), 2s., £2000.

29th.—Ivanhoe Gold Corporation, Kalgoorlie (W.A.), 3s. 6d., £35,000.

November.

3rd. — Bullfinch Proprietary (W.A.), 1s., £23,800.

## MIXED MEMS.

In the West Australian Legislative Assembly last week Mr. F. Wilson, leader of the Opposition, described the clause of the new Mines Regulation Bill dealing with the abolition of the contract system as the most pernicious in the whole of the pernicious bill, as it proposed to take away from citizens the right to earn the best they could for their skill. Even the Minister of Works, he said, was not carrying out all his works on the day wages system. Instructions had been given that railway construction work was to be sublet on a contract basis, the very thing that the Labour party was always complaining of the Liberals doing when they were in power. He asked why an attempt was being made to prevent miners working on contract when the door was being thrown open for contract work in other industries. This clause, however, was passed in committee, as were also those providing for compensation on injury to or death of a worker in cases of proved negligence, accident to be prima facie evidence of neglect, and the granting, cancellation, and suspension of certificates of competency to mine managers.

At the opening of the Miners' and Enginedrivers' annual Charity Carnival at Maldon (V.) last week, Mr. T. M. Jude, general secretary of the Federated Mine Employees' Association, said the trend of recent legislation more than ever emphasised the fact that their legislators required to be brought more directly into touch with the conditions of the mining industry. Measures that were proposed to deal with the position of worn-out miners were mere palliatives. They should get down to bedrock and prevent the conditions that conduced to disease, instead of resorting to measures that were bound to prove futile.

Some inconvenience was caused to the mining companies and the citizens at Broken Hill (N.S.W.) last week by the breakdown of one of the pumps at the Stephen's Creek reservoir belonging to the Broken Hill Water Supply Ltd., and the bursting of some of the main. The inconvenience was less serious than it might otherwise have proved, owing to the falling of Eight Hours Day on Thursday, the necessary repairs to the pumps having been completed by Friday. The position was most keenly felt by the mines at the southern end of the field, the South, South Blocks and Zinc Corporation being the greatest sufferers.

We mentioned a fortnight ago that German hospitals and medical practitioners had been eagerly buying up all the English-made radium that they could procure, and last week a cablegram announced that the various German Governments, the municipalities, hospitals, and private philanthropists were competing to secure mesothorium, one of the derivatives of thorium, which is useful, in a less degree than radium, for all the cures claimed for radium, and that public subscriptions were being raised for the purpose. Mesothorium is a preparation discovered by the Berlin doctor, Otto Hahn, assistant of Geheimrath Fischer, and successfully utilised in the treatment of cancer. Lately some Dusseldorf philanthropists collected £13,000 for the purchase of mesothorium, but that sum was only sufficient, according to the Lokalanzeiger, for the treatment of two patients. Each patient (says the Berlin correspondent of the "Daily News") requires about half a gram, and one gram costs roughly £13,000. There are only four German factories producing mesothorium, and their output is already allocated up to the end of 1914. From thorium earth there is also derived material employed in the manufacture of incandescent mantles.

Speaking at Maldon (V.) last week, Mr. H. S. W. Lawson, M.L.A., at whose suggestion the Legislative Assembly recently appointed a committee to inquire and report as to the conditions of mining work and the position of the unfortunate miners suffering from lung troubles, said that the committee had completed its labours, and the report recommended:—(1) Immediate assistance to worn-out miners; (2) the establishment of a subsidiary fund for worn-out miners; (3) provision for men who are in danger of contracting phthisis by reserving areas of land where a reasonable chance is given of making a livelihood. Considerable difficulty was experienced in obtaining information as to the prevalence of disease, and he urged the branch to assist in furnishing it.

The September output of the Great Cobar Ltd. (N.S.W.) is reported as follows:—Copper produced for month at Cobar 532 tons, containing by estimation—Gold, 2411 oz.; silver, 10,819 oz.; concentrates on hand estimated to contain—Copper, 80 tons; gold, 72 oz.; silver, 560 oz. The output for August was as follows:—Copper produced for month at Cobar, 546 tons; containing by estimation—Gold, 2746 oz.; silver, 10,143 oz. Concentrates on hand, estimated to contain:—Copper, 76 tons; gold, 53 oz.; silver, 485 oz.

A second fire was discovered by the watchman at the Hope mine, Beaufort (V.), on Saturday, and fortunately in time to extinguish it before it obtained a hold. The appearance of incendiarism in the first outbreak is considerably strengthened by this incident.

"We expect," say the directors of the Jumbunna (V.) Coal Mine N.L., in their half-yearly report, "prices of coal to harden in the near future, as owing to the all-round increase in the cost of labour, both locally and in the shipping trade, it is generally admitted that the coal business of Melbourne is at present carried on at a loss." The closing of the company's city depot for four weeks during the busiest season, through the strike of coalyard men, is also referred to, but shareholders are informed that the demand for Jumbunna coal is far greater than the supply. The mine is now passing through an area of faults and low coal, and working costs are proportionately heavier, but the directors "look forward with hope that within the next twelve months they will have opened up an area of good profitable coal, and that the company will again be earning regular dividends. The output during the last half year was 23,122 tons, against 24,404 tons for the preceding term, and 24,743 tons for corresponding August term last year. But the half-year ended in a loss of £463, in addition to a sum of £250 provided last April to make up £2250 to pay the 16th dividend. There is a balance to credit of profit and loss account amounting to £8750.

In reply to Senator Oates, of New South Wales, Senator Clemons (T.), honorary Minister, stated last week that the total amount of counsels' fees in the "Coal Vend cases," initiated by the Deakin Government, but carried through by the Fisher administration, was £17,249, made up as follows:—At the trial, £9256 8s. 5d.; High Court appeal, £1965; Privy Council appeal, £6207 10s. 6d. The total fees to various counsel engaged were:—Dr. Cullen (now Sir William Cullen, Chief Justice of New South Wales), £311 16s.; Mr. Wise, K.C., £6597; Mr. Shand, K.C., £2734; Mr. Starke, £2403; Mr. Bavin, £2138 12s.; Sir R. B. Finlay, £1976 12s. 6d.; Mr. Sargent, £174 6s.; Mr. Page, £1093 10s. 6d.

During the visit of the delegates of the British Association for the Advancement of Science to Victoria next year, one day will be devoted to the inspection of the Bendigo district and its mines, and the following day the party will be taken a round trip to Poseidon, Newbridge, Laanecoorie Weir, Lockwood, and Kangaroo Flat, and return to Bendigo. Mr. Heyman Herman, the State Government Geologist, visited Bendigo last week for the purpose of mapping out the excursion.

A miner who had belonged to the Bendigo (V.) branch of the Mine Employees' Association for 20 years, enrolled himself for employment last week at the Virginia mine, Eaglehawk, in spite of the fact that the Association's officers had called out all unionists on account of non-unionists being employed there.

After making every effort to secure coke supplies, but without avail, the management of the Tasmanian Smelting Company has notified that its works will have to be temporarily closed down. It is explained that the Australian demand for coke has enormously increased, and that this, coupled with the export trade with America, has made reliable supplies impossible. On previous occasions, when the Smelting Company has been short of coke, the Mt. Lyell Company has been able to help it through its famine period, but at present the Mt. Lyell stock is very low. Efforts will be continued to secure the necessary fuel and to resume work as soon as possible. The cessation of work will for the time seriously affect the district, as it means loss of work not only to the employees at the smelting works, but also to many miners and wood-cutters. It is reported that all the unmarried miners at the Hercules mine will be discharged, and also one shift at the Primrose mine, and practically all the men at the Comet mine.

One amendment made in the Victorian Mines Act Amendment Bill by the Legislative Council is regarded with disfavour by several members of the Bendigo Mine Managers' Association, as having a tendency to lower the standard relating to mine managers' certificates. The Council proposed to reduce the number of men underground from twelve to six for a manager to qualify for a first-class certificate. Without a doubt this would largely increase the number of "first-class" men, but the significance of the certificate would be much diminished. However, the Association itself is not unanimous in the desire to maintain a high standard of certificated men.

The first general meeting of shareholders of the Mt. Murphy Wolfram Mining Co., Benambra (V.), was held on 29th September. The chairman (Mr. R. J. Poulton), in the course of his address, stated that No. 2 tunnel was now in about 270 feet, leaving 180 feet to be driven, which he expected would be completed about the middle of November. Upon the commencement of active operations he expected that about 100 to 110 tons of ore would be milled per week, which would yield about 5 tons of wolfram concentrates, worth here, at present prices, about £600. This would leave a large profit for division among shareholders. Mr. Muirson, late manager of the mine, gave full particulars of the work done and in progress. The legal manager was instructed to place the balance of shares (57) of the first issue of 300 at £7 10s. (paid to £5) amongst the present shareholders only or their nominees.

There are persistent rumours at Beaufort (V.) that the directors of at least one of the mines of the district which have been laid idle because unionists are forbidden to work with non-unionists, have arranged for a full complement of men to take the places of those on strike, and that a final notice is about to be issued to that effect. This is the third week of the strike.

In connection with the householders' budget inquiry which the Commonwealth Statistician is conducting next month, nearly 1000 applications for budget books have already been received by the Statistician. In order to enable complete particulars to be furnished for various parts of the Commonwealth, and the results to be tabulated according to size of family, amount of income, occupation, etc., it is desired that several thousand records should be furnished. As the questions involved are at the present time so prominently attracting public attention, the Commonwealth Statistician will be glad to hear from other persons who are willing to assist by keeping a record of income and expenditure for the four weeks from the 2nd to 29th November next. Budget books may be obtained free on application to the Commonwealth Statistician, "Rialto," Collins-street, Melbourne.

## BANK CLEARINGS.

The report of the Melbourne Clearing House for the week ended 6th October was:—

| | | |
|---|---|---|
| Total clearance | | £7,624,468 |
| Balances— | | |
| Settled by certificates | £609,000 | |
| Settled in coin | 188,468 | |
| | | 797,468 |
| Total clearance for the corresponding week, 1912 | | 5,888,304 |

In connection with the discovery of molybdenite near Bega (N.S.W.), 37 applications have been made at the local warden's office for permission to prospect private property. The area covered by the applications totals 1200 acres.

## Government Notices (N.S.W.).

Department of Public Works,
Sydney, October 3, 1913.

TENDERS FOR MACHINERY, ETC.

TENDERS, specified below, will be received at this Department until 2 o'clock p.m., on the dates mentioned:—

MONDAY, OCTOBER 13, 1913.

Supply, etc., of Two 3 ton Electric Jib Crane for State Brickworks, Homebush Bay.

MONDAY, OCTOBER 27, 1913.

Manufacture, etc., of Steel Bridge for Wilson River, Wauchope to Kempsey Section, North Coast Railway.

MONDAY, DECEMBER 8, 1913.

Manufacture, etc., of Steel Bridges for Cooper Lung and Piper's Creeks, on 5th Section, North Coast Railway.

**Further particulars may be obtained from N.S.W. "Government Gazette."**

(6a91) ARTHUR GRIFFITH.

---

N.S.W. Government Railways,
Office of the Chief Commissioner,
Sydney, October 4, 1913.

**TENDERS** will be received at his Office until 12 o'clock noon on the dates specified for the undermentioned works, etc., viz.:

WEDNESDAY, OCTOBER 15, 1913.

The Supply of 13 Direct Current Motors, to specification No. 412 (price, 2/6).

The Supply of Forges, Tools and Shafting for Overhead Line Repair Shops, to specification No. 428 (price, 2/6).

WEDNESDAY, NOVEMBER 12, 1913.

The Supply of Three 30-kilowatt Motor Generators, to specification No. 427 (price, 2/6).

WEDNESDAY, NOVEMBER 26, 1913.

The Supply of One 2000 lb. Storage Battery Freight Truck, to specification No. 426 (price, 2/6).

All specifications are obtainable at the Electrical Engineer's Office, 61 Hunter-street, Sydney.

Tenders are to be endorsed, "Tender for D.C. Motors," or as the case may be.

The Chief Commissioner does not bind himself to accept the lowest or any tender.

By order,
J. S. SPURWAY,
Secretary.

---

BOARD FOR APPOINTING EXAMINERS.

COAL MINES REGULATION ACT.

**APPLICATIONS** are invited for the Position of Examiner of Candidates for First and Second Class Certificates of Competency under the Coal Mines Regulation Act, for the year 1914, and will be received to the 31st October, 1913.

Two examinations yearly.

Remuneration—£10/10/ per examination; 15/ per diem travelling expenses; railway fare.

Also for the Position of Examiner of Candidates for Mine Electrician's Certificate.

One examination yearly.

Remuneration—£6/6/- for the examination; 15/ per diem travelling expenses; railway fare.

The Board reserves to itself the right to appoint any person as an Examiner, whether he shall have applied in response to this advertisement or not.

By order,
C. A. SIMMS,
Secretary.

Department of Mines,
Sydney, October 1, 1913.
(8a34)

---

## Commonwealth of Australia.

Department of Home Affairs,
Melbourne, October 2, 1913.

KALGOORLIE TO PORT AUGUSTA RAILWAY.

LOCOMOTIVE ENGINES AND TENDERS.

**TENDERS**, addressed to the Secretary, Department of Home Affairs, Melbourne, will be received up to 11 a.m. on Wednesday, November 5, 1913, for the Manufacture, Delivery and Erection in running order, of:—

4 or 8 Locomotive Engines and Tenders (New South Wales "P" Type), Tender Capacity 4500 gallons of water and approximately 7½ tons coal.

Specifications will be on view on and after October 7, 1913, at the undermentioned offices:—Commonwealth Railways, 84 William-street, Melbourne; Commonwealth Works Director, Customs House, Sydney; and Commonwealth Works Registrars, Brisbane, Adelaide, Perth, and Hobart.

The charge for each copy of specification will be £1/1/-, which must be paid before the documents can be issued.

Tenders are to be endorsed "Tender for Locomotive Engines and Tenders," and are to be accompanied by the deposit mentioned in the form of tender.

JOSEPH COOK,
Minister of State for Home Affairs.

---

Postmaster-General's Department,
Melbourne, October 3, 1913.

**TENDERS** will be received at the office of the Deputy Postmaster-General, Melbourne, until 3 p.m., on November 11, 1913, for the Supply and Delivery of Relays, Jacks, Lamps, etc. (Sch. 982). See "Commonwealth Gazette," October 4.

AGAR WYNNE,
(1259) Postmaster-General.

---

## MUNICIPAL COUNCIL OF SYDNEY.

TO CONTRACTORS.

**SEALED AND ENDORSED TENDERS** will be received by the undersigned until 3 o'clock on **MONDAY, 27th October, 1913, for the SUPPLY AND DELIVERY OF CURVE DRAWING AMMETERS.** Copies of specifications, etc., may be seen or obtained upon application at the office of the City Electrical Engineer, Town Hall, Sydney, upon payment of the sum of 10s. 6d. The lowest tender or any tender not necessarily accepted. TENDERERS please note that they must pay their cash deposits direct into the City Treasury, and NOT enclose the same with their tenders; otherwise their tenders will be rejected as informal.

THOMAS H. NESBITT.
Town Clerk.

Town Hall, Sydney.
19th September, 1913.

---

## MUNICIPAL COUNCIL OF SYDNEY.

TO CONTRACTORS.

SEALED AND ENDORSED TENDERS will be received by the undersigned until 3 o'clock on **MONDAY, the 13th OCTOBER, 1913**, for the following:—

(a) THE SUPPLY AND DELIVERY OF STONEWARE BRIDGES.

(b) THE SUPPLY AND DELIVERY OF BLACK IRON CABLE CLIPS AND PINS.

(c) THE SUPPLY AND DELIVERY OF COAL TRIMMING CHUTES.

(d) THE SUPPLY AND DELIVERY OF WOOD TROUGHING.

(e) THE SUPPLY, DELIVERY, AND ERECTION OF GANGWAYS, LADDERS, ETC.

Copies of specification may be seen or obtained upon application at the office of the City Electrical Engineer, Town Hall, Sydney, upon payment of the sum of 10s. 6d. in each case.

The lowest or any tender not necessarily accepted.

TENDERERS please note that they must pay their CASH DEPOSITS direct into the City Treasury, and NOT enclose the same with their tenders; otherwise their tenders will be rejected as informal.

THOMAS H. NESBITT.
Town Clerk.

Town Hall, Sydney.
26th September, 1913.

---

## THE METROPOLITAN WATER AND SEWERAGE BOARD.

TO IRONFOUNDERS, MACHINERY MERCHANTS, ETC.

EXTENSION OF TIME.

CONTRACT No. 21 OF 1913.

**SEALED TENDERS will be received until 12** o'clock noon on Tuesday, January 13, 1914, for **the Manufacture and Delivery of Material for an** Aerial Ropeway, in accordance with plans and specification, which may be seen at this office.

On application to the Chief Clerk, conditions of tendering and forms of tender will be supplied free of charge. If copies of the specification, plans and general conditions of contract are supplied a fee of One Pound sterling (£1) for a complete set will be charged, or for specification and general conditions of contract only, a fee of Ten Shillings (10/-) will be charged, which fees, respectively, will, on return of the documents, be refunded to the tenderer on application in writing.

Tenders to be endorsed on front of envelope containing same, "Tender for Material and/or Machinery for Ropeway."

The lowest or any tender not necessarily accepted.

By order,
GEO. JOHNSTON,
Office of the Board, Secretary.
Albert-street, Brisbane.
September 29, 1913.

---

## CITY OF AUCKLAND.

ELECTRICITY DEPARTMENT.

FOR SALE.

Three 250kw. Direct Coupled Steam Generators with Switchgear.

Specifications may be obtained on application to the City Electrical Engineer, Railway Wharf, Auckland, New Zealand.

Offers, endorsed "Tenders for Old Plant," must be addressed to the Town Clerk, Town Hall, Auckland, New Zealand.

HENRY W. WILSON,
September 16, 1913. Town Clerk.

---

## SHIRE OF HEIDELBERG.

TENDERS are invited up to 4 o'clock on Thursday, October 16, 1913, for the following:—(1) Steam Road Roller, fitted with Scarifier; (2) Portable Stone Crusher. Particulars may be obtained at the Shire Office, Heidelberg.

H. J. PRICE, Shire Secretary.
Shire Office, Heidelberg, Sept. 20, 1913.

---

TENDERS are invited for the Purchase or Working on Royalty of the Nichols Copper Co.'s "Improvements in Ore Roasting Furnaces," covered by Commonwealth Letters Patent No. 19,832 of November 3, 1910. The proprietors will dispose of the whole or part interest in the patent or will grant licenses to work the same to fulfil the full requirements of the public. Address: c/o Phillips, Ormonde and Co., patent attorneys and consulting engineers, 17 Queen-street, Melbourne.

---

## MECHANICS AND INSTRUMENT FITTERS.

NEW CLASS just enrolled for Full Course for December Exams. Splendid positions for competent men. We have full equipment for course in Telephony and Bench Work. Class meets again on Wednesday, 8 p.m.

AUSTRAL COACHING COLLEGE,
195 Little Collins-st. F. Thomas, M.A.

---

## WANDILIGONG GOLD DREDGING CO. N.L.

A DIVIDEND (the 58th) of One Shilling per share has been declared, payable at the registered office of the Company, Gavan-street, Bright, on Thursday, October 23, 1913. Transfer books close Thursday, October 16, 1913.

P. J. BREEN, Manager.

---

## FOR SALE.

Hydraulic Sluicing Plant, comprising Robey 30 h.p. Portable Engine, 2 13in. Cylinders, 120 lb. W.P. 10 and 12in.; or 12 and 14in. Gravel and Water Pumps; large quantity Piping, 6in. to 26in. dia., etc., All nearly new, only worked ten weeks. Would quote any portion, or the whole. MILLER & CO. PTY. LTD., Machinery Merchants, 27 Queen's Bridge-street, South Melbourne.

---

## CATHCART CENTRAL GOLD MINING CO. NO LIABILITY.

A DIVIDEND (4th) of Two Shillings per share has been made, payable on Thursday, October 30, 1913. Books for transfer close from Thursday, October 23, 1913. D. MURRAY, Manager.

## FROM FOREIGN SOURCES.

(Specially translated for the "Mining Standard.")

A simple and very handy new switchboard rminal, to which the name of Phoenix has en given, has lately been designed by a firm Westphalia. An insulating rod, about 20in. ng. is provided, with 22 drill holes for the rminals. This rod is then sawn to a length rresponding to the number of terminals required, and fastened by two screws, about ¾in. om the top edge of the switchboard. Only o holes have therefore to be drilled into the ard, whereas previously it was necessary to epare and drill it for every single terminal, ways a tedious and troublesome job. The rods th the terminals can also be fitted in steps he ends of the wires are also fastened by eans of the screw, which serves to fix the terminals in the insulating rod, and it is no longer cessary to bend these and fasten them with e screw-head, as they can be introduced rectly into the terminals. The frame can be ade to correspond exactly with the size of the itchboard, so that everything is covered in. witchboards will be greatly saved by using se terminals, and return a smooth appearance. The main advantages of these terminals re as follows:—Simple and convenient fitting, ving in time, preservation of the switchboards, and reliable and ready attachment to he wires.

A new process of frosting the glass bulbs of ncandescent lamps, called the "Eak" dull picking, has recently been invented by a German rm. No fluor-hydric acid is used in this method, which is easily applied, and gives the mp a beautiful frosted appearance, equal to ything that could be produced in the factory. The operation recommends itself particularly to ectricity works fitters, and retailers of incandescent lamps, as it is absolutely safe, and onsists in a simple process of dipping. The sult is a dull surface etching of the glass, hich does not wear off, and does not turn yellow. The process of frosting is absolutely without danger, and can be executed in any room. Care must only be taken that the latter is kept warm as possible, and the "Eak" pickling can eventually be first warmed in a water bath, aving a temperature of from 40 to 50 degrees entigrade. This will expedite the frosting, which however can also be effected without warming the pickle, in an ordinary room temperature of from 15 to 20 degrees, although, in that case the material according to the nature of the glass, must be left longer on the glass ulb before washing in water and drying. It s stated that the actual cost for standard lamps is only from 1-16d. to 1-8d. per lamp.

The Berlin representative of the "Frankfurter Zeitung," in a telegram, dated May 6, says that he has received from the Company for Wireless Telegraphy (Telefunken) the following communication:—Under the heading of "Marconi's Victory," several German newspapers have copied from the English press the statement that the commission appointed by the British Parliament had recommended the English Marconi system as being the wireless system best suitable for establishing a British world system. The statement of the reasons for this choice, in the form adopted by some newspapers, has had the unintentional effect of giving rise to false impressions concerning the German achievements in this respect. The task of the British Commission consisted in establishing which companies are in a position to produce commercial wireless communications, the technical achievements of which answer certain fixed conditions, with which the English proposals are concerned. The commission has acted systematically and impartially, and has enquired from the Telefunken Co. whether it would be prepared to prove certain achievements. The Telefunken Co. was obliged to return a negative answer, since there is no suitable station available for communicating with the large Nauen station, over a distance of 2300 miles, and no such station could be provided for within the stipulated time. For this reason, the commission merely inspected Nauen without making any distance experiments, and in its report has rendered full justice to the technical position of the Telefunken system as compared to the other wireless systems.

If the report states that the commission had been able to satisfy itself as to the commercial working of the Marconi system over a distance of 2300 miles, whereas Telefunken had not yet adduced the proof for a similar achievement, albeit Nauen had already made successful experiments over a distance of 4000 miles, the commission will certainly not announce an inferiority of Telefunken. It will simply establish the fact that the connection between Ireland and Canada (2300 miles), which has been for years in the possession of Marconi, and works well, has been inspected, while in Germany Telefunken did not show the commission a connection working under similar conditions. That throughout the world there are as many stations equipped with the Telefunken system, and working as well as those on the Marconi system, is perfectly well known to the Technical Commission. Amongst these there are no two stations at precisely the distance and under precisely the same conditions, as asked for by the commission, just as there are, with the exception of the two transatlantic stations which have been examined, no two other such stations on the Marconi system.

In its annual report on the position of the electrical industry, the Berlin Chamber of Commerce states that, on December 31, 1912, the total connections of the Berlin Electricity Works amounted to 241,568kw., as against 216,058kw. on the same date of the preceding year. These connections were distributed as follows: — Incandescent lamps, 1,687,243; arc lamps, 45,585; motors, 37,465; aggregating 149,875 horse-power, appliances 7133. The consumers numbered 40,914 (1911, 34,329), and house connections 19,865 (1911, 17,629). For public lighting purposes, there were installed—2726 arc lamps, 1188 incandescent lamps, and 1 quartz lamp. Including the works' own consumption of light and power, the consumption for the year amounted to 169,575,450kw. hours (1911, 140,963,514); for purposes of electric railway traction, 71,252,422kw. hours (1911, 67,173,261). The Berlin Suburban Electricity Works' connections on December 31, 1912, aggregated 14,842kw., the consumers numbering 5845, with 6538 measuring instruments. The current supplied in 1912 amounted to 1,892,496 kw. hours for lighting purposes (1911, 1,974,646), and 3,493,068kw. hours for power purposes (1911, 2,880,128). In addition, the electricity works of the Felton Canal supplied 891,287kw. hours, and the Electricity Works of the municipality of Friedman 1,979,973kw. hours.

Telephone—5866 Central. Cable Address—"PORPHYRY."

**Edward Dyason and Co.**

MINING ENGINEERS AND METALLURGISTS,

Examine, Report on, and Value Mining and Metallurgical Properties.

Consulting Engineers.

60 QUEEN STREET - - - MELBOURNE,

Codes A.B.C. 5th Edition. Moreing and Neal. Bedford McNeill.

250 H.P. Turbine Showing Wheel and Guide Vanes.

**G. Weymouth Pty. Ltd.**

Electrical Engineers,

Neptune-street, RICHMOND, VIC.

Telephones:—
Office, 2651 Windsor.
Works: 2507 Central.

Manufacturers of all Classes of Electrical Machinery, Turbines, Pumps for Irrigation and Mining, Underground and Surface Mining Locos., Winches, Haulage and Winding Plants, Motors, Generators, etc.

Estimates submitted.

Correspondence invited.

**THE BROKEN HILL PROPRIETARY COMPANY LTD.**

Smelters and Refiners.

TARIFF ON APPLICATION.

MANUFACTURERS OF:

SOFT PIG LEAD, FINE SILVER, ANTIMONIAL LEAD, COKE, SPELTER, BLUEPOWDER (ZINC DUST), and SULPHURIC ACID.

Branch Offices—
LONDON, 3 Great Winchester-st., E.C.; ADELAIDE, Alfred Chbrs., Currie-st.; SYDNEY, Imperial Chbrs., O'Connell-st.

HEAD OFFICE.
Equitable Building, Collins Street, MELBOURNE.

"Allen's"

IMPERIAL

Manganese Steel

FOR

Dredging Pins and Bushes, and all Wearing Parts of Rock-Crushing Machinery, Points, Crossings, Etc.

SOLE MAKERS OF

THE "STAG" TUBE MILL

For Grinding Grit, or Tailings, and Granular Materials, to any degree of Fineness.

THE "STAG" BRAND OCTAGON MINING DRILL STEEL

EDGAR ALLEN & CO., LTD.,
Imperial Steel Works, SHEFFIELD.

Stocks on Hand of Mining and High Class Tool Steels.

AUSTRALIAN REPRESENTATIVES:
P. T. Taylor Ltd., 141 York Street, Sydney.

## BOREHOLES.

### Plea for their Preservation.

Recent events have served to remind mining engineers of the advisability of preserving all boreholes put down for prospecting and other purposes. Hitherto most boreholes have been lost through the mining companies or others not being prepared to purchase the contractor's tubing put into the holes; the tubes have been withdrawn by the contractor on completion of boring operations, with the result that the boreholes collapse and are lost. In many cases a probable valuable asset has been thus thrown away for the paltry cost of the tubes—an item of, say, anything from £10 to £100, according to the diameter and depth of the borehole.

A remarkable instance of a preserved borehole being the means of saving life has been experienced in the recent mishap at Egremont, Cumberland, England, where two men employed by the Townhead Mining Company Limited were imprisoned in the workings of one of that firm's mines through an inrush of water completely cutting off exit by the shaft. The men knew of a borehole to the rise of the shaft; they made their way to it, and soon got into communication with the officials at the surface, who had also gone to the borehole, some 150 yards from the shaft, and were able to converse with the imprisoned men. Arrangements were immediately made to send down through the the borehole thermos flasks containing hot drinks, food, etc., to say nothing of other comforts in the shape of candles, a watch, and such woollen clothes and wraps as could be safely put down a borehole 5 inches in diameter. The borehole was also used for pumping air down to the men. The men were imprisoned 5½ days before the shaft was unwatered and they could be brought to the surface, and the borehole was the means of considerably allaying the fears of the management, to say nothing of the anxious relatives and friends of the entombed men.

Stimulated by this notable example, mining companies and others ought in future to seriously consider the desirability of preserving all boreholes, even if at the time of boring their use as a means of life-saving, etc., may appear remote. Cases have been known where boreholes only partially tubed have remained good for 20 years or more. Apart from their use as a means of saving life, boreholes can be and are being used for water supplies and ventilating purposes; and as holes can be bored of a diameter large enough for a man to be lowered up and down, mining companies may consider making such provision where a second exit by shaft or other means does not exist. Moreover, a borehole of such large diameter might have other uses; it could be utilised for the lowering of all timber required in the workings, a work of magnitude in some metalliferous mines which takes up much valuable time at the drawing shaft. Such a borehole could also be used for conducting electric cables to the workings, thus removing the danger of their presence in the shaft, with the further possibility of reducing the length of cable required. The question will no doubt be seriously considered in the future. —"Iron and Coal Trades' Review."

---

Komata Reefs G.M. Co. (N.Z.) crushed 1000 tons of stone during August for a bullion return worth £1000, as compared with £1443 from 500 tons in August, 1912. But the clean-up at the cyanide works for August this year was left until the end of September, and has, therefore, to be added to the above figure. The ore crushed has been broken since April 12. The total amount won from the mine to date is £399,930.

GREAT COBAR LIMITED,
COBAR, N.S.W.

MINE OWNERS, SMELTERS, COLLIERY PROPRIETORS, PURCHASERS OF COPPER ORES AND MATTES.

VACANCIES FOR COMPETENT MACHINE MINERS.

SYDNEY: Australasia Chambers, Martin Place, And at Lithgow and Singleton. LONDON: 65 New Broad Street, E.C.

## CONTENTS

THURSDAY, OCTOBER 16.

EDITORIAL—

Kieselguhr .. .. .. .. .. .. .. .. 315
Leaderettes .. .. .. .. .. .. .. .. 316
Brief Comment .. .. .. .. .. .. .. 317
News and Notes .. .. .. .. .. .. .. 318
Personal .. .. .. .. .. .. .. .. .. 318
The Investor's Column—
Great Fitzroy Mines Ltd. .. .. .. 319
Port Swettenham Rubber .. .. .. 319
Sydney Stock Exchange .. .. .. .. 319
Metal Quotations .. .. .. .. .. .. .. 320
Australian Oil Industry .. .. .. .. 320
Victorian Mining Activities .. .. .. 320
Mining in Queensland .. .. .. .. .. 322
New Zealand Mining .. .. .. .. .. .. 322
Tasmanian Mining .. .. .. .. .. .. 333
New South Wales Mining .. .. .. 323
West Australian Mining .. .. .. .. 323
Gippsland Copper Co. (V.) .. .. .. 324
Mine Ventilation Rights .. .. .. .. 324
The Coal Mining Industry .. .. .. .. 324
Petroleum in South Australia .. .. .. 325
Correspondence .. .. .. .. .. .. .. 325
Municipal Council of Sydney .. .. .. 326
South Australia and the River Murray 326
State Electric Supply .. .. .. .. .. 326
Melbourne City Council .. .. .. .. .. 326
Melbourne Tramways .. .. .. .. .. 327
British Association .. .. .. .. .. .. 327
Railway Electrification (V.) .. .. .. 328
Postal Electricians .. .. .. .. .. .. 328
The Silvertown Company .. .. .. .. 329
Suburban Traffic .. .. .. .. .. .. .. 329
Trans-Australian Railway .. .. .. .. 329
Miscellaneous .. .. .. .. .. .. .. 329
Invited and Accepted Tenders .. .. .. 330
Public Works and Railways (N.S.W.) IX.

**FIRE. . BRICK** Our Products have proved their superiority.

**FIRE CLAY GOODS** For Every Purpose.

Darley Fire Bricks will withstand the most intense heat, and will not shrink. Our bricks are made near Bacchus Marsh, Victoria, and we supply all the States.

Specialities
**High-Grade Firebricks & Retorts.**
*Prompt Delivery. For Prices, etc., write to—*
**DARLEY F. B. Co.,**
**Oliver's Lane, Flinders St. Melbourne**

**COKE!**
**NORTH BULLI COLLIERY**
**Limited**
Supplies best quality hard
SOUTHERN
SMELTING COKE.
(Weekly output 1250 tons )
H. G. Hyde, Secretary.
Royal Insurance Building, 18 Spring-street,
SYDNEY.

**MINING STANDARD.**
PUBLISHED EVERY THURSDAY.
Forwarded Post Free to any Address.

| | Per annum. |
|---|---|
| Australasia .. .. .. .. .. .. .. .. .. | 26/- |
| British Possessions .. .. .. .. .. .. .. | 32/6 |
| Foreign .. .. .. .. .. .. .. .. .. .. | 34/8 |

Payable half-yearly or yearly, in advance.
All amounts should be made payable to order of "CRITCHLEY PARKER, Bank of Australasia."

12 O'Connell-street,
Sydney.
Tel. City 8103
P.O. Box 331.

376 Flinders-lane,
Melbourne.
Central 7931 & 1838
P.O. Box 253.

CASUAL ADVERTISEMENTS.

The rate for this class of advertisement is governed by the position it occupies.

If it appears on leader page or amongst or next to reading matter, the rate is 15s. per inch (nonpareil) per insertion.

Towards end of reading section—
Brevier, 16 ems width, 6s. per inch per insertion.
Nonpareil, 8s. per inch per insertion.

For the convenuience of advertisers, we might state that—Brevier has approximately 7 words to a line, and 8 lines to the inch—6s. Nonpareil has approximately 8 words to the line, and 11 lines to the inch—8s.

ALTERATION TO ADVERTISEMENTS.

As our publishing arrangements necessitate the "Mining Standard" being issued simultaneously in Sydney, Melbourne and Adelaide on the same day each week, advertisers wishing to change their advertising matter must supply same ten days in advance of publication.

ADVERTISEMENT PROOFS.

Proofs are submitted to advertisers in order to give them an opportunity of going over the advertisements before printing.

Advertising Copy must be typed and so arranged as to clearly indicate the display required for the more important features of the advertisement.

Any departure from the original copy will be charged for. Advertisers are specially requested to instruct their publicity departments to give us clear and definite instructions respecting changes of matter or new copy in order to avoid incurring unnecessary charges.

AUSTRALIAN
**MINING STANDARD.**
PUBLISHED EVERY THURSDAY.
ESTABLISHED 1888.

It is requested that all business communications be Addressed to Critchley Parker.

THURSDAY, OCTOBER 16, 1913.

## KIESELGUHR.

The news that a small company has been formed in Melbourne to work what is called an "infusorial earth" proposition, near Portland (V.), directs attention to a mineral product which comparatively few people have ever heard of, and of the importance of which but a very small proportion of those few are in any degree aware. What then is infusorial earth, or kieselguhr, as the owners of this particular property have elected to call the substance they hope to make money out of? It consists of fossil deposits of the silicious remains of diatoms; hence the best title for the substance is "diatomaceous earth." The existence of deposits in Victoria has long been known, and only last year the Geological Survey of the State issued a Bulletin in which the subject was treated ably and exhaustively by Mr. D. J. Mahony. As is stated in this valuable contribution to the subject, its uses are many and varied. "The more compact varieties are used for making filters and polishing stones. It is used in the manufacture of explosives to absorb and make portable liquids that would otherwise be difficult to handle. Nitroglycerin, for example, when thus absorbed, is known as dynamite. In a similar manner it is used to an increasing extent to absorb liquid fertilisers. Its properties as a non-conductor of heat have led to its being largely adopted as a packing for boilers, pipes and safes, and also as a fireproof building material, either in the form of cements or of bricks which are made solid or hollow. It is used as the basis of many polishing powders and soaps on account of its fine, even grain, abrasive qualities, and freedom from grit. It is also used in the preparation of waterglass, of various cements, of glazing for tiles, of artificial stone, of ultramarine and various pigments, and aniline and alizarine colours, of paper, sealing-wax, fireworks, guttapercha, safety matches, solidified bromine, scouring powders, papier-maché, and a variety of other articles, including gramophone records." But there are other uses to which this substance is put which are not mentioned in the Bulletin we have quoted from. The particular features of the material are, as Mr. Mahony points out, its exceeding lightness and the remarkably fine and even powder to which it can be crushed without any difficulty; and it is precisely these two circumstances that lead to its use in directions unknown even to the average mining man. Diatomaceous earth is, in fact, the great loader of commerce. It is used not only in the manufacture of polishing soaps, as Mr. Mahony has stated, but also for certain toilet soaps. Is is also used, and largely used, for the loading of calico, in which its presence is for all practical purposes indetectible. In fact, it is used for the loading of pretty well everything for which its remarkable lightness and the unusual uniformity of its composition render it peculiarly suitable; and above all it is used in the loading of many cheap foods, notably cocoa, in which it is sometimes employed up to a very high percentage. This action is excused on the ground that, though diatomaceous earth can do no good to the human system, it at least does no harm; but its harmlessness may well be doubted. The mere fact of the value of the substance as a polishing agent does not lead to the belief that it would be altogether innocuous when coming in contact with the internal works of man. The real demand for the substance is for the purposes we have mentioned, only a small proportion of the output being used for purposes in which its use is openly acknowledged. It follows then that almost the whole trade in this substance is of a confidential character. The people who use it most will be the least ready to buy it from any chance seller, and the most ready to profess entire ignorance of its very name. They will buy only from those upon whose secrecy they can absolutely depend, and the prices that they are willing to pay for material of the highest grade is very far in excess of the quotations that are openly made. It is, therefore, a very tricky and dangerous substance to deal in, but one from which good profits can be made once a market has been obtained. Victoria's output last year is set down in the annual report of the Mines Department at 850 tons, and the value of the output at £4 a ton; and that, it may be remarked, was not only Victoria's output, but Australia's as well. The whole of this came from the tripolite deposits ("tripolite" being, by the way, yet another name for the substance we are here dealing with) of Lillicur, near Talbot, the Australian Kieselguhr Company contributing 750 tons and the Lillicur Company the balance. The success of the new company will seem then to depend largely upon the ability of those in control of it to get into friendly communication with those who buy without having their buying generally known.

---

Another old-established Victorian gold mine is moribund, and will soon be amongst the things that were. The Burnt Creek G.M. Co., of Dunolly, was registered in April, 1891, or over 22 years ago. Its capital was £90,000 in 36,000 shares of £2 10s. each, of which only £66,600 has been paid up; the production of gold has amounted to 45,964 oz. from 78,091 fathoms of wash, averaging nearly 10½ dwt. per fathom, the wash treated during the June quarter of this year being worth well over 13 dwt., and nearer 13½ dwt. Yet it has been found expedient to cease operations. In point of fact shareholders have received only £8100 in dividends during the whole course of the company's operations, which is only about 12 per cent. for 22 years, or a little over ½ per cent. per annum, so that there was little encouragement for shareholders to continue operations, although it is known that they have good ground yet to deal with at the east end. At the special meeting held last Thursday to consider the proposal to wind up the company, mention was made of the excessive cost of mining, and the wanton interference of union officials on the non-unionist question, when the men were working cheerfully and harmoniously together. There were complaints against the management by some shareholders, but the chairman, Professor E. J. Nanson, pointed out that the directors held a fifth of the shares and could, therefore, be relied upon to do their best. Shareholders were assured that under present industrial conditions any mine which is not very rich must be in much the same unsatisfactory position as their own; nearly the whole of the gold won went to pay wages, and the shareholders had to be satisfied with what little they could get. As the statutory number of shares was not represented at the meeting, the directors proposed to act upon an authority given under an addition made to the articles of association in 1899, and to realise the company's assets as rapidly as possible. The chairman said that a telegram would be sent to the mine giving instructions to draw out all the material from the mine that could be sold at a profit. No reliable estimate was possible as to what the assets would realise. There were some slimes and the machinery. The previous heap of slimes realised £6000, and it had been stated that the existing accumulation was equally as good, though not so large. After allowing for liabilities, the cash, fixed deposits, and gold on hand represented a balance of £2418. It is estimated roughly that the assets would give about 4s. per share. It was stated by Mr. J. McCrorey that the directors had no objection to the miners belonging to the union, but they strongly objected to shift bosses belonging to it. Those men should be regarded as officials of the company, and while they were members of the association it was practically impossible to carry on the mine and make profits. Since the association had come to the district and got the bosses to join there had been a gradual decline in profits from month to month.

* * *

In the New South Wales Legislative Assembly last Thursday the Bill ratifying the agreement entered into between the Premiers of New South Wales and Victoria respecting the construction and use of lines of railway from Echuca to Moama and from Moama to Moulamein, and to amend the Deniliquin and Moama Railway Act of 1873, was passed through all stages. Being now in opposition, Mr. Wade thought it necessary to congratulate Victoria on the excellent bargain it had made at the expense of New South Wales. The New South Wales Government (he said) was making Victoria a present of the route, the cost, and the revenue of the proposed line. Mr. Wade hinted his fear that the Minister had become the tool of the astute Victorian Government. There was a nasty flavour about the ex-Premier's comment for which he can hardly be commended, and which savoured somewhat of the dog-in-the-manger spirit. It must not be forgotten that it was Mr. Wade himself who, just prior to his going out of office, announced a policy of border railways to enable growers at the western end of New South Wales to get their produce to the nearest markets, which, as Mr. Wade well knew, would be through Victoria. Unfortunately for him, he was put out of office, and his successors have carried out a policy on the same lines as he had proposed; hence these tears! Of course the general policy of border railway building may be advocated without guaranteeing approval of all particulars in any interstate agreement, and on that ground, perhaps, Mr. Wade's attitude is less liable to criticism. Comments similar to those of the leader of the Opposition have been made by certain of the Sydney newspapers, one of which asked, "Why should Mr. Holman be so anxious to present a part of the richest district of New South Wales to Victoria if he is to get nothing out of it? In the far south the best the Government can do is to propose to make Victoria a present of so much money to build railways in New South Wales on her own gauge." To this the Premier, Mr. Holman, replies: "The Government admits that, all things being equal, New South Wales trade should be retained for New South Wales; but in the case of the Riverina border railway things are not equal. It is ridiculous to say that we are presenting money to Victoria. Somebody has to raise the capital—it does not matter which State. Victoria pays the interest upon it. Our policy will develop a rich province at a minimum expense, and ten years earlier than by the extension of existing New South Wales railways. The resultant commerce will not come to the Sussex-street merchant, but, as there is nothing at present for him to get he will lose nothing. Nobody will lose, and a large number of people will gain." Under the agreement come to, Victoria, in addition to paying interest on capital, will bear any loss on working account and pay two-thirds of the cost of bridges, while the railways will belong to New South Wales and will add greatly to the value of its contiguous areas, so that it is by no means clear that Mr. Holman has sacrificed his own State to its next door neighbour.

* * *

The attitude of the New South Wales Labour Council towards the inquiry which Mr. Justice Heydon has undertaken with regard to the cost of living is one of those things which "no fella can understand." They ask for increased wages, and one of their arguments is that the cost of living is increasing so that, to save the worker from actual loss, wages should go up also; they ask for a fair wage, and insist that this must at least be a living wage, yet they have decided, not hastily, but apparently after mature consideration, not to assist in ascertaining what a living wage would be. When the inquiry was commenced several unions were represented, but Mr. Rolin, K.C., who appeared to represent the Employers' Federation, complained that they had received no assistance from the unions; whatever had been done was done by the employers at considerable expense, and seemed likely to be made almost valueless by the inactivity of the other side. Mr. Connington, who appeared for the unions, was, however, quick to ask for the names of tradesmen who had supplied information as to workingmen's domestic purchases, ostensibly that he might check the figures by reference to the parties themselves. The general impression produced is that a policy of obstruction has been decided upon, in order to postpone a final settlement on a satisfactory basis. But in this they are making a great mistake. The question of the increasing cost of living is one which is just now agitating men's minds in all parts of the civilised world, and is by no means merely local; it is being investigated on both sides of the Atlantic and both sides of the Pacific, and in all cases the result will be reflected in the standard of wages paid in the near future. And the manner in which the unionists of New South Wales treat the question (supposing them to be actually represented by the Labour Council) becomes even less promising, with respect to the ultimate issue, when certain utterances are taken into account. For instance, when Mr. Justice Heydon first proposed this inquiry, it was stigmatized as an impertinence, and when it was commenced, the Storemen's Union decided that if certain information obtained were used by his Honour to arrive at a decision in regard to the cost of living, the workers could not be expected to submit to the finding, which looks very much like a declaration that the finding will not be submitted to if it is based on facts. Still more unwelcome is the suggestion that the decision of the court will be submitted to only on condition that it pleases the men.

* * *

For over fourteen weeks the men working on some of the mines at Bendigo (V.) were out of work and out of pocket because a rule of their union forbade them to work with non-unionists; they (or most of them) are now back at work, but the sprinkling of non-unionists with whom they worked previously is larger now than then and will continue so, for the employers have made it clear that, although they are willing to take back as many as they now require of those who were called out, they are not going to discharge the non-union men who helped them to keep their mines going. A few weeks ago there were protestations that, come what might, the question of non-union labour was now to be settled once and for all, so far at least as the Bendigo district was concerned. Are the leaders of this campaign against industrial liberty willing to stand by that undertaking now that they have been beaten? Their failure was not due to any lack of effort on their part; conference after conference they had with the directors as representing the shareholders owning the mines, but they gained nothing; modifications of their demands from time to time, as well as of the tone in which those demands were put forward, brought them no nearer to their goal. Poor Mr. Jude, the secretary of the Victorian association, appealed almost pathetically at times for some little concession on the other side, but without avail. At the last conference with the directors, finding them unresponsive, he said he supposed nothing he could say would cause the mine-owners to alter their decision, to which Mr. McGowan firmly replied: "We have been too long arriving at it to alter it." And Mr. Little, general secretary of the Federated Mine Employees' Association, recognising that the game was up, said disconsolately that if he had his way none of the men would go back on the conditions laid down by the mine owners—those conditions being that the employers declined to ask any applicant for work whether he belonged to the union or not; the mines were to be "open" to all. So the unhappy experiment failed, and it is not too much to hope that a salutary lesson may have been learned.

* * *

There surely is some mistake in the reading of a cablegram in last Monday's Melbourne morning journals. One of these states that "Twelve vessels equipped with the Diesel engine have been built throughout the world, and 25 others are in course of construction." The other says: "That the Diesel oil engine is rapidly growing in popularity is indicated by the fact that twelve vessels have been fitted with the engine, and 25 others are now being built." As we mentioned in our last issue, Diesel engines have been put into some hundreds of vessels of different kinds, up to 9000 tons register, during the last ten years, which is a much stronger indication of their "growing in popularity" than the fact that they have just been put into a dozen and are going into a couple of dozen more. What our other contemporary means by "throughout the world" is hard to guess, unless that be its equivalent for what its rival interprets in the statement "up to the present the use of the Diesel oil engine has been confined to routes on which the oil can be obtained cheaply," as though to say that these new ships will not be so "confined," but will be independent and go anywhere "throughout the world." If we may venture a surmise, may it not be intended to report that twelve new steamers have just been specially built with Diesel engines, whereas previously these engines have in most cases replaced other types; and that twenty-five other ships are now in course of construction, specially adapted for Diesel engines. The fact that the price of oil-fuel has doubled since this engine was introduced will greatly interest those in search of oilfields in the Commonwealth.

* * *

A remarkable feature of the Sydney University's record during the past ten years is the noticeable decline in the number of engineering students. In spite of a substantial increase in the total number of students from 730 in 1902 to 1472 in 1912, the number of those undergoing the engineering course has decreased from 105 to 87 between the two years mentioned. As a matter of fact, 1912 is conspicuous by reason of a recovery from the decline, the number of students in the previous year having fallen to 76. In every other branch of education increases have occurred, the Arts course being the most favoured. That engineering should suffer so by the comparison seems inexplicable at first glance, but that the Arts course is more popular as an introduction to the serious business of life may be due to the fact that the general nature of the Arts course admits the student to a number of professions of a somewhat luxurious nature, whereas engineering, although its scope of application is very wide and varied, really narrows the prospects of the student down to one occupation. Engineering is actually the most important of all subjects, and is closely allied to all the sciences; but it has the disadvantage of being, in many of its aspects, somewhat arduous, and, to be thoroughly acquired, entails an apprenticeship which is often objectionable to the budding youth with supposedly refined tastes, The tremendous expansion which occurred in the world during the latter end of the nineteenth century was chiefly due to the rapid advance in engineering knowledge. So much is due to it that it is a mystery why the subject does not win over a greater percentage of the rising generation than it does.

* * *

The Brisbane "Daily Mail" publishes a letter received from the editor of the "India Rubber World" by Mr. Campbell, director of Gossypium Park, who forwarded to America samples of rubber made from the juice of some North Queensland trees. The letter states: "I thank you for your letter of May 17 enclosing samples of new rubber, which you discovered in Queensland. These samples have been looked at by experts, and pronounced to be of fair grade rubber, one expert saying that it was very similar to Guayule. The last quotation of Guayule in the New York market was 64 cents (2s. 8d.). There have been no quotations since, because no new Guayule has come on the market, owing to the unsettled conditions in Mexico." Guayule rubber is produced in Mexico from plants, and in similar fashion to that adopted by Mr. Campbell. It is noticeable, however, that the testimony of the experts who inspected Mr. Campell's sample is not imparted by the editor of the "Rubber World" in convincing terms. He merely leaves it to be inferred that the Queensland rubber can compete with or equal "Guayule," by quoting the price of the latter. No information is available as to the probable quantity of rubber which can be produced in Queensland, and in the absence of this and some more convincing testimony as to its quality very little can be said about it.

---

## BRIEF COMMENT.

The Mt. Elliott Ltd. (Q.) shows a tendency to pull itself together after having undergone some vicissitudes lately. The return for September—4212 tons treated for a yield of 496 tons copper, 815 oz. gold, and 1160 oz. silver—is a considerable improvement over that for August, in which month operations were resumed after a spell of three months, but in which the run only totalled 25 days. A noticeable feature is the high grade of ore being treated when the company has a huge reserve of low-grade material which ought to be averaged with it. It is a pardonable circumstance that the company should right itself as much as possible by extracting high-grade material when it is in trouble in other directions; but in view of the fact that the 10 and 12 per cent. ore represents the smallest block of reserves it has, the company will find itself in a pretty pickle if it eats up the bulk of the high-grade ore and finds it cannot treat the balance of ore in the mine at a profit. The company has had a severe setback, but it will serve no useful purpose to try to counterbalance this by continual inroads on the high-grade reserves. A rough glance at the ore reserves will show that their average value would be much below 10 per cent., the grade which is now being treated, on account of the huge mass of 3 per cent. ore which figures in the estimate.

The capital of the Adelong Gold Estates (N.S.W.) has been increased by the simple expediency of altering the face value of the shares from 20s. to 25s., shareholders being invited to pay 2s. per share, or £7,500. The accumulated liabilities total £6000, leaving the company £1500 with which to straighten out its troubles. These were apparently more serious than was previously made clear. At the extraordinary general meeting held last week, the chairman (Mr. J. L. Wharton) stated that in the case of No. 1 dredge the value of the ground was disappointing, the impoverishment being due to the occurrence of a bar and an improvement not occurring as soon as anticipated. In the case of No. 2 dredge, the management anticipated getting into good values right away, but the returns had not confirmed the estimated values, causing a belief that a complete recovery was not being effected. The chairman went on to say that owing to defects in the plant a large portion of the ground dredged did not reach the gold-saving appliance. Therefore the trouble was purely mechanical, which, he thought, could be overcome. It would seem by the results of last month's run that No. 2 dredge is making a distinct improvement, and confirms the chairman's forecast of better values being encountered. The estimated value of the ground in the vicinity of present operations, viz., 5d. per yard, should give a substantial profit over working costs, providing those values will stand the test of practical treatment. Nevertheless, the chairman admits that the ground in front of No. 1 dredge remains poor, which is also confirmed by the result of the run. This means that the removal of this material to enable the better value in advance being recovered will narrow down profits, if any, from this source, until the advance is made.

At the half-yearly general meeting of the Bourke's Hill Tin Sluicing Co., Emmaville (N.S.W.), held in Melbourne on the 7th inst., the chairman estimated the life of the ground now held by the company at from 6 to 6½ years. The recently acquired blocks are now the centre of operations, and adjoin the Y-water Co. The chairman estimates that these blocks will take two years to work out, and states that satisfactory arrangements have been made with the Y-water Co. for cutting up the dividing boundary. After these blocks are worked out the company will carry on on its original ground, which will keep the company going for another four years, approximately. This seems to be about the limit of time which can be looked to, as the company has practically all the available ground east of Y creek.

The Block 14, Torrington (N.S.W.), is in difficulties, and at an extraordinary meeting held last week the directors were authorised to borrow from time to time sums of money not to exceed a total of £10,000. It would appear that anticipations have not been realised in connection with the property, and certain alterations and additions are necessary to the plant before profits can be looked for. This means that somebody blundered, but no reference is made as to where the responsibility lies. There is no question that an overdraft is a fearsome and an unnecessary burden, and if the directors and shareholders have confidence in their property it would have been infinitely better had they made a further call, or increased the capital of the company, without having recourse to a mortgage. To add interest and repayment of capital to the liabilities of a company is inviting trouble which the Block 14 Torrington will find some difficulty in getting rid of.

The report of Mr. J. H. Fawcett on the Bald Hills Osmiridium Company's leases at Bald Hills (T.) does not throw much light on the prospects of the field. True, the tunnel being driven to intersect the downward continuation of the gossan outcropping at the surface has still about 100ft. to go; but beyond the statement that dish prospects of the outcrop showed colours of osmiridium and gold, the information is meagre and unsatisfying, indicating that there is not much to tell. The prospect of genuine mining operations being established on this field seems entirely dependent on finding a persistent run of values or a lode. So far, the evidence available in support of either of these possibilities is not very substantial.

Deprive Adelaide of an opportunity to flutter and it would surely lose all interest in life! Good, bad, or indifferent, the latest mining discovery is all its perfervid speculators want. A single mine is not beneath contempt, but it wants an array of them; or better still, a whole field on which to vent its speculative enterprise. A wholesale collapse even does not seem to consign Adelaide to oblivion; it only wants sufficient time to recover from the shock, and it is as conspicuously energetic and enterprising as before. The latest centre of interest is the Ruby Well find, near Meekatharra (W.A.); and, having recovered from the Bullfinch burst, Adelaide is bent on being the first in, and probably the first out of, the one promising discovery which has been made in W.A. since that most lamentable affair. Adelaide has been a very good client to Western Australia, which is probably accounted for by there being no gold country of consequence in South Australia, and Western Australia therefore ranks as its exclusive protege. Already a number of syndicates have been formed in Adelaide to acquire leases at Ruby Well, and the movement is like the shadow of a coming event, the field is going to get as decisive a boost as those interested are capable of giving it. The values so far reported are not exceptionally good, in other words, are not "boom" values; but the pegging has been very extensive, and may be an indication that the country is promising right along the line. There is no saying what the find may lead to, in spite of several languishing centres northward from Day Dawn, Cue, Nannine, and Peak Hill being monuments of what "has been." Meekatharra (the present terminus of the railway) alone flourishes, and is no longer a desert rose blushing unseen. At one time Meekatharra had prospects which led to the belief in authoritative circles that it would ultimately rival the Golden Mile. This has not come to pass; but the district has some magnificent producers. The reputation of Meekatharra may be argued to reflect favourably upon the Ruby Well find; but that is not a logical conclusion by any means, as Nannine, also, is not so far from Meekatharra, and a drearier mining centre could hardly be imagined. The Marmont line at Meekatharra has been pretty well tested to its longitudinal limits, and the merits of the Ruby Well find will have to be found in the field itself.

It is reported that the Lancefield G.M. Co., Beria (W.A.), will probably be forced into liquidation by action of one of the creditors. The only wonder is that this situation has not been precipitated before. For years past the Lancefield has remained an unsolved problem. Its first plant, a stamp battery, was dismantled because nothing could be done with it, and a complete dry treatment plant installed, on lines similar to South Kalgurli practice. This plant was unsatisfactory, and remained so in spite of repeated remodelling and one wholesale reconstruction. On a simpler proposition the plant would probably have stood as a monument to the engineering ability of the management; but it failed to accomplish the desired result, and it is remarkable how, in the circumstances, the management persisted with a patchwork policy on such a tremendously expensive scale, for not only did it consume many thousands of pounds of shareholders' money, but the many thousands of pounds which the mine itself yielded up. The one redeeming feature about the property is the reef, which is one of the largest in the State; but it carries a high percentage of arsenic; moreover, the ore is incredibly tough, and in dry treatment plays havoc with the plant. A reversion to the wet process did not help matters, and the Lancefield has long been recognised as a graveyard for reputations and subscribed capital.

## NEWS AND NOTES.

The Broken Hill South Extended Ltd. (N.S.W.) is being reconstructed in London. A new company is being formed with a capital of £168,000 in 100,000 preference shares of £1 each and 680,000 ordinary shares of 2s. each. Preference shares are entitled to first rights over nine-tenths of the profits and assets. The present shareholders will receive one ordinary share in the new company for each ordinary in the old company, and will also have the right to a preferential proportion of allotment of the preference shares.

Slugs of gold weighing 7 oz. 16 dwt., 2 oz. 13 dwt., and smaller ones, were found last week at Amherst, in the Talbot district of Victoria, by a couple of prospectors.

About ten days ago Mr. J. E. Carne, F.G.S., assistant Government Geologist of New South Wales, and Mr. A. E. Cutler, superintendent of the Government Naval Dockyard, visited Lithgow (N.S.W.) and inspected some limestone deposits near Carlo's Gap, on the Mudgee line, in connection with the proposed establishment of State lime and cement works (writes our Lithgow correspondent, under date October 9th). They again arrived here by motor from Sydney on Friday night last, Mr. Joseph Davis, Director-General of Public Works, being with them. The party, accompanied by a local mining gentleman, again motored to the site on Saturday morning. It is understood that the favourable impression gained by the officers on the first visit was endorsed by the Director-General of Works. The quantity and quality of the deposits of limestone, and the accessibility to coal, shale, and water, and general requirements were considered suitable in every respect for works of the nature indicated. These official visits foreshadow that something of a definite character in connection with the projected works at this particular site will happen in the near future. Later in the day the party inspected the big limestone deposits through McDonald's Hole.

The Cathcart Central G.M. Co. of Ararat (V.) commenced production last year, and its output for the year amounted to 2536 oz. 18 dwt., the value of which was over £10,055; the output for the March quarter of this year was 1097 oz. 6 dwt., worth over £4339, and that for the June quarter was nearly equal to the whole of previous production, namely, 3560 oz. 9 dwt., worth £14,134, making a total for 18 months of 7194 oz. 13 dwt. of a total value of £28,528. This fully justifies the remark of Mr. G. H. Fitches, Inspector of Mines, in the last annual report of the Secretary for Mines, that the company "has developed a payable mine, with some exceptionally rich ground to operate on, and when cut up and drained, should produce a fair and regular remunerative output." The average value of the wash last year is not given in the official report, but that treated during the March quarter this year averaged 2 oz. 7 dwt. 14.26 gr. per fathom, while that dealt with in the second quarter of the year averaged 2 oz. 2 dwt. 11.84 gr. At the beginning of the present week a new make of wash worth 2 oz. per fathom was cut in the south-west drive from No. 1 rise. On the 30th inst. the company will pay its fourth dividend of 2s. per share, making a total return to shareholders of £20,000. The company consists of 50,000 of 10s. each, or £25,000, but as shares are only paid-up to 6s. 10d. each, making the paid-up capital £17,083, more than the whole of this will have been repaid by the end of this month. Besides all this, original shareholders, who have paid only 6s. 10s. for their shares, have the satisfaction of knowing that their present market value is about 49s. 9d. each.

Although mining operations at the Hope mine, Beaufort (V.), are still suspended on account of the non-unionist strike, and although water is rising in the mine through the destruction by fire of the engine-house and machinery, the management are sanguine that work will be resumed within six weeks. A new plant has been purchased and a tender for its erection has been let.

The September receipts of the Emu Bay Railway Co. (T.) amounted to £5696, as compared with £5273 for September, 1912, making the total receipts for the nine months of 1913 £50,576, as against £48,944 for the same period last year.

The railway receipts of Chillagoe Ltd. (Q.) for September amounted to £8892, as compared with £9323 for September, 1913, and for the six months ended September 30 to £53,368, as against £51,866 for the corresponding period last year.

The Silverton (N.S.W.) Tramway Employees' Union has decided to retire from the Barrier Labour Federation.

The failure of the water supply at Broken Hill (N.S.W.) last week proved to be of more serious consequence than was at first believed, particularly to mines at the southern end of the field, and at the end of the week the South, Central, Zinc Corporation, British, and Junction North were all closed, and one section of the Amalgamated Zinc mine was shut down. On Friday, however, the water supply company stated that all the pumps were working well, the reservoir containing over 14ft. of water, and it was anticipated that it would be possible to resume the supply to the mines in the afternoon if no further bursts occurred. The incident gave new interest to the work on the Umberumberka scheme, whence it was announced near upon a fortnight ago that the big dam wall had been completed and that there was already 10ft. of water in the reservoir. It is expected that the water from there will be in the city distributing tanks in February, and that the new service will be in operation in March or April.

The directors of the Colonial Bank of Australasia have decided, subject to audit, to pay a dividend at the rate of 7 per cent. per annum on both preference and ordinary shares for the half-year ended September 30th, and to transfer £10,000 to the reserve fund, making a total increase of £20,000 for the year, and raising the amount to £210,000.

A rich 7ft. reef is reported to have been cut last Saturday at the Tyrconnell gold mine, in the Herberton goldfield, North Queensland. The reef is said to be worth 3 oz. per ton.

The Oaks Amalgamated Gold Mines (N.Q.) has been reconstructed as "Oaks N.L.," the nominal capital being £25,000 in shares of £1 each, of which 10,000 contributing are issued to present shareholders on payment of 4s. per share, as being paid up to 14s. each; shareholders will also receive 10,000 fully paid-up in the proportion of one for each share now held. The balance of 5000 shares will be kept in reserve. The purpose is to instal a complete new crushing plant.

Of a total of 136,099 oz. of West Australian gold bought by the Perth branch of the Royal Mint in September, 77,930 oz. came from the Kalgoorlie district; the Murchison field sent 12,588oz., the Mt. Margaret field 9594 oz., Murchison East 9049 oz., Yilgarn 8409 oz. The combined amounts purchased from the four Coolgardie fields was 88,375 oz.

The gold received at the Melbourne branch of the Royal Mint during the week ended on October 11th amounted to 14,059.97 oz.

In connection with the area lying south of the William's Fancy mine, at Berringa (V.), for forfeiture of which that company recently applied, the company has been informed that the Minister of Mines has given the syndicate which now holds the lease a further six weeks within which to commence operations. It may be remembered that the warden, Mr. Goldsmith, P.M., considered that a question of mining policy was involved in allowing one company to hold too large an area, and that on that ground it was his duty to remit the application to the Minister.

A memorandum forwarded from the Victorian Mines Department last week announced that "No. 7 bore on the line of bores being sunk by the Mines Department two miles eastward of the Hope mines, Trawalla, has bottomed at 294 feet with 4 feet of wash containing fine colours of gold. This is the deepest ground yet proved, and is about 13 feet deeper than that in the last bore sunk ten chains to the north. The line will be continued southward until the shallow ground extending from Mt. Ross is located."

The Edna May G.M. Co., Westons (W.A.) reported last week having crushed and treated during the previous four weeks 1168 tons for a return of 1025¼ oz. of gold, the value of which was £4171. Concentrates produced amounted to 4 tons, the assay value being 18 oz. 4 dwt. per ton, while residues assayed 5 dwt. 5 gr. Working costs were £705, or 12s. 1d. per ton; mine development, £138, or 2s. 4.4d. per ton; do., shaft, £383, or 6s. 6.7d. per ton; capital expenditure, £676, making a total outlay of £1902 for the period.

The monthly report of the Marvel Loch G.M. Co. (W.A.) for September shows that the mill ran only 116 hours, treating 316 tons of Comet ore, yielding 197½ oz. gold, value £643. The manager cleaned up 510 tons sands cyanided, yielding 66½ oz., value £184; while 18½ tons concentrates realised £83 10s., and water £52 5s. The estimated revenue from concentrates in transit is £200. Expenditure: Milling, £135; cyaniding, £45 12s. 6d.; pumping, £64 15s.; concentrates, £47 10s.; surveying, £22 10s.; Comet option, £836. Concentrates on hand, 6 tons, estimated value, £48. The manager is now milling Comet ore on the day shift only, and has 120 tons at grass.

The battery of the Mararoa G.M. Co., Norseman (W.A.) ran 679 hours during September, and crushed 2650 short tons (about 2366 full tons) of stone for a return of 1009 oz. 7 dwt. of bullion, worth 63s. an oz., making a total of £3179, while cyanidation, slimes treatment, etc., yielded £1727, making the total value of bullion for the month £4906.

During the six months ended on September 30th, the Mt. Lyell Mining and Railway Co. consigned 2371 tons of blister copper, as compared with 3161 tons for the corresponding period last year. The outbreak of fire at the North Lyell mine on October 12th last year threw everything into disorder, and the consignment of blister for the intermediate half-year was, therefore, only 853 tons. The metal contents of the latest return have not yet been announced, but that of September, 1912, gave 3124 tons copper, 213,285 oz. silver, and 4316 oz. gold.

The directors of the Royal Bank of Australia, Ltd., will pay a dividend for the half-year ended with September 30th at the rate of 8 per cent. per annum, and add £10,000 to the reserve fund, making it £200,000.

In an address to members of the Early Pioneers' Association (Victoria), delivered at the Temperance Hall, Melbourne, last week, Mrs. Alice Bunt, who claimed intimate acquaintance with pioneer gold-diggers, declared that Clunes was the first place where gold was discovered in Victoria, viz., in 1850.

The reduced dividend of 1s. per share has been declared by the directors of the Amalgamated Zinc (De Bavay's) Ltd., payable on November 12th, This will absorb £25,000, making the total distribution to date £425,000. Transfer books will close at 5 p.m. on the 28th inst., and re-open on the 30th.

The abridged prospectus of the Australian Oil Wells Co., N.L., appears in another column. The public are offered 20,000 shares fully paid to 1s., the total capital being in 100,000 shares (£5000). The company is an acquisition and promotion concern, and will do no boring on its own account; it will acquire options and interests in promising oil areas throughout Australasia.

The strike against non-unionists at Beaufort (V.) continues, although the Bendigo attempt to force the union rules upon the mine-owners proved a fiasco, and an expensive one. The strikers are not unanimous, one way or the other, and it is impossible to gauge exactly which way the preponderance of feeling goes. What was called a ballot was taken the other day, but it was merely a show of hands. It is curious that the union leaders have such a mortal dread of the secret ballot—the most democratic of institutions and indisputably "made in Australia," as, when the occasion suits, is honestly claimed. The mere fact that the leaders decline to submit the issue to a proper ballot suggests that they fear the result.

The operations of the Adelong Gold Estates (N.S.W.) for the four weeks ended on the 2nd inst. resulted as follows:—No. 1 dredge, 401¼ hours, treated 35,200 cubic yards for 90½ oz.; No. 2 dredge, 475½ hours, treated 48,600 cubic yards for 147¼ oz.; totals, 876¾ hours, 83,800 cubic yards, 237¾ oz. For the previous month the figures were:—No. 1 dredge, 457 hours, treated 41,040 cubic yards for 121½ oz.; No. 2 dredge, 443 hours, 33,970 cubic yards for 69¾oz.; totals, 900 hours, 75,010 cubic yards, 191¼ oz. The ground treated by No. 1 plant last month was poorer, and that by No. 2 plant was richer than in the previous month.

## PERSONAL.

Mr. Frank P. Burgess, public accountant, but better known through his connection with several public companies, died suddenly at his residence in East Melbourne on the 7th inst., at the early age of 49 years. Deceased had suffered for some time from heart troubles, and to these his sudden death is attributed. Mr. Burgess was the legal manager of the Lord Nelson gold mine, St. Arnaud (V.), secretary of Fitzgerald's Brewery, Castlemaine, and auditor to the Bellambi Coal Co. (N.S.W.), and at the half-yearly meeting of the last-named company, held two days later, his death was regretfully referred to. Mr. Burgess held similar official positions in connection with several other companies doing business in various parts of the Commonwealth.

Mr. A. R. Cant, who had held the position of secretary to the Colliery Proprietors' Defence Association of the Hunter River District, New South Wales, for about seven years, resigned recently in order to take up a position with the Caledonian Collieries Limited (writes our Newcastle correspondent). Mr. Cant was a hard-working secretary, and tactful in dealing with the different people with whom he was brought into contact; and during the years in which he held the position of secretary to the proprietors, he filled it with credit to himself and with benefit to the association which he represented. It is understood that the vacancy has not yet been filled, but the names of Mr. N. J. Clark, mining adviser to the association, and Mr. A. Neilson, who has had many years' experience as a mine manager and mining man in the Newcastle district, have been mentioned in that connection.

# THE INVESTOR'S COLUMN.

## Some Companies Attracting Attention To-day.

(By Our Exchange Reporter.)

### Great Fitzroy Mines Ltd.

For some little while past there has been a fair amount of quiet attention paid to this stock, and although prices came back rather abruptly from 3s. 8d. to 2s. 7d., these being the limits of the recent fluctuations, it is evident that, despite the company's previous disappointing career, that there are still some persons who have faith in its prospects. In trying to form an opinion on the justification or otherwise for such a belief, the first important matter to remember is that the company is a new one, having risen from the ashes of an older concern. The authorised capital is £225,000, in 900,000 shares of 5s. each. Four hundred and fifty thousand of these have been issued, and are now paid up to 4s. 6d. per share, 2s. 6d. having been paid in money and 2s. otherwise. There is thus a further liability of 6d. per share. The last balance-sheet, issued in August, shows that the liabilities of the company other than the capital include the following items:—£100,000 in First Mortgage Debentures, less about £44,000 which has been paid out of the money received from the sale of the new shares, the net liability being therefore about £56,000. £20,000 of these Debentures were issued as security against loans made to the company by the Australian Metal Company, and the amount owing on account of these advances stands at £9462, less some probable reduction since the date of taking accounts. Sundry creditors are owed £3117. From these figures the actual liabilities may be set down at well under £50,000. The assets consist of the mine, which is valued at £52,728, this being the price at which it was taken over from the old company; and machinery, £75,515—£70,282 being the valuation at the date of transfer to the present company, and £5433 being expenditure since. Stores on hand, at cost, are set down at £9559, and there is a sum of £1144 to come in for blister copper. There are two Suspense Accounts, one of £20,000 First Mortgage Debentures held, as already explained, by the Australian Metal Company as security against the balance owing on account of certain advances, and the other for £6305 in connection with blister copper in transit. The cash in hand and at bankers amounted to £11,568, and some small sums made up £237. One other item has to be mentioned—£2960, for expenses incurred in connection with an option taken over a mine in Papua, known as the Laloki. It will be gathered from these figures that the financial position, despite some rather heavy obligations, has been materially improved under the terms of the reconstruction, and is by no means unsatisfactory in itself; that is to say, that if the Working Account continues to show a reasonable profit, there is hope that the shareholders will eventually receive some return for the capital they have put into the mine. The Working Account, which covers the period of 13 months since the incorporation of the company, shows that the products realised £201,467 (less some revenue included), while the expenses totalled a little over £188,000, there being thus a profit of £13,378. This was not a bad result for a company with a paid-up capital of a little over £100,000, but most of the profit of £13,378 was absorbed in the Profit and Loss Account, only £1100 being left, out of which £550 was set aside for redemption of debentures, and the balance was carried forward. Some of the accounts in Profit and Loss which made such a hole in the profit from the mine are non-recurring ones, such as preliminary expenses, £2951; and share underwriting commission, £1567. There was also expenditure on machinery of £1536, and debenture and other interest came to slightly over £5000. The balance was for costs of administration, together with some small expenses here and in London. It will be seen that, provided similar working results be obtained, that the company should make a better net profit by £5000 next year, in addition to which better recoveries and reduced working costs are anticipated. These are matters for satisfactory reflection, and as the market valuation of the stock at 3s. per share is but £67,500, the shares might be considered good buying for a lock-up, that is by those who can afford this kind of investment. The ordinary speculator would not, however, be likely to touch them for the reason that there is not much probability either of dividends or a market rise; that is, under the conditions referred to above. It is fairly obvious, therefore, that there must be some other reason for the recent market support, and it will probably be found in connection with the option taken over the New Guinea mine. This property is situated 17 miles from Port Moresby, and if the development work be satisfactory, the ore would be shipped to Mount Chalmers, where is the Fitzroy mine. The shaft on the Laloki is down 140ft., and the ore body which is being opened up is basic in character, containing both copper and gold in appreciable quantities—about 4 per cent. copper and 2 dwt. of gold per ton. This class of material would be very valuable for smelting purposes in conjunction with the siliceous ores of the Great Fitzroy mine, and the directors, in securing the option, have taken a step which may have an important bearing on the future of the company. The option was secured after the property had been inspected by Messrs. G. C. Klug and John Adam, and it is probable that the development work since then has been satisfactory, and that the option will therefore be exercised. Speaking generally, the prospects of the Great Fitzroy mines appear to be of a more hopeful character than were ever those of the old company, and at present prices the shares are not a bad speculative investment.

### Port Swettenham Rubber.

The quotations for this stock have recently indicated weakness in the position of its affairs, for after a slight improvement had occurred on the lowest price previously touched, which was about 14s., a subsequent more serious decline ensued, and now, after a sale at 12s. 6d., there are sellers at 13s. 6d. and no declared buyer. A perusal of the last annual report explains the desire to realise, for it is unfortunately of a decidedly discouraging nature. During the year the crop of rubber was 65,231 lb., but the returns have been much reduced for the first months of the current period, and it appears that the previous yields, which enabled for a while the payment of quarterly dividends of 1s. per share, were obtained by unduly drawing upon the capacity of the trees—in other words, they were so severely tapped that they now require very careful nursing and moderate tapping in order to give them time to recuperate. As the plantation is the source of the company's revenue, it may be said that in a manner the dividends have been paid out of capital, although it is hardly necessary to state that the Melbourne office would be quite unaware of this until it became necessary to obtain an expert report upon the property. In consequence of the lower yields, the average working costs have increased—a development which is generally unpleasant news for shareholders, but especially so in this instance, as it is accompanied with a much lower market price for rubber, which is now down to 3s. 6d. or 3s. 7½d. But still more disagreeable food for reflection is the result of the legal proceedings in which the company has been engaged for the last two or three years, and which affords another striking illustration of the "glorious" uncertainty of the law. The Privy Council decided the case against the company, thus reversing the verdict of the local tribunal, and the effect of this decision is that Mr. Loke Yew has entered into possession of about 55 acres of the plantation, and also that the company will have to pay the costs of the appeal, which will probably be heavy. One would imagine that this was about sufficient trouble for the shareholders to go on with for a while, and that they might console themselves with the reflection that the case was settled at last and that they would now keep clear of legal proceedings for the future. So they may have thought, but their trials are not yet over. During the litigation with Loke Yew a sum of £7000 has been held in trust as purchase money for the portion of the plantation which has been in dispute. For some reason or other this money has not been refunded by the trustees, and a suit has been instituted by them against the company, in order to obtain or retain part of it. It is rather difficult to realise that the above brief account of the affairs of this company can be that of an enterprise whose flotation was one of the most successful achievements during the rubber boom, and whose prospects certainly seemed to justify very hopeful anticipations for the future. Such, however, is the case, and one of the lessons to be learned from the disappointing results is that in a financial deal the European, despite his superior civilisation, cannot give away many points, if any, to the Asiatic. The question naturally rises if the shares are worth buying at the present reduced quotations, and it may be regarded as fairly certain that they are worth attention. For the present they appear to be worth letting alone, both on account of the uncertainty as to the amount of the obligations in connection with legal matters, and also because of the very low price of the plantation product. It must be borne in mind that the latter condition of affairs is exceptional, and that just as our own crops of pastoral and agricultural products are subject to fluctuating markets, so the price of rubber may be expected to rise and fall. Seeing that the movement has for a long while been a downward one, the next swing of the pendulum should be in the opposite direction. Another fact for remembrance is that about £5000 has been spent in increasing the rubber-bearing area, there being 100 acres with trees which are not yet in bearing. The plantation is undoubtedly a valuable one, the product is abnormally low, and it is being worked under the best expert supervision. Under these circumstances the shares must sooner or later be worth buying.

---

# SYDNEY STOCK EXCHANGE NOTES.

(Contributed.)

A very subdued atmosphere has pervaded the Sydney Stock Exchange since the Ardlethan trouble, and it is an open secret that one or two of the more recklessly inclined members found themselves nearly swamped in the backwash of the recent boom. Wild-cat flotations and market manipulations have practically swallowed up £300,000, or more, of investors' money. Such a debacle as has taken place in connection with the Ardlethan field could hardly have been witnessed on the other Australian Stock Exchanges. The laws which govern company promotion here are, as antiquated and out-of-date as the Ark would be in the running of a mail service. Also, the rules and regulations of the Sydney Stock Exchange itself have been far too elastic in certain directions. The failure of large sections of the field and the syndicates let loose upon a too credulous public were quite bad enough. But confusion and losses were materially increased by the hole-and-corner work in share transactions by some of the brokers themselves. True, they were not contravening any law of the Exchange; and, as long as the effects of those machinations were confined to the outsider, the older and more matured members were inclined to let matters take their own course. When, however, certain of their own confreres were "caught," the position called forth serious consideration, and it was found that rules and regulations governing delivery and sales of scrip under certain conditions urgently needed reform. The corner worked in Oxide Creek was perhaps most directly responsible for the passing of the rule which was referred to in the leading columns of the "Mining Standard" a fortnight ago. There are, we believe, other reforms in the wind for the general welfare of all concerned. The question of unlisted stocks has been a contentious matter with the members of the Stock Exchange of late. One section of the brokers holds the opinion that, unless a stock is on the official list, neither sales nor quotations should be published. Others declare that, if shares of a company are dealt in by members "on call," then the transactions should be made public with the listed stocks. Feeling has run pretty high on the subject, and endeavours have been made to preclude the sales and quotations of unlisted stocks from appearing in the daily press. To the unprejudiced observers it seems only right that all transactions and quotations "on 'Change" should be reported. The very fact of them being effected in the Call-room stamps them as official to the outsider; and how can an investor in unlisted stocks follow the movements of the market unless he happens to be in town and holds daily communication with his broker. But in a great many instances that is impossible. If a stock is deemed worthy to be officially dealt in "on 'Change," then it should be duly quoted. The point has not been definitely settled, but those members who desire the prices of listed and unlisted stocks to be published declare that unless that policy is adopted they will help to establish an open 'Change. There is no getting away from the fact that the Sydney Stock Exchange has been too secretive. The members have to a great extent been a law unto themselves, but they are a public institution depending upon the outside investor for their existence. It would be a good move on the part of the Committee, and one which would be thoroughly appreciated by the investor, to throw open the "Call-room" to the press. There is absolutely no reason why there should be anything hidden respecting doings "on 'Change."

Whereas there is need for reformation in Stock Exchange procedure itself, our Companies Law needs wholly remodelling, especially in the direction of the flotation of companies. Safeguards are more than urgently needed in that respect. There should be an official declaration as to the assets acquired, and their official valuation, in a prospectus. Likewise, the amount of working capital provided free of flotation charges. That the allotment would be pro rata, or if any priorities were to be granted there should be a definite statement as to what they were. All dealings prior to the issue of an authorised prospectus should be illegal, and there should be a minimum subscription prior to allotment. In a case where no prospectus was issued, then all such particulars should be lodged at the Registrar-General's office, and available to would-be investors. Such safeguards would have done much to avert the crisis in connection with the Ardlethan field.

## METAL QUOTATIONS.

(From Our Correspondent.)

### By Cable.

### London, Tuesday.

The high hopes and great expectations raised in the breasts of holders of copper shares by the improving rates of the previous week's market were rudely shocked last week by the turn of the wheel, for, whereas at the previous week-end the quotation for copper was above £74, at the close of last week it was £3 lower. Tin also suffered somewhat heavily, but the suggestive drop of £2 15s. per ton between Friday and Monday was partially recovered, although the tendency was steadily downwards again after Thursday. Lead, however, though low early in the week, firmed considerably later on, and closed with an advance of 10s. on the previous Friday's rate.

COPPER.—Monday's quotation for spot was £73 3s. 9d., or 18s. 9d. lower than on the previous Friday, and there was then a rise to £73 12s. 6d., but later rates were £72 17s. 6d., £72 7s. 6d., and £71 2s. 6d.

Three months' metal also opened with a fall of 18s. 9d., viz., to £73 1s. 3d., improving next day to £73 12s. 6d., but falling on Wednesday to £72 15s., after which the prices were the same as for "spot," viz., £72 7s. 6d. and £71 2s. 6d.

Electrolytic felt the same influence to some extent, for Monday's quotation of £77 5s. was increased to £77 15s., after which the rates eased to £77 10s. and £77. Yesterday opened the new week at £76 10s.

TIN.—The opening price for spot tin was £184 15s., as against £187 10s. the previous Friday. On Wednesday £186 5s. was paid, but later quotations were £185 10s. and £185.

For three months' delivery the rates were £185 10s. (a fall of £2 5s.), £186 15s., £186 5s., and £185 10s.

LEAD began the week at £20 (5s. lower), and rose to £20 2s. 6d., £20 8s. 9d., and £20 15s.

SPELTER was still unchanged at £21, at which figure it has now stood for four weeks.

SILVER.—The demand was sluggish, and prices wavered between 28⅜d. (a reduction of 3-16d.) and 28¼d.

ANTIMONY.—"Star" brand was stationary at £29, while 50 per cent. ore was again sold at £6 10s.

WOLFRAM (70 per cent. ore) was firm at 33s. 6d. per unit, equal to £117 5s. per ton.

MOLYBDENITE showed no change from 2s. 8d. per lb., equal to £298 14s. per ton.

MANGANESE (50 per cent. ore) brought 10½d. per unit, equal to 43s. 9d. per ton, as last week.

Elder's Metal and Mercantile Prop. Ltd., Melbourne, have received the following cabled average metal prices for September:—Spelter, ordinary brands, £21 3s. 9¾d. per ton; foreign soft lead, £19 14s. 10d. per ton; fine silver, 2s. 6¼d. per oz.; standard silver, 2s. 4d. per oz.; copper, standard, spot, £73 5s. 3½d. per ton; best selected, £78 16s. 1d. per ton.

## AUSTRALIAN OIL INDUSTRY.

A gentleman well versed in the oil industry, discussing with our Lithgow (N.S.W.) correspondent the oil position in Australia, and the proposal for Government action, gives a list of questions which should be answered before the Government finally decides on the nature and extent of support it proposes to give to the industry. They are as follows:—(1) Is the deposit of shale held by the Commonwealth Oil Company sufficiently extensive and rich to justify the erection of a large plant, and the consequent expenditure of hundreds of thousands of pounds? (2) Is the railway in the best or most desirable position? (3) Are the works already constructed (particularly the retorts) adapted, or suitable, to the Australian shales, which are usually much richer than the Scotch? (4) Has the Government had any report or investigation as to the working and results of the business so far, or do they propose to except the original and subsequent prospectuses issued by the company as authoritative figures? (5) Would it not be desirable to have a report from those competent to express an opinion, and whether the figures available from the company have been accessible to the Government in the results of the business? (6) Whether it is safer to accept experts' reports or the figures supplied by the promoters or directors? (7) Is it possible, under any condition, to make the company a commercial success, and on this point surely some information should be forthcoming from the officials of the company? (8) Can an analysis of the expenditure to date be supplied? A further question which applies to both the British-Australian Co. and the C.O.C. is: What experience had the management in the oil industry before coming to Australia; and, under any circumstances, could the company expect to succeed under such management? The authority concludes with the following remark:—The industry can certainly be made a profitable one, but we should know under what conditions, and what Government aid is necessary. It would surely be little short of recklessness on the part of the Government to give a bonus on the production of crude oil, without first knowing if that oil can be treated successfully and sold at a profit. On the other hand, it would be little short of criminal on the part of legislators were they to refuse such assistance as is necessary to put the industry on a sound basis, provided the industry can be carried on profitably. It appears, in order to get these questions answered, that a full and complete inquiry or report is necessary before any final step is taken. Either the Interstate Commission or the Government should get some person or persons qualified to investigate and report on the whole position, and this is specially important in view of the necessity for providing oil for fuel for the navy and other national purposes; and the same investigation might fairly consider and report what effect the Papuan oil-field will have on the shale-oil industry.

## VICTORIAN MINING ACTIVITIES.

### Bendigo and District.

(From Our Correspondent.)

The gold production for the week ending October 11, 1913, amounted to 3974 oz. 12 dwt. (including 1023 oz. 7 dwt. obtained by the Lansell Proprietary mines during the month of September). The principal producers were:—Lansell's Little No. 180, 660 oz. 11 dwt.; Central Red, White, and Blue, 303 oz. 4 dwt.; Lansell's North Red, White, and Blue, 257 oz. 11 dwt.; Golden Pyke, 248 oz. 15 dwt.; Johnson's Reef, 178 oz. 15 dwt.; South New Moon, 167 oz. 15 dwt.; Williams' United, 124 oz. 18 dwt.; Ironbark, 109 oz. 18 dwt.; Carlisle, 100 oz. 12 dwt.; Great Extended Hustler's, 98 oz. 15 dwt.; Catherine Reef, 93 oz. 9 dwt.; Golden Age, 93 oz.

Johnson's Reef showed a very considerable improvement in the return, almost entirely due to meeting an enrichment of the east leg of the 1150ft. inner reef. This back has not been worked so vigorously as the west leg, the lower portion especially receiving little attention. It is the latter part of the east leg that furnished the best stone last week, in driving 40ft. north from a crosscut at 200ft. south of the 1150ft. plat. Operations are here about 30ft. under the cap, where the leg is 12in. thick in driving and enlarges to 4ft. in the two stopes. Gold showed very freely in the level, but the enrichment has not yet extended to the stopes. Upwards to the turnover the greater portion of the leg is intact south of the shaft, the only work previously carried out between these points being the extension of an intermediate level to 50ft. south of the No. 1 rise. In view of this development, it is probable that the corresponding portion of the back will be further prospected north and south of the shaft. The outlook also brightened in the main north stopes later in the term, more gold being visible in the cap and east leg. Intermediate workings are in progress on the west back below 1150ft., but results so far are disappointing. The very flattering prospects of the west leg of the new reef, uncovered for a few firings in rising over the 1225ft. crosscut, were not sustained with later breakings, hardly any gold having been seen during the past few days. A good width of crushing material is still being traversed, and the cap is apparently close at hand. On reaching the turnover, a crosscut will be put through to the east leg, work that will be followed with great interest, as nothing is known of this portion of the formation. The 1150ft. winze, to connect the rise, is opening up a lot of nicely mineralised quartz of little value. On the Paddy's Gully line the stopes are now being extended above the 1730ft. south level off the No. 2 shaft, from where operations were previously suspended at the No. 1 end. The results to date, however, have not been as good as anticipated. Further north, in the same level, a rise has been started where better prospects were seen in driving after getting through a diagonal spur in the footwall.

Golden Age are in about 90ft. with the 655ft. north level at the north shaft, opening up 10in. of reefing stone with a few colours of gold; similar prospects showing in the stope. It was at first anticipated by the management that the level would not reach the Golden Pyke boundary under 200ft.; but an old survey shows that the company's lease does not extend for more than 152ft. north of the 655ft. crosscut. This would leave about 60ft. of ground to traverse before reaching the end of the lease, where a connection will be effected with the Golden Pyke 643ft. main level. South level is in close on 100ft., a little gold showing at intervals. These levels appear to have started about midway between the two most pronounced faults, which are such prominent features of the Golden Pyke stopes above and below 543ft. Under such conditions it would appear to be only a matter of extending the stoping to lead to more remunerative results. Stoping has not been started in the south end. Some years ago this reef was also passed through in the 729ft. crosscut, and a level driven 5ft. north on the 2ft. of spurry quartz. It has just recently been ascertained that this stone averaged about 3 dwt. per ton, a result quite good enough to warrant the immediate opening up of the formation at this depth. The reef is intersected by two faults between 729ft. and 655ft., but has not been tested below the latter depth beyond the workings stated, the levels not having been connected by rising. At the main shaft more gold has been visible lately in the lower stopes above 853ft. The top stope southward from the main crosscut is now 100ft. above the 853ft. level; five stopes operating from this end on an average width of a little over 12in. of reef. The first three stopes are close to the small break in the hanging wall, and show fair gold. In the two stopes off the south boundary, a little gold is also disclosed, but the prospects are not as good. At the eastern shaft on the Paddy's Gully line an interesting position has been created by the location of the new west back at 58ft. from the 1581ft. plat, in crosscutting west. This gives a spread of over 55ft. between the backs, the east-back having been passed through in the first few feet of crosscutting. From the spread of the backs it is evident that the cap is 50ft. overhead, and there is a probability of the formation being of larger dimensions than anticipated. Its further exploitation, however, has been deferred for the present, in order to test the character of some stone extending under the crosscut along a fault. This break is close to centre, and it is thought that the quartz represents the slidy neck of another saddle reef. In the first couple of breakings under the rails this stone has shown galena, but no gold. As the shaft is getting down to the horizon of the Collmann reef, the work is being followed with interest. Should the stone represent the upper limits of a new reef, shaft sinking will be resumed immediately, and another 100ft. lift completed. In sinking to a sufficient depth to open out at 1680ft., there would be further evidence of a reef by the intersecting of an east leg in the shaft.

Carlisle return was considerably less than the official estimate, a calculation apparently based on the battery indications. The explanation appears to be that the gold was finer than usual, making a better showing on the plates. Though of low grade, the average still leaves a profit. It is satisfactory to note that the 1140ft. south level is still uncovering payable spurs at 277ft. from the shaft, and nearly 75ft. under the top fault. Two side stopes are also showing a few colours of gold at 70ft. from the end. Side stoping has also been resumed at 135ft. from the shaft, extending to 27ft. west of the Victory back. A colour or two of gold are visible here, but the spurs are of low value. In the stope above the end of the timber and 20ft. further north payable prospects are reported in a width of 20ft. of crushing material. At 290ft. in the 1200ft. north intermediate level a few colours of gold are exposed in a full width of well mineralised quartz. The top fault will probably show in this end before the expiration of the month. As the stone in the vicinity of the break was of very profitable quality in the rise, connecting with 1140ft., at about 140ft. from the face, more important developments are looked for in driving during the next couple of weeks. The 1264ft. main level is meeting small spurs of no value. As yet the side stopes off the intermediate have not been very productive.

United Devonshire many years ago obtained some phenomenally good yields from a reef associated with an east back above the 590ft. level. During the past few months the company have been prospecting a west back, at about 60ft. from the old workings, intersected in crosscutting off the north level. The back carried a little stone in the crosscut. In rising to 58ft. on it, a number of spurs were exposed in the footwall beds, and at about 8ft. from the top of the rise payable gold was reported in an 8in. vein. The other spurs contained a little gold, and a crushing was broken in opening out at 48ft. up, resulting in the good return of 33 oz. 10 dwt. from 43 tons. It is estimated that there is 60ft. of ground overhead before reaching the next level, and rising has been resumed to effect a connection before opening up the spurs by driving off the rise. As there is a good extent of ground intact in the vicinity of this west back, the development is apparently of some importance. Out of a share register of 32,000, there are only a little over 8000 in issue, the balance having been forfeited through non-payment of calls.

Ulster United have abandoned the 2205ft. workings in favour of the shallower ground. The deepest operations will be at 1700ft., where a rise is going up on a small pug back, dipping west. The corresponding east back is showing on the other side of centre, and they are considered to represent the same reef as the Garden Gully are working at 1552ft. At 510ft. a rise has also been started on a west back carrying 2in. to 3in. of reefy stone. In the footwall are several spurs, the quartz and strata containing a good percentage of minerals. The back is evidently a portion of a centre reef, existing under a strong slide that shows in the 410ft. crosscut. At the latter depth there is 2ft. of stone, which will probably be associated with the neck of the bedded formation. This reef appears to be one of the shallow formations which proved very productive in the Garden Gully mine over 30 years ago. Extending upward into the western beds, the fault is associated with 5ft. of irregular quartz in the 320ft. west crosscut, at some distance from centre. This stone is well mineralised, and is now being prospected by driving south. The first breaking failed to show gold.

Princess Dagmar connected the 853ft. intermediate crosscut with the old rise on the bottom fault above 867ft., after passing through spurs in the syncline. A few of these trough veins showed a little gold, the best prospects being close to the west side of the trough. This connection will enable the extension of the 867ft. main north level being proceeded with, to open up the trough stone northward. The level is on an inner back, but will be diverted east to enter the syncline, and should soon disclose stone. From the end, the company have nearly 250ft. of ground intact along the trough, the overlap giving an additional length of close on 90ft. In advancing the intermediate to 291ft. from the north boundary, the spurs in the trough are of low value. Payable material is being side stoped at a short distance from the face. In stoping north and south of the rise over the intermediate there is up to 2ft. of reef, occasionally revealing fair gold. The north stopes have been beaten through to the original stoping off the rise near the Golden Age boundary, where good payable stone exists in the two top stopes. In preference to resuming operations from this north end, stoping will be conducted from the present rise over the intermediate, unless a depreciation in quality of the stone necessitates drawing upon the reef nearer the boundary. The rise is up 90ft. from the 867ft. main level, with 1in. to 6in. of stone in the top. No gold has been seen for the last 30ft. The cap is not yet disclosed, but there are indications of its proximity in the top. Having a substantial sum to credit, there is a likelihood of a dividend being announced toward the end of the month.

Unity, driving north along the Carlisle fault above 1018ft., are meeting with brighter prospects. The slide is showing in the end, and above it the spurs reveal a few colours of gold. Under the break a full width of crushing material is being traversed. containing galena and a little gold. As the reef channel pitches north, it will be necessary to drive another level lower on the Victory back to keep in touch with the auriferous stone. Though promising, the material is not yet of value. At 920ft. the east crosscut is still in western strata. After reaching centre this work will attract more attention, auriferous spurs having previously been worked from the eastern turnover at the next level above, extending to the Victory back. On the Paddy's Gully line the 1145ft. crosscut is out over 900ft. from the shaft, in eastern strata.

Koch's Pioneer purpose resuming work on the Victory east back above the Carlisle faulting, from the 1450ft. north level. The back is stated to be unprospected for a length of over 400ft. to the north boundary, and it is proposed to rise through to the 1240ft. stopes, starting above the slides. At 2250ft. the north level and stopes are uncovering good-looking quartz along the same back as the Windmill Hill are working at 2610ft. As yet the stone is of little value; but the indications in the first stope are more hopeful, and the outlook may shortly improve in bringing along the second stope. A feature of these eastern reefs is the short rich shoots of stone, the gold deposition occurring at intervals without any observable cause. A few years ago the company drove 200ft. south on this reef through a good width of favourable-looking quartz, but without finding anything of value. Tributers have recently secured the whole of the ground above the level, and in each block payable results have been obtained after rising a few feet. At 2150ft. the company are driving north on the east back of the 1900ft. reef, which is stated to be the continuation of the Victory east back. Short shoots of high-grade stone were the rule at 1900ft., tribs averaging up to 14½ oz. per ton. The company's level is so far unproductive.

North Johnson's reached a west leg of a new reef in the 1334ft. east crosscut, at about 30ft. from centre. There is 6in. to 8in. of mineralised quartz. The crosscut will be continued through the reef channel, and to the east leg, before rising to test the upper limits of the backs and cap. In passing through centre there is a probability of the cap of another formation being intersected. This reef channel exists well to the east of the shaft, and has not received much attention, though actually a portion of the Garden Gully line, and including the lava. Overhead the next crosscut is at 700ft., and apart from crosscuts at 1642ft. and 1743ft., centre is intact to 2500ft. Below the latter depth this "lava" fold has not been seen, practically all the old reefs having been found over the western centre or "Johnson's" line. At 1065ft. the company intend driving south from the north boundary on stone allied to the "Dagmar" bottom fault. This work will be carried out from the Johnson's Reef No. 2 shaft.

Golden Pyke are increasing the milling capacity by 20 stamps, purchased for £250. This section will be linked up with the present mill and a suction-gas plant purchased to replace the present steam motive-power. Prospects continue very satisfactory, the 447ft. level showing gold freely along the hanging wall on Saturday.

South New Moon directors have published a souvenir, commemorating the payment of £500,000 in dividends. The record from August, 1879, reads:—Tons milled, 381,324; gold, 223,891 oz.; estimated value, £841,168. Tributers—Tons milled, 12,723; gold, 7066 oz.; estimated value, £26,672 (exclusive of residues). Capital called up, 17s. 7d. per share—£28,133 6s. 8d. Dividends, £15 12s. 6d. per share—£500,000. Reserve fund, £3821 18s. 7d. Equipment expenses, £19,490 8s. 2d. Payments to Government of income tax on dividends since May 4th, 1905, £8446 13s. 4d. Amount disbursed in wages, £205,710.

## Maldon.

(From Our Correspondent.)

Following on the forfeiture of a lease ordered by the warden during the previous week, application was made by Robert Baxter for the cancellation of a lease held by the South German Reef Extended Co., situated south of that company's plant. The area is 11a. 1r. 4p., and the lease was issued on October 31st, 1910. Applicant said he resided near the ground, and was sure there had been no work at all done on the lease, and there was no plant or buildings thereon. Applicant represented a syndicate comprising, besides himself, Messrs. T. B. Brooks, W. Rewell, A. and S. Best, and it commanded a capital up to £1000. They were prepared to start work when the lease was issued. The Warden was satisfied that the labour covenants had not been observed, and would recommend that it be forfeited and a new one issued to the applicant.

Oswald's Gold Mine has declared its second dividend since the formation of the company. The 25,000 shares will get 1s. each, payable on October 20th.

South German Reef Co. has done some private crushing during the term. At 2000ft. level north a contract has been let to another party for extending the level and crosscutting. The intermediate level north below 1750ft. has been extended to 191ft., where the reef is the full width of drive, with 16in. of laminated stone on the east wall carrying encouraging gold prospects. Samplings of the intermediate level south from the winze were taken, with the following assay results:—At 20ft., 1 oz. 6 dwt.; at 30ft., 13 dwt.; at 45ft., 6 dwt. Stoping will be carried on in this area as soon as possible. At 2000ft. level north the crosscut west off the end has been put out 10ft. in mineralised stone, but the west wall has not been cut. Samples taken from 855ft. north of the shaft showed 5 dwt. dirt; and at 865ft., 17 dwt. This latter is nearly vertically below where the rich stone was proved to be passing underfoot at the intermediate level. Crushings resulted: Cyanide, 660 tons, 48 oz. 11 dwt.; sundries, 12 oz. 16dwt; tributers—Merlo and party, 27 tons, 5 oz. 7 dwt.; pyrites, 2 oz. 9 dwt. Baxter and party, 200 tons (inclusive of pyrites and sand), 188 oz. 16 dwt.

## Castlemaine and District.

(From Our Correspondent.)

Mr. Rewell, the well-known Maldon prospector, intends to have a try at a Castlemaine reef, and has turned his attention to the Town Reef. The reason for this is the fact that certain householders have found gold on the line. The spot chosen is one requiring municipal sanction, situated as it is in Forest-street, east of the gasworks. An application to the council for a road claim has been referred to the surveyor for report. The usual—not to say inevitable—has occurred. Two other Maldon men have gone a street further north, Mostyn-street, and marked out a site, at the same time putting in an application for road claims. The surveyor will also advise the council on these.

Spring Gully had an improved—and a payable—yield for last week. From 200 tons 82 oz. 15 dwt. was got as a result of the battery operations only. The northern stopes in the intermediate above 200ft. are showing better gold. There is an extensive formation suitable for crushing being opened up along the slide right across to the 170ft. level. The south stopes are also showing gold, but not so coarse as some previous samples. There are three gold-bearing spurs in sight. At 318ft. the east crosscut off the main south level is in 13ft., having passed through 12 feet of stone giving gold in the dish. The crosscut will be continued. Altogether a higher return is expected from the next week's operations.

Spring Gully No. 1 east crosscut from the rise over 300ft. has been put out 14ft. The country is still sandstone and slate, carrying two leaders from 4in. to 2ft. wide, giving dish prospects.

South Wattle Gully reports no material change in prospects, with an increased paddocking of stone in readiness for the battery when it has been erected. Stone has also been uncovered ready for breaking down when the same consummation is achieved at No. 3 rise from the 300ft. level (6ft. of stone) and in a rise over the No. 1 rise (3ft. of stone). The 300ft. level is still being driven towards the saddle. The 350ft. level has got into new country, where a reef is making large in a rise. Water is normal.

Little Nuggety has called tenders for cutting down and timbering the shaft, prior to opening out at 240ft.

Campbell's Creek bucket dredge had a payable yield for the previous week (52¼ oz. for a full run by the double plant), but last week the No. 2 plant was idle, and the other one raised 36 oz. 11 dwt., which was above the usual for one dredge.

There is a constant nibbling going on at the known alluvial leads in the vicinity of Newstead and Guildford on the Loddon and Joyce's Creek. Mr. R. W. Stringer, of Melbourne. has taken up a lease of 2045 acres, being the abandoned lease No. 6416. This includes both the Loddon River and Joyce's Creek.

In connection with the reef recently opened up at Taradale by Mr. Job Beer, an interesting case was brought before Mr. Warden Barlow at Taradale last week. Job Beer sought to have compensation assessed in respect to certain land of W. A. McCallum, which he had pegged out for a mining lease. The parties could not agree as to compensation. The solicitor appearing for McCallum took the objection that the warden had no jurisdiction to assess compensation, on the ground that complainant had not marked out on the land with red pegs the area of service that he required to take, and consequently defendant was unable to say what was the particular piece required, or what was its value. After considerable argument between counsel the Warden upheld the point raised, and struck out the case.

## Daylesford.

(From Our Correspondent.)

At the Ajax the west drive southward at No. 7 level shows up best of the faces worked upon at the present time. There is a couple of feet of stone followed north at the level below, but it has not yet shown anything of a payable nature. The Central Ajax is continuing to operate on good quality stone at the majority of the levels, and prospects for a continuance of this state of affairs for some time to come do not lessen. The cutting of the downward course of the Ajax lode in the western crosscut at the new bottom level about 60ft. from the shaft was about as anticipated. The 3ft. of lode formation, though gold-bearing, does not give payable values, but is expected to do so as it is driven upon. Crushing continues with the full 20 heads, and ample dirt is available. The North Ajax are experiencing very hard country in sinking another lift from the 700ft. plat. The Nuggety Ajax are again sinking the main shaft below the 700ft. level. The country is tight, and the progress is slow accordingly. The north drive at the 700ft. level is now in spurry country, not unfavourable for a development. The other drive at this level shows a foot of stone on the hanging-wall, and a couple of feet on the footwall. The latter body of stone carries a little gold, but cannot be classed as of payable quality. The North Nuggety Ajax appears to have brightened up somewhat. The No. 6 level is producing a very fair quantity of payable crushing material. In the drive going south the profitable stone has made under and an encouraging vertical lode track has come in in the face and widens out as it is followed. Some fair-value quartz is being operated upon to the south from the Central boundry. Here, too, the main shaft is being taken down to another level. The North Lord Roberts are pushing ahead with shaft sinking, and at the same time are putting down a prospecting shaft which, at 12ft., has passed through flat leaders of fair size carrying shotty gold. The Lord Roberts drive north from the north shaft shows over 2ft. of payable quartz. The New Specimen Hill No. 2 level stopes are producing payable stone, but at the level above the quality of the quartz is not regular. The William Tell lode, followed south at the No. 5 level, has widened out considerably, is well defined, and shows gold. The New Cornish Company have practically suspended operations, and the only work done is to keep the mine free of water. Tenders are invited for the purchase of the property, which in the past has been a good gold producer. The difficulty seems to be the want of capital to exploit lower levels, and in the hands of an up-to-date company, with a sufficiency of capital to systematically work this fine property, it is possible that the often expressed opinion that "the Old Cornish will see all the other mines on the field out of existence" would be fully realised.

## MINING IN QUEENSLAND.

### North Queensland Fields.

(From Our Correspondent.)

Mareeba, October 4.

A matter of great note to those interested in mining occurred last week, when the Australian Workers' Union (Chillagoe Branch) presented a schedule of wages, showing increases all round. At the conference between representatives of the Union and the mine managers the following companies were represented:—Chillagoe Ltd. (Mr. J. Horsburgh), Mungana Company (Mr. Rodda), Etheridge Company (Mr. De Latour), Great Northern Company, Herberton (Mr. Bonar), Stannary Hills (Mr. V. Martin), Mammoth Company (Mr. C. Rutledge), Vulcan (Mr. Brodie), Tommy Burns (Mr. Lyon), Prince Alfred (Mr. C. M. Clarke). After a long discussion the representatives of the companies returned a final answer to the Union that they would not consider any increase in wages or a decrease in time, and they reserved the right to enter into any contracts they thought fit.

It is evident that the companies are united in this regard, and as the conference was adjourned for one month, it is a matter for conjecture as to what the union intends doing. It is not thought likely that they will enforce their demands, as, it will be remembered, the Chillagoe Ltd., a few months back, issued an ultimatum stating that if there was any interference of the union with contract work that the company would close its mines and smelters.

Considering the excellent progress being made at the Mt. Mulligan Coal Mine, it will be a pity if industrial troubles should arise. The following is the schedule of wages and demands as presented by the A.W.U. at the conference.

Mining Section.—Surface minimum, 10s.; underground minimum—truckers and mullockers, 11s.; platmen and bracemen, 11s. 8d.; hand miners, 11s. 8d.; machinemen, 13s. 4d.; monkeys, 12s. 8d.; timbermen, 13s.; firemen (leading), 12s.; firemen (assistant), 11s.; tool sharpeners, 12s.; boys (minimum), 5s.; boys (whip drivers), 8s.; boys (whip drivers, when sinking operations are being carried on), 10s.

Wet shafts, water dripping upon the miner, sinking under a bucket, hot ends and rises where the temperature is in excess of that set forth in regulation 63B of the Mining Act rates to be 1s. above the ordinary shift.

If a disagreement arises as to the definition of wet ground the matter shall be decided by an arbiter mutually agreed upon by the employer and employees. Shift bosses where hand steel is employed, 13s. 4d.; shift bosses where machines are employed, 14s. 4d.

Overtime.—Time and a half for New Year's Day, Boxing Day and ordinary overtime. Double time for Sundays, Christmas Day, Good Friday and Eight Hours' Day.

Hours.—Eight hours day from bank to bank. Forty-four hours' week, inclusive of half-hour for crib.

Smelters' Section.—Surface minimum, 10s.; tuyere punchers (copper converters), 11s.; head firemen, 12s.; stokers, 11s.; lead tapper and sailor, 11s.; Dwight Lloyd machine attendant, 12s.; horse drivers, 10s. 6d.; tappers and feeders, 11s.; tappers and feeders' assistants, 10s. 6d.; skimmers, 14s.; head liner, 13s.; neck liner, 11s.; liners' assistant (monkey), 11.; pug mill hand, 11s.; crane drivers, 11s.; mechanics, 15s.; blacksmith's striker (on leading fire), 11s.

Overtime same as mining section.

Einasleigh, Cardross, to be 1s. extra on above rates. O.K. 1s. 6d. extra on above rates.

Battery Section.—Jiggermen, 11s. 8d.; feeders, 10s. 6d.; feeders (youths), 8s.

All persons doing mechanics' work to receive mechanics' pay.

Preference to Unionists.

Boys serving apprenticeship to be properly catered for.

Mr. Jenkinson, managing director of the New Minnie G.M. Co., visited the mine on Wednesday last. He was accompanied by Mr. Geo. R. Gordon, who has been associated with the erection of many batteries in North Queensland, and who has been commissioned by the directors to report on a suitable battery scheme. His report will be submitted to the directors to-night, and we think it will be adopted, as Mr. Gordon is a man who knows his work thoroughly.

The mine continues to develop well, and is now a valuable property, and once the battery is in commission should soon pay dividends. It is the most promising gold development that has occurred in the north for some time.

One of the busiest places at the present time is Cardross, where the Mammoth Copper mines are operating. The new manager, Mr. C. Rutledge, is makings things hum, and with Mr. Audrey Smith as adviser, work should be carried out in a proper manner. The company intends carrying out work on a large scale, but they are hampered by a scarcity of labour. There are openings there for good machine men, who can make splendid wages. The prospects of this company appear to be exceptionally bright, and another 12 months should see Cardross one of the most prosperous places in North Queensland.

Good reports continue to come to hand from the Vulcan Tin Mine, Irvinebank, and we will be surprised if the shareholders do not get a good Christmas Box this year.

## NEW ZEALAND MINING.

### Annual Report.

### Diminished Yields.

The annual statement of the New Zealand Minister of Mines (Mr. W. Fraser) to December 31, 1912, was presented to the House of Representatives on September 25.

The value of the mineral output for the year amounted to £3,042,214, as against £3,492,403 during 1911, being a decrease of £450,179, such decrease being due to the disastrous strikes by which the mines at Waihi, Reefton, and Blackwater were rendered idle from May to November. The shortage in the value of bullion from the mines affected is estimated at £450,000. The value of bullion produced from gold mines amounted to £1,429,870 for the year, as against £1,948,369 for 1911. Dividends paid during 1912 by registered gold mining companies amounted to £368,638. The output of coal amounted to 2,177,615 tons, being an increase of 111,542 tons above that of the previous year. Satisfactory increases also occurred in the value of kauri gum and scheelite exported during 1912.

#### Development Work.

The most important development during the past year (says the report) has been in connection with drilling operations in search of petroleum in the North Island, where six companies equipped with modern rotary drills are now engaged. The second Government bonus of £2500 has been won by the Taranaki Oil Wells (Limited) upon its producing 500,000 gallons of crude petroleum from its Moturoa wells, where the company recently laid down a refinery for the treatment of its crude oil.

In the provincial district of Marlborough, a beginning has at last been made to establish the mining industry on a scale of some magnitude. The Dominion Consolidated Co. has developed a promising gold-scheelite lode and has installed a plant. Towards the end of the year crushing was commenced with satisfactory results. On the Ohinemuri River the Waihi-Paeroa Gold Extraction Co., having installed works for the treatment of tailings discharged into that river from the Waihi and Karangahake mines, produced most satisfactory results, obtaining bullion to the value of £33,811, which enabled the payment of a substantial dividend.

On the Buller coalfield an important development of a new coal area has been made by the Westport-Stockton Coal Co., which by means of drilling has located a block of workable bituminous coal, in extent about 600 acres and containing at least 9,000,000 tons of coal. This having been connected by electric tramway to the company's haulage system, the prospects of the company have materially improved.

At Ross, work has been resumed by the Ross Goldfields Reconstructed upon the once famous deep leads of Ross Flat. With systematic development there is a reasonable prospect of an important mine being established.

#### Mineral Exports.

The following table shows the value of gold, silver, and other minerals, coal and kauri gum exported during the years 1911 and 1912; also the quantity of native coal consumed in the dominion during the same periods:—

| Product. | 1911. | 1912. |
|---|---|---|
| Gold .. .. .. .. .. .. .. | £1,816,782 | £1,345,131 |
| Silver .. .. .. .. .. .. .. | 131,587 | 84,739 |
| Mixed minerals .. .. .. | 22,241 | 20,571 |
| New Zealand, coal exported | 204,379 | 216,170 |
| New Zealand coal used in N.Z. | 921,707 | 974,301 |
| Kauri gum .. .. .. .. .. | 395,707 | 401,305 |
| Coke .. .. .. .. .. .. .. | — | 7 |
| Total value .. .. .. | £3,492,403 | £3,042,124 |

Total decrease for 1912, £450,179.

#### Coal Production.

The output of coal during 1912 amounted to 2,177,615 tons, as against 2,066,073 tons during 1911, being an increase of 111,542 tons. There has also been a considerable increase in the quantity of coal imported into the dominion; 364,359 tons having been imported during 1912, as compared with 188,068 tons during 1911. The quantity of coal exported during 1912 was 229,012 tons, and during 1911, 223,275 tons. Our annual consumption of coal has therefore increased by about 182,096 tons during the past year. The following is a comparative statement of the coal and lignite raised during the years 1910, 1911, and 1912:—

|  | 1910. | 1911. | 1912. |
|---|---|---|---|
| District— | Tons. | Tons. | Tons. |
| Northern .. | 400,664 | 397,872 | 383,847 |
| West Coast .. | 1,341,032 | 1,218,693 | 1,301,461 |
| Southern .. .. | 455,666 | 449,508 | 492,307 |
| Totals .. .. | 2,197,363 | 2,066,073 | 2,177,615 |

The comparative tonnage of the various classes of coal, etc., for the years 1911 and 1912 is summarised as follows:—

|  | 1911. | 1912. |
|---|---|---|
| Class of Coal. | Tons. | Tons. |
| Bituminous and semi-bituminous .. .. .. .. .. | 1,358,357 | 1,417,608 |
| Pitch coal .. .. .. .. .. | 4,411 | 4,113 |
| Brown coal .. .. .. .. .. | 601,093 | 544,675 |
| Lignite .. .. .. .. .. .. | 102,212 | 211,217 |
| Totals .. .. .. .. .. | 2,066,073 | 2,177,615 |

As for the balance-sheet of the State mines, the Minister says that changing the rate for annual depreciation from 5 per cent. to 10 per cent., though doubtless a very desirable change indeed, has had the effect of making this year's balance-sheet show a loss of no less than £9989. If the amount for depreciation had been retained at last year's rate and had been computed in the same manner this year's balance-sheet would have shown as good a working result as last year's.

#### Other Minerals.

The quantity of scheelite concentrates exported during the year amounted to 135 tons, valued at £13,347, being a slight increase (as regards value only) over the output during the previous year. The quantity of kauri gum exported during 1912 amounted to 7908 tons, valued at £401,305, as against 7587 tons, £395,707 in value during the previous year. The total value of kauri gum exported to the end of 1912 amounted to £16,210,457.

#### Gold Mining.

The value of the bullion obtained from the quartz mines during the few months the most important of them were worked amounted to £906,189, as a result of treating 335,651 tons of ore; the dividends paid amounting to £314,903 10s. The following is a statement of the value of bullion obtained and the amount of dividends paid by the most important quartz mines during 1912:—

|  | Bullion. | Dividends. | Total Dividends. |
|---|---|---|---|
| Waihi .. .. .. | £316,724 | £148,772 | £4,379,357 |
| Waihi Gr. Junc. .. | 74,371 | 19,219 | 38,437 |
| Talisman .. .. | 246,569 | 125,062 | 685,353 |
| New Big River .. | 36,657 | 15,600 | 67,200 |
| Waihi-Paeroa .. | 33,811 | 6,250 | 6,250 |
| Other quartz mines | 198,057 | — | — |
| Totals .. .. | £906,189 | £314,903 | £5,176,597 |

Gold to the value of £266,348 was obtained from alluvial mines during 1912, being £8868 less than that obtained during the previous year, and £77,884 more than during 1911. This increase may be attributed to a more general rainfall during the past two years rather than to an improvement in the development of the sluicing claims. The value of the production from our gold dredges during 1912 amounted to £257,333, as against £297,900 for 1911; but dredge mining is now acknowledged to be long past its zenith. The dredges in commission numbered 87.

# NEW SOUTH WALES MINING.

## Broken Hill.

(From Our Correspondent.)

Broken Hill, Oct. 10.

The Broken Hill mines worked beautifully again early in the week, but trouble happened again in mid week, when the water supply to a number of mines was checked. A number of the mines had to close down. They blamed the Water Co., naturally. But the fault was the fault of some of the mines themselves. When the break in the pumping plant occurred last week the mines had to fall back on their reserve supplies, and the city filtration plant ran short. The northern mines, directly the service was mended, started to fill their reserve tanks, so the mines at the southern end of the line of lode were unable to obtain a sufficiency of water. Mr. Whitehead, resident engineer of the Water Co., attempted first to fill the town's supply reservoir, for household purposes, but the heavy demand of the mines prevented him, so he was forced to shut down the supply to the mines and treatment plants for a time. Some were able to keep going, but the majority had either to close down altogether or in part. Mr. Whitehead said to-day, however, that he expected by the morning (Saturday) to have the service tank filled and the regular service to the mines complete. Then the mines could complete their reserve supplies and resume normal operation. The greatest sufferers were the South and Central mines, and the Zinc Corporation.

The Water Co. has received considerable blame for the stoppage; but, though the fault a week ago might have been the company's, that of the past few days was the fault of certain of the mines, who greedily rushed the renewed supply, and sought to achieve more than the service could meet. It is even alleged—but the facts speak for themselves. Two or three of the propositions were never without a sufficiency of water. They were not at the southern end.

These water troubles, of course, affected seriously both productive and development work. "Hours lost" appeared prominently in last week's returns, and will be repeated for this week.

The Junction mill was idle for the greater part of last week, the plant treating only 448 tons of crudes for 50 tons of leady concentrates, nearly an 8½ to 1 ration.

Block 14, because it has no mill to take a big flow of water, has been able to keep going without a hitch. Its last official figures (output) were: 250 tons carbonates and 550 tons sulphides, for a week.

The Junction North mill ran 98 hours only, instead of 144. Results of work were on the improving scale, and will assist to meet the high legal expenses that must be paid by both sides, no matter who wins the ventilation law case.

The British crosscut on the No. 11 level, Thompson's section, at latest was in 146ft., still in low grade ore. Production on this mine keeps on the big side. Much advance is being made with the extension of the treatment plants.

The North's main crosscut at the 1400ft. level is in 317ft. from the shaft (or the "advance heading" is), and the lode is still some distance ahead.

Some South Blocks figures (Zinc Corporation): Main shaft, down 1294ft. 1050ft. crosscut, ore worth 16.6 per cent. lead, 2.3 oz. silver, 12.4 per cent. zinc. 891ft. south drive (zinc lode), ore worth 5.6 per cent. lead, 0.9 oz. silver, 14.3 per cent. zinc. Elsewhere, in the zinc lode, developmental values are low.

It isn't much use saying anything fresh about the South, Central and Proprietary. They (and the North) stand out alone, the big, solid concerns of Broken Hill. They have had no developments to "cable home about," but the steady, honest production of the trio (or the quartette) gives them the guinea stamp. There's no need of Broken Hill failing with such mines and works at the head of affairs.

Block 10, too, shapes exceptionally well just now—through the 615ft. western body and the possibility of the body from the Central's 500ft. level proving rich as it descends. The western body has been proved 28ft. wide, and of fair average value.

The mineral exports from Broken Hill for September were valued at £402,720, made up thus:

| | Tons. | Value. |
|---|---|---|
| Silver-lead concentrates .. .. | 30,158 | £304,527 |
| Zinc concentrates .. .. .. .. | 35,881 | 90,498 |
| Silver-lead crudes .. .. .. .. | 2,614 | 6,244 |
| Silver-lead slimes .. .. .. .. | 1,384 | 958 |
| Zinc slimes .. .. .. .. .. .. | 299 | 493 |
| | | £402,720 |

For August the output (exported) was valued at £382,242, and for July £398,499. The comparative figures were: August—Silver-lead concentrates, [illegible]; zinc concentrates, £77,226; silver-lead ore, [illegible]; silver-lead slimes, £1,275; gross value, £382,242. July — Silver-lead concentrates, £312,722; zinc concentrates, £77,769; silver-lead crudes, £6700; silver-lead slimes, £1314; gross value, £398,499.

Again, may I advise mining men, operators, and others, to keep their eyes on the end of the year.

## South Coast.

(From Our Correspondent.)

Wollongong, Oct. 11.

The molybdenite prospect at the Black Range, in the Bega district, is the leading interest just now. Some of those who have secured interests there met in Bega recently and discussed a proposition to jointly develop one of the claims, and so prove the field. They failed, however, to agree about it. Mr. Fred Joseph, of Wagga, has visited the field in the interest of some of the claim owners, with the object of arranging for capital. He took away specimens which he submitted to experts, and, according to local report, they expressed a good opinion of the ore.

## Lithgow and District.

(From Our Correspondent.)

Lithgow, Oct. 9.

The traction hauling plant, which for some weeks has been hauling between the Lloyd copper mine, at Burranga, and Perthville railway station, has made its last trip. The teams are coming on to the road again, a contract for six months having been entered into between the Lloyd Co. and certain teamsters for haulage at a rate of 20s. per ton each way, this being 2s. 6d. per ton less than was being paid for traction haulage. The change is being hailed with delight by all drivers of horse-drawn vehicles, there having been several accidents, and many more narrow escapes, through horses meeting the engine on the road. In fact, many people were afraid to travel when the engine was about.

As a result of having obtained part of the contract to supply steel rails to the Federal Government for the transcontinental railway, G. and C. Hoskins have given instructions for a large number of men to be at once engaged for their Carcoar ironstone mines. For over two years the greatest number employed did not at any time exceed forty, but now, it is stated, employment will be found for about 100, and also for about 12 horses and carts. Business people are pleased with the latest developments, as the increase in the number of hands will mean that about £250 per week will be paid out to the miners in wages when the mine is in full working order.

# WESTERN AUSTRALIAN MINING.

(From Our Correspondent.)

Kalgoorlie, Oct. 6.

Owing, it is said, to the failure of Mr. Ben Howe's experiments to recover gold from refractory ores by the volatilisation process, the directors of the Lancefield have decided to put the company into liquidation, and to finally close down. Keeping the mine free of water is all that is being done at present. The last balance-sheet issued was for 12 months ended June 30, 1911. At that time the debit in working account stood at £36,842. The company owed creditors, £31,721, while debtors and cash represented £652. During the last two years, it is stated that the debit balance has been increased by at least £10,000, and is now over £40,000. The machinery on the mine, consisting of a 40-stamp mill and a sulphide washing plant, is in a wretched state, and would fetch very little, if sold, as it is in an out-of-the-way, and discredited, district.

The Mountain Queen at Marvel Loch, which is practically depleted of oxidised ore, has taken a sampling option on the Great Victoria, 12 miles distant. The latter mine was previously under option to Mr. R. Hamilton, on behalf of the Great Boulder Co., but was turned down owing to unsatisfactory developments. The owners allege that the shaft put down by Mr. R. Robinson for Mr. Hamilton was 80ft. off the lode, and proved nothing. The lode at 300ft. is 125ft. wide, so the reason for Mr. Robinson's sinking a new shaft in country is inexplicable. The price asked is £32,000 and one-eighth share interest. The Mountain Queen Co. also owns the Transvaal, but, like the Gwalia Consols and the Lancefield, the sulphide ore contains arsenical pyrites, and cannot be treated on a commercial basis. The Transvaal, however, is still being developed, so, apparently, there is still a chance of overcoming treatment difficulties. The trouble at the Lancefield and Gwalia Consols is that only small mulga timber, which is very dear, and burns very quickly, is available, while, at the Transvaal, there is an unlimited supply of heavy salmon gum procurable at a low figure.

Dr. Malcolm McLaren's report on the lower levels of the Kalgurli mine is published, and is a most depressing document. He states that there is a broad dyke of quartz dolerite, dipping westward at an angle of 65 degrees, but really flatter owing to faulting, and that all the payable lodes of the Golden Mile are contained in this dolerite. Whenever the lodes pass through this dyke they become impoverished, and, within 60ft., become barren in the underlying older greenstone, or calc-schist. Dr. McLaren asserts that the eastern lodes in the Kalgurli mine finally pass out of the quartz dolerite at 1650ft., and the western at 1750ft. He adds, "that, on the 1850ft. level, no quartz-dolerite whatever has been disclosed, and that level lies entirely in calc-schist. The footwall of this dolerite is slightly east of the Brown Hill lease, and the hanging wall just outside the west boundary of the Ivanhoe, a distance of 1600ft. across." The geologist further asserts "that five other important mines have suffered in the same way, together with several smaller mines. In gaining this experience, certainly not less than £345,000, and probably £400,000, has been expended in actual driving, sinking, and crosscutting in calc-schist. One mine, vainly hoping against hope, has, during the last three years, spent £48,000 in this pursuit, reaching a depth of 500ft. below the dolerite, but recovered practically no payable ore." The leases referred to are, of course, the Lake View Consols, Associated, Perseverance, Associated Northern and the Oroya Brown Hill, and the Associated is the mine specially aimed at. Dr. McLaren concludes by stating, "that, if we are to profit at all by the huge and otherwise profitless expenditure in the calc-schist, the inevitable conclusion is that it is unsound mining business to sink deeper in the Kalgurli mine in search of ore bodies that both the indications and a wide experience of similar conditions combine in asserting to be non-existent.". The Kalgurli mine was reported on by Dr. McLaren in 1910, but his report was never published by the directors. It is significant that, although a new engine, capable of hauling 2 tons from 3000ft., was erected in June, 1910, the shaft, which was then down 1900ft., has not been deepened since, though the two bottom levels have, in the interval, been opened up, and proved Dr. McLaren's contention. The ore reserves, owing to developments in the upper levels, were still given, on July 31, 1913, as 250,000 tons, the same as a year previously, but the value is given as 39s. 4d., against 40s. per ton. On the other hand, the Associated, although it was unofficially examined in 1910 by Dr. McLaren, was not reported on, as the directors did not think it necessary. Just as the doctor was leaving, a few weeks ago, for Queensland, to report on the Great Fitzroy, the directors cabled him to report on the mine, which he will do shortly.

The ore reserves of the Ivanhoe, on June 30, were estimated at 1,045,500 tons, worth 39s. 4d. per ton, against 1,080,850 tons, worth 40s. 7d. per ton on December 31, 1912, and 1,088,400 tons, worth 44s. 3d. per ton on December 31, 1911. The decline in tonnage and value is due to the shortening and impoverishment of the ore shoots caused by the intrusion of a porphyry dyke and graphite in the bottom levels. On Dr. McLaren's advice, the shaft, which is now down 2900ft., is to be sunk to 3500ft., where the porphyry dyke will have dipped out of the lode to the west. Also, on the doctor's advice, the old Ivanhoe Junction, and two leases on the south of it, are held by the Ivanhoe Co., as Dr. McLaren predicts that the quartz-dolerite dyke will be in those leases at a depth of 2000 to 3000ft., and that a fresh big rich lode may be looked for there. Should this prediction prove true, the venue of mining will eventually be transferred to the west of the Golden Mile from the east. These leases are at present under exemption, but it is intended eventually to bore from the deepest workings of the Horseshoe and Chaffers, and the work is expected to cost £10,000.

Evidently the Great Boulder and the Great Boulder No. 1 are to have another try to find a new mine. Mr. R. Hamilton has taken a sampling option on the Big Bell lease, at Paton's Find, 18½ miles west of Cue. If the sampling is satisfactory, an eight months' working option to thoroughly test the ground will follow. A large number of leases have been pegged in the district, but very little work has been done so far. A crushing from a large schist lode carrying narrow quartz veins has yielded 58 oz. from 83 tons, exclusive of gold in tailings. This ore came from a shaft 50ft. deep. Mr. Civial Hawkins, manager of Great Boulder 1, has pegged four leases on the old Rothesay mine, near Field's Find, Yalgoo. These leases were held by an English company 16 years ago, and were equipped with a 20-stamp mill, which crushed 8900 tons for £14,000, an average of 31s. 6d. per ton. This average did not pay at the time, and the mine has lain idle for years, and, only a year ago, the 20-stamp mill was transferred to the Royal Standard, at Yuin, where its erection has just been completed. The mill was erected by rule of thumb, as the plan left by the engineer, who transferred the plant, was lost by the previous manager of the Royal Standard mine, and there has been endless trouble through alignments not being correct, and consequent difficulty in keeping belts on pulleys.

## GIPPSLAND COPPER CO. (V.).

The Gippsland Copper Co. has issued a circular advising shareholders that the Government Loan applied for has been definitely refused, on which account the July call of 2d. per share must now be put into effect. Any shares on which this call is outstanding will be sold by public auction on October 21, at the Stock Exchange Hall, Melbourne, after which date the remaining shareholders will be called together for the purpose of considering and deciding on the future policy of the company.

It is quite natural that the present directors should feel sore at the refusal of the Government to grant the £1500 applied for, particularly since it appears that they are nursing an apparently troublesome baby. This is not saying that the company's property is an unattractive one; on the contrary, it appears to have a good prospect of developing into a good property, but this stage can only be reached at a price far in excess of the company's present resources and the amount of grant asked for from the Government. It is now generally understood that the policy of the Mines Department is to not grant any money which may be spent indefinitely or abortively. In other words, the departmental officers must be satisfied that any sum applied for is adequate for the purpose outlined, and that the applicant is capable of bearing his proportion of the financial obligation imposed thereby. In addressing the meeting of shareholders last month, the chairman of the Gippsland Copper Co. (Mr. Black) stated that the refusal of the Government had come as a great disappointment. He did not, however, state the purpose for which the grant was required, nor the grounds on which it had been refused. He merely stated that this refusal came as a disappointment, particularly in view of a favourable report made upon the mine in 1911 by a now prominent Government mining official, who was then acting in a private capacity, it having been on the strength of this report that most of the shareholders had put up their money. Mr. Kaeppel subsequently threw more light on the identity of this report by stating, in effect, "that it was good enough to warrant the Australian Metal Co. entering into a three years' contract with the Gippsland Copper Co., and advancing that company £1000 for coke." This report, then, was that made to the Australian Metal Co. in 1911 by Mr. Herman. Therefore it could not have been on the strength of that report that shareholders subscribed, but on the inference that the prospects of the Gippsland Copper Co. must be favourable if the Australian Metal Co. considered it good enough to enter into a three years' contract. As a matter of fact, this report is not so favourable as the remarks of the chairman would indicate, and it by no means follows that what in this case was good for the goose was good for the gander also. At the time this report was made, the official estimate of ore reserves in the mine was 75,000 tons of payable ore. What justification there was for making this estimate may be gauged by the following extract from Mr. Herman's report. "Ore is exposed at various levels, as shown on the accompanying plans and sections, but there are no vertical connections in ore to demonstrate the continuity of the ore body or bodies between the various levels. A rigid estimation of ore 'blocked out' would consequently be very small—so small, in fact, as to make it manifest to anyone inspecting the property that such an estimation would not be doing it justice. I have accordingly, after a good deal of consideration of the character of the ore occurrences, taken areas and values (partly ascertained and partly assumed) of the pay-ore at the various levels, and assumed continuity between successive areas, calculating tonnages and values on the averages of area and value at the successive levels. This is the best compromise I can make, and on the whole I think the mine may pretty safely be relied on to make good the estimates thus made." The statement that "there are no vertical connections in ore between levels," necessarily creates wonder as to how the management arrived at the official estimate of 75,000 tons. Further, Mr. Herman, in the absence of evidence of continuity, makes a compromise by adopting a novel formula for his calculation, and yet is only able to estimate the ore reserves in the mine at 18,000 tons, "not including slag, but including ore proved by boring." Mr. Herman further states: "The official estimate of reserves of ore of about 75,000 tons assumes payable ore for average length, width, and height of 100ft., 30ft., and 300ft. respectively. The formation is certainly of a character likely, with a moderate amount of good fortune, to yield large tonnages of pay-ore, and it is quite probable the official estimate will eventually be realised. My own estimate of 18,000 tons, however, involves all the assumptions I feel warranted in making for anything approaching a safe estimate of ore in sight." It is obvious from this that, tied down to the clear issue of valuing the ore reserves on rigid lines, Mr. Herman was unable to give a higher estimate than 18,000 tons. On the other hand, he saw no reason why he should not indulge in a certain amount of speculative estimation on the evidence before him; but if shareholders are influenced by that kind of thing, it is their look-out, it being generally recognised that an attitude of this description is taken in consideration of the risks involved, upon which shareholders are free to use their own judgment. The blame, if any, is really attachable to those responsible for guessing rather than estimating ore which was not completely blocked out, and upon which the public were invited to subscribe money, and if the present position of the mine is not ascertainable on those lines, the sooner the shareholders know it the better. They will then be in the position of determining for themselves whether it is or is not worth their while subscribing sufficient capital to definitely prove the value of the property.

---

## MINE VENTILATION RIGHTS.

### The Broken Hill Litigation.

The litigation which has been in progress for a long time between the Broken Hill Junction North Silver Mining Company No Liability and the Broken Hill Junction Lead Mining Company No Liability has lately been before the High Court, the Acting Chief Justice, Mr. Justice Isaacs, Mr. Justice Duffy, and Mr. Justice Powers, on an appeal against a decision delivered in the Equity Court by Mr. Justice Rich when he was on the Supreme Court bench of New South Wales, but, after the points had been fully developed in Court, counsel for the parties, acting on the suggestion of the Acting Chief Justice, consulted with the object of settling the dispute by arrangement between the parties. A strong bar represented each company; Mr. Irvine, K.C., and Mr. R. K. Manning (instructed by Messrs. Minter, Simpson and Co., of Sydney, agents for Mr. J. R. Edwards, of Broken Hill) appeared for the appellants; and Mr. Leverrier, K.C., and Mr. R. H. Long Innes (instructed by Mr. W. A. Freeman) for the respondents.

The suit was one respecting ventilation rights, and the Junction North company sought a declaration that it was entitled to the free and uninterrupted passage of air from its mine through the defendant Junction Lead company's mine to the surface, and also an injunction to restrain the defendant company from closing the adits or preventing the passage of air, as mentioned. Against this the Junction Lead company counterclaimed an injunction to restrain the Junction North company from, by artificial or other means, forcing foul, hot or humid air through the defendant company's workings. Each company also asked for damages as against the other.

Last Wednesday counsel were able to announce that on the issues before the High Court an agreement had been arrived at, but a new point raised by that court, viz., whether the nuisance complained of was not a necessary consequence of plaintiffs fulfilling obligations imposed by their leases and the Mines Act, and of working their mines in the most effective manner, was remitted to the Equity Court of New South Wales. The agreement having been handed to the court, the Acting-Chief Justice (Mr. Justice Barton) next day announced the order of the court as follows—ORDER—

(1) That the decree of the Supreme Court appealed from be varied by omitting therefrom (a) after the words "This Court did decree and order that the said suit be dismissed," all words down to and including the words "the amount of the said damage, if any," and (b) all reference in the said decree to costs, and that save as aforesaid the said decree of the Supreme Court be affirmed.

(2) That the counterclaim be remitted to the said Supreme Court in its equitable jurisdiction to admit of the plaintiff applying for an order that the defence to the counterclaim be amended in manner proposed by the plaintiffs and assented to by the defendants in the document filed as aforesaid, and to enable the said Supreme Court to make such order as to such amendments and upon the counterclaim, if amended, and as to any further pleadings (including demurrer), in reply to the proposed amended defence thereto as to the said Court shall seem proper.

(3) Declare that in the event of the defendants being finally held to be entitled to recover damages upon the counterclaim, this appeal shall be taken to have failed within the meaning of the order of this Court, dated the first day of September last past.

(4) That the costs of the suit and the costs of the counterclaim incurred up to the date of this order shall be paid by the plaintiffs to the defendants, and that the future costs of and incidental to the counterclaim, and of all further proceedings in connection therewith, be paid as may be directed by the said Supreme Court.

(5) That the appellant pay to the respondent the costs of this appeal, including extra costs as ordered by this Court on the first day of September last past.

His Honour said that the Junction North company had been compelled to abandon one by one the positions it took up in regard to the claim. Their position against the counterclaim was abandoned as it stood, which accounted for the terms of the order. Paragraph 3 was the decision of a majority of the High Court (Mr. Justice Isaacs dissenting), and it meant that the order allowing further time to appellant for the appeal was a concession which must be paid for. The plaintiff company was now permitted to set up what it thought was a good defence; but court expressed no opinion as to the validity of the defence to the counterclaim if it were proved.

The following undertaking was given by counsel in the matter:—

In the event of either party appealing against the decision, or any part thereof, of the Supreme Court of New South Wales, in its equitable jurisdiction, on the hearing of the counter claim, remitted to the court by the order of the High Court, it is agreed that such appeal shall, in the first instance, be made direct to the High Court of Australia; and both parties further agree to use their best endeavours to expedite the hearing of such appeal, if any.

---

## THE COAL MINING INDUSTRY.

### New South Wales.

### Northern District.

(From Our Correspondent.)

Newcastle, Oct. 11.

The export of coal from the port of Newcastle for the nine months ended September 30 showed an increase of 166,756 tons over the quantity sent to foreign and inter-State ports for the first three quarters of 1912, the increase in value being £100,817. The amount exported was 3,786,432 tons, as compared with 3,619,676 tons for the same period of 1912, and the value was £1,982,071, as against £1,881,254 last year. There was a substantial increase in the quantity taken by all the States of the Commonwealth and by New Zealand; on the other hand, the foreign markets show a falling off, that in the case of Chili being over 100,000 tons. The Straits Settlements was an exception to the rule, there being an increase in the export of coal to that part of the world of over 55,000 tons. The export to Mexico shows an increase of 19,000 tons. The trade of the port is still good, and the year should end with the advantage on its side as against 1912. The increase in the inter-State and New Zealand trade more than compensated for the loss in the foreign markets.

Pelaw Main colliery is prolific in disputes, and another arose on Wednesday last over the question of the use of explosives. The men are anxious that they should be allowed to use "Westonite," the explosive which is manufactured at Weston, on the South Maitland field, if it is proved to be suitable for the work, and to show their feeling in the matter they stopped work on Wednesday. Work was resumed on Thursday, but it is said that the movement is only the commencement of one which has for its object the establishment of a testing station, so that the explosive named may be given an opportunity to compete with imported explosives

There is increasing demand for Newcastle and Maitland coals in the Javanese and Straits Settlements markets. Recently a contract was secured for the supply of 90,000 tons of Newcastle coal for Java, and now it is stated that a further contract for the supply of 100,000 tons of coal from this port has also been obtained. Those in the trade say that if freights are at all reasonable, the trade with the East is sure to increase, as the coal sent from here is much superior to Japanese and other Eastern coals. The high freights have alone prevented Newcastle coal getting a complete hold of that market.

The chairmanship of the Southern Miners' Board has been accepted by Mr. C. Hibble, Industrial Magistrate, in succession to Mr. Elliott, who recently resigned that position. Mr. Hibble will probably enter upon his work there on Wednesday next. He will meet the parties concerned, and will ask them to place before him their claims, and will probably arrange to hear them, so as to expedite the matter as much as possible. The Northern miners, noticing that Mr. Hibble is taking up this work, are anxious that something further should be done to complete the claims which they have put forward. His Honour Judge Edmunds is at present engaged upon that work, but he has much other work to claim his attention, and those who know something of His Honour's many duties know that he would not regret being relieved of some, at least, of the strenuous work of the Miners' Wages Board. Yesterday a deputation from the Northern men waited upon the Minister for Labour and Industry, in Sydney, and urged that something should be done to have their claims considered and settled, and it is understood that they have put it to the Minister that Mr. Hibble should be asked to take up this work, in conjunction with that which he will do for the South Coast men. Mr. Watson, the president of the Northern Colliery Miners' Federation, and the other officers, are very anxious that Mr. Hibble should take up this work, as he has had much experience in it, and they believe that he can give satisfaction to both parties. No official report of the Minister's reply to the deputation has been given, beyond the fact that certain proposals were made by Mr. McGowen, but it is generally understood that Mr. Hibble will be approached in connection with the matter, and asked to take up the work of chairman of the Board, so as to relieve his Honour Judge Edmunds.

A stoppage occurred at Whitburn colliery, Greta, yesterday afternoon. The men are asking 2s. 8d. for the filling of tops, and the offer of the management of 2s. 6d. was refused by them, the afternoon shift stopping work rather than take that sum.

The claim of the Pelaw Main machine men for consideration for any loss in wages due to ''deficient'' places, has been before the Wages Board for some days, to the exclusion of other matters. It was felt that the machinemen's grievances were urgent, and that they were likely to kick over the traces in other mines, and so the matter was taken up. A lot of evidence has been taken, and the case should be decided within a few days, if nothing occurs to interrupt the work of the Board.

### Southern District.

(From Our Correspondent.)

Wollongong, Oct. 11.

The event of the week has been the ballot of the Miners' Union for executive officers, whose positions had been vacated by a general resignation designed to determine who was who. Mr. Bowling had expressed himself quite confident of defeating his rival, Mr. Willis, for the position of secretary, but it proved he had made a very big error in his estimate. Mr. Bowling, whose advent some fifteen months ago was noted throughout the district with apprehension in some, expectations in others, and curiosity generally, thus severs his connection with official unionism here. He is understood to be interested in a prospecting proposition in the southern and undeveloped part of the district. After all the battling for the offices, it is not a permanent settlement. This was an election extraordinary; next year's officers are elected in December next. It is said Mr. Bowling will on that occasion try for the honorary office—the presidency. Should he be successful and Mr. Willis be re-elected as secretary, there will be another impossible situation, Mr. Willis being unable to work with Mr. Bowling. Mr. Jas. Maguire, who has regained the office of president, from which he was ousted at last election by Mr. Willis, is an old hand and a steady goer.

The current wages award expired last August, and upon its expiry application was made to the Wages Board for an extension of time to enable the union to prepare its claims, which business, although it should have been completed, had not been begun. The Board granted an extension for three months. Mr. Bowling (then secretary) thought that too long, as his side expected increases. Two months of the time have gone, however, and the preparation of the claims has not been begun yet.

Another matter which should have been heard of, and which usually is waited for with much interest, is the price of coal ascertainment, upon which hewing rates and wages, too, are based.

### Western District.

(From Our Correspondent.)

Lithgow, Oct. 8.

The Western Colliery District Conciliation Committee met on the 7th inst., in the Lithgow courthouse. The committee consists of:—Mr. J. Ryan, chairman; Messrs. A. E. Ivatt and W. P. Minell, representing the employers; and Messrs. W. H. Delaney and F. Gregory, representing the employees. The meeting was called primarily to inquire into the afternoon shift at Oakey Park. After discussion, and separate consultation on each side, it was agreed to await the result of a conference between Mr. Barbour, manager, and the miners' representatives. It is hoped that this will result in a settlement; otherwise the matter will be again referred to the committee. The conference will probably be held in a few days.

Mr. Philip Winchester, who recently discovered an excellent coal area in the depths of the Blue Mountains, is forwarding 100 tons of coal from his Bell coal-mine, near Lithgow, for coke testing purposes. It is rumoured that if the test is satisfactory, the Government will take over the mine. Mr. Winchester is 81 years of age, but climbs gorges in that wonderful but wild Gross Valley which would beat many of the best of our young men. Mr. Winchester has spent half a life-time in fossicking about the Gross Valley.

Last week reference was made to the reports of changes at Cullen Bullen colliery, which will probably lead to considerable developments. On the 3rd inst. it was formally notified that a special resolution has been passed at a directors' meeting, and duly confirmed, to voluntarily wind up the company as from October 4, 1913, and that Mr. W. P. Minell, of Sydney, be appointed liquidator. This is one of the formalities required under the Companies Act. No doubt the new company, with larger capital, will soon be in active control of the property. It is stated that a large sum, exceeding £20,000, will be spent in development work. A considerable new trade is anticipated, which will greatly add to the coal output of the Lithgow district.

The scarcity of trucks was again a predominating feature in the working of the local and district collieries during the last fortnight. Broken time was worked throughout by the whole of the mines, but in some cases the trouble has been acute, particularly at the Oakey Park colliery, where only eight days were put in.

## Victoria.

### Powlett River District.

(From Our Wonthaggi Correspondent.)

The inability of the management of the State mine to supply the Melbourne City Council with the whole of the slack coal it requires for its electric station has caused a good deal of comment in certain quarters. The slow development of the mine has, to a large extent, been held to be the cause, but it is not the only one There are others, which, from the management's point of view, are decidedly beneficial financially in the working of the mine, and these can be briefly stated. At the inception of operations, four years ago next month, all attention was directed to getting coal as quickly as possible. Consequently, the coal measures at the shallow depths were attacked first. This was very friable, and the percentage of slack was high, so much so that a market for the whole of it could not be found. The result was, that in the early part of 1912, there was about 40,000 tons of slack dumped on the mine. As the mine was opened up and the workings got into deeper ground, the coal was much harder, and made less slack. With the development of the coal this year in the Nos. 9 and 10 shafts at depths of 250ft. and 350ft. respectively, and with the introduction of coal-cutting machines, there was a still further reduction in the percentage of slack. From over 50 per cent. there has been a reduction to under 40 per cent. This, on an output of about 500,000 tons per year, is 50,000 tons more large coal than formerly, and the difference in price between large and slack coal will make a considerable difference in revenue of the mine. The cost of dumping slack coal and re-loading it when required, also the waste resulting, are also being saved, and these are not inconsiderable items. Then, again, the demand for the slack increased to such an extent that the dumps are practically exhausted, that remaining on the ground having been sold. From the foregoing it will be seen that the shortage of slack coal, whilst it might be a bad thing for the manufacturers, is from the management's side a good thing, as the slack problem was one of the main things they set themselves to solve.

The statement of the Minister for Mines that the ''life of the State mine is 25 years does not make pleasant reading for those who have invested their all in Wonthaggi, and is open to question, especially so if the estimated quantity of coal in the mine area is to be relied on as correct. Boring operations have, so far, it is said, proved about 28,000,000 tons of coal, of which fully 20,000,000 can be profitably mined. At the present output of half a million tons per year, the ''life'' of the mine would be 40 years. It must also be remembered that, so far, only half of the area has been bored, which, even if the present output were doubled, would give the mine a longer life than that stated.

There is little likelihood of the present output being substantially increased for the ensuing year. It cannot be done until the McBride tunnel opens up what is known as the Dudley area, which is estimated to contain 11,000,000 tons. It is in this area that the second seam of coal was disclosed recently, and which has added materially to the resources of the mine.

## PETROLEUM IN SOUTH AUSTRALIA.

Correspondence which has passed between the Eyre's Peninsula Petroleum Oil Co. and Dr. H. Basedow and others respecting the company's holding at Crinoline Point, in the Hundred of Lake Wangary, west coast, has been made public. Dr. Basedow says:—"A bed of lignite occurs in the low cliff face which overlooks an arm of Coffin's Bay, known as Kellidie Bay. The exposure is a little above high-water mark, and dips westward beneath the sea. It is overlain by a solid bed of phosphatic, fossiliferous limestone, recent loam, sand, and travertine. The deposit is dark brown to black in colour, soft, laminated, and fairly flexible when moist, and in part still retains its vegetable and woody structure. Upon sinking a hole through the overlying formations into the lignite, a short distance inland from the sea, water oozed from the sides into the bottom of the hole. On allowing this to stand for some time an iridescent film covered it. My first impression was that the film was the familiar 'scum' of iron oxide. On disturbing it, however, with a stick, I found it did not 'break,' as oxide of iron would do, but that it followed the little eddies and whirls produced in the water with a rich display of pleochroism. The latter phenomenon would be more characteristic of the film of greasy or oily water. The film was excessively thin and only visible in direct sunlight. In order to obtain, if possible, analytical confirmation (or the contrary) of my suspicion, I forwarded a sample from the bed of lignite to Mr. J. D. Iliffe, B.Sc., with a request to test it chemically. In his report, Mr. Iliffe was emphatic in pronouncing the sample submitted to contain 'a small quantity of an oily substance.' Mr. Iliffe tested the lignite for the presence of any oily constituents and obtained an oily substance, liquid while hot, and of the consistency of a waxy jelly when cold." In answer to questions from the company Dr. Basedow said:—"The occurrence of a bed of lignite containing oily matter is of considerable geological importance from a petroleum prospector's point of view. It is not so much on account of the 'oily matter' contained in the bed, but on account of the alternations of marine with lacustrine or fluviatile conditions, in later tertiary times, that are indicated. If such alternations of marine with fresh-water conditions have been proved to occur in late tertiary times, there is no reason why they should not be found to recur in the depth of the tertiary system of Eyre's Peninsula. It has been proved in other parts of the world that beds of the same horizon are carbonaceous in one locality and petroliferous in another. Quantitatively a field can only be exploited by systematic boring operations. The structural geology and geological conditions are certainly not unfavourable in certain parts of Eyre's Peninsula. The company is certainly justified in endeavouring to exploit the country near Kellidie Bay for possible subterranean supplies of oil. Care will have to be exercised in the selection of bore sites."

## CORRESPONDENCE.

To the Editor, ''Mining Standard.''

Sir,—In a recent issue of the "Mining Standard" I noted a paragraph referring to mining conditions here. From the fact that granitic intrusions have been met with in working the reefs, the presumption was made that the life of the field would probably be short. As far as my observations go—and I have been in a better position to study the chances than any other person, having been able to watch all mining operations here from their inception—I think such a conclusion entirely unwarranted by the facts, which all point to the probability that the veins now being worked will be followed to a considerable depth, and with no more than the usual diminution in gold values as depth is attained. The granitic intrusions which have so far been noted are horizontal bands of pegmatite, varying from an inch to 6ft. in thickness. In every case they are more recent than the quartz reefs, which they cut through. The reefs are not displaced, and have in every instance been found again continuing downwards below the pegmatite intrusions. These pegmatite bands are very common in the Yilgarn district, and are locally known as ''mica bars,'' owing to the quantity of mica showing in them—biotite in this district, but mostly muscovite in South Yilgarn. The gold values in the reefs appear to be entirely unaffected by the pegmatite contacts.

Yours, etc.,

N. S. STUCKEY,

Recovery Mine, Westons (W.A.),
September 27, 1913.

# ENGINEERING AND ELECTRICAL SECTION

Australian
General Electric Co.
217 Clarence Street, Sydney.
Tel.—Central, 3495, 4397; City, 2381.
"Penfold House," Cr. Queen and Little Collins Sts., Melbourne.
Tel.—Central, 2647.
Representing—
GENERAL ELECTRIC CO., U.S.A.
The
BRITISH THOMSON-HOUSTON CO. LTD., of Rugby, England.
The GUARANTEE of EXCELLENCE on GOODS ELECTRICAL

## MUNICIPAL COUNCIL OF SYDNEY.

At the last meeting of the above, approval was given to the Electric Light Committee's recommendation that authority be sought from the Governor-in-Council for the borrowing of a further sum of £250,000 for the purposes of the electric light undertaking on Corporation debentures. On a previous occasion this proposal had been referred back to the Committee for further report.

The following recommendations of the Electric Light Committee were also given effect to:—

That authority be given for the expenditure of an additional sum of £500 on the extension of the saltwater conduit at the Power House required in connection with the 5000 k.w. turbo-generator now on order, making a total sum of £1400 in all.

That two "Orton Boving" pumps to replace the present centrifugal pumps for turbine sets Nos. 6 and 7 be obtained from Messrs. Willans and Robinson at a cost of £481, plus five per cent. This price to include any alteration which may be necessary to pipes, couplings, bed-plates, and the setting to work of the pumps in the Power House. The bodies of the pumps to be cast iron and the cost to be a charge against revenue.

That four water flow indicators for the purpose of ascertaining how much water is being forced by each of the circulating pumps at the Power House, be obtained from the General Electric Company of America at an estimated cost of £27 each.

That the wiring for the connection of the "Leskole" distant thermometers at the Power House be carried out by the Electric Light Department's employees at an estimated cost of £175.

That authority be given for the expenditure of £10 10s. in fees to an expert analytical chemist to investigate the cause of damage to a certain drum of cable, caused by some chemical action in the lead sheathing.

That pending delivery of straight pin insulators under contract, authority be given for the purchase of 3000 insulators from local stocks at an estimated cost of £150, so that there shall be no interruption of the work in the suburbs.

That the following material required in connection with the renewal of parts of the air pumps of turbines No. 6 and 7 be obtained from Messrs. Willans and Robinson, the makers:—Three bucket rods of special Eatona metal; three buckets of cast iron sheathed with white metal; three liners of gun metal, at an estimated cost of £260.

That an expenditure of £225 be authorised on the equipment of a substation in a building to be provided by the Public Works Department for the supply of the Public Works Department's quarry at Marouba Bay road.

That sundry work required at substations be authorised as follows:—Alexandria, Substation No. 37, O'Riordan-street.—Connection of additional distributor; estimated cost, £18 10s. Canterbury, Substation No. 57, Floss-street.—Laying earthenware pipes; estimated cost, £15. Bunnerong-road, Substation No. 58.—Installation of transformers, etc.; estimated cost, £135. Concord, Substation No. 46, Government Brickworks, Homebush Bay.—Provision of an additional 200 k.w. transformer with necessary switchgear; estimated cost, £85. Daceyville, Substation.—Installation of additional feeder panels to take H.T. feeders; estimated cost, £55. Substation on premises of White City Ltd., Rushcutters Bay.—Equipment; estimated cost, £230. Also additional equipment required in the existing substation at Rushcutters Bay, No. 14, required for the transmission of current from Rushcutters Bay to sub-station at White City; estimated cost, £49.

The Council also resolved that it be referred to the proper committee to report upon the advisability of obtaining small garbage destructors similar to those used by the Municipality of Balmain.

In view of the fact that the employees of the Council coming within the jurisdiction of the enginedrivers' and firemen's award, have not had their wages increased by the award, and are practically receiving the same wages now as three years ago, and that the cost of living has increased during that time fifteen per cent. (vide Mr. Knibbs' report), the Council referred the matter to the finance committee to consider the advisability of raising the wages of the employees referred to by fifteen per cent.

## SOUTH AUSTRALIA AND THE RIVER MURRAY.

The Premier of South Australia, Mr. A. H. Peake, in addressing a meeting at Renmark (South Australia), made it evident that his Government intend to take some steps with regard to conserving the waters of the Murray river in South Australian territory, independently of any joint arrangement which might be made between the three States concerned. In the course of his remarks, Mr. Peake said that the Lake Victoria Agreement Bill, which had passed through the House of Assembly, and was now before the Legislative Council, would enable the Government to proceed with work of the gravest importance in connection with the river and its waters. It had resolved not to wait until a conference had decided what agreement should be come to, or what other people should decide to do to help them, but was going to do the work belonging to South Australia—the conservation schemes—which would enable them to make the very best use of the water which they would receive. He recently discussed with the Premier of Victoria the question of holding another conference, as suggested by the three States, and they were hopeful that a representative of the Commonwealth Government would also attend, and that something valuable would be the outcome. He was encouraged to believe that, without binding himself to figures, the Commonwealth Government would spend a million pounds upon conserving the navigation of the river, which they thought was its duty to conserve. If they could hope to that extent—that the navigable rights of the river would be conserved—it would be a very great thing.

Sir Richard Butler, Public Works Commissioner, at the same meeting, stated that in selecting Capt. Johnson as the engineer to report on the Murray works, the Verran Government had made an excellent choice. South Australia would benefit from his advice, and from his knowledge concerning how the locks should be constructed. Capt. Johnson was going to procure another engineer from the United States, and would see that the best machinery available was obtained for the Government. Sir Richard said he was sorry that the Government had not been able to get any reply from New South Wales concerning when the Lake Victoria Storage Bill would be dealt with there. However, the Government here was able, under the power given it by Parliament, to start the general scheme of locking, and this it intended to do. A sum of £200,000 had already been voted, and would be sufficient for the initial expenditure. Before Capt. Johnson left Australia everything would be ready for the building of the first lock, starting at the lower end of the river, and working upward.

It seems hardly probable that any subsequent arrangement which a conference may arrive at with regard to the upper reaches of the Murray will in any way affect the work contemplated by the South Australian Government.

## STATE ELECTRIC SUPPLY (N.S.W.).

In the annual report of the Director-General of Public Works (N.S.W.), reference is made to the suggested establishment of State power-stations for the bulk supply of electric energy. In connection with the scheme, the Director-General says:—

"The main features of the proposal, as at present outlined, include the establishment of an hydraulic station at Barren Jack, where the huge water conservation works already in progress may be made use of and the initial expenditure reduced to a minimum. As the water stored in the dam is required primarily for irrigation purposes, it will be necessary to provide another station to take up the duty when the water is not available for power purposes. This station, it is proposed, shall be located on the South Coast at a point where sufficient coal shall have been proved to warrant a presumption of practical permanence. Rough preliminary estimates, including power-houses, transmission lines, transformers, and branch lines, have been prepared, and are under submission. Further extensions of the system may be obtained by utilising the waters of the Shoalhaven, Tooma, Snowy, Warragamba, and other rivers, and in connection with the first-named river data has been obtained upon which a practical proposal has been based. This provides for a dam 120ft. high, having a storage area of nine square miles, a race 60 miles long, including two miles in tunnel and three-quarters of a mile inverted syphon, a balance reservoir at end of race, and a power-house at a level about 1010ft. below the reservoir, from which 10,000 electrical h.p. could be continuously obtained. The estimates show the probability of a substantial return on the outlay, but as the water may possibly be more urgently needed for irrigation, the views of the Commissioner for Water Conservation and Irrigation are being obtained before proceeding further."

## MELBOURNE CITY COUNCIL.

At a special meeting of the Melbourne City Council, held on the 9th inst., the question of accepting a German or a British tender for an electric light cable was debated. Councillor F. Davies, acting-chairman of the Electric Supply Committee, said, in submitting the tenders for insulated copper cables, that the committee recommended as business men the acceptance of the A.E.G. Company's tender, which was £1251, against £1432 for the British cable. There were no German cables laid down in Melbourne, but they were used extensively elsewhere. With the preference in duty of 5 per cent. in favour of the British cable, it meant the German tender was 10 per cent. lower. There was no fault to find with the German cable. The committee, however, wished to leave it to the Council to decide. The tender of Messrs. Siemens Bros. was more by £120 than that of the A.E.G. Councillor Cabena said that as business men the committee had to recommend the lower tender, and that, moreover, Siemens Bros. were a German firm manufacturing in England. The Council decided, on an amendment moved by Alderman Jeffreys, that Messrs. Siemens Bros.' tender be accepted.

Councillor Davies reported that the contract entered into in March, 1912, with the State coal mine for the supply of 35,000 tons of slack coal for the electric supply station had expired. The committee had been negotiating for a further supply, but had been informed that, owing to contracts already existent, and the reduced present output from the State coal mine, it was impossible to guarantee to the Council more than 60 tons freshly-mined coal per day (11 days a fortnight) up to December 31, 1913; though, should the output increase, the mine would meet the Council's requirements. The committee, therefore, recommended that authority be given to invite tenders for the supply of about 7000 tons of New South Wales slack coal, and for the purchase of such slack coal from the State mine as could be obtained at the ruling rate until the Railway Commissioners were in a position to enter into a definite contract with the Council, as previously. The recommendation was agreed to.

The Electric Supply Committee had invited applications for the position of overhead superintendent in the Electric Supply Department, rendered vacant by the death of Mr. W. J. Crothers, and recommended that Mr. Alfred Smyth be appointed to the position, the minimum and maximum of salary to be £286 and £338 per annum respectively. While several of the Council's employees in the Electric Department had practical experience, none had been found to have the technical knowledge necessary for the position. The recommendation found one or two opponents, but was eventually adopted.

## MELBOURNE TRAMWAYS.

Another suburban tramway was practically decided upon last Friday, when the Camberwell Council considered a letter from the Prahran-Malvern Tramways Trust regarding the cost of construction and the working expenses of a line of electric tramway from Burke-road along Whitehorse-road to Union-road, a distance of about two and a quarter miles. This stated that the cost per mile of track, including overhead wires, would be—Single, £7000 per mile, and double, £12,500 per mile. The revenue per head of population was a figure which varied with the number of other travelling facilities available. The Town Clerk, Mr. R. W. Smellie, estimated the cost of two and a quarter miles of single line at £18,000, while the annual working expenses would amount to £6462. This was based on a service at 10 and 20 minutes intervals for 16 hours a day. The population served by the line would be approximately 3000. On the basis of the receipts by the Prahran and Malvern Trust, the line for the first nine months should return £1744. The expenditure for this period would be £5077, and that would leave a deficit balance of £3313, equal to a rate on the whole town of 5 1-3d., on the North Ward of 15¼d., or on the portion of the North Ward served by the line of 29½d. The loss should be reduced to £1924 in the second year, to £1090 in the third year, and to £257 in the fourth year. The estimates were based on the supposition that the line would be managed by the Prahran and Malvern Tramway Trust, and therefore the cost of cars and power stations was not included. The valuation of the existing properties between Mont Albert-road and Belmore-road was £20,700, and this should be increased to £41,400 after the tram-line had been constructed. The communications were received, and it was decided to apply for an Order-in-Council authorising the construction. The council then, without discussion, adopted the recommendation of a conference of the municipalities of Hawthorn, Malvern, Kew, and Camberwell for constructing a line along Burke-road from Bulleen-road to Waverley-road, Malvern. Details of both schemes are to be printed and sent to each ratepayer.

The Metropolitan Council Bill, now before the State Parliament, is being widely criticised, and last week the Melbourne Town Clerk, Mr. Clayton, outlined a plan of campaign against the Bill as follows:—1. A statement showing the loss by councils of privileges, the future rating, and the financial aspect. This statement would be carried in councillors' and citizens' "waistcoat pocket" for ready reference. 2. Public meetings in the city and suburbs. 3. Addresses in the wards by councillors. 4. United action by a conference of the Metropolitan Board of Works, the Fire Brigades Board, and the councils, to present a petition to Parliament. 5. Separate action by each of these bodies. 6. Endeavour to have the Bill referred to a select committee of Parliament. To refer the matter to a royal commission would have the effect of alienating certain members. 7. Leave to have the representatives of the objecting councils and ratepayers heard before the bar of the House. 8. Preliminary action by members of the council to impress the different members of the House of the gravity of the step. It was decided to call a meeting of mayors of the metropolitan municipal councils for this week.

The Kew Council is opposed to the proposed tramway along Burke-road from Bulleen-road to Waverley-road, Malvern, but an effort is to be made to persuade the council to alter its mind.

In our last issue, the case was mentioned of Edward Withers, part proprietor and driver of a motor 'bus, who was fined £20 by the bench at Cheltenham (V.), for having driven a stage carriage without a license. The defendant conveyed a number of passengers from the Mentone railway station to the racecourse in a motor omnibus. The Bench held that a motor omnibus should be considered to be a stage coach, and that it would be very unjust if a motor omnibus, without a stage coach license, were allowed to compete with cabs. Last week application was made to Mr Justice Hodges in the Practice Court, Melbourne, for an order nisi to review the finding of the magistrates. His Honour granted the order asked for, on the grounds that there was no evidence that a motor 'bus was a stage coach within the meaning of the Carriage Act, 1890, that its registration gave full authority to the defendant to ply for hire, and that there was, further, no evidence that each passenger had paid defendant a separate and distinct fare.

## BRITISH ASSOCIATION.

### Birmingham Meeting.

(From Our London Correspondent.)

(Continued.)

The address of the President, Sir Oliver Lodge, first contained references to matters of general interest, as is customary. Sir Oliver then turned to a scrutiny on the side of pure science, and asked what, in the main, was the characteristic of the promising, though perturbed, period in which we live. "Different persons would give different answers, but the answers which I venture to give is—Rapid Progress, combined with Fundamental Scepticism." Rapid progress was not characteristic of the latter half of the nineteenth century—at least not in physics. Fine, solid dynamical foundations were laid, and the edifice of knowledge was consolidated; but wholly fresh ground was not being opened up, and totally new buildings were not expected. "With the realisation of predicted ether waves in 1888, the discovery of X rays in 1895, spontaneous radioactivity in 1896, and the isolation of the electron in 1898, expectaton of further achievement became vivid, and novelties, experimental, theoretical and speculative, have been showered upon us ever since this century began. That is why I speak of rapid progress." Of the progress itself Sir Oliver said little; he spoke more of the Fundamental Scepticism. The argument, summarised, is as follows:—A marked feature of the present scientific era is the discovery of, and interest in, various kinds of atomism; so that continuity seems in danger of being lost sight of. Another tendency is toward comprehensive negative generalisations from a limited point of view. Another is to take refuge in rather vague forms of statement and to shrink from closer examination of the puzzling and the obscure. Another is to deny the existence of anything which makes no appeal to organs of sense and no ready response to laboratory experiment. Against these tendencies Sir Oliver Lodge contended. He urged a belief in ultimate continuity as essential to science; he regarded scientific concentration as an inadequate basis for philosophic generalisation; he believed that obscure phenomena might be expressed simply if properly faced; and he pointed out that the non-appearance of anything perfectly uniform and omnipresent was only what should be expected, and was no argument against its real substantial existence.

An account of the Sperry Gyro-compass was given by Lieut. R. E. Gillmor, who began by saying that the increasing use of steel in shipbuilding had made it necessary to develop a compass which was not dependent upon magnetism. A rotating body suspended with freedom about two axes will, when subjected to an angular motion, tend to place itself so that its plane of rotation is co-incident with the plane of the motion to which it is subjected. In the Sperry gyro-compass this phenomenon is utilised in such a manner that the rotating wheel of the compass places and keeps itself in the plane of the earth's rotation, while at the same time remaining unaffected by the movement of the ship. The gyro-compass must be so suspended that there is almost an entire absence of friction about the vertical axis. In the Sperry gyro-compass this is accomplished by suspending the gyroscopic or sensitive element from a stranded steel wire, the top of which is held in a frame surrounding the sensitive element, and made to follow it by a system of electrical contacts controlling a motor which drives the frame. This surrounding frame is used as a base, from which forces are impressed on the gyroscopic element to suppress its freedom and cause it to maintain its position in the north and south meridian. The method of suspension of the gyroscopic element, though perfectly sensitive about the vertical axis, permits of the use of a very heavy wheel, so that a large directive force is obtained. Any gyro-compass must have a certain natural error, depending upon three variables, i.e., the speed, course, and latitude of the ship on which it is used. An automatic device attached to this gyro-compass constantly corrects the card of the compass against these errors. The system comprises a master compass, which is placed in a well-protected position in the ship, and repeater or auxiliary compasses, the dials of which are controlled electrically from the master compass. The method of design used in this gyro-compass has made possible a simple and substantial instrument, which at the same time is extremely accurate.

One of the most interesting papers was that contributed by Mr. F. W. Lanchester on "The Internal Combustion Engine Applied to Railway Locomotion." He said that the position of the steam locomotive was being assailed on the one hand by schemes of electrification, and on the other by the development of the internal combustion engine, and more particularly by self-propelled independent units—motor coaches. Mr. Lanchester described in detail a recent development of the self-propelled railway coach in the form of a vehicle built by the Metropolitan Waggon Company, and equipped with its power installation by the Daimler Company. The general lines of the coach—a 60ft. bogie—were described; the installation was furnished in duplicate, each power unit comprising a six cylinder sleeve-valve Daimler engine of 6in. bore and 6in. stroke, a triple-tandem six-speed epicyclic gear box, in which the speeds are grouped as three low-gear ratios, whose function is mainly in starting and giving high acceleration, and three high-gear ratios, which are exclusively used for running at speed. The whole of the gears are actuated by clutches of the magnetic type. The right-angle transmission is fitted to a prolongation to one of the bogie axles, and consists of a bevel drive, in which the pinion on the tail shaft gears simultaneously into two crown wheels on the axle, an alternative clutch being arranged to bring one or the other into positive connection. By this means the reversal of the car is effected. The two units are disposed symmetrically on opposite sides of the vehicle, and drive on to opposite ends, so that the job is entirely symmetrical. The vehicle can be controlled from either end, drivers' cabins and duplicate controllers being fitted. The electric equipment consists of dynamos coupled direct to the tail-ends of the respective engine crank shafts and an accumulator battery, and serves both for starting the engines and for lighting purposes, and driving an electric air compressor to operate the air brake. Mr. Lanchester gave calculations as to resistance, fuel consumption, etc., and illustrated his paper by diagrams and lantern slides.

Two papers were read by Mr. J. S. Anderson:—(1) "A New Method of Starting Mercury Vapour Apparatus"; (2) "A New Method of Sealing Electric Conductors Through Glass." In the first of these papers he referred to the inconvenience of the arrangement by which, in the best types of mercury vapour lamps on the market, the arc was started by tilting the lamp or rectifier, either by hand or automatically. The inconvenience was especially noticeable in dealing with lamps for scientific purposes. For example, in carrying out experiments on the Leeman effect, a mercury vapour arc lamp was extremely suitable, but the difficulty arose from the fact that the lamp must be placed between the poles of an electro-magnet, the distance between the poles being usually so small that any tilting apparatus that may be employed interferes with the proper mounting of the lamp. Mr. Anderson and Mr. G. B. Burnside had overcome this difficulty by constructing a lamp which might be fixed in position between the poles of an electro-magnet or in any other suitable position, and then started without having to be tilted. They employed a heating arrangement near one of the electrodes, preferably the negative electrode. The lamp tube is provided with a small vessel near this electrode, the vessel having a re-entrant portion or recess in which a heating element is placed. The part of the tube immediately above this small vessel and its recess is constricted. The heating element may conveniently consist of a small coil of platinum wire wound round a suitable support; it may be placed in the recess of the small vessel or removed at will without interfering with the vacuum of the lamp. The heating coil of wire is connected in series or in shunt, in the latter case being provided with an automatic cut-out. An external resistance is placed in series with the lamp. Before starting, the small vessel is full of mercury, which forms a continuous connection inside the tube between the positive and negative electrodes. When the electrical current is switched on, the heating coil becomes incandescent, and the heat given off by the wire goes to raising the temperature of the vesesl and its contained mercury, there being no appreciable loss by radiation into the surrounding air. Very little heat is required, because the first bubble of mercury vapour formed rises to the constricted portion of the lamp, and is there caught, thus breaking the continuity of the mercury inside the lamp, and starting the arc. Owing to the resistance of the mercury vapour, which is formed once the arc is started, the current is cut down to the value required for running the lamp. The platinum wire of the heating element can be made of such a thickness, and the external resistance can be so adjusted, that the wire does not emit heat when the lamp is working, but becomes incandescent when the lamp is started, the action being quite automatic.

In the course of their experiments, Messrs. Anderson and Burnside experienced great difficulty at first in obtaining a satisfactory method of sealing the electrical conductors through the glass of the lamps. Mr. Burnside solved the difficulty by devising a simple method whereby platinum wires might be sealed through Jena glass. According to the same method, other conductors, such as copper wires, may be sealed through ordinary glass.

The method consists essentially in fusing the metal and glass together in the usual way, and then immersing the seal, after it has cooled to about a red heat, in a bath of oil or fat. Each immersion lasts about two or three seconds. The seal is immersed a little further in the cooling medium at each successive immersion until it is completely cooled. For currents up to 15 amperes solid conductors may be employed, but for larger currents it is found advisable to make use of tubular conductors, which may be quite easily sealed through glass, according to Mr. Burnside's method. In preliminary experiments, copper wires 1.5 mm. in diameter were successfully sealed through German glass, and platinum wires of 1 mm. diameter were sealed through Jena and other glasses. A copper tube, capable of carrying a current of 100 amperes was sealed through German glass. Platinum wires were sealed through Jena glass in mercury vapour lamps, and the seals were found to be air-tight after a period of over eight months, although they had from time to time been subjected to the heat of the lamps when burning.

The advantages claimed for the above method were stated by Mr. Anderson as follows:—

(1) The process of obtaining seals is much simpler than any at present in use.
(2) For incandescent electric lamps and all kinds of vacuum tubes, with the exception of mercury vapour apparatus, copper or other high conductivity metal may be used as the conducting material.
(3) In the case of mercury vapour apparatus, a minimum quantity of platinum is used in the tubular form of conductor for large electrical currents, because the tubular shell may be filled in with copper subsequent to the sealing process.
(4) Conductors of very much greater cross-section than it has hitherto been possible to employ may be sealed through glass.
(5) The one process is applicable to all kinds of glasses.

Professor S. B. McLaren, M.A., in a paper entitled "A Theory of Magnets," recalled some difficulties of magnetic theory, and suggested how they might be avoided.

Dr. E. E. Fournier d'Albe, in a paper on the minimum quantity of light discoverable by means of selenium, dealt with the behaviour of selenium under very faint illumination. Some new applications of the properties of selenium were demonstrated by the author in the University Buildings at Birmingham.

The Rev. A. L. Cortie, S.J., contributed a paper on "Solar and Terrestrial Magnetic Disturbances," and Mr. J. H. Jeans, F.R.S., one on "Radiation." Dr. W. F. G. Swann dealt with the electrical resistance of thin metallic films, contributing also a second communication on "The Expression for the Electrical Conductivity of Metals as Deduced from the Electron Theory."

A committee appointed for the consideration of the nomenclature and definitions of magnetic and electrical quantities submitted an important and lengthy report drawn up as a discussion on the present nomenclature and definitions of electrical and magnetic qualities, and giving various alterations that have been proposed at times, together with some new suggestions.

### Sectional Presidents.

The following are the names of the gentlemen nominated to preside over the various sections of the Congress of the British Association for the Advancement of Science to be held in Australia next year:—

Agriculture.—Mr. Alfred Daniel Hall, commissioner under the Development Act of 1909, and formerly director of the Rothamsted experimental station (Lawes Agricultural Trust), 1902-12.

Anthropology. Sir Everard im Thurn, formerly Governor of Fiji and High Commissioner of the Western Pacific.

Botany.—Mr. Frederick Orpen Bower, Regius professor of Botany at Glasgow University.

Chemistry.—Mr. William Jackson Pope, professor of chemistry, Cambridge University.

Economics.—Mr. Edward Gonner, K.C., professor of Economic Science, University of Liverpool.

Education. Mr. John Perry, professor of Mechanics and mathematics, Royal College of Science, South Kensington.

Engineering.—Mr. Ernest George Coker, professor of mechanical engineering and applied mathematics, City and Guilds College, Finsbury, London.

Geography.—Sir Charles Prestwood Lucas, formerly assistant Under-Secretary for State and head of the Dominion Department, Colonial Office.

Geology.—Sir Thomas Henry Holland, professor of Geology, Manchester University.

Mathematics and Physics.—Mr. Frederick Trouton, Quain Professor of Physics, University College, London, since 1902.

Physiology.—Mr. Charles James Martin, director of Lister Institute of Preventive Medicine, and professor of Experimental Pathology, University of London.

Zoology.—Dr. Arthur Dendy, professor of Zoology, King's College, London University.

## RAILWAY ELECTRIFICATION (V.).

The difficulty which arose on maturer consideration of the power-station problem in connection with the electrification of the Melbourne suburban railways appears now to have been solved, though it remains yet to be ascertained what the actual direct and indirect cost of the change of site will amount to. Until a few months ago it was considered a settled point that the power-house was to be erected on the Saltwater River at Yarraville, as originally decided by Mr. Merz. But it was discovered later by engineers of the Railways Department that the flow of water in the Saltwater River was not sufficiently strong to enable an adequate supply to be obtained for the use of the condensing plant. The flow is regulated by the tidal influence of the Bay on the River Yarra, so that when the tide is "in" the waters of the tributary river are held back and the passage of the water checked. In consequence the heated water, after passing through the condensers and being returned to the river, would not clear the intake pipes, but would be pumped back into the condensing tubes, which would upset the whole operation of condensing and render the plant useless.

It therefore became necessary to substitute another site. One, at Port Melbourne was turned down as offering no proper foundation for the heavy building with its machinery, and the choice then lay between sites at Newport and Fisherman's Bend. As the Premier, Mr. Watt, explains, the quantity of water to be used at the power station for cooling purposes would amount on peak load carriage to about 6,500,000 gallons per hour. Averaged over the 18 to 20 hours during which the railways would be making power, that would amount to a little over 70,000,000 gallons per day, which was practically equivalent to a supply greater than that consumed by the whole of the population of Melbourne on its hottest summer day. It was therefore of very great importance to see that a sufficient volume of water was obtained to give the greatest efficiency in the cooling process. Ministers were advised that the station could grapple with the problem so long as the kilowatt power of the station did not exceed 40,000, but they were anxious, as the station was likely to grow beyond that, to assure themselves that no water difficulty would occur subsequently. The Railways Commissioners now propose, with the full concurrence of Mr. Merz, and after deliberation with the Ministry, to change the site to a point further down the river, on the Williamstown side of the Yarra, near where the steam ferry crosses. The bulk of this site, the larger part of which is owned by the Melbourne Harbour Trust, and part of which is privately occupied, is on basaltic rock, with an underlie of hard clay. It will be so near to the training wall that they will be able to take the salt water straight from the outside of the wall, and discharge it after use into the River Yarra, thus keeping the two streams, inwards and outwards, entirely separate. The area will also be larger than the original site selected, and will not only afford an opportunity of greater growth, should the future demand it, but for the erection of any building which might be thought desirable at some later stage to deal with by-products. This will involve a new railway connection from the Williamstown line, and the lengthening of the main transmission cable by between one and a half and two miles. Already railway accommodation leading to the old site has been provided, at a cost of £12,000, but the Commissioners believe that this will be utilised by some of the manufacturers, whose works abut on it, and who, for a considerable time past, have been agitating for siding accommodation.

A new difficulty now present itself. The Harbour Trust Commissioners have planned an extensive scheme of Port improvements, and this, as designed by the Trust's engineers, provides for important works on both sides of the river in proximity to the new site of the power house for the development of the export trade. Near the mouth of the river it is proposed to provide deep export wharves, while higher up more accommodation will be made for vessels which draw less water. Large reclamation works will be carried out, and lines of railway will connect the wharves with the Melbourne-Geelong line. In consequence of the adoption of a new power-station site, some amendments may have to be made in the Harbour Trust's scheme. It were better, however, that the comparatively small additional expense should be borne now, than that a much heavier one should be relegated to a later date.

Reference was made to the electrification of the suburban railways by Mr. W. J. Newbigin, President of the Victorian Institute of Electrical Engineers, at the annual "smoke night" of the Electrical Traders and Contractors' Association of Victoria, last Saturday night. Mr. Newbigin said that Melbourne was about to have, near Williamstown, a station which would rank as something, not only in Australia, but in the world. For years those who were interested in electricity had been fighting an up-hill battle, but the great growth of electricity, as far as Melbourne was concerned, had occurred within the memory of the youngest inhabitant, not the oldest. Fifteen or sixteen years ago a machine of 150 or 200 kilowatts was something worth while going to look at. Now a 5000 kilowatt machine was not uncommon; a 10,000 machine was pending, and a 20,000 machine was an early possibility. This was a fact for which they could all take a considerable amount of credit. It was desirable to increase the use of electricity, and as long as the traders were able to persuade people to buy their "juice," so long would those who supplied the plant be able to do business.

## POSTAL ELECTRICIANS.

### President Varies His Award.

On account of the dissatisfaction which prevailed amongst the electrical mechanics of the Sydney branch of the Postmaster-General's Department, the Postal Electricians' Union last week, at the suggestion of the Postmaster-General, requested his Honour Mr. Justice Higgins to hear arguments why the award given last April, and which came into force on September 12, should be amended, and, in order to avert the trouble which threatened to grow out of the reduced pay given to some of the men, his Honour agreed to treat the matter as urgent and to hear it at once. The hearing extended over two or three days, and last Saturday Mr. Justice Higgins gave his decision.

In doing so, his Honour said:—"There are many temporary employees attached to the electricians' branch, and hitherto called temporary mechanics. The growth of the branch has been so rapid that many men skilled in outside trades, and not belonging to the Public Service, have been temporarily employed. These men have been paid at the same rates as those paid to the permanent employees, and they are entitled to the same holidays, but they are out of the line of promotion, increments, leave of absence, and they have not any permanence of tenure—they can be removed at will. The award states that the minimum rates to be paid to the employees and, among others, to mechanics (telegraph and telephone) is £168 a year. But the Public Service Commissioner and the Postmaster-General refuse to pay these wages. They insist now on calling these men temporary junior mechanics, and on paying them at the rate of £144 a year, the minimum for junior mechanics over 22 years of age.

"The question now is, had the P.M.G. and the Public Service Commissioner any legal right to treat these men as not entitled to more than £144? If the Commissioner and the Postmaster-General really thought that the award made £144 the minimum, that it turned these mechanics into 'junior mechanics,' they surely undertook a grave responsibility in issuing instructions that these men should be asked to accept re-employment at £144 a year, at even less wages than they had been receiving under the New South Wales award.

"Reading the award, as we are bound to read it, so as to make all its parts consistent, the explanation is found in Clause 7, which relates to promotion, and, therefore, to permanent employees, officers only. The word 'officer' is actually used in that clause, not 'employee,' and it is used several times. The definition of junior mechanic was only meant to apply to those who enter the ranks of the service as regulars—not to those who are temporarily employed on the wings as auxiliaries. Those who are in the service (officers) have the privileges of increments, leave of absence, and promotion, and Clause 7 states on what condition, in due order of promotion, a junior mechanic becomes a mechanic. Therefore, in my opinion, on the award, each of these men is entitled to £168 a year. I am told, however, what I was not told at the hearing, that there are a few—a very few—of the temporary employees under 21, and that these ought to be treated as junior mechanics and paid as such. There is no evidence before me as to this matter, but if I get sufficient evidence to guide me on a proper application to vary, I shall probably prescribe a suitable scale based on age. Meantime, to place the point now debated beyond cavil, I propose to substitute the word 'officer' for the word 'employee' in the definition of 'junior mechanic.' I order the award to be varied accordingly. I refuse to accede to the wish of the Postmaster-General, as expressed through Mr. Heaketh, that temporary mechanics employed under section 40 should be paid as junior mechanics, unless they pass the examination provided for junior mechanics, who wish to become mechanics."

## THE SILVERTOWN COMPANY.

During the past three years a very noticeable expansion has occurred in connection with the business of the India Rubber, Gutta Percha, and Telegraph Works Co. Ltd., better known as the Silvertown Company. Originally this company occupied premises in Flinders-street, Melbourne, but, upon the introduction of an active and progressive policy for its electrical branch, these were found to be inadequate. From time to time extensions were made to these premises, until it was found impossible to extend further, and the company was compelled to make other arrangements to cope with their rapidly expanding business. The company now has completely equipped workshops for repairs to dynamos and machinery, and the manufacture of switchboards and heating apparatus, in a'Beckett-street, and 20,000 sq. feet of store space in Leicester-street, Carlton, which is also used as the contract and despatch department. Extensive additions have also been made to the Elizabeth-street branch, which now has a large shop frontage, and will be used as the offices and showrooms for both the rubber and electrical departments of the company in Melbourne. The company's officials have had their hands full keeping pace with the increasing business and the necessity of providing accommodation therefor during the past three years. Great credit is due to Mr. Wylde Ball, engineer and manager of the electrical department, for the growth of this branch of the company's enterprise and adequate provision for its accommodation. Mr. Jas. Wilson is general manager in Australia for the company, which has branches all over the Commonwealth and New Zealand, as well as in all other parts of the world.

## SUBURBAN TRAFFIC.

### Motor 'Bus v. Tramways.

The Town Clerk of Hawthorn, Mr. H. Broad Hall, has received from Councillor Russell, chairman of the Municipal Association, now in London, a letter giving the effect of his impressions on street traffic, etc., gathered during his visit to England. The following summary of the communication will be of interest. Councillor Russell found the overhead system of electric tramways in use in the majority of towns visited, but in all cases the cars were "double-deckers," the explanation being that they could carry double the number of passengers at the same cost as in the single-deck car. In crowded towns, of course, this was a great advantage, and the London trams were all "double-deckers." Amongst other systems inspected was the "contact system," at Leeds. This was an electric tram with plates in the roadway between the rails, about two feet apart, from which the electricity was obtained by a wire brush on the car wheels, which comes into contact with these plates as the tram runs. The system had not proved an unqualified success, and had not been extensively adopted. Another system observed was that of railless trams in use at Bradford. With this Councillor Russell appears to have been disappointed. There was only one car running on the route, and he followed it from end to end in a motor car to see its running and how it worked. From personal observation and from inquiries he was satisfied that an ordinary motor 'bus is in every way superior for passenger traffic. The railless car weighed 5 tons, and this would be the ruin of the magnificent roads of Hawthorn. An ordinary London motor 'bus weighed three tons, and to his mind was much better and much more effective for passenger traffic. Of course, electric power could be produced more cheaply than petrol power, but the motor 'bus had the advantage that it did not require any overhead equipment like the railless tram car, and if a route did not pay it could be taken off and put on another one. To run railless cars required just as good a surface on the streets as for motor 'bus traffic, and if a good surface had to be put down, he judged that motor 'buses would always do better, pick up traffic more easily, and be easier to manage in every way than the railless tram. Councillor Russell summed up his observations thus:—"In twenty-five years all your electric trams will be out of date, and as obsolete as the Melbourne cable trams now are. Motor 'buses, either driven by petrol or by some improvement thereon, will be the means of carrying the passenger traffic in all the large cities. The motor 'buses in London are capturing the traffic from the tramways, and you cannot wonder at it when you see the pace at which the motor 'buses go, how easily they move in and out of the traffic, and how they can come right up to the footpath to take up and let down passengers. Just imagine if the Melbourne municipalities went to the expense of laying down an expensive electric tramway system at a cost of £3,000,000 or £4,000,000, and immediately it was started an improvement was made in the motor 'buses, and enterprising companies started running these 'buses in opposition to the tramways. What a hole would be made in the tramway receipts! And, what would become of the magnificent asset of the municipalities?"

## TRANS-AUSTRALIAN RAILWAY.

The honorary Minister in charge of the Home Affairs Department, Mr. Kelly, last week accepted the tender of Messrs. Gray Bros., of Williamstown (V.), for the construction and supply of 50 40-ton bogie waggons for use on the Trans-Australian railway construction works, at £378 each, or a total of £18,900. Twenty-five are to be delivered at Port Augusta (S.A.), and the others at Kalgoorlie (W.A.). Other Australian tenders were sent in, but that of Gray Bros. was the lowest.

A large quantity of other rolling stock will be required for construction purposes, and the Engineer-in-Chief, Mr. H. Deane, has submitted to the Minister the following list as necessary:—

| | Each.<br>£ | Total.<br>£ |
|---|---|---|
| Six 8500-gallon water tank waggons | 850 | 5100 |
| Twelve guards' vans | 1000 | 12,000 |
| Ten internal combustion locomotives | 8000 | 80,000 |
| Four ballast ploughs | 250 | 1000 |
| Four passenger cars | 2500 | 10,000 |
| Ten louvre vans | 400 | 4000 |
| Total estimated cost | | £112,100 |

According to a return laid on the table of the House of Representatives last week by Mr. Kelly, nearly a thousand men are at present employed in various ways on the line, including 646 at the South Australian end and 257 at the West Australian end:

| | |
|---|---|
| Engaged at head office, Melbourne (including six temporary officers) | 61 |
| Men (exclusive of office staff) employed on work of construction— | |
| At Port Augusta end | 620 |
| At Kalgoorlie end | 240 |
| Number on staff and in office of supervising engineer— | |
| At Port Augusta | 26 |
| At Kalgoorlie | 17 |
| Total | 964 |

## MISCELLANEOUS.

With the object of rendering the overhead electric-power cables between the generating station and the mine as nearly as possible "fool-proof," the Waihi Gold Mining Co. (N.Z.) has attached to the iron poles which carry the cables a device surmounted by a "death's head and crossbones," beneath which, in bold letters, is the warning: "Fatal to Touch Wires." This appears on every post over a distance of 40 miles. Is the company still liable to pay compensation in case of accident?

* * *

The Waihi (N.Z.) Gold Mining Company's great hydro-electric scheme is now so nearly completed that electric current can be sent on the high-tension transmission line between the power-house and Waikino, a distance of 44½ miles. The power is derived from the Horahora rapids, on the Waikato River. The plant at the power-house consists of six 1500 brake horse-power turbines operating under a head of from 24ft. to 26ft. of water. Each turbine is direct coupled to a three-phase alternator generating current at 5000 volts, with a frequency of 50 cycles. Current is taken by two three-core armoured cables from the power-house to the transformer-house, and is there transformed from 5000 to 50,000 volts.

* * *

Still another hydro-electric lighting scheme is contemplated in New Zealand, in which power from the Hunua Falls, eight miles from Papakura, would be harnessed to provide electric lighting for the three townships of Papatoetoe, Manurewa, and Papakura. The scheme is being seriously considered by some of the progressive residents in the districts concerned, and a public meeting will shortly be called to discuss its practicability. Some time ago it was understood that the Auckland Gas Company intended to provide a gas supply for Papatoetoe from its works at Otahuhu, two miles distant, but after the mains had been laid a short distance the project was apparently abandoned. Several residents have already installed gas-generating plants, and one house has an excellent electric lighting service of its own, and there is a feeling that these private lighting intallations may become so numerous as to be a serious obstacle against the adoption of a general scheme unless prompt action is taken. In magnitude, the scheme is small in comparison with some others, but the proposal shows that the people are awakening to the value of the power which has hitherto been allowed to run to waste.

* * *

The Northcote (V.) Town Council last week accepted the following tenders in connection with the electric lighting scheme, which is expected to be completed in six months' time:—Supply of 600 poles, R. S. Groom, £385; 50 ironbark poles, Lind Bros., £102 10s.; four single-phase transformers, Australian Metal Co., £372 10s.; fuse and switch gear for sub-stations, Australian Metal Co., £550; rubber covered cables, Steffens and Noelle Ltd. and Henleys Telegraph Works Co., £239 7s. 6d.; metal filament lamps, cast-iron brackets, and reflectors, Noyes Bros., £96 15s.; delivery of flame arc lamps, Union Electric Co., £192 2s. 8d.; insulators, iron pole brackets, and pins, Commonwealth Art Pottery, £236 13s. 9d.; house service fuses and A.C. meters, Australian Metal Co. and Helsby Cable Co., £406 3s.; bare copper cables, British Insulated and Helsby Cable Co., £495 3s. 4d. The total amount was over £3000.

* * *

The traffic receipts of the Brisbane Tramways for September totalled £25,588, an increase of £2886 over the amount of £22,702 reported for September of last year.

* * *

Flinders Island and the Melbourne station are now in communication by wireless. The Postmaster-General (Mr. Wynne) sent the first message, as follows:—"Desire to congratulate residents of Flinders Island upon the establishment of communication by wireless, bringing them into touch with the mainland."

* * *

The Commonwealth Art Pottery and Insulator Co. has secured a contract from the Postmaster-General's department for a supply of insulators and tubes, amounting in all to a little over £3000. The amount is not large, but it is the first successful Australian tender, and the price was very little higher than the quotations of other firms. The contract is for 250,000 of the B type of insulator, 10,000 of the A type, and about 30,000 tubes. The B type insulators are said to have passed exhaustive Governmental tests, but the order for 10,000 of the A type is in the nature of an experiment. The Department will require about 1,100,000 insulators this year, and tenders for a three-years' supply are being considered.

* * *

A proposal has been made to the Government of Western Australia by the Norton-Griffiths Co., of London, to build the State broad gauge railway from Fremantle to Kalgoorlie, on the firm's usual terms, viz., a percentage on the actual cost. The firm offers to supply all material, to provide its own staff, to do the work subject to the approval of the engineer in chief, with a monthly audit of accounts, and to take payment in Government debentures.

* * *

The Auckland (N.Z.) Electric Tramways Co. Ltd., a London corporation, registered in 1899, which has an authorised capital of £400,000 in shares of £1 each, of which 50,000 are 6 per cent. cumulative preference shares, has decided to increase the capital to £600,000.

* * *

The Postmaster-General, Mr. Wynne, has accepted the tender of W. T. Henley's Telegraph

**P & O.** COMPANY'S ROYAL MAIL STEAMERS
FOR MARSEILLES, PLYMOUTH AND LONDON.

Leave Sydney on the subjoined dates, calling at usual ports.

FIRST AND SECOND SALOON ONLY.

| Steamer, | Tons. | Commander. | Noon. | Melb., 3 p.m. |
|---|---|---|---|---|
| MARMORA | 10,500 | Lockyer | Oct. 18 | Oct. 21 |
| MOLDAVIA | 10,000 | Gordon | Oct. 29 | Nov. 4 |
| MEDINA | 12,500 | Notley | Nov. 15 | Nov. 18 |

PASSAGE MONEY TO LONDON—
Single, £41 16s. to £82 10s.
Return, £69 6s. and £123 4s.

Return Tickets between Inter-State Ports are available for return by Orient, Messageries Maritimes, and N.D.L. steamers having room.

SPECIAL HOLIDAY RETURN TICKETS to COLOMBO are now issued, available for two months. Fares from Sydney, £45 2s. first saloon, and £31 18s. second saloon.

A. GORDON WESCHE, Superintendent IN AUSTRALIA, 63 Pitt-street, Sydney.

**The COLONIAL MUTUAL FIRE Insurance Company Limited.**

Principal Office: 60 MARKET-ST., MELBOURNE.

Branches in all the States.
Transacts Fire, Guarantee, Employers' Liability, Marine, Burglary, and Plate Glass, Accident, Workers' Compensation and Live Stock Insurances.
Send for Prospectus.
W. TUCKER, General Manager.

Harringtons LTD.

**ANALYTICAL & METALLURGICAL DEPT.**

Highest prices given for all gold, silver or platinum residues, etc.
Lowest fees for all kinds of Assay, Analytical, and Metallurgical work.
Expert Advice on Ore Treatment, Bullion Refining, Smelting, etc., etc., Directed by a qualified Analyst from Messrs. Johnson and Sons, London: Assayers and Refiners to Bank of England, H.M. Mint, The Council of India, etc.

**HARRINGTONS LTD.**
**386 George Street, Sydney.**

Works Co. Ltd., of Collins-street, Melbourne, for the supply of submarine cable as follows:—Ten nautical miles (shore end), £3422; ten nautical miles (intermediate type), £2020; and ten nautical miles (main or deep-sea type), £1310.

* * *

Mr. A. C. Wright, manager of the Commonwealth Small Arms Factory, Lithgow (N.S.W.) states that the matter of extensions to the factory is now in hand. An officer from the ordnance department was in Lithgow last week looking into the question. The extensions will include additions to the office building, a new laboratory for testing equipment of various kinds, and a second storey to the storehouse. When the output of 15,000 rifles per annum was decided upon, arrangements were made in the main building for storing finished component parts, but instructions having been given to increase the output to 20,000 rifles per annum, additional machinery has been ordered, and it has been found necessary to make arrangements for storage. One shipment of the new machinery has already arrived, but the remainder of the machines will not reach the factory for four months. Mr. Wright expects to despatch the balance of 500 rifles this week, and hopes from now on to get an increased product every month, as the men engaged on assembling are becoming more skilled in the work.

* * *

Our Lithgow (N.S.W.) correspondent writes:—About forty men are employed procuring limestone at the quarries at Havilah (on the Mudgee line) for Messrs. Hoskins, Ltd. The output is about 60 tons per day, or 360 tons for the week, and is conveyed to Lithgow. A tram line, which will be about 400 yards long, is being laid down, the grade being about 1 in 46. When this is finished and connected with the railway line, the engine will be able to proceed to the quarry and bring out the loaded trucks. About one ton of dolomite is forwarded weekly.

* * *

In 1911-12 the number of employees in the Federal Public Service was 22,893, drawing, in the aggregate, salaries amounting to £3,114,159. In 1912-13 there were 27,251 public servants, drawing £3,663,628; and provision has been made for paying £4,577,215 to 33,989 employees during the present financial year.

# *Invited and Accepted Tenders*

It is particularly requested that the information regarding contracts open, and the successful tenderers, be forwarded to The Editor not later than Monday of each week.

The following contractions are used throughout:—S—supply; D—delivery; M—manufacture; C—construction; E—erection; P—purchase; I—installation; R—removal. Where no contractions appear, supply and delivery is understood. The date at the beginning of each paragraph refers to the closing of tenders.

## INVITED.

### Commonwealth.

Specifications, tender-forms, etc., for tenders invited for the Postmaster-General's Department of the various States under this heading may be had as follows:—Victoria—Various State G.P.O.'s. New South Wales—Departmental Stores, Sydney, and various G.P.O.'s in other States. South Australia—Adelaide, Melbourne, Sydney and Brisbane G.P.O.'s. Western Australia—Departmental Stores, Perth, and various G.P.O.'s in other States. Queensland—Various State G.P.O.'s. All States—Various G.P.O.'s. If the specifications, etc., may be had elsewhere, in addition, the places will be given in parentheses.

POSTMASTER-GENERAL'S DEPARTMENT, Melbourne.—21st October.—S. and D. of 12 auto re-winding electric clocks for wireless stations, as per schedule No. 969.

5th November.—Galvanised iron piping, as per schedule No. 952.

11th November (extended from 4th November).—D. and E. of eight automatic telephone switchboards at the Ascot, Canterbury, Malvern, Cheltenham, Footscray, Oakleigh, Sandringham, and Williamstown Telephone Exchanges, as per schedule No. 953.

11th November.—S. and D. of motor tubes, covers and solid tyres, as per schedule No. 987.

11th November.—S. and D. of relays, jacks, lamps, etc., as per schedule No. 982.

16th December.—S. and D. of one common battery multiple switchboard at the Telephone Exchange, Wills-street, Melbourne, as per schedule No. 968.

30th December.—S. and D. of telephone material, as per schedule No. 976. (See advertising columns.)

POSTMASTER-GENERAL'S DEPARTMENT, Sydney.—22nd October.—S., D. and E. at the Telephone Exchanges, Randwick, Mosman, Parramatta, Ashfield, Burwood, Homebush, and Rookwood, Sydney, of seven (7) automatic switchboards, with associated equipment, as per schedule No. 281.

5th November.—S. and D. of 100 tons No. 4 steel wire, schedule No. 344.

12th November.—S. and D. of motor accessories, as per schedule No. 341.

12th November (extended from 8th October). — S. and D. at the Telephone Exchange, Watson's Bay, Sydney, of 1 automatic switchboard, with all associated equipment as per schedule No. 234.

12th November (extended from 22nd October).—S. and D. of 3000 caps for supervisory lamp, schedule No. 338.

12th November (extended from 22nd October).—4500 cords, 3 steel conductors, schedule No. 328.

12th November (extended from 22nd October).—500 fuses, 3 ampere, schedule No. 338.

12th November (extended from 22nd October).—250 telephonometers, schedule No. 338.

12th November.—S. and D. of 380 cable boxes, as per schedule No. 342.

12th November (extended from 22nd October).—S. and D. of 7 miles copper-clad steel wire, as per schedule No. 335.

19th November.—S. and D. of 450 bells, magneto, as per schedule No. 333.

18th March, 1914.—S., D. and E. at the Telephone Exchanges, Epping, Ryde, Hunter's Hill, Drummoyne, Wahroonga, Paddington and Waverley, Sydney, of seven (7) automatic switchboards, with associated equipment, as per schedule No. 179.

POSTMASTER-GENERAL'S DEPARTMENT, Brisbane.—22nd October.—S. and D. of dry cells and battery glassware, as per stores schedule No. 281.

19th November.—Bronze wire, as per schedule No. 273.

17th December.—S. and D. at the Stores Branch, Postmaster-General's Department, Brisbane, of insulators, as per stores schedule No. 280.

31st December.—S. and D. at the Stores Branch, Postmaster-General's Department, Brisbane, of insulators, as per stores schedule No. 282.

7th January, 1914.—S. and D. of switchboards, as per schedule No. 274.

7th January, 1914.—S. and D. of telephone instruments, as per stores schedules Nos. 275, 276 and 277.

7th January, 1914.—S. and D. of protectors, parts, etc., as per schedule No. 278.

POSTMASTER-GENERAL'S DEPARTMENT, Perth.—29th October.—S. and D. of C.I. pipes, spigot and socket, and split bends, as per schedule No. 309.

19th November.—S. and D. of rectangular dry cells.

10th December.—S. and D. of 60 tons wire (galvanised iron).

POSTMASTER-GENERAL'S DEPARTMENT, Adelaide.—12th November.—One lamp signalling trunk line switchboard, of five sections, one cable turning section, and one cable storing section, one two-position recording desk, and one chief operator's desk, as specified in specification No. 431, etc., delivered at the Telephone Exchange, Adelaide, as per schedule No. 296.

POSTMASTER-GENERAL'S DEPARTMENT, Hobart.—1st December.—S. and D. of dry cells, as per schedule No. T. 84.

DEPARTMENT OF HOME AFFAIRS.—27th October.—S. of circulating and exhaust pipes and bends, valves, flanges, etc., for Federal Territory Power Generating Station.

26th November (extended from 24th November).—Water supply pumping plant for Canberra.

DEPARTMENT OF HOME AFFAIRS.—Kalgoorlie-Port Augusta Railway.—5th November.—M., S., D. and E. of 4 locomotive engines and tenders (N.S.W. "P" type); tender capacity, 4500 gallons of water, and approx. 7½ tons of coal. (See advertising columns.)

5th November.—S. of 100,000 jarrah sleepers (9ft. x 10in. x 5in.).

2nd December.—600 pairs of wheels and axles (9in. x 4½in. journals).

DEPARTMENT OF DEFENCE—Small Arms Factory, Lithgow, N.S.W.—29th December.—P. of scrap steel, brass, jute bags, whale oil, etc.

### Victoria.

RAILWAY DEPARTMENT.—16th October.—High speed tools, steel carborundum discs, carbon holders, porcelain bushes, insulators for carbon holders, box spanners, gear and ratchet wheels, Globe strain insulators.

17th October.—Kerosene lamp brackets, steel motor belt fasteners.

22nd October.—C. and E. of steel decking and lanterns, subway, Caulfield.

22nd October.—C. and E. of steel verandahs at Toorak Station.

22nd October.—S. and D. of 3 pneumatic riveting hammers.

22nd October.—S. and D. of 30 tons red oxide.

22nd October.—M., S. and D. of 6 sets "C" class jibs, valves, and brackets for combined tanks and cranes.

29th October (extended from 8th October).—S. and D. of steel sheet piles for coffer dam. P.D., £10.

5th November.—Copper rod.

5th November.—Locomotive seamless copper tubes.

5th November.—Best Yorkshire iron angle and tees.

**SPECIAL NOTICE !**

**The Mount Morgan Gold Mining Co. Ltd.**

**ARE PREPARED TO PURCHASE** Ores, Concentrates and Furnace Products, containing Gold and Copper, at most favourable rates.

**ALSO TO INSPECT MINING PROPERTIES** with a view to Developing, Financing, or Purchasing same.

**Address:—MR. B. MAGNUS,** GENERAL MANAGER, MOUNT MORGAN, QUEENSLAND.

5th November.—Best steel boiler plates.

5th November.—Copper plates.

5th November.—100 tons of good machinery cast-iron scrap.

5th November.—S. and D. of mild steel flat bars.

12th November.—Steel channel bars.

12th November.—20 tons steel ingots.

12th November.—Steel blooms, for crank pins.

12th November.—Locomotive boiler tubes.

12th November.—High-speed tool steel.

12th November.—M., S. and D. of one 15-ton electric crane for Ballarat.

12th November.—Flame arc lamps.

12th November.—Insulated copper cable.

19th November.—M. and D. of one 60h.p. electric motor and accessories.

19th November.—M., S. and D. or cast steel wheel centres for A2 engines and new truck stock.

19th November.—Brass locomotive tubes.

19th November.—150 tons pig iron.

19th November.—10 tons sulphate of copper, best quality, for electrical purposes, battery material.

26th November.—S. and D. of 1000 cast steel blooms for axles for electric motor bogies.

3rd December.—Steel blooms, for piston rods.

3rd December.—S. and D. of vulcanised rubber electric light wire.

10th December.—M., S. and D. of one 15-ton crane for Ballarat.

7th January (1914).—S. and D. 10,000 porous pots for batteries.

7th January.—S. and D. of best steel boiler plates.

7th January.—S. and D. copper rod.

7th January.—S. and D. copper plates.

7th January.—S. and D. of cast steel wheel centres.

7th January.—S. and D. of steel blooms for crank pins.

7th Jan.—S. and D. of locomotive brass boiler tubes.

7th January.—S. and D. of best Yorkshire iron angles.

7th January.—S. and D. of locomotive seamless copper tubes.

7th January.—S. and D. of steel channel bars.

14th January.—S. and D. of 5 Detroit lubricators.

14th January.—S. and D. of 100,000 lineal yards tarpaulin canvas.

14th January.—S. and D. of high speed twist drills.

14th January.—S. and D. of one concrete mixer.

21st January.—S. and D. of one high speed lathe.

VICTORIAN RAILWAY COMMISSIONERS STATE COAL MINE.—20th October.—S. of hard-drawn bare copper wire, 14 gauge.

22nd October.—S. and D. of 2 10h.p. motors.

22nd October.—M., S. and D. of 3000 cast-iron truck pedestals.

22nd October.—M., S. and D. of 2000 steel skip wheels.

12th November (extended from 1st October).—S. of rope haulage engine and electrical equipment for McBride Tunnel.

DEPARTMENT OF PORTS AND HARBOURS.—24th October.—S. of machinery for shipyard, Williamstown. (See advertising columns.)

PUBLIC WORKS DEPARTMENT.—16th October.—A. and extension pier, Portland.

23rd October.—Extension breakwater, Warrnambool.

## New South Wales.

PUBLIC WORKS DEPARTMENT.—27th October.—M. of steel bridge for Wilson River, Wauchope to Kempsey section, North Coast railway.

8th December.—M., S. and D. of steel bridges for Cooperabung and Piper's Creeks, on fifth section, North Coast Railway, viz., Wauchope to Kempsey.

RAILWAY DEPARTMENT.—12th November. S. of three 30 kilowatt motor generator.

26th November.—S. of one 2000 lb. storage battery freight truck.

METROPOLITAN BOARD OF WATER SUPPLY AND SEWERAGE (341 Pitt-street, Sydney).—20th October.—S. and E. at Ryde pumping station of steel frame support for coal bunkers.

3rd November.—M. and D. of 36in. and 30in. sluice valve, at Leichhardt Depot. (See advertising columns.)

15th December.—M. and D. of one turbine centrifugal pumping plant for Crown-street Pumping Station. (See advertising columns.)

SYDNEY HARBOUR TRUST.—20th October. —S. of rolled steel joist runways for travelling geared blocks on upper deck of jetty sheds on berths Nos. 8 and 9, Dawes' Point to Miller's Point.

## Western Australia.

GOVERNMENT TENDER BOARD.—30th October.—S. moulding machine cupolas and pneumatic hack saw bench for Railway Department.

November 20.—S. of copper firebox tube plates for Railway Department.

November 20.—1000 yards roofing canvas.

November 20.—200,000 yards tarpaulin canvas.

## Queensland.

TREASURY DEPARTMENT.—29th October.—C. and E. of central sugar mill at Babinda Creek, North Queensland.

PUBLIC WORKS DEPARTMENT.—7th November.—S. and D. of electric light material for hospital for insane, Goodna.

## South Australia.

RAILWAYS DEPARTMENT.—21st October.—S. and D. of 3000 porcelain insulators.

28th October.—C. of Decres Bay Railway.

28th October.—S. and D. of 12,000 gallons kerosene oil.

28th October.—S. and D. of 2000 Parabo springs.

4th November.—S. and D. 368 tons coloured or white cotton waste.

18th November.—S. and D. of 1137 bars of copper.

13th January.—C. of 12 bogie goods break vans, with passenger compartments, 3ft. 6in. gauge.

## New Zealand.

RAILWAYS DEPARTMENT.—31st October.—S. and D. of stores for the period from April 1, 1914, to March 31, 1917.

PUBLIC WORKS DEPARTMENT.—31st October.—S. of telephone instruments and accessories for Lake Coleridge power scheme.

## General.

CITY OF MELBOURNE.—17th October.—S. and D. of C.I. and W. steel pipes and bends.

17th October.—7000 tons Newcastle slack coal.

MELBOURNE and METROPOLITAN BOARD OF WORKS.—21st October.—S. and D. of girders for carrying 34in. pipe. (See advertising columns.)

21st October.—S. and D. of 350 tons of 9in. C.I pipes of Australian manufacture. (See advertising columns.)

21st October.—S. and D. of 1000 ¾in. water meters of Australian manufacture. (See advertising columns.)

21st October.—M., S. and D. of wrought-iron ventilator tubes, 9in. and 12in. diameter. (See advertising columns.)

21st October.—S. and D. of 20 tons 3in. C.I. pipes of Australian manufacture. (See advertising columns.)

SHIRE OF NUNAWADING (V.) (J. R. Kefford, Secretary, Box Hill).—25th October (extended from 18th October).—Electrical equipment.

MUNICIPAL COUNCIL OF SYDNEY.—27th October.—S. and D. of curve drawing ammeters. (See advertising columns.)

THURSDAY ISLAND TOWN COUNCIL.—31st October.—S. of a suitable gas lighting plant for street, house, and cooking purposes.

BRISBANE THE METROPOLITAN WATER AND SEWERAGE BOARD (Albert-street).—13th January, 1914.—M. and D. of material for aerial ropeway.

MACKAY HARBOUR BOARD (Q.) (H. F. McDonnell, Secretary).—29th October.—S. of Portland cement.

ELDERSLIE STATION, Winton, W. Q'land.—19th November.—Sinking and completion of an artesian bore, maximum depth 4500 feet.

CITY OF LAUNCESTON (T.) (C. W. Rocher, Town Clerk).—27th October.—S. of electrical fittings, incandescent lamps, wire and cable.

27th October.—Annual supplies for 1914.

24th November (extended from 13th October).—Section i., S. and D. of transformers, etc.; section ii., S. and D. of feeder cable, etc.; section iii., S., D. and E. of high tension switchboard, etc.

DOMINION PORTLAND CEMENT CO. LTD., Wellington (N.Z.).—Wairua Electric Power Scheme.—31st October.—Section 10, high-tension insulators for 22,000 volt service.

CHRISTCHURCH CITY COUNCIL (H. R. Smith, town clerk).—5th January, 1914.—S. and D. of series street lighting plant and accessories. Specifications may be seen Town Clerk's office, Melbourne.

CITY OF AUCKLAND (N.Z.) (Henry W. Wilson, Town Clerk).—For sale, three 250kw. direct compound steam generators and switchgear. (See advertising columns.)

GRANTON SAWMILLS AND TIMBER SEASONING LTD., Healesville (C. R. Ferguson, Director).—25th October.—C. of about 2½ miles tramway line.

HAMILTON ELECTRIC SUPPLY CO.—13th November.—P., as a going concern, plant, land, rights and business.

ROYAL MINT, MELBOURNE.—17th October. —P. of 3 tons C.I. scrap, 3 tons W.I. scrap, about

A.U.S.N. Co. Ltd.

*Fast, Regular, and Comfortable Passenger Steamers*

(also carrying cargo) from and to

MELBOURNE, SYDNEY, ADELAIDE, FREMANTLE, BRISBANE, and all QUEENSLAND PORTS.

Passage Tickets interchangeable, with other Inter State Companies, on certain conditions.

Full Particulars at

COMPANY'S OFFICES

at all principal Australian Ports.

The Mount Lyell Mining & Railway

CO. LIMITED.

Purchasers of Ores containing Copper, Gold and Silver. Rates obtainable on application to the Secretary

Manufacturers of Coke for Smelting and Foundry Purposes, Acids, Etc.

HEAD OFFICE—

39 QUEEN-STREET, MELBOURNE.

D. G. LUMSDEN,
Secretary

THE

-PACIFIC CABLE BOARD-

Best route to Great Britain, Canada, New Zealand, Germany, etc.

New Direct Cable to Auckland from Board's Sydney Office opened December, 1912.

A Week End rate is now available between Great Britain and Australasia.—Rate 9d. per word, with minimum of 18/- (24 words). Week End Cable Letters are accepted up to midnight on Saturday for delivery in Great Britain on the following Tuesday morning.

TARIFF PER WORD "VIA PACIFIC."

| | Ordinary. | Daily Deferred. |
|---|---|---|
| GREAT BRITAIN | 3/- | 1/6 |
| GERMANY | 3/- | 1/6 |
| NEW ZEALAND | 4½d. | — |
| CANADA | 2/4 | 1/2 |
| U.S.A. | 2/4 to 2/8 | 1/2 to 1/4 |
| ARGENTINE, BRAZIL, CHILI and PERU | 5/8½ | 2/10¼ |

West Indies, Central America, and other rates, on application.

Cable forms, Deferred and Week End Regulations, may be obtained at—

THE PACIFIC CABLE BOARD,

77 Pitt Street, Sydney. Tel., City 1346 (3 Lines).
408 Collins Street, Melbourne. Tel., 2588.

J. Milward, Manager in the Pacific, 77 Pitt Street, Sydney.

Dunlop Mining Goods

Dunlop Rubber Belting

Is more efficient than Leather belting for Outdoor & Wet Work.

Sample & Price on application

The DUNLOP RUBBER Co of AUS. Ltd
108 Flinders St. MELBOURNE.
& ALL STATES

Note this on every belt.

Be sure you get

"DICK'S"

We know there are numerous imitations. Dick's maintains its high reputation for strength and efficiency. Every belt guaranteed. Sole agents

JAMES HARDIE & CO.

Melbourne and Sydney.

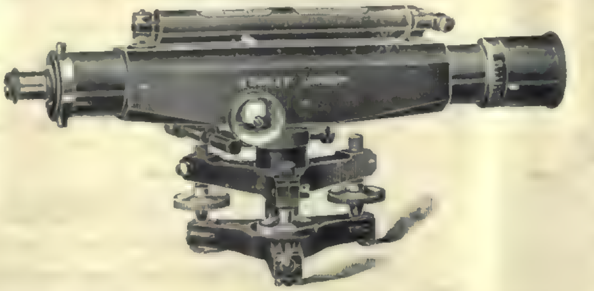
**Surveyors - Architects - Engineers**

will be interested to know that

***W. F. Stanley & Co. Ltd.,***

the greatest instrument-makers of Britain, are now adequately represented in Sydney. We have an enormous stock of every necessity in connection with your profession. We are selling these goods at the English Catalogue Prices, plus only duty and importing expenses 15 per cent.

*We will forward Catalogues upon application.*



**Fairfax and Roberts Ltd.,**

Sole Agents in New South Wales,

**23 and 25 Hunter Street, Sydney.**

665 brass scrap, about 200 lbs. copper scrap, about 220 lbs. zinc scrap, one s.h. 14in. stroke shaping machine.

BURNT CREEK G.M. Co. (S. J. Warnock, Manager).—P. of mine, plant and machinery, as going concern, exclusive of slimes.

WANTED.—Horizontal engine. (See advertising columns.)

## ACCEPTED.

### Commonwealth.

POSTMASTER-GENERAL'S DEPARTMENT, Victoria.—Item No. 8, 750,000 sleeves, paper jointing, internal dia. 0.120in., 2s. 6d. per 1000; item 9, 250,000 sleeves, paper jointing, internal dia. 0.180in., 2s. 6d. per 1000; item 1, 10 miles (nautical) cable, shore end, £342 4s. per nautical mile; item 2, 10 nautical miles cable (intermediate type), £202 per nautical mile; item 3, 10 nautical miles cable (main or deep sea type), £131 per nautical mile: item 1, 25 boxes, cable distributing, 5 pairs, 9s. 6d. each; item 2, 50 boxes, cable distributing, 10 pairs, 12s. 6d. each; item 3, 50 boxes, cable distributing, 13 pairs, 14s. 6d. each; item 4, 25 boxes, cable distributing, 26 pairs, 24s. each; item 5, 25 boxes, cable distributing, 52 pairs, 38s. each—W. T. Henley's Telegraph Works Co. Ltd.

Item 1, 50 miles wire, copper, tinned, rubber insulated, cotton covered, and braided, £3 9s. per mile; item 2, 60 miles wire, tinned, copper, rubber insulated, cotton covered, and braided, £2 19s. per mile; item 8, 150 miles wire, twisted pair, tinned, annealed copper, vulcanised indiarubber insulated, taped and braided, £13 15s. per mile—The Armorduct Manufacturing Co. Ltd.

Item 11, 20,000 zincs, Leclanche, 1.79d. each—The Lawrence and Hanson Electrical Co. Ltd.

Item 1, 300 brushes, steel, battery, 2s. 3½d. each; item 4, 750 coppers, 6.7d. each; item 9, 10,000 zincs, Meidinger, 7⅜d. each; item 10, 8000 zincs, for gravity cells, 1s. 5½d. each—The India Rubber, Gutta Percha, and Telegraph Works Co. Ltd.

Item 2, 1500 clamps, G.I. suspended strand, 1s. 6d. each—Western Electric Co. (Australia) Ltd.

POSTMASTER-GENERAL'S DEPARTMENT, New South Wales.—Item 1, S. and D. of 12 miles cable, switchboard, silk and cotton insulated, light lead taped and braided, and to contain 43 conductors, arranged in three groups. The cable shall be approximately rectangular in section, with overall dimensions 19-32in. x 9-32in., at £89 per mile—W. T. Henley's Telegraph Works Co. Ltd.

Item 2, S. and D. of 4 miles cable, switchboard, silk and cotton insulated, light lead taped and braided, and to contain 63 conductors, arranged in four groups. The cable shall be approximately rectangular in section, with overall dimensions, 7-8in. x 5-16in., at £124 per mile—British Insulated and Helsby Cables Ltd.

Item 3, S. and D. of 2 miles cable, switchboard, silk and cotton insulated, light lead taped and braided, and to contain 21 conductors; the cable to be round, and of a diameter not exceeding 11-32in., at £42 10s. per mile; item 4, 14 miles cable, telephone, switchboard, silk and cotton insulated, and light covered, consisting of 104 conductors, or 52 pairs metallic circuits, in 440 yd. lengths, at £224 2s. 10d. per mile—The Australian Metal Co. Ltd. (Electrical Department).

DEPARTMENT OF HOME AFFAIRS, New South Wales.—S. of transformers for the power plant, Federal Capital, £1214—The Australian Metal Co. Ltd.

POSTMASTER-GENERAL'S DEPARTMENT, Queensland.—124½ tons pipes, cast iron, 3½in., £10 5s. per mile—Messrs. C. Monteath and Sons.

Item 3, 11 tons G.I. wire, 60 lbs. per mile, £16 6s. 2d. per mile—Noyes Bros. (Sydney) Ltd.

Item 4, 30 tons G.I. wire (stranded) for mechanical purposes, four strands, No. 8 S.W.G., £12 10s. per ton—Messrs. Gilbert Lodge and Co.

Item 5, 20 tons steel galv. wire, seven strands, No. 12 S.W.G., £16 2s. 4d. per ton—Edward Duckett and Son.

Item 3, 1838 tubular poles, iron or steel, length 24ft., £3 5s. 3d. each; item 4, 3181 tubular poles, iron or steel, length 26ft., £4 4s. 6d. each; item 5, 300 tubular poles, iron or steel, length 30ft., £5 15s. each; item 6, 21 tubular poles, iron or steel, length 36ft., £7 5s. each—Messrs. Stewarts and Lloyds (Aust.) Ltd., Brisbane.

DEPARTMENT OF TRADE AND CUSTOMS, Northern Territory.—S. and D. of an automatic light, £822 14s.; S. and D. of an automatic light, £427—Gardner, Waern and Co.

### New South Wales.

PUBLIC WORKS DEPARTMENT.—S. and D. of 500 tons iron spikes for 60 lb. rails, £14 7s. 6d. per ton, in bags; £15 7s. 6d., in cases—Brown and Brown.

M., S. and D. of 15 jib water cranes (5 tenders to be reported).

Installation of electric passenger lifts, Chong's Building (2 tenders to be reported).

### Victoria.

VICTORIAN RAILWAYS.—M., S. and D. of galvanised pipes, reducing pieces, bends, junction pieces, hoods, dust gates, and dust separator for the nickel-plating shops, Newport—C. C. Weickhardt.

M., S. and D. of 1in. steel fishbolts with steel nuts for 80 lb. and 100 lb. rails (from steel which will be sold to the contractor by the Corporation) for renewals, at £24 9s. 9d. per ton—McPherson's Pty. Ltd.

M., S. and D. of ⅞in. diameter steel guard rail stay bolts with steel nuts for 60 lb. rails (from steel which will be sold to the contractor by the Corporation), at £25 19s. per ton—McPherson's Pty. Ltd.

M., S. and D. of 1in diameter steel guard rail stay bolts with steel nuts for 80 lb. and 100 lb. rails (from steel which will be sold to the contractor by the Corporation), at £22 19s. per ton —Sewell and Gaskell.

S. and D. of balls and ball races for 70ft. turntables—Item 1, set of 2in. steel balls, consisting of 65 balls per set, at £12 per set; item 2, hardened steel rings and equalising split ring, at £65 per set; item 3, mild steel ball cages, at £18 per set—Gardner, Waern and Co.

M., S. and D. of green buffalo trimming leather, at 1s. 1d. per square foot—J. P. Howe and Co. Pty. Ltd.

M., S. and D. of 1 centrifugal pump for the State coal mine, at £105—Thompson and Co. (Castlemaine) Pty. Ltd.

S. and D. of hollow chisels and bits—Item 1, hollow chisels and bits, 1⅝in. diameter, at £3 3s. 6d. each; item 2, hollow chisels and bits, 1½in. diameter, at £2 13s. 6d. each; item 3, hollow chisels and bits, 1¼in. diameter, at £2 6s. 6d. each; item 4, hollow chisels and bits, 1⅛in. diameter, at £2 1s. 3d. each; item 5, hollow chisels and bits, ⅞in. diameter, at £1 14s. 3d. each; item 6, hollow chisels and bits, ⅝in. diameter, at £1 6s. 3d. each—Bevan and Edwards Pty. Ltd.

S. and D. of cast iron scrap for foundry use, at £4 7s. per ton—N. Bear and Co.

S. and D. of cast iron scrap for foundry use, at £4 5s. per ton—N. Bear and Co.

Oil (engine, cylinder, lubricating), 3s. 3d. per gallon—Vacuum Oil Co. Pty. Ltd.

Vulc. I.R. hose, 2in. steam, 2s. 9d. per foot; 2in. steam armoured, 2s. 11½d. per foot—Dunlop Rubber Co. of Aust. Ltd.

Caustic soda, 12 tons, at £19 15s. 6d. per ton—W. and G. Dean.

Stockholm tar, 1s. 7d. per gallon—Paul and Gray Ltd.

Oxygen, 16,000 cubic feet, 1d. per cub. foot—Australian Oxygen Co.

Galvanised iron, corrugated, 3 tons, at £16 15s. per ton, 7 and 8ft.—Johnson, Clapham and Morris; 9 and 10ft., £16 19s. 6d.—Morris and Meeks.

Expanded metal, 1¾in. mesh, 1s. 4d. sq. yard; 2½in. mesh, 1s. 2d. per sq. yard—T. Robinson and Co. Pty. Ltd.

Malleable tube fittings, black, £100; galvanised, £100; black fence, £15; galvanised, £10—Wm. Adams and Co. Ltd.

### Western Australia.

WATER SUPPLY DEPARTMENT.—Stoneware pipes, £23,997 1s. 8d.—Mills and Co.

### New Zealand.

POSTAL DEPARTMENT.—100,000 insulator bolts, £1292—Richardson, McCabe and Co. Ltd.

100,000 insulator cups, £1573—Richardson, McCabe and Co. Ltd.

Quarter-mile of cable, lead covered, silk and cotton, £327 15s.—A. D. Riley and Co. Ltd.

10 miles aerial cable, 26 pairs, £1397—P. R. Baillie and Co.

15 miles aerial cable, 52 pairs, £3330—Turnbull and Jones.

7 miles aerial cable, 78 pairs, £2219—Turnbull and Jones.

15 miles aerial cable, 104 pairs, £5730—Turnbull and Jones.

8 miles cable, 208 pairs, air space, £7784; 2 miles 66 yards cable, 208 pairs, air space, £1483 6s.—P. R. Baillie and Co.

5 miles cable, 312 pairs, air space, £4546 0s. 6d. —P. R. Baillie and Co.

1 mile cable, 416 pairs, air space, £939—A. D. Riley and Co.

1 mile cable, 520 pairs, air space, £1152—A. D. Riley and Co.

3 miles cable, 624 pairs, air space, £4095—A. D. Riley and Co.

20 miles galvanised steel strand suspension wire, 7/11, £253 10s.—J. Nathan and Co.

### General.

MUNICIPAL COUNCIL OF SYDNEY.—S. of 100 street orderly bins, £327—Jones Bros.

GEELONG WATER WORKS.—S. of reinforced concrete sewer pipes, £4782 10s. 8d.—Stone and Siddeley.

---

## DIVIDENDS.

**The following dividends and bonuses of mining companies in Australia have been declared, and are payable on the dates noted:—**

October.

16th.—Tongkah Compound Tin Dredging Co., Siam, 1s., £2500.

20th.—Oswald Estates Mines, Maldon (V.), 1s.

21st.—Campbell's Creek Dredging Co., Castlemaine (V.), 6d., £800.

22nd.—Tongkah Harbour T.D. Co., Siam, 2/-, £15,000.

23rd.—Ajax Central G.M. Co., Daylesford (V.), 2s., £3000.

23rd.—Wandiligong G.D. Co., Bright (V.), 1s., £300.

28th.—Harrietville Star B.D. Co., Harrietville (V.), 1s., £250.

29th.—Ivanhoe Gold Corporation, Kalgoorlie (W.A.), 3s. 6d., £35,000

30th.—Cathcart Central G.M. Co., Ararat (V.), 2s., £5000.

30th.—Blair Athol Coal Co., Rockhampton (N.Q.), 6d., £1250.

November.

3rd. — Bullfinch Proprietary (W.A.), 1s., £23,800.

12th.—Amalgamated Zinc (De Bavay's) Ltd., Broken Hill (N.S.W.), 1s., £25,000.

---

The Dunlop Rubber Co. of Australasia Ltd. has issued its statement of accounts for the year ended 31st July, which shows an improvement over the results of the preceding period. During the year a net profit of £72,892 was made, which was swelled to £75,023 by £2131 brought forward from the preceding term. Out of this sum dividends aggregating £51,100 were paid, £20,000 placed to reserve, and £3923 was carried forward. The total amount now in reserve is £35,060, which includes £60 premium on shares. Since its inception two years ago, the new company has paid in dividends a total of £100,737. In the balance-sheet of the old company, the item of goodwill, including patent rights, leases, trade marks, etc., stood at £137,524, after £13,716 had been written off. In that of the new company this item stands at £180,000 for both years. The total liabilities to creditors now amount to £107,147, a decrease on the amount of £111,876, standing under the same head at the end of the previous period. Amount written off for depreciation is £93,322, against £94,996. Freehold property at £58,046 shows an increase of £6193; plant, furniture, and fittings at £59,089, an increase of £5465; sundry debtors at £89,590, an increase of £18,841; while stocks at £295,820 show a decrease of £18,297, against the corresponding items for the previous year.

## TASMANIAN MINING.

### Mount Lyell District.

(From Our Correspondent.)

Queenstown, October 10.

As anticipated in my notes of a fortnight ago, the result of the Mount Lyell Company's operations for the half-year ending September 30th last is, when all the circumstances are considered, highly satisfactory. The writer's forecast that the copper production would approximate 2500 tons was fairly close to the mark, as the official report states it to be 2371 tons, as against 831 tons for the six months ending March 31st last. An excellent smelting run was obtained during the last four-weekly period of the half-year, three furnaces being in constant operation for the full term, while the output of copper was 589 tons, as compared with 453 tons for the previous month.

At the North Lyell mine work generally is proceeding on satisfactory lines, and orebreaking continues to be actively prosecuted at the 850, 1000, and 1100ft. levels, while at the 400ft. and 700ft. levels similar work, although on a much smaller scale, is also being carried on. Altogether, at the three lowest levels, 15 stopes are being attacked—five at the 850ft., six at the 1000ft., and four at the 1100ft., and the ore right through is keeping well up to the average 6 per cent. grade. The minimum daily output is about 400 tons, and there is every probability (unless any unforeseen interruption occurs) of this tonnage being shortly increased.

At the Mount Lyell mine they are "plugging" away as usual, with good results, and the output of pyrites is from 700 to 750 tons a day, with every prospect, in the near future, of increasing this to 800 tons a day. At the South Lyell mine, which may now be considered as part and parcel of the big mine, the preparatory work required to ensure a regularly productive condition, which involves the cutting of main and cross galleries through the ore body, is well in hand. The next three or four months should see this mine in the necessary order to contribute an appreciable quota of the pyrites required for smelting purposes.

At the Reduction Works, after a continuous run extending over five weeks with three furnaces in full blast, one furnace has been down for the last few days. This stoppage is, however, only temporary, and before this appears in print it is pretty certain that three furnaces will be going again, and with every likelihood of another good smelting campaign with this number of furnaces in regular commission.

Regarding the labour supply, it continues to be fairly adequate, as far as numbers are concerned, but it is also of a very "migratory" character, and men appear to be coming and going every week. As to the efficiency of a good deal of the labour available at the mines, the less said the better, but the management is obliged to put up with it. The total number of men at present employed by the company is not far short of 1900. Of these over 1000 are at the mines, while about 700 are engaged at the Reduction Works and on Lake Margaret power scheme, and about 150 are working in the railway department.

The Tasman and Crown, a mining concern with a remarkably chequered experience, appears to have struck another "resurrection." Some time ago it was stated on fairly good authority that negotiations for the sale of the property to the Mount Lyell Company were in progress; but evidently, if such was the case, nothing eventuated. Any way, it is known that for some time there was a dispute between the two companies over the matter of easements in connection with the working of the Mount Lyell Company's Comstock property and litigation was in the air. As a matter of fact, the case was set down for hearing in the Warden's Court at Queenstown, and a number of witnesses were summoned, but an amicable arrangement was arrived at and proceedings lapsed. It is understood that, by the agreement arrived at, the Mount Lyell Company is to have the easements it requires for mullock tips and tramway lines on and over the Tasman and Crown property, and in return for these concessions the Mount Lyell Company will allow the Tasman Company certain transport privileges over its lines from the Comstock to Queenstown, and from Queenstown to Strahan. Some seven or eight men are now employed, and a small tonnage of ore is being won from the galena body of the mine. It is stated that the company is arranging to have a fairly large parcel of the ore experimentally treated at the Zeehan smelters; but the closing down of their works will probably upset this arrangement. And so it looks as if the unlucky Tasman and Crown will be "up against it" once more, although, to be sure, it must now be getting used to this kind of thing. But somehow the writer cannot help thinking that the tonnage of payable ore which the Tasman and Crown is ever likely to be able to send over the Mount Lyell Co.'s lines will not in any way increase the wear and tear of the rolling stock.

The chief topic of interest just at present among the West Coast mining community (or at least that portion of it which is identified with Zeehan and the surrounding districts) is the shutting down of the Zeehan smelters, for the reason, it is alleged, that the company is unable to obtain the necessary supplies of coke for smelting purposes. The unfortunate happening is naturally a terrible setback to the Zeehan district, which during the last few years has had anything but a prosperous time. What is puzzling a lot of people is that other smelting companies all over Australia can get all the coke they want; and, this being so, why cannot the Zeehan smelting company do the same? The manager of the company states that the stoppage is only temporary; but the fact remains that all the staff has received a month's notice, and this looks as if it will be some time before operations are resumed. Anyway, whether the stoppage is of long or of short duration, it is a complete knockout for Zeehan, for the time being; and the opinion is freely expressed that it is time the Government seriously considered the advisability of taking over the whole business and running it as a State concern. One thing is sure, that few, if any, industrial enterprises in Australia (and certainly none in Tasmania) have received the same generous aid from the State as the Zeehan Smelting Company has, and under these circumstances it is singularly unfortunate that its operations have so far been anything but successful.

---

The return of Victorian gold actually received at the Melbourne branch of the Royal Mint during September was 43,811.43 oz. gross, or 40,849.28 oz. fine, the value being £173,559. The gold received during the week ended on the 4th inst. amounted to 17,638.95 oz.

The amount of gold purchased by the banks of Bendigo and Eaglehawk (V.), during September was 14,196 oz. 19 dwt. 19 gr., as compared with 15,122 oz. in August, and with 14,369 oz. in September, 1912. This was the lowest quantity purchased in September for several years past, but it must be remembered that several mines are partially closed down through the strike against non-union labour. The total for the nine months was 123,546 oz., which is the lowest aggregate for the same period for several years, that of last year being 130,821 oz., and that of 1909 156,407 oz.

The remark made by Mr. Nat. Harper, M.L.A. (W.A.), that "when the mines give out the agricultural industry of that State will be called upon to bear the burden of interest and sinking fund on borrowed capital," does not fall very gracefully from the lips of a man who owes as much to the mining industry as that gentleman does. It is not such a matter of importance to the people of Western Australia what Mr. Harper thinks, as the impression a statement made by a man who apparently has the vote and confidence of a section of the people in that State would have on people in other parts of the world who are directly or indirectly interested in the mining industry of W.A., and who do not know Mr. Harper. Naturally it would be inferred by them from Mr. Harper's remark that the industry is on the verge of collapse. It is not difficult to account for the very decided change in Mr. Harper's views, which are no doubt occasioned by the change in his choice of vocations. As an agriculturist, Mr. Harper probably views with some alarm the prospect of being taxed out of existence. In this connection he need have no fear, as Western Australia's mining resources are much greater than he seems to imagine.

At the annual smoke social of the Electrical Traders and Contractors' Association of Victoria, held at the Vienna Cafe on Saturday evening, Mr. E. H. Westwood, president, in the chair, Mr. H. R. Harper, city electrical engineer, in proposing success to the electrical traders' association, said he thought the association might well turn its attention to the tariff, now that the Inter-State Commission was getting to work. The manner in which duties on electrical appliances had been fixed by the Federal Parliament was little short of farcical. When lamps were under consideration it was suggested by one member that a factory for their manufacture was about to be started in Melbourne. It had not commenced yet, and he did not think there was any possibility of anyone doing so for a long while to come. On the item meters, someone suggested that as there was a high duty on gas meters the same rate should be put on electrical meters. At the present time about 25,000,000 units was being sold per annum in Melbourne. When the railways and tramways were electrified he thought the consumption would be about 150,000,000 units. That would not be a bad output for a city like Melbourne. In Chicago, with a population of 2,225,000, the consumption was 800,000,000 units, so that by comparison the consumption in this city was satisfactory. It was sometimes said that electricity was still in its infancy, and to some extent that was true, because almost every day they saw something wonderful in the way of progress.

## Commonwealth of Australia.

Postmaster-General's Department,
Melbourne, October 10, 1913.

TENDERS will be received at the office of the Deputy Postmaster-General, Melbourne, until 3 p.m. on December 30, 1913, for the Supply and Delivery of Telephone Material. (Sch. 976). See Commonwealth Gazette, October 11.

AGAR WYNNE,
(1262) Postmaster-General.

---

Department of Home Affairs,
Melbourne, October 2, 1913.

KALGOORLIE TO PORT AUGUSTA RAILWAY.

LOCOMOTIVE ENGINES AND TENDERS.

TENDERS, addressed to the Secretary, Department of Home Affairs, Melbourne, will be received up to 11 a.m. on Wednesday, November 5, 1913, for the Manufacture, Delivery and Erection in running order, of:—

4 or 8 Locomotive Engines and Tenders (New South Wales "P" Type), Tender Capacity 4500 gallons of water and approximately 7½ tons coal.

Specifications will be on view on and after October 7, 1913, at the undermentioned offices:—Commonwealth Railways, 84 William-street, Melbourne; Commonwealth Works Director, Customs House, Sydney; and Commonwealth Works Registrars, Brisbane, Adelaide, Perth, and Hobart.

The charge for each copy of specification will be £1/1/-, which must be paid before the documents can be issued.

Tenders are to be endorsed "Tender for Locomotive Engines and Tenders," and are to be accompanied by the deposit mentioned in the form of tender.

JOSEPH COOK,
Minister of State for Home Affairs.

## Government Notices (V.).

Department of Ports and Harbours,
Melbourne, October 10, 1913.

TENDERS will be received up to 12 noon on Friday, October 24, 1913, for the Supply of the undermentioned Machinery, to be delivered at the Ship-yard, Williamstown:—

1 Steam and Hand Windlass.
3 Hydraulic Lifting Rams.
1 Hydraulic Pressure Pump.
1 Steam and Hand Windlass.
1 Hand Windlass.
1 Rivet and Bolt Header.
2 Weighing Blocks.

Lowest or any tender not necessarily accepted.

Tenders to be endorsed "Tender for Machinery, Williamstown," and addressed to "Engineer-in-Charge, Ports and Harbours, Melbourne."

Plans and specifications can be seen at Ports and Harbours Office, Custom House, Melbourne, and at the Shipbuilding Yard, Williamstown.

Preliminary deposit, to accompany tender, £5.

Final deposit, 5 per cent.

C. W. MACLEAN,
Engineer-in-Charge Ports and Harbours.

---

STATE RIVERS AND WATER SUPPLY COMMISSION.

PUMPING MACHINERY.

TENDERS, addressed to the Secretary, and endorsed "Tender for Merbein Pumping Plant," will be received until noon of Saturday, December 6, 1913, for the Manufacture and Supply of a Centrifugal Pump and Quick Revolution Steam Engine (of about 800h.p.), with Condenser, etc. Alternatively, tenders may be for:—

(a) The plant all of Australian manufacture.
(b) The same plant, with all parts except the engine of Australian manufacture, and an imported engine of British manufacture.

Copies of specification and forms of tender may be obtained at the offices of the Commission, Treasury Gardens, Melbourne, price 5/- per set. Preliminary deposit, £100.

M. NALLY,
14/10/13. Secretary.

## Government Notice (N.S.W.).

---

### METROPOLITAN BOARD OF WATER SUPPLY AND SEWERAGE.

TENDERS for the works specified below will be received up to 2 p.m. on the dates mentioned. For particulars see Government Gazette.

NOVEMBER 3, 1913.

Manufacture and Delivery of 36in. and 30in. Sluice Valve, at Leichhardt Depot.

DECEMBER 15, 1913.

Manufacture and Delivery of One Turbine Centrifugal Pumping Plant, for Crown-street Pumping Station.

WILLIAM HOLMES,
Secretary.

341 Pitt-street,
Sydney, October 10, 1913. (6144)

---

## THE MELBOURNE AND METROPOLITAN BOARD OF WORKS.

Separate TENDERS are invited for the undermentioned works, etc. Tenders, accompanied by the necessary preliminary deposit, and endorsed "Tender for ——" (as the case may be), must be deposited in the Tender Box at the offices of the Board, 110 Spencer-st., Melbourne, at or before 11 o'clock a.m., on the dates as specified:—

TUESDAY, OCTOBER 21, 1913.—Manufacture, Supply and Delivery of Girders, with hanging straps, bolts, and other fittings, for carrying the main O'Shannassy 34in. Pipe over the Woori Yallock Creek. Preliminary and final deposit, £15.

TUESDAY, OCTOBER 21, 1913.—Supply and Delivery of three hundred and fifty (350) tons of nine (9) inch C.I. Pipes of Australian manufacture. Alternative tenders for Nine (9) Feet and Twelve (12) Feet Lengths. Preliminary deposit, 2½ per cent.; final deposit, 5 per cent.

TUESDAY, OCTOBER 21, 1913.—Supply and Delivery of One thousand (1000) ¾in. water meters of Australian manufacture. Preliminary deposit, 2½ per cent.; final deposit, 5 per cent.

TUESDAY, OCTOBER 21, 1913.—Manufacture, Supply and Delivery of Wrought-iron Ventilator Tubes 9in. and 12in. diameter. Alternative tenders for spirally riveted or straight riveted joints. Preliminary and final deposit, £6.

Full particulars at this office. The lowest or any tender not necessarily accepted.

GEO. A. GIBBS, Secretary.

---

## WANTED.

Horizontal Engine, 18in. Cylinder by 30in. Stroke, with Right-hand Flywheel. Compact. Trunk Engine preferred.

Box 387, G.P.O., Adelaide.

---

## AMALGAMATED ZINC (DE BAVAY'S) LTD.

NOTICE is hereby given that a DIVIDEND (the 13th) of One Shilling per share on all shares in the capital of the abovenamed Company has been declared, due and payable at the registered office of the Company, No. 360-6 Collins-street, Melbourne, on Wednesday, November 12, 1913.

Dividend warrants will be posted direct to shareholders.

Transfer books and share register will close at 5 p.m. on Tuesday, October 28, and re-open at 10 a.m. on Thursday, October 30, 1913, and the dividend will be payable to all shareholders registered on Wednesday, October 29, 1913.

By order of the Board,
HAROLD L. SHACKELL,
Melb., Oct. 9, 1913. Assistant Secretary.

---

## MUNICIPAL COUNCIL OF SYDNEY.

TO CONTRACTORS.

SEALED AND ENDORSED TENDERS will be received by the undersigned until 3 o'clock on MONDAY, 27th October, 1913, for the SUPPLY AND DELIVERY OF CURVE DRAWING AMMETERS. Copies of specifications, etc., may be seen or obtained upon application at the office of the City Electrical Engineer, Town Hall, Sydney, upon payment of the sum of 10s. 6d. The lowest tender or any tender not necessarily accepted. TENDERERS please note that they must pay their cash deposits direct into the City Treasury, and NOT enclose the same with their tenders; otherwise their tenders will be rejected as informal.

THOMAS H. NESBITT,
Town Clerk.

Town Hall, Sydney.
19th September, 1913.

---

## MUNICIPAL COUNCIL OF SYDNEY.

CONNECTION OF ELECTRIC INSTALLATIONS AND ADDITIONS TO THE ELECTRIC SUPPLY MAINS OF THE CITY COUNCIL OF SYDNEY WITHOUT NOTIFICATION.

On the 3rd September, 1913, a certain Company, carrying on business in the city, appeared at the Central Police Court, charged with breaches of the City Council of Sydney's By-law No. 698, which reads as follows:—

"No person shall connect, or cause to be connected, any apparatus for the consumption of electricity with the Council's works without first notifying the Council of his intention so to do, and until the consumer shall sign a contract with the Council in respect of the supply to such apparatus in the form approved by the Council."

The defendant Company pleaded guilty, the magistrate inflicting a fine of 20/-, and requiring the payment of 6/- costs.

It has been decided to proceed against any Electrical Contractor known to have connected additions to installations connected to the City Council's mains without notifying the City Council.

THOMAS H. NESBITT,
Town Hall, Sydney, Town Clerk.
October 2nd, 1913.

---

## THE RENISON BELL PROSPECTING AND MINING CO. N.L.

NOTICE OF DIVIDEND.—Notice is hereby given that a Dividend (the 8th) of Sixpence per share on all shares in the abovenamed Company has this day been declared, and will be due and payable at Hobart, on Thursday, October 30, 1913. The transfer books of the Company will be closed from the 20th inst. to the 30th idem., both days inclusive. By order of the Board,

J. SMITHIES, Manager.
82 Collins-st., Hobart, Oct. 7, 1913.

---

## THE BULLFINCH PROPRIETARY (W.A.) Limited.

A DIVIDEND of One Shilling per share (less income tax) has been declared, payable on November 3, to shareholders registered on or before October 27. For purposes of the above dividend, transfers on the Adelaide register must be lodged at the Adelaide office on or before 4 p.m. on Monday, October 27, 1913.

VICTOR P. JONES,
60 Brookman's Building, Adelaide Secretary.
Grenfell-street, Adelaide.

---

## CITY OF AUCKLAND.

ELECTRICITY DEPARTMENT.

FOR SALE.

Three 250kw. Direct Coupled Steam Generators with Switchgear.

Specifications may be obtained on application to the City Electrical Engineer, Railway Wharf, Auckland, New Zealand.

Offers, endorsed "Tenders for Old Plant," must be addressed to the Town Clerk, Town Hall, Auckland, New Zealand.

HENRY W. WILSON,
September 16, 1913. Town Clerk.

---

WILLIAM WILSON HAMILL'S Australian Letters Patent No. 2738, dated October 11, 1911, for "Improvements in Carburetters for Internal Combustion Engines."

NOTICE IS HEREBY GIVEN that the above Patentee is prepared to License the Manufacture of the above patented invention or to sell or otherwise dispose of the Patent on reasonable terms, or offers, proposals, or suggestions, from any person, firm, or corporation desirous of using, exercising, or vending the patented invention in Australia, or of otherwise supplying the requirements of the public in respect to said invention, will be favourably considered. The specification (including drawings) of the Patent may be inspected at the Custom Houses of the Capital Cities of the States, and at the address below. For the proprietor, FRED WALSH, Patent Attorney, George and Wynyard-streets, Sydney.

---

## A SURE AND CERTAIN LAND INVESTMENT.

For mining and city men, mariners, civil servants and sons desirous of investing or establishing agricultural revenue earning homes, who can buy now and expend an amount per annum for improvement through us, as managers for absentee owners, will do well to consult us re Flinders Island, where we can show 10 to 50 acres lucerne paddocks, also splendid sheep, clover, dairy and root crop land. Guarantee your expenses back if we cannot verify our statements. How can you go wrong at the prices—30/- to £3 per acre for new settlement land? Within easy and cheap access to Melbourne and Sydney markets. Conveniences: 5 piers, good steamer, school, doctor, wireless telegraphy, hotel, stores, council, marvellous mild climate, sure rainfall, scenery equal to Sydney Harbour. Write for booklet, Flinders Island Land Settlement Bureau. H. J. HOLLOWAY & CO., 339 Collins-street, Melbourne. 'Phone 8091.

---

ENGINES (2), Ransomes, Sims, and Jefferies, 7h.p., 4½ x 8, 100 lb. steam pressure, 260 r.p.m., absolutely new; will sacrifice to clear. Warburton, Franki (Melb.) Ltd., 380-2 Bourke-street.

---

## THE AEROPLANE CLOTHES HOIST.

(The Perfect Clothes Line).

A well-known Medical Man said:—

> "If the machine's advantages to womankind, from a health point of view, were fully realised, your company would not be able to supply them fast enough."

ON VIEW AT GREAT ALL-AUSTRALIAN EXHIBITION.

Aeroplane Hoist Mfg. Co. of Australasia Ltd.,

31 Queen-street. 'Phones 7186, 2990.

---

# Australian Oil Wells Company,

**No Liability.**

## Capital - £5,000 in 100,000 shares of 1s. fully paid.

**Directors: Messrs. V. J. SADDLER, GEO. B. GORDON, and GEORGE D. MEUDELL. Brokers: Messrs. S. B. BAGLEY & CO., 408 Collins St., Melbourne.**

This Company, formed to acquire options and interests in likely Oil Areas throughout Australasia, offers an issue of 20,000 Shares fully paid to One Shilling.

The Company will do no boring on its own account, as it is an acquisition and promotion Company, and uses its Capital to promote oil-boring Companies. Brokerage of 5 per cent. will be paid on all Shares allotted.

Full particulars and reports may be obtained at the Company's Office, 31 Queen Street, Melbourne.

ALEX. GORDON, Manager.

## PUBLIC WORKS AND RAILWAYS (N.S.W.)

The annual report of the Public Works Department (N.S.W.) shows a total expenditure for the year ended 30th June last of £3,636,378, which does not include expenditure on State brickworks, road metal quarries, Government docks, water conservation, and certain works carried out by the Department of Education. Of this sum £270,375 was absorbed by the cost of administration, design, and supervision, equivalent to 7.16 per cent. of the total expenditure. This percentage is slightly in excess of the average, 7.08 per cent., for the preceding ten years. Expenditure on railways absorbs £1,089,510, this figuring as the chief item.

Contracts to the number of 461 were let during the year for a total of £693,635. Of that sum railways and tramways absorbed £204,867, public buildings £166,338, water conservation and supply £153,654. At the close of the year 177 of these contracts were still incomplete, and the outstanding liability was £308,570.

On June 30 the total length of railway under construction (omitting those sections of the North Coast line not actually in hand) was 520 miles, estimated to require a further outlay of [illegible], and authority had been given for the construction of 554 miles of new line at an estimated further cost of about £2,003,540.

The year's expenditure on public buildings amounted to £751,954, including £82,520 for the Commonwealth Government, and £308,240 for other State departments, the bulk of the latter amount being on behalf of the Department of Public Instruction. The value of the work carried out by day labour, including work at Daceyville, was £503,107, of which £231,051 was paid in wages, the balance being expended in the purchase of material. The balance of the expenditure is made up on water works, abattoirs, harbour works, etc.

In connection with the City railway, complete details of the scheme are furnished by Mr. Davis (Director-General of Public Works). In brief, this scheme provides for an underground loop railway, which, whilst corresponding generally to the recommendations made by Mr. David Hay, M. Inst. C.E., in his special report, differs materially in several particulars, the principal divergences being:—The substitution of a triple for a double track; the removal of the junction with or off-take from the existing system from the present terminus to a point about 54 chains further south; alteration in site of several of the underground stations, notably that at the Town Hall, in order to avoid interference with the foundations of existing buildings; and the relocation of practically the whole of the eastern portion of the line.

The total length of the line as now designed is 5 miles 17 chains 8 feet, of which 4 miles 63 chains 42 feet will be underground. Cost is estimated at, approximately, £4,000,000.

In anticipation of Parliamentary authority being granted to put the work of construction in hand, and in order that no delay may then occur, surveys have been made and plans prepared for the first section, extending from the present Redfern Station to Wynyard-square, and the work of testing the formation is being rapidly pushed forward.

---

The third reading of the City (Sydney) Railway Bill was carried in the New South Wales Legislative Assembly last week by 24 votes to 14, and referred to the Legislative Council. The Standing Orders were suspended in the same sitting of the Assembly, in order that Railway and Public Works Bills, aggregating about £1,000,000 of expenditure, might be dealt with. The following Bills were carried through all their stages:—Ballina-Booyong railway, £122,000; Grafton-South Grafton railway, £200,000; Canowindra-Eugowra railway, £100,000; Sydenham-Botany railway, £136,000; Roslyn-Taralga railway, £81,000; Bardmedman-Rankin Springs railway, £274,000; Newcastle floating dock, £110,000; and the Tamworth water supply, £22,600.

---

The revenue of the Victorian railways for the first quarter of the financial year amounted to £1,202,709, or £46,612 in excess of that obtained during the same period of last year. The principal increases were £29,560 from goods traffic, £4579 from live stock traffic, £3838 from passenger traffic, and £2070 from parcels traffic. Owing to the holding of the Victorian Royal Agricultural Show at the end of September, the receipts for the last ten days of that month amounted to £131,378, as compared with £110,606 for the corresponding period last year. Revenue from passenger traffic alone increased by £12,012.

The Sydney Municipal Council has decided to rigorously enforce the by-law dealing with connections to their electric supply mains. Recently a prosecution for so connecting, without notifying the Council and signing a contract, was successfully instituted against a Sydney firm. Particulars of the by-law in question and the fine imposed for the above-mentioned breach thereof are advertised in another column.

**SOUTH** THE AUSTRALIAN GAS RETORT & FIRE BRICK MANUFACTURING CO., TOORAK ROAD, SOUTH YARRA— For Fire Clay goods for all purposes. Send for Catalogue. **YARRA**

**SHAW'S Steel Wire Ropes**
**FOR ALL MINING PURPOSES.**
Large Stocks always on hand at HEAD AUSTRALASIAN DEPOT
**JOHN SHAW Australia, Limited,**
**445 KENT STREET, SYDNEY.**
*Victorian Agents: Welch, Perrin and Co., and Inglis, Smith and Co.*
*Brisbane: Engineering Supply Co. of Australia Ltd.*

**Crane Ropes**

Wire ropes have many advantages over chains, for cranes and hoists. They are cheaper; occupy less space on the barrel; are lighter, stronger, and safer. The best are easily identified by the

**Red Thread**

Manufactured by
**Thos. & Wm. Smith Ltd.**
*Newcastle-on-Tyne.*

**B. K. Morton Pty. Ltd.**
*Melbourne:* 512 Little Collins St.
*Sydney:* 127 York St.

Next Time Try
**PEERLESS**
Piston Packing

**and see if you are not glad you saw this advertisement. It has for a core the celebrated Rainbow Packing Compound. Does that not mean something? Your dealer can get it if you insist, but it is stocked by most engineering suppliers**

**Peerless Rubber Mfg. Co.**
New York.

General Representative—B. K. MORTON Pty. Ltd.
512 Little Collins St., Melb. 127 York St., Sydney.

# QUEENSLAND MINES DEPARTMENT

**GEOLOGICAL SURVEY PUBLICATIONS. REVISED LISTS FORWARDED ON REQUEST**

## Charters Towers School of Mines.

SUBJECTS AND INSTRUCTORS:

Geology, Mining Geology, and Mineralogy.—The Director, H. I. McGillivray, M.A. (Melb.).

Chemistry, Assaying, and Metallurgy.—J. A. Hughes, F.C.S.; W. H. Bowater, F.C.S.; P. Harvey, A.C.T.S.M.

Mechanics, Materials and Structures, and Physics.—A. R. Wright, F.S.A.S.M.

Mining, Ore Dressing, Surveying, and Mechanical Drawing.—E. C. B. Heden, B.A., B.E., B.Sc. (Syd.).

Mathematics.—G. F. Clinton, A.C.T.S.M.

Secretary.—J. F. Horrigan.

Candidates prepared for Associateship in Mining and Metallurgy, Diploma as Chemist and Assayer, the Mine Managers' Examination, and in all branches of Metallurgical Work, such as Cyaniding, Chlorination, etc.

Scale of Fees.—15s. per class per term (three terms of three months each per year), or £2 per class per year. A full course of six or more classes for £10 10s. per annum. Full particulars on application to the Director.

Managers of Mines, Mills, and Smelters requiring trained Assistants are invited to communicate with the Director.

## Queensl'd Government Mining Journal

**A Monthly Publication Issued under the Authority of the MINES DEPARTMENT.**

Containing Official Reports, Statistical Tables, and other Authentic Information relating to

**MINING IN QUEENSLAND.**

SUBSCRIPTION—Per Annum, 6s.; Posted within the Commonwealth, 6s. 6d. To any place beyond, 8s.

PUBLISHERS—GORDON & GOTCH, Brisbane, and at 15 St Bride-street, Ludgate Circus, London, E.C.

---

# Department of Mines Western Australia

## SCHOOL OF MINES, KALGOORLIE.

Situated in the Chief Mining District.

SCHOOL TERMS commence end of February and May, and the middle of August. EXAMINATION at the end of November

### SUBJECTS.

Mathematics, Geology, Physics, Chemistry, Assaying, Metallurgy, Electricity, Mineralogy, Petrology, Mining, Mining Geology, Surveying, Applied Mechanics, Building Construction, Engine-driving, Mechanical Drawing, Engineering Subjects, Fitting and Turning.

PREPARATORY CLASSES for beginners will be held in Mathematics, Mechanical Drawing, Chemistry, Physics and Physiography. Fee, 15/- per term per subject Scholarships of £15 and upwards are offered annually for competition

CLASS FEES, 15/- to 1½ guineas per subject per term.

F. B. ALLAN, M.A., B.Sc., Director.

### MINING PUBLICATIONS OBTAINABLE.

| | Price each—s. | d. |
|---|---|---|
| Maps of the State of W.A., in one sheet, scale 50 miles to an inch | 1 | 0 |
| Route Maps, in book form (2 vols.), scale 10 miles to an inch | 2 | 6 |
| Route Maps, in separate sheets (8 sheets), scale 10 miles to an inch | 1 | 0 |
| Maps of each Mining Centre, showing Mining Leases, Town sites, Roads and Reserves, etc., scale 20 and 40 chains to an inch | 1 | 0 |
| Stock Route, Kimberley to Eastern Goldfields, by A. W. Canning | 1 | 0 |
| The Mining Act, 1904, including Mining on Private Property Act and Sluicing and Dredging for Gold Act | 2 | 0 |
| Annual Reports of Department of Mines from 1894 (illustrated) 6d. to | 3 | 0 |
| Mines Regulation Act, 1906 | 0 | 9 |
| Coal Mines Regulation Act, and Regulations, 1902 | 2 | 0 |
| Mines Development Act, 1902 | 0 | 9 |
| The Inspection of Machinery Act, 1904 | 1 | 6 |

| | Price each—s. | d |
|---|---|---|
| Explosives Act, 1895 | 2 | 0 |
| Explosives Act, Amendment Act, 1902 | 1 | 0 |
| Enginedrivers' Regulations, 1905 | 0 | 6 |
| Report on the Pilbara and West Pilbara Goldfields, by A. Montgomery, M.A., F.G.S., State Mining Engineer, 1907 | 1 | 0 |
| Also on Northampton Mineral Field | 1 | 0 |
| Kanowna Mines, 1908 | 1 | 0 |
| Yilgarn Goldfield, 1908 | 1 | 0 |
| Waverley or Siberia District, 1909 | 1 | 0 |
| Progress of Mining in the Districts Between Leonara and Wiluna | 1 | 0 |
| Murchison and Peak Hill 1909 | 1 | 0 |
| Kunanalling and Broad Arrow 1910 | 1 | 0 |
| List of Cancelled Gold Mining Leases (Postage 2d.) | 1 | 0 |

### GEOLOGICAL MAPS AND REPORTS ISSUED BY THE GEOLOGICAL SURVEY OF WESTERN AUSTRALIA.

| | £ | s. | d. |
|---|---|---|---|
| Geological Map of Northampton | 0 | 2 | 6 |
| Geological Map of Coolgardie | 0 | 10 | 0 |
| Geological Map of the North Lead, Kanowna | 0 | 1 | 0 |

| | £ | s. | d |
|---|---|---|---|
| Geological Map of Kalgoorlie (scale, 10 chains per inch) six sheets | 1 | 1 | 9 |
| Geological Map of the Boulder Belt, and Sheet of Horizontal Sections | 0 | 12 | 6 |
| Annual Reports of the Geological Survey, from 1898 | 0 | 1 | |

### BULLETINS.

I. Bibliography of the Geology of Western Australia (out of print). II. The State of Mining in the Kimberley District, and the probability of obtaining Artesian Water between the Pilbara Goldfield and the Great Desert (out of print). III. The Coolgardie Goldfield, 1s. IV. The Mineral Wealth of Western Australia (out of print). V. The Phillips River Mining District (out of print). VI. Notes from the Departmental Laboratory, 2s. 6d. VII. The Auriferous Reefs of Cue and Day Dawn, 2s. 6d. VIII. Lennonville, Mt. Magnet and Boogardie, 2s. 6d. IX. The Northampton Mining District, 2s. 6d. X. Palaeontological Contribution to the Geology of Western Australia, 1, Carboniferous Fossils from the Gascoyne District, 2s. 6d. XI. The Country between Edjudina and Yundamindera (out of print), XII. Mulline, Ularring, Mulwarrie and Davyhurst, 2s. 6d. XIII. Leonara (out of print). XIV. Part of the Murchison Goldfield (out of print). XV. Preliminary Report on the Pilbara Goldfield (out of print). XVI. The Mineral Production of Western Australia up to end of 1903 (out of print). XVII. Southern Cross, Yilgarn Goldfield, 2s. 6d. XVIII. Mt. Morgans and Mulgabbie (out of print). XIX. Minerals of Economic Value, price 1s. XX. Further Report on the Pilbara Goldfield (out of print). XXI. The Norseman District, Dundas Goldfield, 2s. 6d. XXII. Menzies, North Coolgardie Goldfield (out of print). XXIII. Third report on the Pilbara Goldfield (out of print). XXIV. The Laverton, Burtville, and Erlistoun Auriferous Belt, 2s. XXV. Artesian Water in the Kimberley District, 2s. XXVI. Miscellaneous Reports by various members of the Geological Survey Staff, 2s. XXVII Palaeontological Contribution to the Geology of Western Australia II (out of print) XXVIII. Lawlers, Sir Samuel, Darlot, Mt. Ida, and part of Mt. Margaret Goldfield, 2s. XXIX. Cue and Day Dawn Districts, Murchison Goldfield, Parts I. and II., 3s XXX. The Distribution and the Occurrence of the Baser Metals in Western Australia, 1s. XXXI. The Bonnievale and Kunanalling Districts, and the Black Range District, 2s. XXXII. The Greenbushes Tinfield; Mt. Malcolm Copper Mine, Eulaminna; and Fraser's Gold Mine, Southern Cross, 2s. XXXIII. Geological Investigations in parts of the Gascoyne, Ashburton and West Pilbara Goldfields, 2s. 6d. XXXIV. The Barrambie, Errolls, Gum Creek and Wiluna, 2s. XXXV. Gold and Copper Deposits of the Phillips River Goldfield, 2s. 6d. XXXVI. Palaeontological Contributions to the Geology of Western Australia, III., 2s. 6d. XXXVII. Geological Features along the Route of Transcontinental Railway in W.A., 2s. XXXVIII. Irwin River Coalfield and adjacent districts from Arrino to Northampton, 2s. 6d. XXXIX. Wiluna, Hall's Creek, and Tanami, 2s. XL., Pilbara Goldfield (Reprint of B. 15, 20, 23), 2s. 6d XLI. West Pilbara Goldfield, 2s. 6d.

**IN PREPARATION.**—Kalgoorlie Goldfield, Kimberley District; Yilgarn Goldfield, Meekatharra, Murchison Goldfield. Geology and Mineral Resources of Western Australia. Also: Annual Reports of the State Mining Engineer, Reports of Royal Commissions, Lithographic Plans, Code of Signals in Mines, General Rules. Miscellaneous Maps, etc., etc., etc

Fuller List of publications, post free, to be had on application at the Department of Mines, Perth, Western Australia.

HON. P. COLLIER, M.L.A.,
Minister for Mines.

H. S. KING,
Secretary for Mines

---

*THE*

# BROKEN HILL PROPRIETARY CO.

*LIMITED.*

## SMELTERS & REFINERS.

TARIFF ON APPLICATION.

Manufacturers of:

**SOFT PIG LEAD, FINE SILVER, ANTIMONIAL LEAD, COKE, SPELTER, BLUEPOWDER (ZINC DUST), AND SULPHURIC ACID.**

Branch Offices:

London, 3 Great Winchester-st., E.C.; Adelaide, Alfred Chbrs., Currie-st.
Sydney, Imperial Chambers, O'Connell-st.

***HEAD OFFICE — Equitable Building, Collins Street, MELBOURNE.***

---

THE BROKEN HILL PROPRIETARY CO. LTD.

TENDERS are invited for the SUPPLY of STORES and MINING REQUISITES for the 12 months ending 31st March, 1915.

Schedules obtainable on application at the Company's offices, Melbourne, Adelaide, Sydney, Broken Hill and Port Pirie.

Tenders will be received at Equitable Building, Collins-street, Melbourne, up to noon on Saturday, 10th January, 1914.

The lowest or any tender not necessarily accepted.

F. M. DICKENSON,
Secretary.

Melbourne, 6th October, 1913.

## PUBLISHERS' ANNOUNCEMENTS.

**Critchley Parker**

**Publications**

**Past and Present Metal Markets.** W. E. Figgis. Book and 2 Charts, 15/-. Posted, 16/3; foreign, 16/5.

**Coalfields and Collieries of Australia.** F. Danvers Power. 440 pages, 229 illustrations, demy octavo. 25/- nett. Posted, 25/3; foreign, 26/8. (Size, 9 x 6.)

**High Explosives.** W. R. Quinan. 224 pages, royal octavo, 21/-. Posted, 21/3; foreign, 22/4. (Size, 10 x 7.)

**Power.**
(*Issued under authority Sydney Municipal Council.*)
2/6 nett; post free.

**Australian Mining and Metallurgy.** Donald Clark. 600 pages, royal octavo. 21/- nett. Posted, 21/4; foreign, 22/9. (Size 10 x 7.)

**Gold Refining.** Donald Clark. 134 pages (plates), demy octavo. 12/6 nett. Posted, 12/7; foreign, 13/1. (Size, 9 x 6.)

**West Australian Mining Industry.**
(*By authority W.A, Government.*)
250 pages, crown folio. 10/- nett. Posted, 10/2; foreign, 10/8. (Size, 14½ x 10.)

**New South Wales Mines and Minerals.** 250 pages, crown quarto. 5/- nett. Posted, 5/1; foreign, 5/7. (Size, 10 x 7½.)

**Victoria, and its Mining Resources.**
(*By authority Victorian Government.*)
84 pages, crown quarto. 3/- nett; post free.

**Mining and Railway Map of Australia.** (In preparation.) Cloth, 21/-.

**Ventilation of Mines.** Johann Sarvaas. 60 pages. 2/7 post free.

**Australasian Joint Stock Coy's Year Book.** R. L. Nash (Financial Editor, "Daily Telegraph," Sydney). 500 pages, demy octavo, 10/6 nett. Posted, 10/8; foreign, 11/9. (Size, 9 x 6.)

**Australian Mining Standard, Engineering and Electrical Record.** Issued every Thursday 26/- per annum. British possessions, 32/6; foreign, 34/8; post free.

Size stated in inches.

Order through your Bookseller, or

***AUSTRALIAN MINING STANDARD,***

**Sydney: 12-14 O'Connell-street.**
**Melbourne: 376 Flinders Lane.**
**London:** Hill Publishing Co., 6 Bouverie St., Fleet St.

*Also published by us, but now out of print.*

**Tasmania and its Mineral Wealth.**
(*By authority Tasmanian Government.*)

**Metallurgy of Tin.** P. J. Thibault. Demy octavo. 12/6.

**Resourceful Queensland.**
(*By authority Queensland Government.*)

**New South Wales Mines and Minerals.**

ESTABLISHED 1866.

**BONDHOLDERS' REGISTER**

Publishes the Actual Numbers of all Drawn Bonds Throughout the World.

PUBLISHED FORTNIGHTLY.

**10s. PER ANNUM.**

73 FARRINGTON ST., LONDON, E.C.

Australian Offices,
376 FLINDERS LANE, MELBOURNE.

## PROFESSIONAL CARDS.

**G. H. BLAKEMORE,**
CONSULTING METALLURGIST
For Copper and Lead,
MINING ENGINEER,
CASTLEREAGH CHAMBERS, 10 CASTLEREAGH ST
Telegraph Codes· Bedford McNeill 1908 Edition.
Moreing & Neal.
A.B.C. 5th Edition.
Cable Address. Radgarn. Telephone 7124 City.

**MATTHEW C. COATES, A.M.I.E.E.**
CONSULTING MECHANICAL and ELECTRICAL ENGINEER. Expert Reports given for Power Generating Plants, Factory Installations, Steam, Gas and Electric.
99 QUEEN-STREET, MELBOURNE.

**VALENTINE J. CROWLEY,**
CONSULTING ELECTRICAL ENGINEER.
Hydro-Electric Plants and Transmission Lines Designed and Supervised.
Austral Chambers, Telephone 7736.
97-99 QUEEN STREET, MELBOURNE.

**GOYDER & HALLETT,**
ASSAYERS AND ANALYSTS.
110 Gawler Place, Adelaide.
Telephone 169.
Metallurgical and Chemical Processes Investigated.
Ores Sampled and Assayed.

**T. J. GREENWAY, M.I.M.M., F.I.C.**
MINING AND METALLURGICAL ENGINEER.
60 QUEEN STREET, MELBOURNE.

**KAY, MACNICOL & CO.,**
Mechanical, Mining & Electrical Engineers.
BROKEN HILL CHAMBERS.
31 QUEEN STREET, MELBOURNE.
Cable Address: "Engineer," Melbourne.
Telephone, No. 4883.

**McCARTY, UNDERWOOD & CO.,**
CONSULTING ELECTRICAL AND MECHANICAL ENGINEERS,
31 QUEEN STREET, MELBOURNE
Telephone, 7096.

**J. D. AUDLEY SMITH,**
MINING ENGINEER,
9 Bridge-street, Sydney.
Telegraphic Address—
Audley Smith,
Mining Engineer,
Sydney.
Telephone No.—
City 2677.

**WALTER F. SMITH,**
MANAGER FLOATER G.M.
Ravensthorpe, W.A.
Mines Sampled, Valued, and Reported on.
ASSAYS MADE.
Code: Bedford McNeil.
Reliable Information Furnished on the Phillips River Gold and Copper Field.

**E. A. WEINBERG,**
MINING AND METALLURGICAL ENGINEER,
19 QUEEN STREET, MELBOURNE.

**FRANKLIN WHITE,**
MINING ENGINEER,
CITY MUTUAL CHAMBERS,
62 HUNTER ST., SYDNEY.
G.P.O., Box 1498.
Code: Broomhall Imperial Combination.

**BALLARAT School of Mines**

DEPARTMENTS:
CHEMISTRY and METALLURGY,
ENGINEERING and SURVEYING
ELECTRICAL ENGINEERING,
GEOLOGY and MINING
MATHEMATICS and PHYSICS.

Prospectus on Application.
F. J. MARTELL, Director.

The gravitation yards at North Melbourne in connection with the up-country traffic of the Victorian railways is rapidly approaching completion, and it is believed that the yards will be available for use during the coming busy season. As soon as the contractors have completed a bridge over the Bendigo and Williamstown lines, the permanent junction to connect the North-Eastern lines with the new yards will be taken in hand. Apart from the staff employed by the contractors for the bridge, only eight men are engaged by the Department in maintenance and ballasting work. At one stage over 300 men were engaged, but as different sections were completed the services of a number were dispensed with. Many of those dismissed were employed duplicating the Caulfield line, while others were utilised for the formation of embankments for shunting yards at Tottenham to further relieve the congestion at the Melbourne yards. About 80 men are employed there.

**"INGREY"**

**PATENT WEIGHING & RECORDING MACHINES**

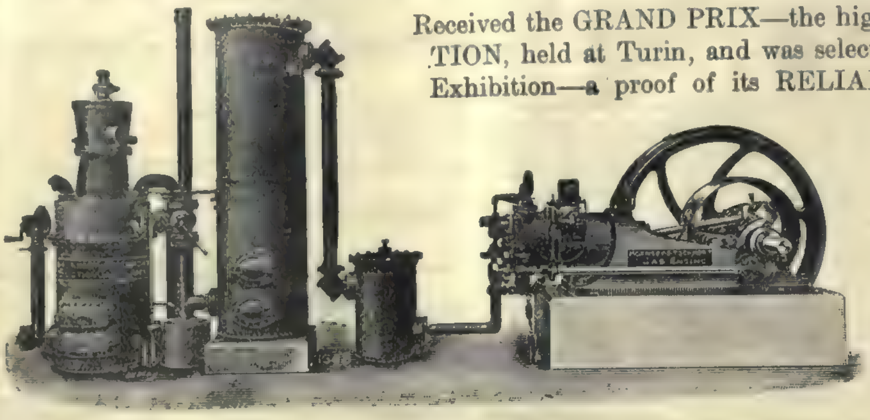
ARE

**Installed in H.M. Dockyards.**
**Certified by the Board of Trade.**
**Accurate and Reliable.**
**Automatic in action and**
**Pay for themselves in a year!**

**H. A. HARVEY & CO. LIMITED, LONDON.**

Australian Representative — LASCELLES PARRINGTON & BRACHÉ.
London House, 97 Elizabeth Street, Melbourne.
New Zealand Buildings, Pitt Street, Sydney.

HORNSBY GAS ENGINE & SUCTION GAS PLANT



Received the GRAND PRIX—the highest award—at the INTERNATIONAL EXHIBITION, held at Turin, and was selected as the power to provide Electric Light for the Exhibition—a proof of its RELIABILITY.

The Only Efficient, Reliable and Economical Power Plant on the Market. Write for our Catalogue and consult Users if confirmation needed.

**Sole Agents for the "BRISBANE" Charcoal Retort. Superior in every way to any other make. Retort can be placed near to Engine, attended to by the man in charge at NO EXTRA COST. Converts one cord of wood into one ton of charcoal.**

**R. HORNSBY & SONS LTD.,**
**Melbourne - Sydney - Brisbane.**

---

GREAT COBAR LIMITED,

COBAR, N.S.W.

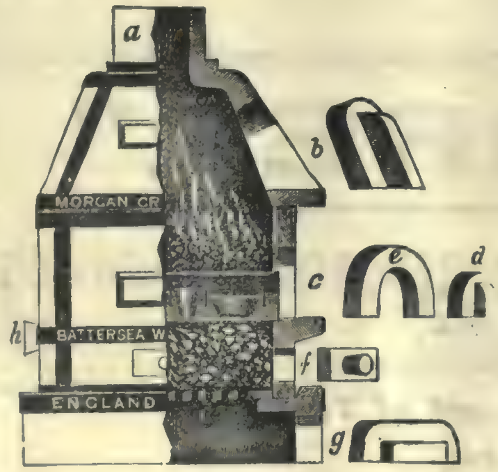
**MINE OWNERS, SMELTERS, COLLIERY PROPRIETORS, PURCHASERS OF COPPER ORES AND MATTES.**

**VACANCIES FOR COMPETENT MACHINE MINERS.**

**SYDNEY:** Australasia Chambers, Martin Place, And at Lithgow and Singleton. **LONDON:** 65 New Broad Street, E.C.

---

ASSAYING AND ANALYTICAL APPARATUS.

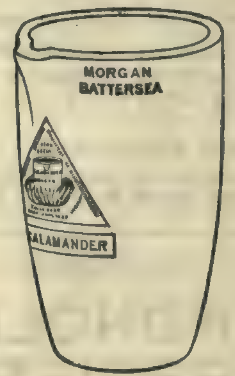


A large assortment of Assay Furnaces, Muffles, Crucibles, Roasting Dishes, Scorifiers; and Cupels of all sizes and makes kept in stock, . . . . .

All apparatus required by Assayers, Metallurgists & Mineralogists supplied, .

**Chemical Glass Ware a Specialty.**

Write for Quotations before ordering elsewhere.



ELLIOTT BROTHERS LTD.

*O'CONNELL STREET, SYDNEY.*

## CONTENTS

THURSDAY, OCTOBER 23.

EDITORIAL—
The Curse of Victorian Mining .. 335
Britain in the Mire .......... 335
Leaderettes .................. 336
News and Notes ............... 337
Brief Comment ................ 337
Personal ..................... 338
Metal Quotations ............. 338
Investor's Column—
Queensland National Bank ...... 338
Broken Hill Block 10 .......... 338
Sydney Stock Exchange ......... 339
The Coal Mining Industry ...... 339
Hercules and Energetic (V.) ... 340
N.S.W. Mining ................. 341
Victorian Mining Activities ... 341
Mining in Queensland .......... 342
Mining in New Zealand ......... 343
Western Australian Mining ..... 343
South Australian Mining ....... 343
South Australian Radium ....... 344
Oil in South Australia ........ 344
Victorian Mining Industry ..... 345
Mining Companies Law (V.) ..... 345
Unionist Outrage .............. 345
Royal Mint Returns ............ 345
Sydney City Railway ........... 346
Burrinjuck Reservoir (N.S.W.) .. 346
Victorian Railways ............ 346
British and European Developments .. 347
N.S.W. Railways ............... 347
Miscellaneous ................. 348
State Debts and the Commonwealth .. 348
Invited and Accepted Tenders .. 349
Mixed Means ................... 351
Technical Education (V.) ...... 354
Northern Territory Tin ........ XII.

HENLEY'S
Electric Wires and Cables
AND INSULATING TAPES
ARE THE BEST.
W. T. HENLEY'S Telegraph Works Co. Ltd.
546 COLLINS ST., MELBOURNE.
61 YORK ST., SYDNEY.

BELTING!
Largest stock of all kinds of Machine Belting in the Commonwealth.
Conveyor and Elevator Belting for all purposes.
HOPKINS BROS. & ODLUM PY. LTD.
LEICESTER ST., CARLTON, MELBOURNE.
'Phone, Central 754 and 5202. Box 377 G.P.O.

COKE!
NORTH BULLI COLLIERY
Limited
Supplies best quality hard
SOUTHERN
SMELTING COKE.
(Weekly output 1250 tons.)
H. G. Hyde, Secretary
Royal Insurance Building, 16 Spring-street,
SYDNEY.

**MINING STANDARD.**
PUBLISHED EVERY THURSDAY.
Forwarded Post Free to any Address.

| | Per annum. |
|---|---|
| Australasia | 26/- |
| British Possessions | 32/6 |
| Foreign | 34/8 |

Payable half-yearly or yearly, in advance.
All amounts should be made payable to order of "CRITCHLEY PARKER, Bank of Australasia."

12 O'Connell-street,
Sydney.
Tel. City 8103
P.O. Box 331.

376 Flinders-lane,
Melbourne.
Central 7931 & 1838
P.O. Box 253.

**BACK NUMBERS OF THE "MINING STANDARD."**

The following is the rate for back copies more than a month old. Applications by post must be accompanied with cash and postage added. In no case can we guarantee to supply copies, as our storage accommodation is limited.

A postcard will be sent if the number required is out of print.

For copies three months old, ninepence; six months, one shilling; and beyond that period, one penny per month per copy.

As there is a regular demand for back copies of the "Mining Standard," newsagents are requested to send back all returns uncut and in good condition, otherwise they will not be accepted.

All Returns from Newsagents must reach us by the end of each month (the whole paper must be sent). No credit will be allowed beyond this term.

Postage—British, 1d.; Foreign, 1½d.; Australasia, ½d. per copy.

Stamps will be accepted as pre-payment.

Address communications: Publishing Department "Mining Standard."

**CASUAL ADVERTISEMENTS.**

The rate for this class of advertisement is governed by the position it occupies.

If it appears on leader page or amongst or next to reading matter, the rate is 15s. per inch (nonpareil) per insertion.

Towards end of reading section—
Brevier, 16 ems width, 6s. per inch per insertion.
Nonpareil, 8s. per inch per insertion.

For the convenuience of advertisers, we might state that—Brevier has approximately 7 words to a line, and 8 lines to the inch—6s. Nonpareil has approximately 8 words to the line, and 11 lines to the inch—8s.

**ALTERATION TO ADVERTISEMENTS.**

As our publishing arrangements necessitate the "Mining Standard" being issued simultaneously in Sydney, Melbourne and Adelaide on the same day each week, advertisers wishing to change their advertising matter must supply same ten days in advance of publication.

**ADVERTISEMENT PROOFS.**

Proofs are submitted to advertisers in order to give them an opportunity of going over the advertisements before printing.

Advertising Copy must be typed and so arranged as to clearly indicate the display required for the more important features of the advertisement.

Any departure from the original copy will be charged for. Advertisers are specially requested to instruct their publicity departments to give us clear and definite instructions respecting changes of matter or new copy in order to avoid incurring unnecessary charges.

AUSTRALIAN
MINING STANDARD.
PUBLISHED EVERY THURSDAY.
ESTABLISHED 1888

It is requested that all business communications be Addressed to Critchley Parker.

THURSDAY, OCTOBER 23 1913.

## THE CURSE OF VICTORIAN MINING.

The Budget speech of the Victorian Premier and Treasurer, Mr. Watt, in that portion of it which dealt with the mining industry, stated that it was intended that in future the influence of the State should be directed towards inducing more businesslike methods in the formation and conduct of mining companies, and that the policy of doling out a few hundreds of pounds here and there to save weakly-constituted companies from 3d. or 6d. calls would be discontinued. As regards both of these proposals, approval may be readily conceded by those who have the interests of the mining industry really at heart; but Mr. Watt drew attention also to one or two evils in regard to which it does not seem that the Government is going to take any action. The Bill now before Parliament for the amending of the Companies' Act may do some good by making it a penal offence to issue knowingly incorrect or misleading statements of a material character in a prospectus; but for the industry to be put on a thoroughly sound footing provision needs to be made for the working capital being really adequate to the purposes the company has ostensibly in view, and for a reasonable reserve fund being built up out of profits. The curse of Victorian mining has been the call-paying system; but even that system, unsatisfactory as it is, would not have worked so badly had shareholders been less greedy. As it is, the usual course of procedure in Victorian gold-mining has been for every possible penny of profit made to be paid in dividends, and, when money is needed for further development, and there is a prospect of a period of call-paying, for the mine to be abandoned. Had mining companies been forced to expend in development work a fair percentage of their profits it is hardly too much to say that Victoria's gold yield would be to-day 50 per cent. in excess of what it is, inasmuch as a number of now abandoned mines would be profitably working. The Victorian Treasury is willing to give practical encouragement to mines which are struggling, and for the sake of the industry such encouragement is entirely to be approved of; but also the Government should make a point of enforcing by the necessary legislation the principle that a Company which is doing well should help itself to continue to do well in the future by putting aside a proportion of its profits for the work of development.

## BRITAIN IN THE MIRE.

The appointment of Sir Rufus Isaacs as Lord Chief Justice of the United Kingdom is perhaps the heaviest blow that has yet been dealt to the reputation of the kingdom for the stern upholding of the very highest code of business morality on the part of its public men. The conduct of the new Lord Chief Justice and of the Chancellor of the Exchequer in connection with the market in Marconis must be fresh in the minds of our readers. They constituted the ugliest incident in British public life for a generation or more. Sir Rufus was guilty of the glaring indiscretion (to use a very mild term) of speculating on the Stock Exchange in the stock of a company which was an off-shoot of one with which the Government of which he was a member was entering or had entered into a contract, and of which his own brother was managing director. That fact was quite bad enough in itself, but what made it ten times as bad as it would otherwise have been was the fact that the transactions of himself and his brother Minister, Mr. Lloyd George, were not divulged even when questions were asked in the House of Commons, and were allowed to leak out only by a series of accidents which the Ministers plainly did not foresee. As if that were not bad enough, the two men, when they found themselves confronted with an angry and irritated Opposition in the House of Commons, clothed themselves in sham sackcloth and ashes, and expressed their great regret at the indiscretion of which they had been guilty, whereupon their subservient party carried a whitewashing motion in their favour. We use the word "sham" deliberately, because the subsequent conduct of both men showed their absolute insincerity. Once they found themselves clear of the danger to which they had been drifting, they cast off their affectation of repentance and regret, and, boldly denouncing their accusers, posed as injured innocents. Bad as the conduct of both men had been throughout, the brazenness of their behaviour in this respect was a hundred times worse than anything that had gone before. The present Government has morally humbled Great Britain in the dust as she has never been humbled before, and the effect upon her oversea dominions will be deplorable. Pharisaical England may always have been; but she has at least been honest in her pharisaism; but now, if she hold up her hands in horror at the loose commercial morality of any other part of the world, she is tolerably sure to have cast in her teeth the unpleasant fact of the elevation of Sir Rufus Isaacs to the Lord Chief Justiceship.

---

New Zealand leads us in many things, but she has one rule in particular which the Australian States, and the Commonwealth also, would do well to consider adopting. The Legislature Act of the Dominion, while it provides for the salaries of Members of Parliament, provides also that a member absent without leave shall be liable to a penalty of £2 for every day he is so absent. What is more, although this provision has not always been availed of and the penalty enforced, it has been put into force lately, to the consternation of some who had deemed themselves immune from control as regards attendance, except, of course, in the case of protracted absence, for which leave is usually asked and granted. A couple of members of the New Zealand legislature recently obtained leave for a period long enough to enable them to visit the Old Country, but they overstayed their time, and a deduction of £2 a day is being made from their Parliamentary wages. An exchange states that in one case, that of a prominent member of the Opposition, the deduction of £2 a day will come to a larger amount than the hon. member's payment for the period for which he was present, so that he is actually a debtor to the Treasury. The fact that one at least of the two members mentioned was a "prominent member of the Opposition," shows how wanting in reflection the parties were who blamed the Government for fining him. It is obvious, or it should be, that a Prime Minister or a Treasurer is not likely to be exceeding wroth with members of the Opposition for being absent, be they influential or only voting machines; there have been instances when a Cabinet of Ministers would have been delighted if all the Opposition were away, just as there is on record one such occasion which caused a count-out of the Commonwealth House of Representatives, and resulted in a waste of time, for which, however, the country had to pay. The Prime Minister of New Zealand, when he heard of the blame of the fining being laid upon his Government, hastened to explain that the Government had, and could have, nothing to do with the case; indeed, he knew nothing about it. The matter is in the power and discretion of Mr. Speaker; and, according to the Prime Minister, the rule is "that in the case of a member being absent on account of illness, on his own part or on the part of any member of his family, no deduction is made; but if he be absent from Parliament for more than 15 days on his own business in any session a deduction of £2 per day is made. If the House decide that the rule is not to be complied with, the amount has to be placed on the Estimates and voted at the end of the session."

* * *

Australia may congratulate herself that the grave injustice which was threatened in connection with the Federal Capital designs competition has been prevented by the action of the present Government. We pointed out at the end of last year, when the Minister of Home Affairs in the late Government decided that the first premiated design was not to be followed, that it could not be supposed that the mere money prize was the only, nor even the chief, inducement for men of professional eminence to devote the necessary time to planning a capital for a foreign country. There was also the kudos for having designed the city which was afterwards actually built, which is considerably greater than that for having had a design accepted and paid for, and then quietly pushed on one side as inferior to one "made in Australia." Even if the substituted production had been (as was claimed, but as was not the case) composed of the best features of the three premiated designs, that was a distinct departure from the conditions which governed all parties in the competition, and the Federal Government no less than the competitors. It was therefore but an act of common justice for the new Government to invite Mr. W. B. Griffin to come from Chicago, see what was being done, see the actual site of the city, and make what modifications of his original design were proved to be necessary or desirable on such personal inspection. Another point which would naturally weigh with an architect in such a competition was the prospect of a lucrative position in connection with the carrying out of his design, such as usually attaches to such an undertaking. And it is satisfactory to know now that in this respect also Australia's credit is to be saved, for the arrangement now is that after Mr. Griffin has returned to Chicago and made the necessary arrangements for carrying on his business there, he will return to Australia under a three years' engagement, at 1000 guineas a year, and will generally supervise the laying out of the works, as well as examine and approve of plans for the principal buildings before they are accepted, and check the specifications and contracts. Mr. Griffin, on his part, has consented to postpone his return to America for a month in order that he may be able to determine the sites to be temporarily occupied by the army of workers which will necessarily be required as preparatory work approaches completion. The people will now at least have the satisfaction of feeling that a fair thing was done in connection with the founding of their capital, and that architects and engineers in older countries will not be able to say that it was planned by jugglery.

* * *

It would be inconsistent with experience to suppose that any consideration of the remote consequences of their acts will weigh with the colliery workers of New South Wales, who appear to think it part of the whole duty of man to lay first one mine and then another idle, even at the imminent risk of ruining the trade on which they live. In the case of previous strikes, time has been good to the coal trade, and the business which had been temporarily lost has for the most part been regained. But a new element of danger is now fast coming into the conflict. The use of oil fuel on big liners is rapidly making it easier to do without coal, and a continuance of strikes is already having the effect of disposing shipowners more and more to cut themselves free from the domination of a discontented body, which is never so happy as when it can find a pretext for downing tools and taking a holiday. The San Francisco branch of Messrs. J. and A. Brown's Newcastle business lately notified that firm of what is going on there. One American firm which had been inconvenienced by the laying up of its ships at Newcastle, and by the high cost of coal from New South Wales pits, has been compelled to resort to oil fuel. In their latest communication from San Francisco the Messrs. Brown read as follows:—"The company referred to expects to soon have in commission four new steamers, and they will be a feature in the fuel oil business. Four other companies have plants for oil, and therefore the consumption of coal must be reduced. If the new fields at Vancouver turn out as well as expected, the coal trade will be cut out. The Canadian Pacific Company has fitted its steamers to burn oil. All this is a very serious problem, and it seems a pity that the Australian miners are not better advised of the conditions. Californian oil will yet find its way to Chili and Peru. Your best customers—the railways in Gautemala—have been using oil, and in the construction of the Panama Canal oil is being used and pipe lines have been laid to give oil at any stage of the canal. Vessels under the American flag will all use oil. The miners are killing the coal business in America and Australia."

* * *

Tasmania certainly has good grounds for being proud of the phenomenally rich Mt. Bischoff tin mine. The mine has been working steadily since 1873, and has been paying dividends practically ever since, that due for payment next Saturday being the 437th, while there is not the smallest reason to think that this wonderful property is approaching exhaustion. But it is unnecessary to make wild and extravagant statements concerning it; nothing is gained by gilding sovereigns. This remark is elicited by a statement lately made by the Zeehan and Dundas Herald, under the heading "World's Greatest Tin Mine," in which the adjective must not be interpreted as a synonym for "biggest," but as indicating its productiveness and promise, its eminence and its commanding position on the Stock Exchanges. The writer understates the amount paid in dividends as £2,356,000, whereas it was £2,410,500 to the end of last August, and £2,416,000 to the end of September. But he overdoes the thing altogether when he writes:—"There is not another metal mine of any kind in the world that has returned this much to shareholders, and hence Bischoff's fame is reckoned by cash returns to scrip holders rather than by industrial achievement." By all means speak well of your friends, but don't descend to flattery and flummery. There is no need to get outside Tasmania itself to find a mine which has returned a larger amount to its shareholders, for the Mt. Lyell company had paid £2,766,574 by June of last year. Looking beyond the borders of his own "tight little island," the writer would come upon the Broken Hill Proprietary, which had paid £9,848,000 in August last year. In Queensland he would strike Mt. Morgan, which to July, 1913, had paid £8,129,167, while away to the West he would find the Great Boulder, with £4,523,675 to a month ago, and the Ivanhoe Gold Corporation with £3,100,000 at the end of July. Clearly the writer's enthusiasm ran away with him, but just as clearly there is sound ground for the great hopes he still indulges for the future of this wonderful property.

* * *

If the consideration given by the New Zealand Government to the proposal made by the Ethelburga Syndicate, that the Government should take over, and work in the public interest, the Parapara iron ore deposits now leased to the syndicate, should lead to nothing more than the free expression of very varied opinions by members of the Dominion Parliament, that end has already been attained; and, really, appearances suggest that nothing more may come out of it. A special commission was appointed some months ago to fully investigate the case as put forward by the would-be vendors, and its report was presented recently; but it was not until a fortnight ago that the Prime Minister, Mr. Massey, replying to a question asked in the House of Representatives by Mr. R. McKenzie, made any statement on the subject. The Prime Minister was asked whether the Government intended to submit any proposals to Parliament this session for the development of the Parapara iron deposits, either as a State enterprise or by offering reasonable inducements to private enterprise to undertake the manufacture of iron and steel in the Dominion. Mr. Massey replied:—"So far, private enterprise has failed to submit to the Government any scheme for developing these deposits which could possibly be entertained. The Government has nc present intention to submit proposals to Parliament enabling them to work the Parapara iron deposits as a State enterprise." Mr. Massey maintained silence upon the contents of the expert report, which had been made at the instance of the Government, and Mr. McKenzie once more besought the Prime Minister to take the House into his confidence, and frankly state what he intended to do in regard to these deposits, especially in regard to the proposals submitted by the Ethelburga Syndicate. But his appeal fell upon deaf ears, and members were allowed to discuss the matter amongst themselves. One said that proposals from so strong a syndicate as the Ethelburga warranted the Government in tackling the matter boldly; a second claimed that the Government ought to make Parapara a State iron-manufacturing centre; while a third warned the Government to watch the syndicate with the greatest care. The original proposals, under which the State was asked to guarantee a big subsidy, he regarded as a gross piece of jobbery. The promoters of the scheme proposed under that guarantee to unload shares on the British public and make a large profit for themselves. He hoped that members of the House would watch this matter very carefully. Perhaps the Prime Minister will comply with the evident desire of the House of Representatives for information, and make public the report of the special committee of experts.

## BRIEF COMMENT.

The Nor' West Prospecting Syndicate (W.A.) have been rather fortunate in acquiring an interest in Speakman's find on the Hampton Plains Estate, south of Coolgardie. The history of this estate is an interesting one, inasmuch as the company acquired it many years ago, and all mineral rights with it. Holding mineral rights, it is exempt from that provision of the Mining Act which enables a prospector to obtain a permit to enter private property in search of minerals. The result has been that the Estates, on which the company has done only a little desultory prospecting, have been effectually closed against the one class most likely to be successful, viz., fortune-hunting prospectors. In the case of Speakman's find, which has been known for some considerable time, satisfactory arrangements have been made with regard to the leases; and, as negotiations are now in progress for the formation of a much larger company, in which the Nor' West Syndicate will receive a large paid up interest and some cash consideration, they will probably be developed on a scale which the prospects of the lode certainly seem to warrant. A feature of West Australia is the great variety of material in which gold occurs. The lode formation in Speakman's leases differs very much in appearance from other gold-bearing lodes in the west, but, withal, it is exceedingly attractive. The stone appears to be tough, but is good milling material, and shows gold freely enough to warrant the assumption that the results of assays and crushings as reported are correct. The formation is said to be about 260ft. wide in one section, and if it proves to average 5 dwt. over the full width of lode the Nor' West Syndicate has the best opencut proposition in the State, and one which, on present indications, gives every promise of yielding first-class profits for many years to come.

That the tributing system has its advantages for mining companies is evidenced by the fact that it has largely contributed to the salvation of the Round Hill S. and L. Mining Co. (T.). Two years ago, owing to the low price of metals, and inadequate funds at the outset, the company drifted into debt totalling £3000, and decided to let a section of the mine on tribute, with the result that, with the aid of royalties and calls totalling 1s per share, the company has been able to keep moving, and wipe off its liabilities. It is now proposed to increase the capital with the object of prospecting that portion of the mine not under tribute, and, according to the report of Mr. Joseph Wilks, the call for further funds seems to be well justified by the prospects of the mine.

Another company to make a proposal for fresh funds is the Great Zeehan Dundas S.L. M. Co. (T.). This company, however, is only in the prospecting stage and the usual unexpected difficulty in regard to funds has arisen. It is proposed to place the reserve shares, for which purpose shareholders will be called together in Melbourne on the 24th inst. The prospects are very encouraging. Four lodes have been exposed in the property; but, on account of the initial work having been undertaken at too shallow a depth, it has now been found necessary to put in a tunnel at a lower level, in order to crosscut the country and intersect the four lodes. The situation of the proposed tunnel is clearly correct, and, as it will have to traverse about 300ft. of virgin country before it reaches a point beneath the vicinity of the present workings, there is some hope that that much of it will not be entirely dead work. Altogether, something over 400ft. of crosscutting will be necessary, to expose the known lodes, and the cost of this, for the bare work, should not exceed the same number of pounds. In addition, a very satisfactory find of tin has been made, which the company would do well to determine the extent of as far as possible.

The business in Mt. Oxide options on Sydney exchange has been rather dull of late. No doubt, the flame which caught this stick is nearly burnt out, and soon nothing will be left but scorched fingers and charred remains. All the talk of a squeeze by London and of large sums of money having been paid over in connection with the property is so much humbug; and the rumours which have been in circulatoin have no foundation in fact, and were probably originated in Sydney for market purposes. Meantime, London remains "mum" and indifferent. It may safely be assumed that no definite official statement will be made until the transfer is fixed up beyond shadow of a doubt. Indeed, it is doubtful if anything will be known until Mr. Gerard Williams has reached London, and conferred with the directors. It is evident, however, that he will return here with ample authority. No authentic information is yet available as to who the Australian directorate or representatives will be, outside of the fact that Mr. Williams is to be general manager.

An interesting development in connection with the Amalgamated Hill End Co. (N.S.W.) is the find, reported by the manager, of the Star of Peace lode, which was worked nearly forty years ago, and abandoned on account of the shaft by which access was obtained to it being condemned as unsafe. Such statements may always be treated with a good deal of scepticism, as we have yet to learn that a lode which has been proved to carry high values is lightly turned down when the principal difficulty is an unsafe shaft. Although two companies are said to have been formed for the purpose of re-opening the shaft or sinking a new one, it looks as if the lode either petered out or was not rich enough to warrant further attention. It it be true that the two companies referred to spent their funds in other directions, the fact is inexplicable, as the cost of picking up the shaft would not be excessive under ordinary circumstances, nor would a new shaft 500ft. deep be beyond justification if the values were there, especially as the precise locality was definitely known. There is no reason, however, to discredit the statement that the manager of the Amalgamated Hill End did, in his hazardous effort, find evidence of a lode in the old Star of Peace workings; but it does not prove anything beyond that. It is to be hoped, however, that the company will be successful in pursuit of its object, in which case there will be another chapter added to the romance of mining.

The development at the 350ft. level in the Hampden-Cloncurry copper mine (Q.) is on a new make of stone, and, but for the fact that insufficient work has been done on it to determine this point, it may be regarded as important. It opens up possibilities in a hitherto unexploited direction, and although the work has been for some time past in low grade material, a distinct improvement has occurred in connection with both value and width, sampling over a width of 5ft. giving an average value of 9.5 per cent. copper.

The Gwalia Consolidated G.M. Co., Wiluna (W.A.) is another refractory proposition about to go into liquidation. The chief trouble here is the presence of a high percentage of antimony, although when the oxidised zone was being worked on the open-cut principle, it was anticipated that no difficulty would be experienced in making it into one of the biggest concerns in the State. The property ran for a long time under the management of Mr. Horace P. Robertson, who, fortunately, had control when the oxidised zone was being worked, and quitted before the trouble became acute, although it cannot be said he made the best use of his opportunities. Later, the mine was under control of Mr. E. King, a Kalgoorlie metallurgist, with a reputation, which suffered in contact with the property. Then Messrs. Bewick, Moreing and Co., who have a penchant for tough propositions, undertook the management, with the result now known. Like other refractory propositions in the State the Gwalia Consols has the fault of otherwise being very attractive, if size of lode and values go for anything. There are now in Western Australia about six of the toughest metallurgical propositions imaginable awaiting the advent of that new revolutionary process which has been the metallurgist's dream since metallurgy became a science.

## NEWS AND NOTES.

A feature of the last (October) issue of the Queensland Government Mining Journal is a large folded map of wolfram and its environs, by Mr. Lionel C. Ball, B.E., Assistant Government Geologist, showing the situations of the mines and leases on what is now regarded as one of the chief wolfram and molybdenite producing districts of the world. The map was prepared to accompany a special report on the field by Mr. Ball, but as this will be delayed for some time it was decided that at least the map might be issued.

Work has been resumed on the North Duchess copper mine, Cloncurry (Q.), after having been suspended for some time, and the shaft has been baled out and made ready for sinking. This work should be well in hand by now, a contract having been let for it last week.

The Scottish Australian Mining Co. Ltd., which was formed as long ago as 1859 for the purpose of working the mineral properties of the Scottish Australian Investment Co., has declared a dividend at the rate of 4 per cent. per annum for the half-year ended on June 30th. The operations of the company are mainly in connection with the Lambton and Burwood collieries, near Newcastle (N.S.W.). The company also owns the Cadia copper mine, but has leased it to another company for 21 years, with 16 years still to run.

With the payment of its usual monthly 10s. dividend on the 25th inst., the Mt. Bischoff Tin Mining Co. (T.) will have paid shareholders £2,416,500, or £201 7s. 6d. per share.

Mr. Isaac Fenton, of 121 Queen-street, Melbourne, has been appointed legal manager of the Lord Nelson G.M. Co., St. Arnaud (V.), which position was rendered vacant by the death of Mr. F. P. Burgess. For many years Mr. Fenton was managing the business of the late Mr. Burgess, and he has now succeeded him in some other official positions.

The Ivanhoe Gold Corporation Ltd., Kalgoorlie (W.A.), has decided on a reduction of profit to £10,000 per month from the beginning of next year. This means a reduction of dividends by 3s. per quarter.

The gold received at the Melbourne branch of the Royal Mint during the week ended on the 18th inst. amounted to 9896.13 oz.

Neil Petersen, prospector, had been working his alluvial claim at Wilson's Patch, Leonora (W.A.), for some months to little purpose, and becoming discouraged, agreed to sell out for £10. Next day the purchaser picked up a 42 oz. slug on the claim —an early reward for his enterprise.

The general manager of the Briseis Tin and General Mining Co., Ringarooma (T.), reports as follows for September:—Total output black tin, 40 tons; Briseis drift and overburden removed, 21,000 cubic yards; Ringarooma drifts, 40,000 cubic yards; Ringarooma overburden, 13,000 cubic yards. Mutual Hill yield for quarter, 89 cwt. black tin, 30,000 cubic yards turnover. Wallace properties, Yackandandah (V.), 530 oz. gold from 131,600 cubic yards, including 68 oz. gold from 27,100 cubic yards "Argo" property.

The secretary of the Austral Malay Tin Ltd. reports that the directors have exercised the option held by the company over tin-bearing land at Kota, near Taiping. The total area is 170 acres, averaging 41ft. deep, and values, as a result of 170 bores by Mr. T. W. Horton, are given as slightly over one pound of tin oxide per cubic yard. It is proposed to form a company at an early date, to be known as the Larut Tin-dredging Co., in order to equip and work the property. Mr. A. W. Freeman has advised that the company's option areas at Tupai, Klang, Semenyeh, Serdang, and a further area of 288 acres at North-west Kamunting, recently secured, have been examined and bored by Mr. Horton, and declined. The Renong options held by the company are reported as looking promising, and close-boring these areas has been started.

## PERSONAL.

Messrs. W. Forster Woods, E. Ward, and A. J. Noall were elected by the annual meeting of the Stock Exchange of Melbourne as members of the committee last Thursday.

Mr. W. J. Roberts was, last Friday, re-elected as chairman of the Stock Exchange of Melbourne for the fifth year in succession, and for actually the eighth time.

Captain Collins, secretary to the Commonwealth in London, and Mr. Mackenzie, the New Zealand High Commissioner, have been appointed members of the Board of Trades' new advisory committee on commercial intelligence for a term of three years.

Mr. E. Rouse, for 15 years a member of the committee of the Stock Exchange of Melbourne, retired from active connection with the Exchange last Friday, to the great regret of members generally.

Mr. W. George, who has been manager of the Junction Dredging Co.'s plant at Porepunkah (V.), since dredging was commenced in the Bright district, has resigned to take charge of the Adelong Estates Gold Dredging Co.'s property (N.S.W.). Mr. George will be greatly missed in the North-East of Victoria, where he has taken a prominent part in local-government affairs, having been a member of the Bright shire council for many years, and president of many various institutions at Porepunkah.

Mr. James Syder, ex-chairman of the Victorian Railways Commissioners, died on the 15th inst. in a private hospital at East Melbourne, after an operation on the previous Sunday. Until quite recently he had been in excellent health. Deceased arrived in Victoria in 1852, and joined the Railways Department about the year 1860. He served successively in the positions of chief goods clerk, station master, district superintendent, general traffic manager, and Acting Chairman of Railways Commissioners. On his retirement in 1896, the Turner Ministry, in which Mr. H. R. Williams was Minister of Railways, acknowledged the value of his services by granting him a substantial bonus. Mr. Syder's success in working his way to the head of the Department did not affect his genial temperament and courteous manner, and he retained the esteem of those under his direction until the termination of his official life.

The death of Dr. Rudolf Diesel is now, apparently, beyond doubt, though the circumstances of it are enveloped in mystery. A director and the engineer of the Consolidated Diesel Engine Manufacturers Ltd. stated that all three had left Antwerp together, and that they had been walking the deck in his company until they separated to go to their cabins; while an employee of the Great Eastern Railway Co. stated that although Dr. Diesel came aboard he went ashore again. Finally, what is alleged to be his body was found in the River Scheldt, and was identified by his son, but only through certain articles found upon it. Now it is stated that, so far from being the wealthy man he was thought to be, Dr. Diesel was, in reality, very heavily in debt, his liabilities amounting to £75,000 and his assets to £2000; consequently his widow and family are reported to be in very straitened circumstances, and an appeal on their behalf is made to the engineering profession throughout the world.

---

## METAL QUOTATIONS.

(From Our Correspondent.)

### By Cable.

London, Tuesday.

The low prices which ruled for the leading industrial metals during the greater part of the previous week were continued in the early portion of last week, but towards the end there was a fair recovery; indeed, on Thursday the highest price for tin of the previous week was exceeded. Spot copper at the end of the week was nearly up to the opening price of the previous week, but much below the highest point reached a week earlier. Lead was in very little demand, and prices were consequently very low.

COPPER.—Tuesday's rate for spot lines was £70 17s. 6d., but later, daily prices were £71 15s., £72 11s. 3d. and £73 2s. 6d.

Three months sales were not recorded during the first two days, but on Wednesday the quotation was £71 15s., followed by £72 11s. 3d. and £73.

Electrolytic, which opened the week at £76 10s., rose to £76 15s., fell back to £76 10s., but on Friday returned again to £76 15s. Yesterday's quote was £78.

TIN.—Spot delivery brought £184, or 20s. below the previous Friday, and then rose to £185; on Thursday the price was £186 10s., and on Friday £186 5s.

Three months parcels brought £184 10s., £186 15s., and £186 5s.

LEAD opened the week at £20 2s. 6d., then for two days stood at £19 17s. 6d., rose to £20 2s. 6d., and finished at £20 8s. 9d.

SPELTER was still fixed at £21.

SILVER had little demand, the only sales worth recording being those of Tuesday, 28 3-16d., and Wednesday, 28¼d.

ANTIMONY.—"Star" brand rose to £29 10s., showing an advance of 10s. per ton, but 50 per cent. ore went down from £6 10s. to £6 5s. per ton.

WOLFRAM (70 per cent. ore) was still firm at 33s. 6d. per unit, equal to £117 5s. per ton.

MOLYBDENITE showed no change from 2s. 8d. per lb., equal to £298 14s. per ton.

MANGANESE (50 per cent. ore) brought only 9 3-8d. per unit, equal to 39s. 1d. per ton, as compared with 10½d. per unit, equal to 43s. 9d. per ton, last week.

## THE INVESTOR'S COLUMN.

### Some Companies Attracting Attention To-day.

(By Our Exchange Reporter.)

### Queensland National Bank.

The improvement in the financial position of Australia during seven prosperous years has been brightly reflected in the higher prices of our stocks—that it is like a transformation scene in the great drama of human affairs; and as the change for the better was brought about mainly by the rehabilitation of our great producing interests, it was only natural that the companies and business institutions which were connected with these primary interests should be among the first to awake from the prevailing depression, and renew their vitality. For notable instances, on the one hand, is Goldsbroughs, a pastoral company, and, on the other, the Queensland National Bank, an important State-controlled pastoral and business institution. The story of the former is well known in Victoria, how, after being unable to meet its engagements and compelled to reconstruct, it has become one of our greatest and soundest investment stocks, while the shares which once would have gladly been given away by many people in order to avoid the liability on them, are now, after having been once worse than valueless, worth over £5 per share, that is, after allowing for issue of new shares. Queensland National Bank shares have not had so sensational a recovery, but, after declining to a nominal price, they have, during the last two or three years, gradually recovered, until they are nearly worth their paid up price of 60s., the last quotations being 54s. 6d. buyer, 58s. 6d. seller—sales at higher prices having taken place not long ago. From one point of view, such a recovery is very remarkable, inasmuch as according to the statement made by the chairman of the directors in February last, and repeated, in effect, at the last half-yearly meeting, there is but little chance of the shareholders receiving a dividend for the next six or seven years. This certainly will not appear an encouraging outlook to many of those members of the public who still regard bank shares as a safe and payable investment; especially when it is remembered that those who buy in now will not only receive no dividend, but will also be out of pocket for interest on whatever price is paid for the shares. Keeping this fact in view, and allowing 55s. as the present market price, the interest, at the rate of 6 per cent. per annum, would, in seven years, bring the cost of the shares to the purchaser up to over 80s. Assuming that the present annual rate of profits of about £100,000 be maintained, the return to the shareholders on a a price of 80s. would be equal to, say, 15 per cent., that is, after making the usual annual deductions for reserves, etc. On such a basis, the shares may be regarded as a good investment by those fortunate persons who can afford to lock them up and go without any return during the long period of seven years. The above estimate must not be taken as anything more than an attempt to arrive at an idea of what the shares are approximately worth, for it would require a careful actuarial examination of the various items in the balance-sheet, and an equally careful interest computation in order to form a definite opinion. It must be remembered also that no allowance has been made in the above estimate, first for the expansion in the Bank's business, which will probably be on a large scale, and, secondly, the consequent payment of dividends some time before the date mentioned by the chairman of directors, whose estimate, it may be assumed, was on a conservative basis. No allowance for such a possibility is, however, necessary in order to form an opinion on the merits of the shares. On the present market price, their value as a lock-up investment is undoubtedly great.

### Broken Hill Block 10.

As the shares in Broken Hill (N.S.W.) stocks are, with one exception, at lower prices than was the case a month or six weeks ago (the reduction in some instances being rather considerable) attention is naturally directed towards those which during a period of generally declining values have slightly improved. The exception is Block 10, which, although the best offer for them was recently 27s. 6d., are now worth from 30s. to 31s. An important development is the reason for this increased support in a dull market, but before going into details regarding this new discovery it may be interesting to briefly examine the last half year's account of the working operations. It will be found that they are of a fairly satisfactory character, although not sufficiently so, to in themselves justify the prices which are now ruling. The working account showed a profit of £11,869, added to which was a sum of £9166 on account of a surplus received from zinc tailings. There were also items for interest on investments, £1356, and sundry receipts £1002, making altogether £23,394. This amount was reduced by £6534, which was written off for plant, machinery and buildings, leaving a net profit of £16,860. As the balance brought forward from the previous term was £87,795, the total balance in hand came to £104,656, less two dividends of 2s. each, absorbing £20,000, which had been paid so that the credit balance carried forward amounted to £84,656. One of the most pleasing features of the report was the statement that the results obtained from the new treatment plant showed that better average recoveries were being made, for the question of the treatment of the company's crude ores has been for years a cause of anxiety to the directors and disappointment to the shareholders, and the money spent in attempting to solve it must have run into a greater sum than it would be pleasant to remember. However, the difficulty now seems to have been solved, that is, substantially so; but, despite this improvement in the position of affairs, there was not much inducement to buy the shares for the reason that the ore reserves are not great, being equal to not much over two years' supplies for the mill, namely, 220,000 tons, and as the prospecting work continued to give discouraging results, Block 10 shares might have been summed up as an investment which would probably return a purchaser somewhere about the amount of capital he put into it, while there was a chance that something else payable might be discovered before the existing ore reserves were exhausted. This latter prospect could not, however, be regarded as a promising one, for until quite recently all the exploratory work has been attended with discouraging results. At the 1815ft. level nothing payable has been found, and in addition to this the ore bodies seem to get very hard with depth, so that even if good grade material were met with, the cost of mining and treatment would certainly be much greater than has been the case with the ore obtained from the higher levels. The hopes which had been awakened by the discovery of the western lode close to the boundary between the company's lease and that of the Central Broken Hill seemed doomed to disappointment, as the result of subsequent operations was not up to expectations, or its value, perhaps, quite realised. Working costs have also increased, owing largely to the fact that the movements in the ore channels at the upper levels are very frequent, entailing considerable expense for repairs. It will be gathered from the above brief account that the condition of the company's affairs could not be described as highly inducive to investment, and a gradual decline in the price of the shares set in, until they were at a figure which perhaps represented pretty fairly their value. The improvement in the quotations which has recently taken place, amounting to about 3s. per share, is nothing very remarkable, and it might reasonably be assumed, therefore, that the development which has occurred is not of much consequence either; this is quite possible, and further work is necessary to show what it is worth. This much can be said, that a number of the market operators who had for a long while ceased to deal in Block 10, "would not have them on their minds," have lately been dealing in them with considerable freedom, and if the hopeful anticipations regarding the value of the latest developments are substantially fulfilled, it may be regarded as assured that Block 10's, once a leading stock in the mining market, will again provide a considerable amount of business for members of the Stock Exchange. Perhaps it is about time to describe exactly of what these recent developments consist.

As already stated, the company having obtained permission from the Sulphide Corporation, drove the 515ft. level into the Block 10 mine from the boundary, and for a distance of about 100ft. putting out crosscuts also across the lode and boring in different directions. This work proved the width of the lode to be 20 to 30ft., and the average value similar to that of the ore reserves now being treated by the company. These operations had been carried on at the southern end of the lease. Since then an ore body has been located from the company's shaft at the 515 and 615ft. levels. This is practically certain to be the continuation of the lode met in the other part of the mine, as its characteristics are the same both as to size and values, one of its best features being that it is not so close grained as the general run of the ore, and it is, therefore, easier to treat. The improved recoveries from the treatment plant are probably owing largely to this fact.

The ore body has thus been proved for a distance of 700ft., and has been located at two different levels. The most important point, however, is that this western ore body is in what may be described as virgin ground, and it is quite

**probable that its upward and downward extension** will be proved by further development work. The position is in some respects similar to that of the **British Broken Hill's, after the discovery of the** parallel lode, which gave the company **a new mine to work.**

**At about 30s. the shares seem to be a promising** mining investment.

---

## SYDNEY STOCK EXCHANGE.

Doings on the Sydney Stock Exchange during the week have been characterised by no standout features. In investment stocks good, reliable dividend yielding securities have experienced a **firm market, and buyers have found no cheap sellers. Something above current market quotations has had to be offered to attract a seller. In the banking section, quotations have ruled** particularly steady. The lower quotations prevailing for Bank of Australasia have been due **to the payment of the dividend. Gas, insurance** and steamship companies have received a moderate amount of attention, but although movements have been slight, they have displayed a good deal of irregularity. Miscellaneous companies have changed hands fairly freely during the week, with **prices, in a number of instances, inclined to favour** buyers. The profits of the large pastoral, wool, and stock companies last season were not as **great as previously. The earning capacity of such** houses this year should be materially increased, even though their wages bills are augmented. For the harvest bids fair to be a record one, feed is plentiful for our flocks and herds, while the wool season is now opening out very satisfactorily, and there will be an enlarged clip. Such circumstances create more wealth, and more wealth **means more investments, and a larger turnover.**

**Money has been distinctly tight of late, and is likely to continue so until our coming harvest and new wool clips have been financed. But, perhaps, the most potent factor which has tended to restrict operations in the investment stock market on the Sydney Stock Exchange of late has been the continued and systematic policy adopted by so many of our leading companies of increasing their capital. In most cases these new shares have been issued at face value, on a very small premium as compared with the current market rates. Naturally, the holder strives to take up his quota of a new allotment, for it represents a bonus in the price paid for the shares, and an increase in his dividend. That policy has most certainly proved a drain on the finances of all but the opulent investor, and has perforce diverted the stream of money for investment from the channel of new and smaller ventures. From the stockbrokers' point of view it has not been profitable. A pre-election period is also probably an adverse factor in investing circles. The present one especially tends to check business, as Governmental extravagance has landed the State finances in a chaotic condition, and investors want a change.**

**The position of the New South Wales banks, as disclosed by the returns already published for the September quarter, indicate the cautious policy** pursued, but at the same time present a very **sound position. True, there has been a contraction both in deposits and advances, but the hold**ing of coin has distinctly increased. A fresh **Government and a bounteous season will doubtless** see expansion in the banking figures. A comparison of the principal items of **the averages already published is given hereunder:—**

| | June Quarter | | September Quarter. | |
|---|---|---|---|---|
| | Deposits. | Advances. | Deposits. | Advances. |
| **Bank of New South Wales** .. .. .. .. .. .. | £19,753,902 | £13,469,471 | £19,190,279 | £13,585,379 |
| Commercial Banking of Sydney .. .. .. .. | 17,481,113 | 14,684,561 | 17,114,177 | 15,120,224 |
| Bank of Australasia .. .. .. .. .. .. .. | 4,910,821 | 3,399,735 | 4,889,838 | 3,462,149 |
| Aust. Bank of Commerce .. .. .. .. .. .. | 2,562,209 | 3,915,648 | 2,569,383 | 2,987,540 |
| London of Australia .. .. .. .. .. .. .. | 1,213,317 | 1,636,309 | 1,240,715 | 1,647,905 |
| Bank of North Queensland .. .. .. .. .. | 283,268 | 207,985 | 288,065 | 206,741 |
| Commercial of Australia .. .. .. .. .. .. | 454,336 | 425,341 | 465,859 | 413,878 |
| Colonial of Australasia .. .. .. .. .. .. | 63,481 | 106,082 | 60,216 | 164,019 |
| Queensland National .. .. .. .. .. .. .. | 259,882 | 73,332 | 234,058 | 78,874 |

Perkins' Brewery, Brisbane, have paid an interim dividend at the rate of 10 per cent. per annum for the half year ended August 31st.

**The shareholders of the Permanent Trustee** Company of New South Wales will have little to **grumble at in the report to be presented at the meeting next Monday. In 1911 the paid-up capital** of the company was £25,000, now it is £50,000. **A dividend of 10 per cent.** is announced, and **a still larger balance carried, amounting to £7812,** In the balance some £3,254,448 is shown standing to the credit of the estates administered, but that amount has since been increased by £600,000, making the total just over £3,850,000. The principal items in the balance sheet compare with the two previous three years, as follows:—

| | Sep. 30. 1911. | Sep. 30. 1912. | Sep. 30. 1913. |
|---|---|---|---|
| Net profit .. .. .. .. | £6,241 | £5,832 | £6,238 |
| Brought forward .. .. | 3,501 | 3,742 | 6,574 |
| | 9,742 | 9,574 | 12,812 |
| Dividend at 10 per cent. | 2,500 | 3,000 | 5,000 |
| To reserve fund .. .. | 2,000 | — | — |
| To reserve for equalisation of dividends .. .. | 1,500 | — | — |
| Carried forward .. .. | 3,742 | 6,574 | 7,812 |
| Capital paid up .. .. | 25,000 | 30,000 | 50,000 |
| Reserve funds .. .. .. | 30,000 | 30,000 | 30,000 |

The past year's workings of the Perpetual Executors and Trustees' Association of Australia, which terminated on September 30th, were productive **of net profits to the extent of £3793, as against £3527 for the previous twelve months. A dividend of 7 per cent. per annum was declared, half of which was paid in April.**

Circumstances have conspired during the week to depress the Sydney mining market. The continued **retrogression in industrial metals has naturally de**tracted from the value of our mineral output. The tightness of money, both in England and Australia, has greatly militated against free operating. Broken Hill stocks have been out of favour, and have suffered depreciation. Rumoured selling **orders from London of British Broken Hill shares** have played into the hands of would-be "Bears," while the market for B.H. Proprietary, B.H. **Souths and Norths, have failed to maintain pre**vious levels. The fall in the price of copper has taken the heart out of Sydney market, so that buyers have been the nervous operators even at lower figures. The saving clause in regard to Ardlethan stocks has been, from a brokers' standpoint, in the dealings in Carpathia shares. Certain covering transactions to be negotiated and **scrip deliveries to be made played into the hands of the "Bulls," who, nothing loath, made the most of their golden opportunity, and prompt business, at sellers' risk, were effected at up to 19s. 6d., and the market at the time of writing was still going strong. The company has announced its third 1s. dividend payable on October 21st. Wild Chimes have likewise slightly favoured the holder. Amongst the unlisted stocks there have been daily transactions in Mount Oxide Options, but the basis of the scheme of reconstruction was all in favour of the English shareholder, and the Australian shareholder has lost faith. A slight rally in prices was experienced during the week, but the Sydney market is fitful, to say the least of it, and no wonder, for the Australian holders' rights were wofully transgressed. Ardlethan as a tin field has been damned, but the question arises, is it a complete "fausi pas." There are still a number of tin-mining experts who hug the belief that there is life in the young dog yet, sufficient to enable it to attain a more respectable old age. A lasting field does not rely upon rich surface finds so much as lower-grade ores at a depth. It takes time and money to prove such conditions, but once established, success is practically assured.** Development work at the Carpathia **has opened up some large bodies of rich ore, though their extent has not been proven beyond what the shafts have disclosed. Even if the statements that Nos.** 1 and 4 shafts contain no value in the bottoms be **true, the nature of the ore deposition in No. 1 would account for it in No. 1, and the ore body** underlying west would account for it in No. 4, **which, being a vertical shaft, has doubtless cut** diagonally through it. Highly payable ore has **been mined from No. 4 nearly all the way to the bottom. Nos. 3 and 5 are both on good ore, and** the indications are that those ore bodies are extensive. As a low-grade proposition the field may yet win out. The recent development in the Hampden-Cloncurry has assumed greater importance. **The fact that the formation disclosed is pyritical** in character adds materially to the value of the development both from a metallurgical and commercial **view-point. Samples taken over a width** of 60in. of the new ore body gave an average of 9.5 per cent. copper. Its importance in the life **of the mine is very great.**

---

A find of small diamonds is reported from the Upper Clarence, near Yulgilbar (N.S.W.). The find has been inspected by an expert from Sydney, but no information as to the probable importance of the discovery is available.

## THE COAL MINING INDUSTRY.

### New South Wales.

### Northern District.

(From Our Correspondent.)

Newcastle, October 18.

Reference was made last week to the fact that trouble had occurred at the Pelaw Main colliery over the price of explosives, and that the mine had been idle one day in consequence. A similar notification to that given the Pelaw Main men has now been given to the employees of the Hebburn colliery. At Pelaw Main the men have been asked to pay one half-penny per lb. more all round for the explosives used, and at Hebburn they have been asked to pay a half-penny per lb. more for monobel and one farthing per lb. more for samsonite. On behalf of the colliery proprietors, it is stated that they have been compelled to increase the price at which the powder is supplied to the men, owing to advances in the manufacturers' prices. They say that the advances in price, so far as the men are concerned, are not unreasonable; and that, in fact, the increase is in some cases barely sufficient to cover the extra cost of the explosive as it comes from the maker. On the other hand, the miners consider that they are being overcharged already for the explosives which they use, and that there is no good ground for the increase. To counterbalance the increased cost of explosives—for in some of the Maitland mines a large quantity is used by each man per day—they intend to ask for an advance in the hewing rate. If that be done, there will be further complications on the Maitland field, for the proprietors are certain to resist any attempt to increase the cost of production of coal by increasing the hewing rate. Some of the miners who have been spoken to on the subject contend that the explosive which is manufactured at Weston, on the South Maitland field, is as good as any now in use in the mines there; and they complain that although it is considerably cheaper than the imported article, they are not allowed to use it, as it has not been placed on the list of "permitted" explosives. They point out that the explosives now in use are tested in England, or in other countries thousands of miles away from Australia, and that they are used here without any further test when they are landed. This, they say, should not be; all explosives for use in mines should be tested in the Commonwealth, and care should be taken to see that none is kept stored beyond a certain time before being used. The Hebburn miners, at a meeting at the beginning of this week, passed a resolution that the executive officers of the Colliery Employees' Federation be requested to take all necessary steps to bring about the establishment of an Australian testing station, and that the assistance of the Federal and State members of Parliament be sought for the purpose of having the station founded without delay. The Delegate Board of the Federation has decided, not only to ask for a testing station, but to urge that inquiry be made as to the increase in the cost of explosives used in mines.

Abermain Colliery, in the Maitland district, has completed a fortnight under the one-shift system, and, so far, there has been no hitch in connection with the operations. The mine has reached an output of over 2000 tons under the system, and this compares very favourably with the output under the two-shift system. At No. 2 pit the output has now reached 500 tons per day, and is increasing steadily every week.

The Scottish-Australian Mining Company's Lambton B pit, which has been idle for the past seven months, owing to a dispute between the men and the management regarding the rates of pay and general conditions of working, will start again on Monday. A settlement has been effected through the efforts of Mr. G. Gregory, Inspector of the Department of Labour and Industry. He had an interview with the manager, Mr. F. Croudace, at which Mr. N. J. Clark, representing the Colliery Proprietors' Association, was present, and the manager agreed that if the men would go back to work, he would consent to a conference to consider their claims. Mr. Gregory subsequently addressed a meeting of the men, and urged them to accept the proposal, which they agreed to do. It is expected that a full complement of miners will be ready to go into the pit on Monday.

The Colliery Employees' Federation of the Northern District has sent a cable message to the union in Wales, expressing sympathy with the relatives of the victims of the terrible disaster at the Universal colliery. They will also send a donation to the relief fund. One proposal is to send £200, and the other is to send £500, and the lodges are to be asked to vote on the matter. As soon as the returns come in, the money will be cabled home.

A meeting of the delegate board of the Colliery Employees' Federation was held on Thursday and yesterday. When the board met on Thursday, The chief business before it was a proposal which had come from the Minister for Labour for expediting the work of the Wages Board. There was a long discussion on the matter, and there were many speakers who condemn the action of certain lodges in stopping work without any notice to the Federation, thus interfering with the work of the Wages Board on the important matters which had been placed before it. It was felt that the frequent interruptions were not in the best interests of the federation, and that it was not fair to men who had waited months, and even years, to have grievances settled that others should be allowed, by making a noise, and stopping work, to have their demands brought before the Wages Board out of their turn. The following resolution, carried by the board, showed the temper of the majority of the delegates:—"That in future the cases cited before the Wages Board should be taken in their turn, irrespective of any other cases that might arise." A resolution was also carried to the effect that the Minister for Labour be asked to make such arrangements as would enable the present Wages Board to continue its proceedings without interruption, in order that the board might be given an opportunity to demonstrate whether or not it could satisfactorily deal with the grievances of the federation; and, failing that, that the proposal of the Minister to alter the personnel of the Wages Board be considered; but that in the meantime the proposed alteration of the Board remain in abeyance.

At the same meeting the following resolution was passed with respect to the use of safety lamps in gassy mines:—"That after a thorough, practical trial of the C.E.A.G. electric safety lamp, by all classes of workmen in the West Wallsend district collieries, we are strongly of opinion that the time is opportune for the introduction of the flameless type of safety lamp, in lieu of the ordinary oil lamps at present in use in the gassy mines of New South Wales, and that the advantages gained by the use of the C.E.A.G. electric lamp outweigh any objection to its practical adoption; and with this object in view, we urge the necessity of vigorous action by the federation, and that a deputation be appointed to interview the Minister and officers of the Mines Department to solicit the assistance of the Government in obtaining the introduction of this lamp in practical use." The co-operation of the Southern and Western miners is to be sought in this matter.

## Southern District.

(From Our Correspondent.)

Wollongong, October 18.

Old Bulli colliery is being transformed into one of our largest, and the new machinery, which has been arriving from England, is now in course of installation. There is a large area of land attached to the colliery, or rather, comprising part of the assets of the Bulli Coal Co. purchased by the late George Adams, and in view of the colliery extension and new working population that this will bring to the locality, portions of the estate have been sub-divided for sale in building lots. The first sale took place last Saturday, and the attendance indicated a live local interest in the prospects. A considerable number of lots were sold at prices which seemed to satisfy both parties. The insufficiency of houses in most of the colliery villages of the district continues, and there is no doubt that some discomfort is being suffered and that the conditions in which some families are living are not what authorities on hygiene would approve.

The mode of settling deficiency claims by an inspector under the Industrial Arbitration Act visiting the mines and examining the place with the object of bringing about an agreement on the spot, is not being accepted cordially by the Employees' Association. Complaints have been sent to the Industrial office by lodge secretaries, and the delegate board at last meeting gave instructions that particulars of complaints be obtained from all the lodges which have any, and sent on to the office. As this mode of settlement was certainly a ready one, and ought to have been as fair as could be devised, it is to be regretted that it should not be giving satisfaction. Mr. Waugh, the inspector, is an experienced miner, who knows this district.

This week the making of the railway system which is to serve the new coal loading jetty at Port Kembla was begun. There will be a number of sidings, for the place will serve as a railway yard for the whole of the port. The Railway Department has not yet got possession of the lines of railway which connect Port Kembla with the Government line, of which there are two, some three or four miles in length, which were constructed by colliery companies. The lines have been resumed, but their transference to the Railway Department will probably not take place until there are better means of dealing with traffic than at present. There will certainly be expectations of considerable improvement in this respect when the Railway Department takes the business over. One expectation is the provision for passenger traffic between Port Kembla and Wollongong, and points between. The town of Wollongong has been agitating for a train line direct, but the Department has submitted estimates of cost upon which there would be no prospect of a return, and has approved of proposals from outside interests to utilise the existing lines for such purposes. There has been for years talk of one industry or another being about to establish at Port Kembla; at present, however, there are really no facilities to serve any considerable industry.

## Victoria.

### Powlett River District.

(From Our Wonthaggi Correspondent.)

Boring operations are to be resumed by the management of the State mine on what is known as the three-acre blocks area, where, some time ago, a payable seam of coal was disclosed. The object in view in putting down additional bores is to obtain the information required for laying out plans for opening up this area, which is to be undertaken in the near future.

The last fortnight's pay amounted to £6071 19s. 8d., but deductions for rent of Government cottages, materials, doctors' fees, and contributions to the Government accident fund and local hospital amounted to £631 6s. 5d., leaving the net amount paid out £5440 13s. 3d. This was about £300 below the previous pay. The falling off was due to it being the first fortnight's work of the miners and wheelers in the new places drawn by them at the last cavil. The next pay will be up to past averages, as the men are now settled down in their places.

A breakage in the machinery driving the underground haulage in the Nos. 6 and 11 shafts took place during the week, as a result of which between 50 and 60 employes were thrown idle for several days. The necessary repairs were effected in time for the men to resume work on Monday.

The committee of management of the Victorian Coal Miners' Association met in Wonthaggi on the 13th inst. The general secretary reported that, so far, no settlement of the dispute at the Jumbunna colliery had been effected. It was also reported that there was likely to be serious trouble at the Austral colliery, Korumburra, as the men would not accept the rates offered by the manager. The committee decided to instruct the secretary of the Korumburra branch to inform the manager that the rates offered by him would not be accepted. The branch secretary was also informed that any fresh developments were to be at once reported to the general secretary at Wonthaggi. The financial position of the Association was discussed, as the affairs of the first four months of the year are not in a satisfactory condition. A special sub-committee was appointed to go into the matter, and furnish a report. The affairs of the Powlett branch are also engaging the attention of the auditors, and the balance-sheet is long overdue.

The Powlett North Woolamai Co. continues to get good results in the bores going down to prove the extent of the coal resources in the lease which adjoins the area reserved for the State mine. On Saturday, the eighth bore went through the bottom seam at a depth of about 280ft. The coal passed through is over 3ft. thick, and of excellent quality. Considerably over a million tons of coal have been proved by the bores, and eventually the shareholders should receive some return for the large amount of money spent on the property. It is understood that active operations are likely to be resumed at an early date. If this is not done, threats have been made that steps will be taken to ask the Minister of Mines to grant the company no further suspension of the labour covenants.

## HERCULES AND ENERGETIC (V.).

(From Our Bendigo Correspondent.)

A very favourable development, and one that is likely to have an important bearing on the company's immediate prospects, was reported on the 17th inst., payable quartz having been uncovered in the 680ft. crosscut on the Sheepshead line of reefs. The crosscut was extended in anticipation of opening up the reef from which the Ironbark Company have been paying dividends for the past two and a half years, below the 480ft. crosscut off the main shaft. The objective appears to have been gained, for the reef just discovered has many of the characteristics of the formation sought. Were it not for the presence of a couple of overlying backs connected with another centre reef not far above the 680ft. crosscut, it could be definitely stated that the auriferous stone is identical with the cap of the Ironbark formation. In deepening the shaft from 500ft., a small east back was met at a few feet below the 600ft. plat, and which has again been intersected in the crosscut now going west at that depth. Approaching the 680ft. plat a couple of bedded veins of quartz were reached, the inner one being then considered to be the Ironbark east back. In crosscutting west at this depth, however, another and well defined east leg was passed through in the first 7ft. This back carries 3in. to 4in. of bedded quartz, but failed to show gold. Onward toward centre, which was reached at 22ft. from the shaft, the strata were chiefly sandstone, containing a number of well mineralised spurs. The last spur before meeting the black mineralised slates, in which the auriferous centre reef is deposited, showed a colour of gold. Penetrating the sandstone hanging wall of the reef the anticline formed in the slates, the gold bearing quartz conforming in a measure to the dip of the beds. The latest firing uncovered the same bed of sandstone where it recurs with a western dip; and associated with it is 18in. to 20in. of reefing quartz. Across the centre there is 5ft. to 8ft. of crushing material of payable quality overall. The gold is of very fair sample, and does not appear restricted to any portion of the formation. Instead of continuing the crosscut to the west leg of the overlying reef, as originally proposed, the company purpose driving north and south on the new reef. Prominent features of operations in the Ironbark mine have been slates of very similar character underlying the bedded quartz, with a network of highly mineralised spurs in the saddle and a lengthy neck of stone, that has proved highly auriferous where the lava evidently influenced the gold deposition. As yet the lava is not visible in the Hercules and Energetic 680ft. crosscut, though found in the shallow levels. It will probably be located closer to the west back of the reef above. Assuming the 680ft. stone to be the Ironbark formation, the reef overlying it may be taken as a smaller one that is showing in the next company's 480ft. crosscut, but which has not been prospected. This would make the back going over the 600ft. crosscut identical with one recently intersected by a shallower crosscut from the Ironbark new eastern shaft. As already indicated, operations are not far enough advanced to fix the identity of the reefs with any certainty. Between the Hercules and Energetic shaft and the Ironbark boundary there is 416ft. of ground available, which may be worked throughout from present levels as the reef channel rises in that direction. To open up the formation over the length of 1500ft. north of the shaft to the Pearl Company's lease, it may be necessary to deepen the shaft another 150ft. A much deeper penetration would be imperative, but for a reversal of pitch in the reef channel approaching the north boundary. The 600ft. crosscut will be extended to the corresponding west back of the uppermost of the three reefs. Subsequently rising will be started to ascertain the value of the upper portion. Simultaneously it is likely that a centre winze will be put down at this depth, to provide facilities for working the bottom formation and open up the reef intervening. As operations progress, it is anticipated that the fault which intersects the west leg of the Ironbark reef further south will again be revealed. At 265ft. and 315ft. the company are persevering with a highly mineralised reef of a spurry character, also located in centre. This stone has so far been of consistently low value, but with the large holding there is ample scope for stone of better value to exist. The share register is in 30,000, of which only 21,455 are in issue, the balance being held in trust for some years in consequence of non-payment of calls.

On the north end the Pearl Co. have a shaft down 1000ft., about midway between the north and south boundaries of a lease embracing 2820ft. along the Sheepshead reef channel There is no machinery on this shaft, which is also too shallow to reach the Ironbark reef. At 1120ft. in the south shaft there is a long east crosscut out to the line, traversing several backs, but nothing of value was found. A centre winze has since been put down 200ft. from this crosscut, also disclosing very little of importance. A small west leg was reported last week. This winze should shortly be getting into the same channel as the Ironbark reef, according to the pitch plan of the Mines Department.

Further north the New Victoria Catherine shaft is down 420ft., with a crosscut west about 150ft. This crosscut exposed contorted bedding, which is probably the Sheepshead anticline, as the latter begins to roll out about this locality.

Southward the Ironbark are driving on the 480ft. reef off the 550ft. crosscut at the new eastern shaft. Operations are here nearly 330ft. from the Hercules and Energetic boundary, and the formation is intact for 80ft. behind the level, and a few colors of gold are occasionally visible in the level, above the turnover. This company also have about 180ft. of the reef to beat out south.

---

Candidates for election as the Victorian Rhodes scholar for 1914 must lodge applications with the president of the Professorial Board, Melbourne University, not later than 30th November.

# MINING IN NEW SOUTH WALES.

## Broken Hill.

(From Our Correspondent.)

Broken Hill, Oct. 17.

Broken Hill is not a source of mining information at present. It is the centre, once more, of strikes, the aftermath of strikes, threatened strikes, and possible strikes. It is the home, on the one hand, of violent "red raggers," who have taken the labour unions under their control, and are continually doing most reckless and absurd things; and, on the other hand, of the best behaved body of workmen in Australia, who would be content to earn big money and live happily and peacefully if the agitators would only bury themselves. All the recent local industrial troubles have been brought about by a small section of extremists, most of whom are non-workers, men who live on the profits of discontent they create. The B.L.F. is the head, legs, and whole body of the industrial upheaval in Broken Hill. Some of the unions are getting sense—several have already withdrawn from the federation, and even the A.M.A. is considering whether it can, or will, leave the socialist-ruled organisation.

While all this wrangling and haggling is going on the mines do not quite know where they are. They (the mines) have an agreement with the unions, which expires under the Act at the end of the year, though, by arrangement, it was determined that it should be continued for a further 18 months. The "red raggers" are seeking to smash this agreement at the end of the year and bring about a further row with the mining companies. The Engine-drivers and Firemen's Association was content to renew its agreement (through the Arbitration Court) with most of the mines, and no trouble with the four "out" mines is looked for. But the controllers of the situation want a fight, and are working every point to secure it.

Under all these circumstances, Broken Hill is unstable. The mines in work certainly do their best in the way of production adn development, but operations are confined to a few mines. "Outside" propositions are a drug on the market.

Important developments underground are things that occurred in the dim past. The British certainly is opening up at the 1100ft. level, but the crosscut so far remains in low grade ore. The upper levels are all right, and continue to meet expectations. Steady progress is being made with the reconstruction of the treatment plants.

Block 10, too, shapes well enough at the 615ft. level, going west. A fairly wide body has been proved, and the length is undetermined. A convulsion of Nature might just as well have put this body of ore at the bottom of the mine; then, instead of share values being, say, 27s. 6d., they would be more than double.

The Eight Hours' Day holiday and the stoppages over the water shortage (through a break, not through any lack of the fluid) so affected production and mill returns for the past fortnight that the figures are not worth quoting. None of the plants worked to their capacity.

The mines with the best records continue to be the South, North, Central, and British. A little fuss has been made over the slightly lower lead values of the South for September, but figures must fluctuate when much development is progressing. When ore from development is put through the mill a deal of low-grade must be included.

The wibbly wobbly condition of the metal market causes some concern, but the export of concentrates continues on the usual basis. The ups and downs of values are too sudden to even cause a thought of "stacking". Shipments sent away on a £20 scale (lead) might easily hit a £21 or £22 market. Silver, too, is over 2s. 4d. an oz., which is a consideration.

## Bathurst District.

(From Our Correspondent.)

Bathurst, Oct. 17.

The new reef at Kempfield, near Trunkey, discovered by McKellar Brothers, looks like making into a big thing, and is certainly the most promising find for many years past. It is a big quartz reef, going down on an exceptionally well defined footwall. There are two shafts being sunk, the present depth being about 20ft., and from the bottom a kindly blue-colored quartz is carrying the best gold they have yet had. Another bulk crushing is about to be put through, and from present showing it will go better than the last one, which panned out a shade over 2 oz. to the ton. It is a pity the prospectors did not take up a larger area, and they might have pegged the ground to better advantage. As it is, if the values continue to a depth, those who hold the underlay blocks on their western boundary will be on a good wicket, since a vertical shaft will cut the reef at about 125ft. Nice gold has been found in two claims north of the prospectors' claim, on the same reef, and there is no reason to doubt that the same will be picked up on the south blocks, but, as no leases have been granted yet, very little work is going on. The Mt. David people have a three months' option over McKellar's for £4000; but, as the prospectors' block consists of only two acres, they will be wise to enlarge their area, for which they will, doubtless, have to pay; and, as already stated, the underlay holders occupy a strong position. Prospecting the field is much hampered for want of water. Immediately north of the prospectors is H. Bell, who holds a two-acre block, through which the reef runs strong, carrying gold so far as opened up. An option on this property has been secured by Mr. H. C. Slade, of Bathurst.

Amalgamated Hill End shareholders have reason to be in good heart, and very important developments may be looked for now the old Star of Peace workings have been reached. A series of articles that appeared in a monthly journal, "The Australian," in 1880, by Mr. T. G. Parrott, civil engineer and surveyor, make peculiarly interesting reading just now. According to a map that therein appears, the depth of the Star of Peace shaft is given as 763ft., some 300ft. of it was vertical, till the reef was struck; thereafter it went down on the underlay. There was evidently no western crosscut put in, or the rich veins recently cut would have been pierced. If so, they would never have left the 40 oz. stone which the present company had proved to exist. The plan, however, shows an eastern crosscut some distance up from the shaft bottom; but its distance is not given. The funds of the company at the time were at a low ebb, and subsequently instructions were received to close down; and it would now appear that this was done when a bit more work would have led to complete success. Such are the chances of mining. As far as disclosed, the Star of Peace reef is of good size and gold-bearing; and, the whole of the water having been liberated to this level, stoping can be commenced, as the air supply is now all that can be desired. Future prospects of the field are excellent.

## Emmaville.

(From Our Correspondent.)

Emmaville, Oct. 16.

The Vegetable Creek Tin Mining Company, having connected the western workings from Allen's shaft with the eastern ones from the Rock shaft, should now be in a position to maintain a regular output of tin oxide for some time to come, blocking-out having been commenced from somewhere about the junction point above, working back each way towards the Rock shaft and Allen's shaft. According to reports, the results at Chandler's shaft continue more or less patchy.

In the southern gold mining district (writes our Wollongong correspondent) a new find is reported near Cobargo, on private land. A reef, the report states, well defined and gold-bearing has been struck, the prospector being George Williams. The locality at one time attracted some mining attention, one reef—the Riley—yielding some very good stone. One or two claims have been pegged out on the strength of the last find. Yambulla mining has taken an improving turn of late. There are but few working parties, but all are getting gold. Interest centres in the prospecting claim of Bowman and party and Haugh's cut comes next in interest.

---

# VICTORIAN MINING ACTIVITIES.

## Bendigo and District.

(From Our Correspondent.)

The gold production for the week ending Oct. 18, 1913, amounted to 2744 oz. 3 dwt. The principal producers were Central Red, White, and Blue, 317 oz. 11 dwt.; Golden Pyke, 251 oz. 2dwt.; and Johnson's Reef, 164 oz. 17 dwt. Two dividends, totalling £2530, were declared, viz.:—Golden Pyke, 1s., £1372 10s.—total to date, £83,547 17s.; Spring Gully, 1s., £1157 10s.—total to date, £77,830.

Golden Pyke 447ft. level is in 451ft. from the crosscut at 70ft. south of the shaft and within a few feet from the Constellation lease. For the past week nearly a full width of stone has been traversed, showing good prospects in the 18in. of reef adhering to the hanging wall. The spurs in the footwall also maintain their profitable character. The north stopes take an average width of 12in. of stone, in which a few colors of gold are visible. In the south stope, near the saddle, fair gold is showing in 12in. to 15in. of well mineralised quartz. At 543ft. very fair gold is showing in beating the leading stope into the north boundary. Stoping will be suspended here shortly, and another stope started near the No. 3 rise, where some rich stone should be dislodged at a few feet higher up. The reef is still of good quality in the stope near the No. 1 rise. Southward, the stope is advanced to 20ft. from the Golden Age boundary. There is a small vein of quartz on the hanging wall here, and a few spurs of low value. In working the reef in the same direction south of the No. 2 rise above 643ft., a similar width of hanging wall stone is showing. The footwall portion, however, is 2ft. 6in. thick, and carries a few colors of gold. The important stope from the No. 1 rise will be started during the next few days, and should reach the bottom of the rich shoot, and good prospects are afterward expected right through to 543ft. at this point, a height of about 50ft. The 730ft. crosscut is within 30ft. of the continuation of the main reef. On the outer formation the stopes are taking 18in. of fair quality stone, and a suction-gas engine, which will be utilised in milling, has been purchased from Messrs. Hornsby and Co. for £1850.

North New Moon recently started rising over the 1050ft. north crosscut, with the object of proving the value of the west leg of a reef that has been missed north of the shaft. On Firday the firing uncovered 4in. to 12in. of stone, showing good prospects. It is not yet certain whether the quartz is allied to the faulting or the west back.

New Prince of Wales have an important development in the 690ft. workings. The north intermediate level, from a rise south of the south shaft, has uncovered very encouraging prospects in a greater width of stone. This level is only in a few feet ahead of the stopes, where some good quality stone has been extracted; and the better grade quartz in the intermediate is believed to be the continuation of the same shoot. The formation is intact for several hundred feet ahead of the intermediate. Stoping has been resumed off the south winze, and a level also commenced south to test the 90ft. of ground remaining to the South Prince of Wales boundary.

Unity, in driving the 1018ft. north intermediate level through the Carlisle fault, have exposed 4ft. of stone with a few colors of gold. The level is on the Victory back, and the stone is probably a portion of the Carlisle Company's spurry formation.

## Castlemaine and District.

(From Our Correspondent.)

The McDonald's Reef Co., at German Gully, Fryerstown, is doing good work. In the bottom of a winze which has been re-commenced with a view of intersecting the second saddle reef there is 2ft. of regular quartz showing, and it contains a little gold. It is expected to reach the said saddle within 30ft. The prospecting shaft that is being sunk 300ft. south is going down well. This is being done in the hope of intercepting other reefs.

The gold yield for last quarter, as purchased by the local banks, shows a continued downward decrease, but it is so obviously different from the actual production as to make it unreliable. The fact that the Spring Gully yields are not included acts unfairly to the district in a statistical sense. The banks bought 2967 oz., made up of alluvial, 2868 oz. 11 dwt.; alluvial, 98 oz. 9 dwt. This is 117 oz. less than the previous quarter, which was 145 oz. below that of March. This is the first time the total so recorded came below the 3000 oz. mark, at least for very many years.

Spring Gully's weekly return was much akin to that of the previous week in point of total, although the reduced quantity treated made the average much better. Last week 150 tons yielded 86 oz. 16 dwt., while the previous week gave 82 oz. 15 dwt. from 200 tons. The directors have placed a reserve fund of £500 on fixed deposit, and at the beginning of last week had £1140 to credit after paying all accounts. This makes enough for a 1s. dividend, which was duly declared on Saturday night. An improvement in the north stopes is the most notable event for the week.

Spring Gully No. 1 have gone across to the eastward, and 20ft. up the 300ft. rise there are two flat spurs showing. The bottom spur is developing size and value as uncovering proceeds.

Both plants of the Campbell's Creek bucket dredge were working last week, and the 51 oz. 6 dwt. that was procured is just on the payable margin.

## Maldon.

(From Our Correspondent.)

Derby United Co. has struck a solid reef in the rise over the eastern crosscut from the 680ft. level. At 20ft. the reef came in from the west, showing blackjack, blue metal and a little gold. It has been broken through for 3ft. and the western wall is not showing. The value will be tested as soon as possible. At the 840ft. level the west crosscut has been extended a further 29ft., and the gold-bearing leaders passed through further back are being opened up. The cyanide plant has been in operation, after a long stop, for over a week.

Parties of tributers are working on the old Union lease, and sending their stone to the South German battery. Two of them have got good averages, viz., E. Hibbert and W. Jury, 25 tons, 14 oz.; T. Blackmore and party, 7 tons, 9 oz. 8½ dwt.

New Day Dawn has extended the 90ft. level to 89ft., and mineralised spurs carrying a little gold are to be seen. The eastern crosscut is out nearly 100ft., and has cut into the Cumberland reef, where the stone is heavily mineralised. The stone in the prospecting shaft is opening up well, and payable ore is being broken out for a width of about 2ft.

South British syndicate reports a nice body of stone showing a little gold, in the 200ft. level, north from the crosscut.

The syndicate that a few weeks ago began to prospect a reef on the mount near the rifle range have met gold-bearing stone at a depth of 80ft. The shares are at a premium, holders refusing £3 for the original shares of £1.

The South German report shows that the intermediate level has been extended to 195ft., where the reef is wider than the drive, with no change in quality. The west crosscut at 2000ft. has been put through a reef 14ft. wide, carrying gold all through, with a spur in the end of the crosscut.

Oswald's Gold Mine Co. cleaned up at the chlorination plant for 305 oz. 3 dwt. Above the 500ft. level stoping is going on on a reef up to 4ft. wide, and worth over an ounce per ton. At 600ft. the crosscut off the stopes has proved 20ft. of solid stone, worth 3 dwt. In the north drive off the crosscut, stone worth half an ounce is being broken; and similar value is shown in 5ft. of stone below the level. Leaders are showing gold both at "Tabletop" and at 800ft. level south of the shaft.

## Malmsbury.

(From Our Correspondent.)

Although the wait seems wearisome, the latest from the Malmsbury Alluvial indicates a successful culmination. At the beginning of the week the manager issued an official statement that the intermediate drive had reached No. 11 bore and obtained nice prospects of fine gold. He had then opened a drive to the north, as instructed. This is now in 15ft., and payable prospects have been got from the opening to the face. Half a bucket of wash was lifted, and from it some coarse gold was taken, three specks weighing 7 dwt. 9 grains. This is considered to be excellent. The gold seems waterworn, which indicates the proximity of a channel of good wash. It is now intended to drive into the channel at No. 8 bore, which has given the best prospect of all the bores. Driving is also being continued towards the Confluence.

Hanover Co. and O'Connor's Co., at Drummond North, and the New Galatea-Energetic (Malmsbury) are each prospecting, and the reports read well, but there is nothing worthy of note in them.

The tributers working the Rainbow reef (Mr. B. Beer's lease) at South Kyneton put through 29 tons at the Taradale battery for 96 oz. retorted gold. The stone now showing in the face has been estimated at seemingly extravagant values of 20 or 30 ounces to the ton. A dispute between the tributers and the leaseholder has put a stop to an early proof. Instead, the warden will be called up to decide the matter on the 29th inst., when each side will be represented by counsel. A Melbourne syndicate have an option over the mine, which has been pluckily exploited by Mr. B. Beer for some years, and all along the reef has been rich, although the body of ore has never been large enough till lately to justify the formation of a company.

---

A new steam launch, built by Messrs. Robison Bros., of South Melbourne, on account of the Navy Department, was floated last Saturday, and the operation was watched eagerly for about three hours by an interested crowd. The little craft, which is christened the "Jenner," was designed by the construction branch of the Navy Department and is built of mild steel, with a turtle-back deck forward, and built for rough weather. Her length is 75ft. over all, beam 14ft., with a depth of 8ft. amidships. Her speed is 12 knots. She is driven by compound surface condensing engines. The propeller is of phosphor bronze, and makes about 240 revolutions per minute. Her destination is the quarantine station at Sydney, when she is completed, which will be about the end of November. All the work, machinery included, was carried out by the local contracting firm, who have another boat on the stocks for similar work at Adelaide. To put her into the water, the "Jenner" was made fast to a strong lorry and the two were then lifted by the Harbour Trust's crane and lowered until the boat was fairly in the river; then she was released, and rode on her own keel. The total weight lifted was about 60 tons.

# MINING IN QUEENSLAND.

## North Queensland Fields.

(From Our Correspondent.)

Mareeba, October 9.

The Oaks Amalgamated Gold Mines Company at Kidston has been in stormy waters for some time past, and the company has been again reconstructed, and a new company styled "The Oaks No Liability" has been formed. The capital of the company is £25,000 in 25,000 shares of £1 each, of which 10,000 are contributing, issued as paid up to 14s. per share on payment of 4s. per share. The applicants for these contributing shares receive 10,000 fully paid-up shares of £1 each in proportion of one paid-up share for every one contributing share applied for. The remaining 5000 shares are fully paid up and held in reserve. This company takes over the assets and liabilities of the Oaks Amalgamated Gold Mines N.L. as a going concern, and, with the fresh capital raised, propose installing a completely new crushing plant.

It is thought by the directors that a new crushing plant will solve all their difficulties, but this, in my opinion, will not be the case. The mines comprise country traversed by small gold-bearing leaders, and the formation also carries gold. When Mr. T. A. Waters was manager, he predicted splendid results from the big bodies supposed to be gold-bearing. in fact, it was stated that the whole hill could be worked in a face. However, one or two crushings at the antiquated battery, installed by Mr. Waters, dispelled this idea. There is no large body of stone exposed in the mine, and crushing stone of payable values takes some finding. The company has some country which is as yet undeveloped, and which is likely to give good results, being, as it is, adjacent to the Mountain King mine, a large low-grade proposition owned by Messrs. Craven and Jansen, and which is being profitably worked. Although a new up-to-date mill is an absolute necessity, a greater necessity is a capable manager, one who can handle low-grade propositions. If such a manager is obtained, there is then a possibility of the shareholders receiving returns, but if the new company is to be worked on the same lines as the old one, in a haphazard way, then there is no hope of the shareholders getting their money back.

At the present time, the batteries on the field are hung up for the want of water, but, as scattered thunderstorms are now in evidence throughout the district, the Oaks may be favoured at any time. It will be pleasing news when rain is recorded, as the mine owners will be able to crush, and then, perhaps, a little more development work will be done. Up to date, not one good reef has been located at a satisfactory depth.

Mr. Lionel C. Ball, B.E., Assistant Government Geologist, is at present on the Etheridge Goldfield, Hogan district. As his visit follows so soon after that of the Railway Commissioner, it is natural to suppose that the Government are taking a lively interest in the proposed railway from Forsayth to the Percy River gold and copper mines. In my previous notes I commented on this proposed railway line.

A good deal of excitement prevailed at Kingsborough last week when a reef carrying good gold values was struck in the Tyrconnel mine. Mr. David Morgan has for the past two years been managing this mine for the Tyrconnel Gold Mine Co. N.L., the shares in which are mainly held in Sydney. The shaft was sunk to a depth of 150ft., and a crosscut commenced from the bottom. On Friday last, at a distance of 80ft. from the shaft, the reef was bored into. Mr. Keating, the original owner of the mine, brought the pleasing news to Mareeba yesterday. He stated that the reef had been bored into for 3ft., and its full width was not yet known. Samples of the stone and the borings were prospected, and gave a return equal to about 4 oz. to the ton. Some of the stone so far broken is specimen stone. This find has put new heart into the residents on the Hodgkinson. The company's battery is nearing completion, and the arrival of the suction gas plant, which is expected in about a fortnight's time, will complete same.

The New Minnie Moxham G.M., Northcote, continues to develop splendidly. The western level from the bottom of the shaft is now in 50ft. in gold-bearing quartz of a high value all the way. As there are about 500ft. of backs above this level, the erection of a battery is considered justifiable by the directors. Mr. Geo. R. Gordon has been appointed constructing engineer, and as he has had 25 years' experience in Nth. Queensland, having erected during that time batteries at Charters Towers and Croydon, and also treatment plants at O.K. and Cardross, he should give the company satisfaction. He visited the mine last week and submitted a preliminary report to the directors, who decided to adopt it. He was very much impressed with the mine developments, which he considers sufficient to justify the immediate erection of a 10-head stamper battery, to be driven by a suction gas plant. There is a fine dam site about 25 chains from the mine, on the Moxham Creek, and it is proposed to throw across this creek a concrete dam. The battery will be erected at the mine, and the water will be pumped to the mill. The directors are now issuing the 16,000 shares held in reserve, for battery purposes. The shares are being issued to original applicants at 1s. on application, and the balance in four calls of 1s. at intervals of not less than one month. It is not considered likely that the whole of this money will be called up, as the finances of the company are in a sound state. Not much stone is being broken, as the company is pushing along with its development work, so when the battery is ready a large tonnage of high-grade stone will be immediately available.

Mr. R. Hill, of Messrs. R. Hill and Company, sharebrokers, Charters Towers and Sydney, is at present visiting Mareeba seeking medical attendance, having, unfortunately, injured his ankle whilst at the Barron Falls.

The manager of Leisner's Wolfram Block mine now has the main shaft down to a depth of 350ft. The country rock is very hard, and streaks of molybdenite are discernible, which is a good indication. The same band of country was met they intersected the lode which is at present being worked and giving such good returns.

There is a rumour current here that the lode has been again struck in the Prince Alfred mine at Sunny Mount; but I have been unable to receive any confirmation. Later, just prior to posting this, I have received confirmation.

The Tommy Burns Tin Mine's battery has been hung up for some time, owing to a break-down of a gear wheel on the cam shafting. All work has been stopped pending the arrival of a new wheel from Messrs. Walkers Ltd., Maryborough, who supplied the plant. The hopper recently erected at the foot of the incline has been completed, and is working satisfactorily. This enables the ore to be worked from the bottom of the shaft, where there is better grade ore than that now being worked.

Mr. R. H. Miller, manager of the Almissa Tin Syndicate, Mount Windsor, was in town during the week, and he stated that satisfactory progress is now being made. The granite bar below the alluvial tin deposit has been cut for a distance of five chains, and there is another five chains to do before the nozzle will play. He has had great trouble getting the material to the mine, as the country is almost inaccessible and everything has to be packed. However, about February or March next, he hopes to be packing tin to Mount Carbine.

The Gilmore Tin Mine is looking exceptionally well, and ore up to as high as 40 per cent. black tin is being mined. The extent of this rich patch is not yet known, and it is hardly likely that this grade ore will continue for any distance. The last parcel of dumps treated at the Gurrumbah mill gave a return of 3 per cent. tin, which paid handsomely. The third parcel of 500 tons of dumps is now going forward for treatment.

The returns from the Chillagoe gold and mineral field for the month of September are as follows:—Black Tin—Mill returns, 777½ tons of stone were crushed for a yield of 40 tons tin, valued at £3024. The Irvinebank Company's mines at Koorboora were mainly responsible for the above totals. The Two Jacks mine crushed 133 tons for a value of £431 12s. 10d., and 152 tons for £740. This mine is looking very well at present. The Tennyson mine gave a return of £321 from 152 tons of stone. Thompson and party crushed 19½ tons of stone for £286, and the Southwick, another of the Irvinebank Company's mines, crushed 10½ tons of ore for 1 ton 13 cwt. tin, valued at £181. Messrs. Ryan and Nelson put through 12 tons for £220. Several other good individual crushings were recorded. From the Tennyson mine 236 tons of tin-lead-silver ore gave 52 tons of concentrates, valued at £783. At the Irvinebank Company's mill, at Wolfram, 290 tons of molybdenite and bismuth-wolfram bearing stone were crushed for a yield of 3 tons 11 cwt of molybdenite and 8 tons 17 cwt of bismuth-wolfram, the total value being £1958. The Murphy and Geaney mine was the principal producer, putting through 120 tons of stone for £1236 10s. 1d. At the Chillagoe smelters, 1610 tons of ore were treated for a total value of £7266, made up as follows:—Gold, 7.3 oz., value £29 11s. 8d.; silver, 14,370 oz., value £1733 18s. 6d.; copper, 53.15 tons, value £3487; lead, 103.37 tons, value £2015. The Mungana Company was the principal supplier, sending in 1045 tons of ore, which gave 10,830.5 oz. silver, 50.89 tons of copper, and 61.41 tons of lead; the total value being £5832. The quantity and value of the ores smelted from the Chillagoe Company's New Einasleigh copper mines are not included in the above figures, as the New Einasleigh mine is situated on the Etheridge gold and mineral field, and its returns are included in the report of the warden of that field. His reports are always belated, whereas the Chillagoe and Herberton warden's reports are available early in the month.

## MINING IN NEW ZEALAND.

Recently an inspection was made of the Talisman Consolidated mine, Karangahake, by two directors of the company, Dr. B. Prendergast Knight and Mr. R. B. Jackson, and their report, which has been forwarded to London, is very favourable. It states that they were more than pleased with their inspection, the several development points being very interesting. Very little ore of any consequence was left for stoping above the random of the 12th level, and no new developments had been made above this level. The 13th level had opened out better than any level above, and the 14th seemed to be better still. The most curious and interesting feature of this level had been the flattening of the reef, and the continuance of values on an almost level plane in the northern end of the Dubbo section. A further supply of ore might be obtained from this point. The continuance of values at a point where the reef became flat had never before been found in the history of the mine. At the extreme southern point of this level, the reef had cut out, and a crosscut, No. 8, was being made to the east, with a view to seeing if the lode had been missed. On the 14th level, which was turning out a long way the best level in the mine, several runs of new ore had been disclosed. The Bonanza and Dubbo shoots seemed to be about to form one continuous lode for a distance of 1600ft. The total footage of non-payable ore would not exceed 300ft. The most interesting point of the mine was the No. 19 winze, which was going down at the extreme southern end of the Dubbo section, where values had been found. This at the time of the visit was down 27ft., and had carried good payable values for that distance; neither wall was showing. At the point of the commencement of the sinking of this winze the lode was 15ft. wide.

The men working in the face at the 1000ft. level of the Thames Deep Levels works had an exciting experience in the early morning of September 30th, when, without warning of any kind, a flood of water broke in. The men were quickly surrounded, and had to drop their tools and run for the shaft, which they gained safely, and were hauled to the surface. The speed of the pumps was then increased from seven revolutions a minute to 17, and even at that speed the volume of water was so great that the pumps could not keep it down. It gradually gained, until at eight o'clock there was 4ft. of water on the flat sheet in the chamber. Since then, up to four o'clock in the afternoon, the water still gained a little, and the measurement taken at four o'clock showed an increase of 7in. for the eight hours. There was a hope that in the course of a day or two the pressure would ease off as the water drains away. The crosscut has been passing through a very close-grained class of country for some months, through which water could not penetrate. It is probable that a watercourse has now been cut, which connects with the water in the northern end of the field, which is now being drained. A measurement taken in the Moanataiari shaft shows that the water there has fallen 4ft. This seems to show that the present flow in the main low level is draining away the water from that locality.

Upon the completion of the work for which the Thames Deep Levels Board is responsible, in a few months' time, it will be unnecessary for the Deep Levels Board to remain in existence. This was the opinion expressed by the chairman, Mr. C. Hudson, at the recent meeting of the Thames Drainage Board. The supervisory duties of the Deep Levels Board could, he said, be very well undertaken by the Drainage Board. Probably the execution of such an arrangement would have to be done by Order-in-Council. It was decided that the Deep Levels Board be written to suggesting that when its work was finished the Drainage Board would be willing to assume its duties and responsibilities of supervision and upkeep, and that it would be advisable to get the consent of the Government towards this end. This would save the expense of two authorities, but, perhaps the Deep Levels Board will object to being passed out in this manner. The Board has still about 180ft. to drive to complete its task.

The Waihi-Paeroa Gold Extraction Co. Ltd. will pay its second dividend of 1s. per share on the 20th inst., amounting to £6250. For the four-weekly period ended September 20th, the company treated 11,550 tons of tailings for a return of £3720. This return is from fine sand, dredged from below Puriniki's Bend. The total amount won by the company now totals £65,231.

Thorpe and party, who were in receipt of a prospecting subsidy from the Government, recently struck gold at Back Creek, near Greymouth. On being so informed by the Minister of Mines, Mr. Fraser, the representative of the district, Mr. Seddon, telegraphed to the Westland County authorities extending his congratulations to the party and the district as a whole. The discovery has caused a great stir in the district.

Mr. J. E. Jenkinson, M.H.R., president of the Early Settlers' Association at Wellington (N.Z.), has sent the local committee a cordial message regarding the celebration at Hokitika next January of the jubilee of the West Coast goldfield, in the following terms:—"The celebration is an attempt in some way to pay a debt of gratitude to those big-hearted men and women who laid the foundation stone in these islands, upon which so many of the present generation have built up happy homes." It is announced that the Government had agreed to grant a subsidy of £ for £ up to £200 towards the cost of a pioneers' memorial. The memorial, which has been ordered, will represent a miner in early-day garb, standing on a granite pedestal. The figure will be life-size and made of marble. Subscriptions are generally invited, and on Campaign Day, November 1st, a special effort will be made to raise funds for this object.

The report presented by the directors at the half-yearly meeting of the Ross Goldfields Reconstructed Ltd., held at Auckland, stated that since the company was reconstructed 6s. 6d. per share had been called up, inclusive of the call due on September 8th. In view of the quantity of water found to exist in the Cassius workings the directors made an application to the Minister of Mines in June for a subsidy. The Minister intimated, however, that he was unable to authorise a further subsidy to assist the development of Ross Flat. Application was then made under "The Mining Act, 1908," for a loan from the Government, and the company's application is now being considered. Independent of a subsidy or Government loan the directors thought the company had sufficient capital to prospect and develop a large area of ground. The mine superintendent's report showed that payable gold had been proved to exist in and around the Cassius workings, and also that payable gold extended in the direction of the flat. The latter feature the directors considered a most encouraging development.

## WESTERN AUSTRALIAN MINING.

(From Our Correspondent.)

Kalgoorlie, October 13.

A pleasant surprise for shareholders in the Golden Horseshoe, and an unpleasant one for the "bears," is the declaration of a dividend of 4s. per share, payable on October 30. This means a distribution of £60,000, and means cutting things very fine. On January 1 the company started with a credit balance of £35,000, and has since made a profit of £30,000, so that, after payment of the dividend, the credit balance will be only £5000, plus possibily £5000 for October profit. The company has an issue of £100,000 6 per cent. debentures, which are redeemable at the rate of £12,500 yearly. Of this amount, £6300 was redeemed in May and £6200 is redeemable in November, and after this payment the company would actually have a debit balance of £2500, exclusive of outstanding interest on outstanding debentures. However, developments in the deepest levels, and also in the south end of the mine below 1200ft. have been so satisfactory during the year that a bright era for the shareholders appears to be in sight. The ore reserves, on December 31 last, were 800,000 short tons, assaying 30s. 4d. per ton; and it is certain that by December 31 next both the quantity and grade will be materially increased by the inclusion of ore between 2630ft. and 2780ft. of the rich No. 4 lode, and also of ore from the Nos. 2 and 3 lodes in the southern section of the mine, in which the ore-shoot petered out in the upper levels, but is improving greatly, especially at and below the fourteenth level.

The Golden Ridge Company has already abandoned its options on the Viola and Yerilla Queen mines, and now only retains the option on the Yerilla King and an adjoining block pegged by the manager. Crushings taken from the Viola and Queen since the options were acquired, have fallen considerably short of the results reported by the prospectors, hence the abandonment. The directors of the company are still on the outlook for a new property, but are very cautious in making a selection, and do not take a sporting chance like Adelaide and Melbourne speculators, who generally manage to secure the plums, such as Brookman's "Sheep Farm" and the Black Range mine.

It transpires that Mr. Ben Howie's reports on the result of his 60-hours' continuous run of his volatilisation process on the Gwalia Consols ore were pure imagination. Instead of recovering 90 per cent. of the gold contents of the 45 tons treated, the £39 recovered was only 36.4 per cent. of the £107 assay gold contents of the ore. The consumption of fuel Mr. Howie gave as 16 per cent., or 3.2 cwt. per ton of ore treated, while it really panned out at 62.7 per cent., or 12.54 cwt. per ton of ore. His costs of 7s. 6d. per ton, exclusive of the 1 cwt. of salt required per ton of ore, which, at Wiluna, 170 miles from Leonora, and over 800 miles from Perth, would itself cost 10s. to 12s., were obviously wrong. Ben Howie was specially sent out from England to solve the difficulty, and to teach men who knew a lot more than he professed to know. The result of the fiasco is the liquidation of the Gwalia Consols and Lancefield Companies, and the possible abandonment of the Transvaal mine by the Mountain Queen Company.

Messrs. Bewick, Moreing and Company have practically settled an option on the Great Victoria mine on behalf of the Mountain Queen Company. The mine is about 12 miles south of the Mountain Queen, which is getting very short of ore, and might help to revive the company. The price asked for the Great Victoria was previously £32,000 cash and one-eighth share interest, or £100,000 cash; but it is understood that all Bewick, Moreing and Company offer is £10,000 cash and one-eighth interest. As the mine is nearly useless to its present owners from scarcity of water, which Government will only go out of its way to supply to a capitalistic company, a deal is likely to be shortly arranged.

## SOUTH AUSTRALIAN MINING.

The annual report of the South Australian Government Geologist (Mr. L. Keith Ward) has been issued, together with an appendix on the artesian water resources of South Australia. Mr. Ward points out that, "while it is essential, with the existing small staff, that geological investigations should be at the present time restricted to the problems which most urgently call for attention, it is at least equally important that the goal of a completed geological survey of the whole State should be kept in view,'' because of the value attaching thereto from the points of view of the various departments of the public service, the residents of the districts investigated, and those further afield, who, by appreciating the success of others, may turn to practical and profitable account the natural resources of their own land. Among the outstanding economic problems for attention in the near future are the systematic and critical survey of the deposits of rock phosphates of the State, the complete geological survey of the district embracing Wallaroo and Moonta, the systematic determination of the boundary between the useful and salt water of the River Murray artesian water basin, and the publication of a bulletin on the iron ore resources of the State. The suggested operations cannot be carried out efficiently within a short period by the existing small staff, and an increase in the numerical strength of the department is urged. A beginning has been made with the collection of typical specimens of rocks, minerals, ores, and fossils for reference purposes, but the department is unduly hampered by the restricted accommodation for the exhibits, and consequent inability to collect so extensively as desirable for advertising purposes in the State and elsewhere.

Developments at the newly-discovered deposit of white lead, situated about four miles from the Mount Lofty Railway Station, and only a few hundred yards from the main road to Echunga, are proceeding satisfactorily. Operations at the works, which are under the management of Mr. E. Mullins, are being carried out on the system of the open cut, and are assuming a business-like aspect. The plant has been erected, and when in working order will materially increase the output. A further consignment of several tons of machinery from the Kilkenny works of Forwood, Down and Co. has been railed to Aldgate. The stuff from the quarry is being hand-dressed, and after bagging is despatched to New South Wales for treatment. It is understood that the trial parcels sent over several months ago proved quite satisfactory; hence the installation of additional plant and machinery to augment the output.

Considerable interest is evinced in the opening out of the Utica copper mine, a few miles south of the Burra, where the main shaft is down about 100ft. in fine ore. The ore body is said to have been met at a depth of 65ft. The lode is running N. and S., and is upwards of 5ft. in width. The management intend to continue sinking until a depth of 200ft. has been reached.

A well-attended meeting of shareholders in the Cowell Proprietary Silver Mining Syndicate and the Cowells Blocks Development Syndicate was held at Cowell recently. Mr. Martin Bennett, who attended in behalf of the proposed new company, explained the terms of the amalgamation, and outlined the prospects of the field generally. In his opinion, the field was one of exceptional promise, and he fully expected that when he reached Adelaide, and showed samples he had that day brought from the property, the issue would be quickly taken up. The mine had passed the prospecting stage, and there was undoubted evidence of a large and payable ore body. This he expected would prove payable from the start, and on that account the present working capital would prove quite sufficient. The idea that the find was only a pocket was erroneous, as chlorides without lead had been traced over a considerable distance, and were again showing in the drive at the foot of the hill, some 400ft. distant. This drive was now in 55ft., and it was proposed to continue it to 150ft., and connect with the original shaft, which would be deepened another 100ft. or more. Mr. Bennett has had a large mining experience throughout Australia, and has, on several occasions, inspected properties for Messrs. Bewick, Moreing and Co.

The old Marowie copper mine at Cowell has been cleared out to 65ft. Some rich ore has been cleaned out. Blue and green carbonate is most prominent, though black ore occurs in smaller quantities. The old bottom has not yet been reached. The mine was worked years ago, and the ore was carted 100 miles to Port Lincoln. It was abandoned when the Moonta rush broke out. Ore veins down to 20ft. are running in all directions, but at deeper levels are more defined, and the general trend is north and south. Lead and silver also occur. The copper can be easily extracted by concentration.

## SOUTH AUSTRALIAN RADIUM.

### British and European Demand.

### Government Geologist's Report.

Some months ago the South Australian Government Geologist, Mr. L. Keith Ward, made inquiries of the Imperial Institute, London, respecting the demand for radium bromide, and the replies were made public by the Premier, Sir Richard Butler, last week. It is stated that several large firms, both in the United Kingdom and on the Continent of Europe, have been consulted on this point. The opinion generally expressed is that though it is difficult to say how long the present active demand for radium bromide will continue, there are no signs of any falling off in the demand. A high medical authority in London took the view that the demand for radium bromide is steadily increasing, but he stated that the present supply is more or less in the hands of a ring, who endeavour to maintain the price at a high level. With regard to the market for crude radio-active ores, the Institute states that the firms consulted were unanimously of opinion that it would be unprofitable to export unconcentrated South Australian ores containing only 2 per cent. of uranium oxide, and that for export to Europe it is essential that radium bromide should be made, or that at least a high-grade radio-active concentrate should be produced. It is stated also that the following firms have expressed their readiness to negotiate with the producers with a view to the possible purchase of radium bromide and concentrated radio-active ores from South Australia:—Radium, Limited, 93 Mortimer-street, London, W.; Allegemeine Radium Maatschappij, Amsterdam, Holland; Herr E. de Haen, Chemische, Fabrik "List," Seelze, near Hanover, Germany.

Mr. Ward has just published a special report on the Radium Hill mining field, Olary, which lies about 12 miles S.S.E. from the Cutana Siding on the Broken Hill railway, and comprises about 4½ square miles of exceptionally broken, but not mountainous country. The country is highly mineralised, and both copper and gold mines are in operation there, besides ironstone quarries for fluxing material. Speaking of the field generally, Mr. Ward says that the prospecting work hitherto carried out has been restricted to the sinking and driving on the lodes which have been recognised at the surface. In the course of this work it has been proved that the distribution of the metallic minerals is somewhat irregular, and that shoots of ore may exist at a depth of 50ft. below the surface, even if no sign of lode matter can be detected on the apparent course of a lode formation at a point where an outcrop might be expected. For a similar reason it is found that other shoots of ore which afford promise at the surface diminish rapidly in depth. The metallic ingredients of the lodes in the district are, in fact, distributed through the lode formations in shoots of irregular form. In a few places the ore bodies appear to have resulted from the filling of a fissure with lode matter introduced in solution. The principal workings of the Radium-Hill Company afford exposures of a lode which appears to be of this character. The form of the fracture has directly controlled the distribution of ore; and where, as at the northern end of these workings near No. 2 shaft, the fissure has been interrupted in its course by the existence of a resistant mass of amphibolite rock, the continuity of the ore has also been interrupted. It has been supposed that the lode has been dislocated by faulting at this place, but there is no evidence of the existence of a fault. There appears, from the published reports on the various mining properties in this field, to be a general belief in the existence of a single well-defined lode traversing the several properties from end to end. There is no justification for such a view. In each property there are several lode formations represented, and it is not wise to attempt to establish the identity of one particular lode in one lease with a certain lode in another lease.

Mr. Ward's report is too long to be quoted in extenso, but the following extract will be of interest:—

"The demand for the prepared radium salts does not seem likely to diminish in the near future. The demand for radium preparations comes from physicists and from the medical profession. The scientific investigations which were commenced but a few years ago are still being carried on with unabating zeal in the principal laboratories in all parts of the world, and it is certain that this research will continue. While the scientific results which have been obtained from this world-wide interest in radium have the utmost basal importance, it is to be borne in mind that the direct application of radium to industrial ends has not yet been accomplished. With regard to the application of radium to medicine, the case is rather different. The conclusions of C. L. Parsons, of the Bureau of Mineral Technology, United States Geological Survey, in this connection are deserving of close attention. In a paper on the 'Uranium and radium situation,' he wrote:—'A recent report of the London Radium Institute and the many articles emanating from minor laboratories experimenting in the application of radium to therapeutics all tend to show that it has a real value, the certain application of which must wait further experimentation. In the meantime no credence should be given to the many stories that are sure to be printed, unless they are backed up by the highest medical authority, which will always give publicity with caution. The best medical authorities appear to agree that up to the present radium has not been proved to be a specific for any disease, although it has been shown to be helpful in many cases. The outlook for its future application to certain diseases not easily treated otherwise is decidedly encouraging.' As regards the world's supply of ore, the following countries are the principal contributors:—Saxony, Cornwall, North America, and German East Africa. The researches of the United States Geological Survey have recently proved that the principal producing country at the present time is the United States, the pitchblende and carnotite ores being obtained chiefly from Colorado and Utah. In the paper by C. L. Parsons it is stated that much of the radium imported into America was prepared in Europe from crude ore exported from America. Moreover, it is pointed out by Mr. Parsons that in the mining and dressing of the carnotite ores in America there is a considerable waste. Experiments conducted by the Bureau of Mines with the object of preventing this waste are stated to have a fair prospect of success. This statement, when read in conjunction with the official conclusion that America has exported carefully selected ores at a price by no means commensurate with the radium value if worked up at home,' should lead to the establishment of a radium refining industry in the United States that will profoundly affect the market. It certainly appears that it is not wise for any country to export ore containing 2 per cent. of uranium oxide at the present market price of such ore. European buyers stipulate a grade of 2 per cent. uranium oxide, and the price paid for American ore of this quality is a little more than £15 per ton, f.o.b., New York. It has been found by actual experiment that in old and unaltered uranium minerals the ratio of radium uranium is a constant. This ratio is technically known as the 'equilibrium ratio,' and, expressed in terms of familiar weights, means the presence of 320 milligrams of element radium in every ton of the element uranium. If then this equilibrium ratio holds true for the ore under consideration it follows that each ton of ore containing 2 per cent. of uranium oxide contains 5.44 milligrams of the element radium, or about 9.3 milligrams of anhydrous radium bromide. Taking the value of radium bromide at £16 per milligram, the gross value of the radium bromide in ore carrying 2 per cent. of uranium oxide is about £148 per ton. It is therefore not astonishing that there is an eager demand for ore of this grade at the rate of £15 per ton. The conclusions to be drawn from such figures are that either the cost of producing prepared radium salts is excessively high, or that the producer is not obtaining a fair price for his ore. The authority of Rutherford in this connection is of more than ordinary value. In his recent work 'Radioactive Substances and Their Radiations,' he wrote:—'The exceedingly high prices of radium at the present day (about £10 per milligram pure radium bromide) bear no relation to the cost of separation of the radium from the uranium minerals. The present price is artificial, and has resulted in part from the comparative rarity of deposits of pitchblende or of uranium minerals containing a fairly high percentage of uranium. The extensive use of radium for medical purposes, as well as for physical and chemical experiments, has so far absorbed the output. At the same time, the undoubtedly large profits to be realised at the present prices have led to a careful search for uranium deposits in various countries. It is known that there are extensive deposits of low-grade uranium ores in various parts of the world, and it is to be hoped that in the immediate future methods will be devised for treatment of such ores. There seems to be no reason why the present abnormally high prices of radium should be ultimately maintained.' The establishment of the radium refinery in Sydney by the Radium Hill Company, N.L., was due to the early recognition of the ratio of the cost of production to the intrinsic value of the ore, and it is to hoped that this Australian enterprise will prosper in proportion to its merit. The Radium Hill Company has published the cost of treatment at the Sydney works. This treatment cost is stated to be £19 10s. per ton, and the total cost, including mining, crushing, concentrating, and conveying the concentrates to Sydney, are stated at £28 17s. 11d. per ton. At times it is announced that the stage of regular production has been attained. But hitherto the treatment has been confined to the ore from the company's own mine at Radium Hill. It seems but a small step to the treatment in Australia of all the radium-uranium ores mined, and it is to be hoped that in the interests of Australian welfare the step will be taken. It will be seen from the figures cited above that there is so wide a margin between the price paid for crude ore and the gross value of the contents of such ore that a generous allowance may be made for depreciation in the market price of finished radium preparations and the cost of treatment. It is, of course, essential to remember that the values given are based upon the supposition that the radium bears to the uranium of the ore the 'equilibrium ratio,' and that this ratio is known to be variable in the case of secondary ores, such as autunite. The radium-uranium ratio has not, so far as the writer is aware, been determined for South Australian radium-uranium ores.

## OIL IN SOUTH AUSTRALIA.

### Experts at Variance.

The controversy which is exercising the minds of the investing public of South Australia as to existence or otherwise of petroleum fields in that State is heightened by the fact that the Government has already pronounced against it through its Geologist, Mr. L. K. Ward.

In a bulletin issued early this year, Mr. Ward made public the result of his investigations, and stated that "of the various discoveries that have been made none is of such a character as to indicate the probable existence of any commercial concentration of any oil-bearing material on either Kangaroo Island or Eyre's Peninsula," and also that "in the light of what is yet known with regard to the districts of which this bulletin treats, the writer is unable to recommend the expenditure of capital in boring for oil."

At the time this report was published, considerable capital of a private nature was in process of being made available for the purpose of sinking bores for oil prospecting; but, naturally, the unfavourable nature of the Government's pronouncement checked for the time being private enterprise in the matter. As, however, a large number of people remained unconvinced by the Geologist's reasonings, the question has not been allowed to drop, and a deputation waited on the Minister for Mines on Thursday, asking for the appointment of an independent expert to examine and report on the most likely neighbourhoods. This party is by no means unsupported by expert advice, and the opinion of Dr. Basedow, M.A., M.D., B.Sc., F.G.S., formerly Assistant Government Geologist, S.A., and late Consulting Government Geologist to the Northern Territory, is strongly in their favour. This gentleman bases his opinion on the grounds that the geological formation of a wide stretch of country in South Australia, and embracing Eyre's Peninsula, Kangaroo Island and the country south of Coorong, includes a system of fossiliferous Tertiaries which have been proved in other parts of the world to be petroliferous, and that it would be a scientific mystery if so extensive a system should ultimately prove to be devoid of subterranean reservoirs of petroleum. He further states that the regular appearance on beaches after gales of various bitumens points strongly to their submarine origin within the limits of the great continental shelf, as, though soft when first picked up on such occasions and exhaling an odour of petroleum, they harden and lose all smell after being kept for a few days, thus negativing the theory held by the opposite camp that their origin is possibly antarctic or otherwise remote. Herein, again, he differs from Mr. Ward, who states that "the freshest material available for examination has such a density that it will float readily in sea water," while Mr. Basedow's specimens would not.

The points at issue between these gentlemen are, however, purely of a scientific nature, and while interesting to the public as an example of, so to speak, "doctors differing," are calculated in the end to obtain the reference of the question to some form of outside arbitration, which will doubtless be in the best interests of the country; but the personal bias imported into the question by the deputation to the Minister against Mr. Ward and his predecessor, Mr. Brown, is to be deprecated as making the matter harder for Sir Richard Butler to deal with, since he must necessarily support his own officers, and the more so if their capabilities are impugned.

In view, however, of the great importance of the question, not only to South Australia, but also to the British Empire, and if the statements which are credibly made that a favourable, or not unfavourable, pronouncement backed by the authority of the Government would result in the immediate supply of sufficient capital to conduct exhaustive tests, it is to be hoped that the question may be sufficiently thrashed out to terminate the existing doubts.

## VICTORIAN MINING INDUSTRY.

### Comments by the State Premier.

### "Government Aid" Policy.

Mr. Watt, the Victorian Premier and Treasurer, in the course of his Budget speech last week, naturally had something to say of the premier industry of the State, the industry to which it owed its rapid rise to independence, and to which it is still heavily indebted, not for the wealth which it provides for sanguine investors of hard-earned savings, but for the army of men for whom it finds employment, and appear to now regard it as their own concern, to be run on lines dictated by themselves, the privilege of the shareholder being to make up from his savings any deficiency in the working expenses of the mines. Mr. Watt said:—

"Our annual gold yield has for some years shown a steady decline, some of the best and most regularly producing mines having reached old age and poverty without the development of a corresponding number of youthful successors. Nevertheless, the industry plays, and is likely to continue to play, an important part in the progress and material welfare of the State. Though the production of 516,000oz. for 1912 does not favourably compare with preceding years, its value was over £2,000,000, and it was responsible, according to the Government statist, for the support of 60,000 persons. The total value of gold won in Victoria to the present is over £290,000,000; our total wheat production has reached about £70,000,000 only. There is reason to hope that the downward course of our gold yield has, to use an appropriate mining term, nearly reached bed-rock. From dredging and sluicing we may expect a further gradual decline, but the prospects of lode and deep alluvial mining are of quite a hopeful character. At Ararat and Beaufort important new mines have appeared within the last couple of years, and considerable areas of promising alluvial ground hitherto untried have, during the last twelve months, been taken up by investors. In lode mining Bendigo maintains its reputation for always having a fair number of good yielders and dividend payers on its list, while at Ballarat West there has been a revival of energetic mining on a field which, only a few years ago, was thought to have seen its last days. At Costerfield gold and antimony mining has appreciably increased, and regular shipments of ore are being made to England. A large pump-sluicing plant has been recently erected by English investors at a cost of £32,000 at Toora for tin sluicing, and much activity is being shown in prospecting many promising tin lodes in the North East.

"Of the various causes to which the decline of gold mining has been attributed, perhaps the chief of those within human control are the misleading statements on which companies are frequently formed by unscrupulous promoters, and the subsequent loss, as investors in mining, of persons 'once bitten twice shy;' the absurdly inadequate cash provided by many companies at their inception, the early ensuing financial difficulties, and consequent inability to carry through a development programme calculated to give the lode or lead being tested a proper trial; and the culpable neglect of most mining companies either to put aside out of profits a decent reserve fund for a day of adversity or to keep development and ore reserves well ahead of extraction. As far as it is practicable, it is intended that the influence of the State shall in future be directed towards inducing more business-like methods in the formation and conduct of mining companies. A Bill to amend the Mining Companies (No Liability) sections of the Companies Act, under which it will be a penal offence to issue, knowingly, incorrect or misleading statements of a material character in a prospectus, is now before Parliament. The Bill provides also for the closing of many avenues leading to the exploitation of investors and for reforms in other directions.

"The Government has decided that assistance by the State to mining will not be rendered in future without due weight being given to the financial considerations mentioned. We shall discontinue the doling out here and there of a few hundred pounds to save weakly-constituted companies from 3d. or 6d. per share in calls, or to encourage them to perform an amount of prospecting or developing too small to be useful. But if a situation of importance to a district or the industry generally should arise wherein, in the specific words of the Mines Development Acts, 'the expenditure of large sums will be necessary, extending over a considerable period of time,' then we shall in no niggardly spirit endeavour to assist companies or individuals whose properties show prospects of success. It is essential in all cases that work shall not cease before showing some conclusive result, favourable or otherwise. Consequently, stipulations are now being made by the Department of Mines in the case of every advance that the company's financial arrangements shall be adequate for the completion of the approved scheme. The first chapter in the history of most mines is their discovery and preliminary development by prospectors and co-operatively working miners. Practical encouragement to these will be continued in the form of advances up to a maximum of £250, as has been done for many years past. The money made available under the various Acts for mining development has been almost expended. To give effect to the policy I have set forth it will be necessary to provide additional authority. Consequently, members will be asked this session to approve of a Mining Development Bill authorising the expenditure of £100,000, of which £75,000 shall be for gold-mining companies, £10,000 for minerals and metals other than gold, and £15,000 for co-operative prospectors and working miners.

"Attention is also being given to our brown coal resources. By boring operations we are increasing our information as to the quality, extent, and distribution of the coal beds. Exhaustive tests are being made as to the value of lignite when directly used as fuel, for power-gas production, and for the output of by-products such as sulphate of ammonia, benzine, paraffin, oils, dyes, etc. In a bore operating between Morwell and Traralgon, and situate 3½ miles from the nearest proved occurrence, seams of brown coal about 400ft. thick have been revealed. This exploratory work will be gradually extended over about 1000 square miles of territory, chiefly in the Morwell and Alberton districts. It is not unreasonable to anticipate that in vast deposits of good brown coal Victoria will, in the future, find compensation for her comparatively limited sources of bituminous coal. Altogether the sums set apart this year under special appropriations and votes for the furtherance of the mining industry amount to £54,880."

## MINING COMPANIES LAW (V.).

The Victorian Attorney-General, Mr. J. Drysdale Brown, moved the Second Reading in the Legislative Council, on the 14th inst., of a Bill to amend the present law relating to mining companies (no liability) based largely upon suggestions and recommendations made over three years ago by a conference of the committee of the Stock Exchange of Melbourne, the Chamber of Mines of Victoria, and the Legal Managers' Association. In introducing the Bill, the Attorney-General said it was designed to give greater protection to shareholders and the public. It provided that the original of every prospectus should be in duplicate. One such original prospectus would, immediately after issue and before an application for registration of the proposed company was lodged, be filed in the office of the Registrar-General. This prospectus would be open to inspection by any person upon payment of a fee of one shilling. A considerable penalty was proposed against any person issuing a false prospectus. One innovation in the Bill was a clause providing that before a company was registered and incorporated as a "no liability" company two-thirds of the proposed capital should be subscribed, and five per cent. of the capital subscribed must be paid in cash. It would be the duty of the manager to pay money and cheques into the bank within seven days. Verified copies of the half-yearly balance-sheets and statements would have to be lodged with the Registrar-General. Books of accounts, balance-sheets and half-yearly statements would be open to the inspection of shareholders in and creditors of companies. The manager would have to give all reasonable information to shareholders as to the working of the company, which would mean that shareholders would be able to obtain the same information as the directors. Another innovation was a clause providing that no director or manager of a company should be personally interested in a contract for profit made on behalf of the company. If a man wished to be a director, he should not sell his machinery to a mining company in which he was interested. There were cases on record where the whole board of directors was interested in contracts let by the company. The Bill was intended to secure the better organisation and management of mining companies generally, and simpler means were provided for the winding up of companies. Debate on the Bill was postponed until the 28th inst.

## UNIONIST OUTRAGE.

### Two Men Charged with Attempted Murder.

Up to the end of last week the general conduct of the men on strike recently at Bendigo, and still at Beaufort (V.), on the question of working with non-unionists, was nearly all that could be desired, so far as their behaviour towards those who were working is concerned. On one or two occasions the law had to be invoked, but, in general, there was nothing to complain of. On Friday night, however, an incident occurred which, for brutality and cowardice, it would be difficult to parallel. Shortly before midnight, the police at Ballarat were apprised by telephone from Beaufort that a gang of 30 or 40 men from Waterloo had attacked the office of the Beaufort Deep Leads mine, in which four non-union working miners were sleeping, that two of them had been forcibly carried away, and that the other two, having sought refuge in the mine shaft by climbing down the ladder-way, had been attacked there by rolling down boulders from the surface, and that even the door of the shaft had been taken off its hinges and thrown down the shaft after the refugees. Mr. J. R. Wotherspoon added the information that he had been calling down the shaft for two or three hours, but had received no reply, so that the worst consequences were feared. Inquiry proved that the first report was, contrary to experience, not exaggerated, although the natural fears that the fugitives had been killed were set at rest by their subsequent rescue. Their names were Tyres and Roberts, and having descended about 30ft., thinking that they were being followed, Roberts put his arm round his youthful companion and pulled him into a place of safety behind the pump column in the side of the shaft, and from here they listened anxiously to the rain of stones and timber which was being sent down. Later on the two men made their way to the bottom of the shaft, along the reef drive for about 1000ft. and up a rise, whence they were liberated, two or three hours later, by Mr. W. Moore, the mine manager. The two men, Boase and Ake, who had been seized, were carried in a cart to a house three miles away and left there to pay for the hire of the cart; next morning they were driven to the Beaufort railway station and allowed to go away, though they were watched until they left. Two men were arrested, and on Sunday morning Mr. R. Sinclair, J.P., attended at the Beaufort police station, when they were formally charged—George Thompson with having shot at with intent to murder John Roberts and James Tyres; and Thomas Abrey with having attempted to murder Roberts and Tyres. Mr. W. E. Finch (secretary of the local branch F.M.E.A.) applied for bail, but this was refused, and the accused were remanded to Ballarat and taken under escort to the Ballarat gaol.

## ROYAL MINT RETURNS.

### Perth Branch.

The gold purchased by the Perth branch of the Royal Mint during September was as follows:—

| Sources. | September. Oz. gross. | Since Jan. 1. Oz. gross. |
|---|---|---|
| Western Australia .. .. | 136,099.34 | 1,102,193.06 |
| Other Australian States | — | 14.73 |
| Unknown origin .. .. | 22.13 | 489.66 |
| Total weight .. .. | 136,121.47 | 1,102,697.45 |
| Value of gold (calculated at £3/9/11 per gross oz. of material received) .. .. .. .. | £475,858 | £3,868,558 |

The official statement of revenue for Victoria for the quarter ended on September 30 shows that receipts from the State coal mine amounted to £29,365, or £1302 more than for the same period last year.

Further influence on supplies of copper will be exercised by the renewal of disturbances in connection with the strike of copper mines at Calumet, Michigan (U.S.A.). A recent cablegram announced that a mob had attacked a special railway-car which was conveying men who had resumed work to the mines, and forced the driver to return. Calumet is one of the principal centres of the copper producing industry in the Lake Superior district, and the Calumet and Hecla Company alone produced 330,879 tons of copper in 1911.

# ENGINEERING AND ELECTRICAL SECTION

THE FAMOUS
"Brimsdown"
"Wirum"
BRITISH MADE Lamps.

The most popular, reliable and economic lamp on the market.

Sole Agents—
THE
LAWRENCE & HANSON
Electrical Co. Ltd.

405 LONSDALE ST., MELBOURNE.
33 YORK ST., SYDNEY.
and at WELLINGTON, N.Z.

## SYDNEY CITY RAILWAY.

### Rejection of the Bill.

The flow of legislative extravagance in New South Wales has received a check in the Legislative Council. Of the sheaf of Bills which have passed through the Assembly with comparative tranquillity the major portion have been treated with scant ceremony in the Upper House, and on the sanest of grounds. Of them all the City Railway Bill was the most important, but because of the enormous financial burden which it, with other proposals, would impose upon the people, it was not likely that it would be sanctioned by a body one of whose functions it is to check rash expenditure.

When the Bill came up for the second reading Mr. T. Hughes asked the House to give it different treatment to that which they had accorded to the country railway proposals. The completion of the city railway at the present moment was the most urgent work in connection with the railway service in that State. This was the opinion of a number of experts who had at different times considered the question. Three separate Royal Commissions had reported in its favour. According to the Railway Commissioner, 40,000 passengers were handled every hour at the Central railway station during the busy hours. This was increasing at the rate of 15 per cent. per annum. The congestion of the railway and tramway service at present was reducing it to breaking point. The city railway would pay for itself from the jump, and the whole question did not permit of further delay.

The Bill was further supported by Mr. Heydon, who deprecated the city versus country cry which had been raised in the discussion. In every city in Europe and America half the size of Sydney they had better facilities for handling their traffic than had Sydney. This was a productive work, that would pay handsomely over and over again. A combination of city and country interests was necessary; the country depended on Sydney for its prosperity, and Sydney depended in like manner on the country, and it was regrettable that anyone should try to drive a wedge between the two communities.

Sir Allen Taylor said that the longer this matter was delayed the greater would be the cost, and it should be carried out at the earliest possible moment; while Mr. Trickett gave it as his opinion that the present tramway facilities in Sydney were 25 years behind the times. The underground railways of London were wonderful, and could be quoted largely to support this movement in Sydney. The Government did a wise thing when it asked Mr. Hay to come from England and report. Let them make this the beginning of a great national work; every day they waited it would become a greater tax upon the people.

Mr. Ashton, probably one of the most vigorous opponents of the Government's profligate policy, claimed that they could not sink millions of money in a work and let the interest come out of the taxpayers, without giving them some adequate return. The purpose for which they had postponed the construction of country railways was in order to allow the Government to put the money at its disposal to the completion of the duplication works and lines at present under construction. The money for this city railway had to come off the country railways, and he was not going to prejudice their completion by diverting £5,000,000 to the city railway.

Dr. Nash said he would not be a party in that House to pledge the people of this country to a shilling more expenditure until he saw some way out of the terrible position into which they had got.

The second reading of the Bill was rejected by 22 votes to 16.

## BURRINJUCK RESERVOIR (N.S.W.)

In connection with the proposal to determine any movement which may occur in the vicinity of the Burrinjuck reservoir by reason of the enormous weight of water it will hold when full, Professor Helmert, Director of the International Geodetic Institute at Potsdam, has written to Professor David intimating that he is despatching to Sydney two extremely delicate and valuable sets of pendulums for that purpose. It is proposed to instal these pendulums at the ends of some short tunnels in the rocks, above the level of which the water will ultimately rise when the reservoir is full. These pendulums will be kept continually swinging, and any variations in swing due to the bodily subsidence of the earth's crust resulting from the great load of water—about 1000 million tons—will record themselves automatically on the paper on revolving drums. It is thought that there certainly will be an appreciable subsidence of the earth's crust, though not of such a serious order as to in any way imperil the strength of the great dam. At the same time, the bending crust might be quite sufficient to somewhat alter the distances between various spots in the locality in such a way that the actual distance from one another of adjacent trigonometrical stations will be shortened to an extent that will be approximately calculable.

## VICTORIAN RAILWAYS.

### The Premier's Review.

In the course of his Budget speech last Thursday, Mr. Watt, the Premier of Victoria, made the following references to the State railways:—

''Special attention has been given to the question of improving the train service for the conveyance of passengers on country lines. In 1906-7 the revenue of the country services was £989,285, in 1912-13 £1,387,785, showing an increase of £398,500, or 40.2 per cent., with an increase of passenger journeys of 47.9 per cent. For the same years the suburban revenues were £645,448 and £1,040,774, the increase during the seven years being £395,326, or 61.24 per cent., for an increase of 60.5 per cent. passenger journeys. Contracts, involving an expenditure of approximately £1,250,000, have been let for a considerable portion of the electrical equipment and machinery, and for the power station buildings required for electrification of suburban railways. It is not proposed at present to obtain from outside sources any of the power required for the railway electrification scheme, and arrangements have accordingly been made to exercise options over additional units for the power-house so as to provide for a total capacity of 60,000kw., which it is estimated will be sufficient for the conversion of all our present suburban lines. The anticipation that conversion operations will be completed early in 1917 is likely to be realised. It has been decided to change the situation of the power-house to a site lower down the River Yarra.

In pursuance of the policy of decentralisation, and to facilitate the development of the outer ports, the competitive freight rates between Melbourne and the eastern and western coastal districts were abolished on January 1st, so that the goods rates are now practically uniform throughout the State. The highest scale of rates (Class 3) was also abolished. The estimated loss of revenue entailed by these two alterations is over £7000 per annum. According to the promise of the Government, a further increase was made in the wages of railway employees; the men in labouring vocations can now obtain a wage of 8s. per day, whilst the minimum for a skilled labourer has been increased to 8s. 6d. per day. The concessions referred to will involve an increase of approximately £72,000 per annum in the working expenses.'' A decentralisation policy is also being followed in New South Wales, which has led to the construction of Border railways by which the agriculturists, pastoralists and other producers at the western side of that State will be enabled to get to an earlier, because a nearer, market than that offered by Sydney. Mr. Watt referred to the opposition offered in the New South Wales Parliament to the agreements executed by the Governments of New South Wales and Victoria providing for three important lines into the Western Riverina, and for linking them with the Victorian railway system, crossing the Murray at Wentworth, Euston, and Moama. He said:—''The Government feels that an equitable arrangement has been arrived at, which will render practicable the settlement of upwards of 3,000,000 acres of land hitherto unprovided with railway facilities. Many of these border bills were defeated in the Upper House in New South Wales. I am in hopes that they will be reintroduced. The Government of Victoria will be ready when the Government of New South Wales is.''

### Suburban Electrification.

The conflict between the Railways Commissioners and the Harbour Trust Commissioners, brought about by the selection of a site at Newport for the railways power-station, portion of which belongs to the Harbour Trust and the utilisation of which in its port improvement scheme had already been decided upon, shows the extent to which the bungling of one department may interfere with the working of another. Several conferences have been held between the two bodies, but finality has not yet been reached. Naturally enough, in view of the fact that the designing of plans to provide adequate deep water berths at the river mouth has involved considerable time and thought, the Harbour Trust Commissioners are not prepared to allow their scheme to be interfered with without protest. Probably the Railways Commissioners will arrange to put their power-house further back from the river, which, however, will involve fresh difficulties in its working. They state that there is little likelihood of any of the plant for which contracts have been let reaching Melbourne before early next year, so that there should be no delay in construction through the belated change in site, and they still consider that the first line to be electrified, namely, that from Sandringham to Broadmeadows, should be in operation by the middle of 1915. The Commissioners made a long statement last week, in the course of which they said that the contracts with Messrs. Babcock and Wilcox, and C. A. Parsons and Company, for the power-station buildings and machinery, were proceeding satisfactorily; as also were the contracts with Messrs. Siemens Brothers and the General Electric Company for the substation plant and the coach equipments respectively; while the sites of the twelve sub-stations had been practically decided upon. Arrangements in respect of the under-frames, bogies, and driving compartments of the rolling-stock had been substantially agreed to. The question of erecting a large car repair shed, which was to be erected at Jolimont, was approaching settlement, and the shed, which would require to be used for fitting the electrical equipments to the coaches, would probably be completed by the end of next year or shortly after. Much information had been forwarded to Mr. Merz in connection with the overhead contact lines and overhead high tension transmission lines, and it had been arranged that the structures to carry the line should be constructed in Victoria. Tenders would be invited when the necessary specifications were received from Mr. Merz; and tenders were being invited in England for the supply of the wire, etc., and the attachment. The structures would be erected by the department. Tenders had been received, and were being considered, for the condension plant for the power-station, and others had been invited for the switch gear required at the power-station and the twelve substations. Mr. Merz was now engaged in preparing a specification for the high-tension cables, which were to be placed underground, and on similar work in respect of an automatic signalling scheme, which was discussed by him with the chairman of the commissioners and Messrs. Calcutt and Blazey, the departmental experts.

The Commissioners have also amplified and explained the Premier's announcement, as given above, that options over additional units of generating plant are to be exercised. They state that the contract with Messrs. C. A. Parsons and Co. contained a definite order for four 10,000kw. generating sets complete, representing a total capacity of 40,000kw., and included a provision that two additional 10,000kw. sets, to make the station of the capacity of 60,000kw., provided for in Mr. Merz's complete scheme, could be ordered by the Commissioners at any time within two years from the date of the contract, 1st January last. The contract which was entered into with Messrs. Babcock and Wilcox for the power station buildings and boiler equipment for one boiler house also included a similar provision in respect of the second boiler house required, to correspond with the increase in the generating plant. In view of the decision of the Government that all the power required for the railway electrification scheme should be generated at the railway power station, it became necessary for the options for the additional plant, etc., held under these contracts to be exercised, and the cost involved, which is included in the estimates submitted by Mr. Merz, will be approximately £232,000. The additional plant will probably be erected in the early part of the year 1915.

## BRITISH AND EUROPEAN DEVELOPMENTS.

(From Our Correspondent.)

London, Sept. 19.

The past week has been one of considerable anxiety owing to a renewal of labour unrest in Dublin, Liverpool, Birmingham, London, etc. There have been warnings that there might be another national railway strike, in spite of a railway labour representative's condemnation of the "sympathetic" strike, but there are hopes at the moment that the rank and file of railway employees are not favourably disposed. In Sheffield there is another strike of moulders in progress, which will hamper certain departments of industry, and in London we are having, among other diversions, hourly announcements about the prospects of a big 'bus and tram and tube workers' strike, which shall bring everybody to his knees, so to speak.

It is your own particular brand of disagreement this time. Tillings declined to permit their drivers to wear their Union badge without the company's authority, and "sacked" some of their men. They have issued an explanation to the press, but press comment seems to favour the men rather than the proprietors, and yesterday morning the "Times" as good as told Tillings that they were in the wrong. But our august contemporary did not seem to quite understand the bearing of the wearing of the badge, when it remarked that it did not see what it mattered to anybody whether they wore a badge or not. The day had gone by for taking up a needlessly hostile attitude toward the Unions. For the edification of its readers our contemporary also gave an account of the Brisbane badge controversy and inquiry, showing what sort of a conclusion had been arrived at in the Australian Commonwealth. And now, hardly have the foregoing lines dried on the paper, than my evening paper announces in its "stop press" section as follows:—"Messrs. Tilling's . . . have agreed to modify their regulations and make no further objection to the wearing of the badge, providing it is worn in such a way as not to interfere with the official equipment and licence badge. They will reinstate the men at present out on the understanding only that they will not interfere with the other employees." There is still doubt, however, whether a settlement will be arrived at without a big struggle, affecting all metropolitan' bus, tram and electric tube systems.

An echo of the disastrous Diesel engine explosion which occurred at Bray, Ireland, about a year ago, and was fully dealt with in these pages at the time, has just reached us in the shape of an official document containing the report of H.M. Inspector of Factories on the occurrence, and the conclusions arrived at as the result of his investigation. He considers that the observance of the following recommendations would tend to reduce the risk of explosions and accidents in connection with the running of Diesel oil engines:—"Compressed oxygen on account of its intense chemical affinity and combustible gases like hydrogen should not be used for the purpose of recharging air vessels, and a warning to this effect should be issued by the makers of Diesel engines. Definite instructions should be issued by the makers with regard to the adoption of safe methods for re-charging air vessels. Only competent engineers or experienced men under the direct supervision of a qualified engineer should be employed as engine attendants on Diesel plant. Traces of oil or oil vapours should be removed as far as practicable from the compressed air before it passes into the blast vessel. Air vessels, especially blast vessels, should be cleaned and examined internally as far as practicable once every twelve months. They should also be tested hydraulically once in every four years, and the amount of expansion of the vessel under the test pressure should be carefully gauged. Some device should be fitted for preventing the transmission of flame explosions along the compressed air pipes."

On Tuesday next, September 23rd, the four days' conference of the Municipal Tramways Association will be opened at Sheffield with the presidential address of Mr. A. R. Fearnley, the general manager of the municipal tramway system of that city. During the meetings Mr. J. B. Hamilton, the manager of the Leeds City tramways, will open the subject of urban passenger transport, and there are to be a couple of other papers, one by an Alderman, and the other by a Councillor, on "The Maintenance of Paving on Tramway Track," and "The Advantages and Disadvantages of Platform Fare Collection."

The first installation (2000kw.) at the Barugh waste heat station of the Yorkshire Electric Power Company is now being tested preparatory to being put on the commercial load. Increased demands have compelled the directors to order a 3000kw. turbine as well. The 5000kw. complete station will be a useful addition to the Thornhill plant in regard to both security and efficiency.

In addition to the other matters already mentioned in these pages as coming under the notice of the British Association at Birmingham, was a paper by Prof. J. T. Morris, M.I.E.E., of London, on "Domestic Electric Cooking and Heating—Results of One Year's Working." The author, after mentioning that it was demonstrated more than 20 years ago that electric cooking of food was possible and also very cleanly, said that before the average householder would adopt this method, he or she must be assured that the electric cooker was reliable, and that the Bill for energy used would not be too heavy. Thoroughly reliable makes are now available. Great strides in the construction of the cooker have been made during the last five years. In regard to the weekly consumption of energy, if a householder could get an idea of the number of units which would be used, then knowing the tariff for electric cooking in the district, he could form an approximate estimate as to the weekly cost of electric cooking in his case. Prof. Morris's object in the paper was to give particulars of a case where the daily consumption had been recorded throughout a period of one year. Experience had brought out clearly the following facts:—(1) That joints of meat and steak were cooked better by electricity than by other means, and that a shorter period of training was required. (2) The heavy work in the kitchen was largely reduced, owing to the fact that there was far less coal to be handled, and there was no kitchen range to be cleaned and polished every morning. (3) The certainty that if the same time was given for the same operation, exactly the same result would be produced. (4) The convenience and cleanliness and the avoidance of an unhealthily hot atmosphere in the kitchen. It had to be allowed that a difficulty was experienced in the supply of hot water in large quantities, where either the electric cooker or the ordinary gas cooker was used. Special arrangements were obtainable for this purpose, but Professor Morris said he had yet to be convinced that any of them could compete with coke or anthracite slow-combustion stoves, on the score of cost at least. The heating of the kitchen in cold weather was also a difficulty. The author believed that at any rate, as far as large blocks of flats were concerned, a central boiler kept permanently fired would be used for supplying hot water continuously to all of the flats in the block, so that it could be obtained as easily as cold water—indeed, this was already being done in places. The independent householder must have some arrangement for obtaining hot water.

In the case which formed the basis of his study, Prof. Morris said that a Jackson (Marylebone) electric cooker was used, having three hot plates, two for boiling and one of lower heat for simmering, one grill and a fair-sized oven (38in. high, 30in. wide, 24in. deep). He gave tabulated figures showing the units used when each of the hot-plates, etc., were in use individually for one hour, and the cost per hour at ½d. per unit. He also gave a table of the units used each day for five or six persons for a period of ten months. Neglecting exceptional cases, this quantity varied from 5 to 15 units, depending on the quantity of cooking required. The record consumption occurred on December 16th, and "was due to the Christmas pudding." The average daily consumption over the whole period was 9.75 units, which at ½d. per unit amounted to 4.87d. per day. The figures were obtained in a flat having six rooms, a kitchen, and a bathroom, and represented the consumption for a household of five persons. In one room a coal fire was used for part of the period, so the figures for heating were smaller than they would otherwise have been. There are no gas pipes in the flat. The maximum weekly consumption for heating was 129 units, and this was due to visitors. With reference to the lighting the maximum weekly consumption was 6.5 units, or 3¼d. per week. This amount was insignificant in comparison with the amount due to the annual charge, but it must be remembered that this annual charge covers all uses of electricity, though based on the maximum possible lighting load. The individual charges which go to make up the total expenditure for one complete year ended at July 26th, 1913, on cooking, heating and lighting, were given as under:—

| | | | |
|---|---|---|---|
| Annual "telephone" charge .. .. .. | £6 | 10 | 8 |
| Hire of cooker at 15s. per quarter .. | 3 | 0 | 0 |
| Cooking: 2934 units at ½d. .. .. .. .. | 6 | 2 | 3 |
| Heating: 2068 units at ½d. .. .. .. .. | 4 | 6 | 2 |
| Lighting: 200 units at ½d. .. .. .. .. | 0 | 8 | 4 |
| | £20 | 7 | 5 |

Including coke and wood, £4 11s., the total was £24 18s. 5d.

In comparing this method of heating and cooking with methods using coal, it must be borne in mind that a saving of from £25 to £30 had been made in the cost of domestic service; there was therefore on the above tariff a considerable gain made on the score of economy, cleanliness and independence. Experience gained with the electric cooker in question had suggested to the author the following directions in which improvements would be specially welcome:—

(1) At present a rather serious obstacle in the way of reheating dishes—a common every-day need in most households—is the relatively long time taken in bringing the oven to the working temperature, and consequently the disproportionately large expenditure of energy to effect a comparatively trifling result.

(2) The time taken to boil a pint of water, especially the first one in the morning when the cooker is quite cold, might be shortened with considerable advantage.

(3) Cooking utensils, however perfectly flat-bottomed they may be when first supplied, appear, with ordinary wear and tear, to soon lose this quality, so necessary for economy both in time and energy used.

Professor Morris said that these matters were receiving attention at the hands of some designers of electric cookers, for he was informed that the latest form of electric cooker, of which about a dozen were in use already, had the ovens arranged so that the direct radiation from the heater was not shielded in any way, with the result that the time taken for raising the oven to the working temperature had been reduced to about one-half of what it was in the older patterns. Further, in a week or two a red-hot plate would be put upon the market which would halve the time necessary for raising cold water up to the boiling point, would avoid the necessity for special utensils, and was robust, for cold water could be poured upon it with impunity.

The author concluded with a reference to popular and groundless misapprehensions on the part of the general public regarding electric cooking, and a brief statement of some of the general advantages such as cleanliness, safety, and so forth.

The discussion on the paper was brief, but among those who offered comment was Dr. J. A. Fleming, who said that from his observation it might generally be taken that one unit per day per person, with an additional unit or two for the cooker, was the average kitchen consumption.

## N.S.W. RAILWAYS.

At a reunion of permanent tramway employes at Botany last week, Mr. F. J. Page, M.L.A., quoted figures relative to the development of railways and tramways since 1901-2. In that year the mileage open for traffic was 3026, the capital cost of which was £40,565,073. The revenue derived in that year amounted to £3,668,686, which, with expenditure at £2,267,369, showed a surplus of £1,401,317, or a net return of 3.45 per cent. on the capital outlay. In 1911-12 the mileage had increased to 3832, the capital cost of which was £53,514,903, and the revenue totalled £6,491,473, which, with expenditure at £4,169,591, showed a surplus of £2,321,882, or a net return of 4.33 per cent. on the capital cost. In 1901-2 the passengers carried were 30,885,241, and in 1911-12 70,706,721. In the same years the respective figures for goods were 6,467,552 and 10,910,553 tons. In connection with tramways, the mileage had increased from 104 in 1901-2 to 195 in 1911-12, the capital cost correspondingly increasing from £2,829,363 to £5,664,324. In 1901-2 the revenue was £631,757, which, at an expenditure of £541,984, showed a surplus of £89,773, or a net return on capital of 3.17 per cent. In 1911-12 the revenue was £1,581,393, which, at an expenditure of £1,331,413, showed a surplus of £249,980, or a net return of 4.41 per cent. on capital cost. The passengers carried showed an increase from 108,135,111 in 1901-2 to 266,789,546 in 1911-12.

In no instance is the return on capital cost good, taking into consideration the monopolistic nature of the enterprises, although they are run on principles alleged to be for the public benefit. The principal factor against a good return being shown on capital outlay is the very high figure at which capital outlay stands. It will be observed that the average capital cost per mile in 1911-12 is only a fraction below £14,000, which may be assumed to include everything in the shape of way and works. There has obviously been much waste and extravagance during the entire period of railway evolution, and the figures are interesting inasmuch as they show that the return on capital cost is not adequate to pay interest, and are such as would class a private enterprise returning the same percentage as a comparative failure. Under private management responsible officials would have to look to their laurels, and would either have to reduce running costs, or increase receipts, in order to make a satisfactory showing. In the light of these figures, it is a debatable point whether the conduct of the State railways on the lines the elector has long been told is exclusively for his benefit, is correct or not. It is, however, patent that the whole question of adequate return on capital hinges on the working expenditure and efficiency, and since an increase in rates would be resented by the elector, the New South Wales railways, in order to show a better return on capital cost, must reduce working expenditure considerably before they can be regarded as a good business proposition.

## MISCELLANEOUS.

When in London at the beginning of the year, Mr. Scaddan, Premier of Western Australia, arranged for a power-house and plant for the Perth trams and lighting, and for the electrification of some of the railway sections. Four contracts have been let for a total of £188,521 with Babcock and Wilcox, Williams and Robinson and the British Westinghouse Co., and tenders have been called in London for three others, estimated at about £85,000. All works are to be completed by June, 1914. Last week an agreement was signed by the Premier and the Mayor of Perth respecting the lighting of the city. The engineer-in-chief, Mr. Thomson, now in England, is reporting on the railways electrification scheme.

* * *

Two more Victorian shire councils have decided upon electric lighting for their principal towns, viz., the Numurkah Shire, to light Nathalia, at an estimated cost of £4000; and the Waranga Shire, to light Rushworth. Messrs. McCarty, Underwood and Co., of 31 Queen-street, Melbourne, have been appointed to carry out the work in each instance.

* * *

Mr. J. D. Batty, electrical engineer to the Poowong and Jeetho Shire (V.), has reported to the council that the profit on the electric light scheme at Korumburra would allow of a fair amount being written off for depreciation for the financial year just ended.

* * *

The Warrnambool (V.) Town Council requires an engineer to succeed Mr. J. C. Ross, who resigned to take up a similar post at Hobart. The salary is to be £150, with commission on all loan works carried out by the engineer, and £100, with similar commission to be paid by the Waterworks' Trust.

* * *

The salary of the West Australian Commissioner of Railways, Mr. John T. Short, has been increased from £1500 to £2000.

* * *

A special meeting of the Northern Engineering Institute was held at Newcastle (N.S.W.) on October 11. Mr. J. L. C. Rae, President, was in the chair, and there was a fair attendance. The business of the evening was the discussion on Mr. D. N. Morison's paper on ''Typical Winding Engines,'' the following members taking part:—Messrs. F. A. Spence, A. W. Tournay-Hinde, W. Humble, H. J. Thomas, T. Hynde, H. J. Scarfe, A. Wilson and the President. Much valuable information was given during the discussion especially by Mr. W. Humble, who gave some very interesting information gathered by him during his recent visit to Europe. Mr. Morison replied to the various questions raised giving some additional information, and at the conclusion was accorded a hearty vote of thanks.

* * *

At a Senate meeting of the Sydney University last week the regulations governing the award of the Walter and Eliza Hall Fellowship were adopted. The object of the fellowship is to promote the interests of engineering science and practice in Australia by enabling distinguished graduates in engineering of the University of Sydney to obtain special experience abroad, and subsequently to return and give the advantage of their experience to the Engineering School of the University. The fellowship is of the annual value of £300, and is available for a maximum period of three years, the first two of which shall be spent abroad, and the third at the University of Sydney.

* * *

Mr. C. Evans, Commissioner for Railways (Q.), is a staunch advocate for decentralisation as making for economy in railway working and administration. Speaking last week on this matter, Mr. Evans said that the scheme which he had inaugurated upon his appointment to his present position had worked very satisfactorily. It had resulted in doing what it had been intended to do—to facilitate the handling of traffic and accelerate railway matters generally. He pointed out that immediately he had been appointed as Commissioner he had recommended the appointment of general traffic managers for each of the three divisions. Provision had also been made for maintenance engineers, and the locomotive branch had been rearranged. Mr. Evans is an opponent of the proposed scheme for the linking-up of the North Coast and South Coast railway systems by means of a bridge over the Brisbane River. In his opinion, such a scheme would only result in congestion of traffic.

* * *

The Premier of Queensland, Mr. Denham, announced last week that an agreement had been arrived at between the Government and the Brisbane Tramways Company regarding the construction of extensions that had been delayed for some months, and that Orders in Council will be issued to give the authority for the construction of the lines. Mr. Denham intends to table a Bill this session on lines submitted to him by local authorities, to facilitate the resumption of tramways by the local authorities. The Bill would be merely introduced, but not passed this session, thus giving time for the consideration of the question.

* * *

The National Sailors and Firemen's Union has unanimously decided to refuse service in any ocean-going cargo steamers, after May 1, 1914, unless they are properly equipped with wireless apparatus. This resolution was prompted by the terrible plight in which all on board the British emigrant steamer ''Volturno'' recently found themselves on the outbreak of fire, when all hands must have perished but for the assistance which came from various parts of the Atlantic in response to urgent wireless appeals. The human freight of the doomed vessel numbered 757, out of whom 521 were rescued. The vessel belonged to the Canadian Northern Steamships Ltd., and was built in 1906.

## FINANCIAL.

### STATE DEBTS AND THE COMMONWEALTH.

In the early years of the present century much misplaced attention was directed by members of Parliament and others to the question of the taking over of the State debts by the Federal Government. Indeed, even before the inauguration of the Commonwealth the economy which it was assumed would result from this, through a lowering of the rate of interest, was one of the leading arguments used in advocating the establishment of Federation. This expectation was entirely illusory. The one thing that could be said for it is that investors prefer one large stock—like British consols or French rentes—to the one hundred and twenty or so separate stocks into which Australian Government indebtedness is subdivided. A large stock is more readily and quickly saleable than a small one, however sound the latter may be. Holders who may have occasion to sell at short notice prefer a stock of that sort rather than one in which the sale of any considerable parcel could not be made without adversely affecting the market with consequent loss to themselves. There are, on the other hand, several weighty countervailing reasons unfavourable to a Commonwealth stock as compared with State stocks to which we will presently refer.

In the early years of Commonwealth history above mentioned, a vast amount of flatulent and exceedingly ignorant talk was indulged in on this subject. One of the distinguishing characteristics of the British Parliament, as contrasted with Australian legislatures, is that, in the former, members recognise that, unless they have something to say which really adds to the information or illumination of their fellow members, on the particular subject under discussion, they personally lose weight and reputation by joining in. But, on our side of the water, many members seem to think that the more they talk and the oftener they talk on every subject that comes up for discussion the more they will be thought of, at least by their own constituents. And, with the lack of mental training that many of them suffer from, they are wholly unable to compress the little they really have to say within any reasonable compass. This is one of the reasons—among many more important ones—why our Parliamentary institutions are falling into contempt, a contempt which will ultimately lead to very important, and perhaps not in all respects, advantageous, modifications in our system of government. On the particular subject under review hardly half a dozen—certainly not a dozen—members of the Federal legislature are competent to express, or even to form, opinions of any value. The financial outlook of the great majority has an exceedingly limited horizon. For the larger number of that majority it has been bounded for most of their lives by the thought of what next week's wages would be. Very numerous and, indeed, very important, as the class of manual workers must be in every community, and entitled, as they are, not only to just but sympathetic consideration, they are no more competent to efficiently do the political thinking of the community than the trained thinker on politics is competent to make bricks or hew coal with efficiency.

All schemes for ''taking over'' the State debts, in spite of numerous conferences of those early years, came to naught, and entirely failed to materialise in any practicable form, for the very good reason that they were impracticable. Members seemed possessed of the naive notion that Commonwealth stocks would be more attractive than State stocks, and that holders of the latter would rush to exchange their holdings into Commonwealth stocks. The futility of this expectation was pointed out in these columns at the time. The only asset, if it can be called an asset, that the Commonwealth has is its power of taxation. But the States have that also, and have, besides, many thousands of miles of railways, and eighteen hundred millions of unalienated Crown lands as well.

The whole subject remained in a moribund condition for several years, but has now reared its unattractive head again. Sir John Forrest, in his Budget speech delivered on the 2nd inst., stated that the Commonwealth Government proposed to introduce a Bill ''to take over the State debts as they mature, and to relieve the States of all liability in respect of such debts afterwards.'' Now this is a very remarkable proposition, and Sir John can either have given but little consideration to the matter, or has—for the time, it is to be supposed—omitted to give some explanations which the public are entitled to possess. Not a word is said as to what security the States are to give the Commonwealth. It is true that as to the interest, Sir John says that ''the interest and sinking fund will be provided from the surplus revenue paid to the States.'' This is a surprising statement. The surplus paid to the States last year was only a little over £6,000,000, while the interest paid by the States was over £10,000,000, and the proposed sinking fund of ½ per cent. or over £300,000,000 of State indebtedness is over £1,500,000 more. This seems rather a casual way of treating a very large and very important subject. Then, also, we know that the public indebtedness increases at a more rapid rate than the population increases, so that the wide gap between debitor and creditor indicated above would tend to increase rather than diminish.

With regard to the expectation that the Commonwealth will be able to borrow on more favourable terms than the States, we can but regard it as an entirely chimerical idea. With the exception of the favourable reason given early in this article, every consideration goes against it. There is the fact, as already mentioned, that the States possess all the assets, while the Commonwealth does not possess any. And, most unfortunately, the progress of the Commonwealth Government and Legislature in financial credit, and, one might almost say, in reputation for financial sanity, has been a markedly retrograde one. Many of the schemes involving large expenditure and the general gross extravagance of the Commonwealth legislation and administration, whatever incidental benefits may in some cases have resulted, have caused grave misgivings, not to say alarm, in the minds of those whose business it is to think and those whose business it is to lend. Above all, and worst of all, the party whose avowed intention is to transfer all wealth from the hands of those who have shown their capacity to accumulate it to the hands of those who have shown no such capacity, and, indeed, the very reverse of such capacity, is the most disquieting feature in forecasting the future.

There is good evidence that the States themselves have already in their financial credit suffered from the misdoings of the Commonwealth. The Australian State loans floated in 1900 at 3 per cent. fetched about the same prices as the 4 per cent. loans floated in 1913. Their three and a halfs were well above par in 1900, while their fours are below par in 1913. In 1900 their four per cents. ranged from 109 to 116. Since then there has been a fall of over 15 per cent. in the capital value of Australian State stocks. No doubt worldwide movements have accounted for the most of this fall, but we cannot acquit the Commonwealth Governments and Legislature, with their reckless and foolish finance, of freedom from the charge of having adversely affected the value of the States' securities by the malign influences which the Commonwealth has exercised. The States should have a care, and look well before they leap, lest they be dragged into the vortex beneath which the Commonwealth will sink unless wiser counsels prevail in the future.

# *Invited and Accepted Tenders*

**It is particularly requested that the information regarding contracts open, and the successful tenderers, be forwarded to The Editor not later than Monday of each week.**

The following contractions are used throughout:—S—supply; D—delivery; M—manufacture; C—construction; E—erection; P—purchase; I—installation; R—removal. **Where no contractions appear, supply and delivery is understood.** The date at the beginning of each paragraph refers to the closing of tenders.

## INVITED.

### Commonwealth.

**Specifications, tender-forms, etc., for tenders invited for the Postmaster-General's Department of the various States under this heading may be had as follows:—Victoria—Various State G.P.O.'s. New South Wales—Departmental Stores, Sydney, and various G.P.O.'s in other States. South Australia—Adelaide, Melbourne, Sydney and Brisbane G.P.O.'s. Western Australia—Departmental Stores, Perth, and various G.P.O.'s in other States. Queensland—Various State G.P.O.'s. All States—Various G.P.O.'s. If the specifications, etc., may be had elsewhere, in addition, the** places will be given in parentheses.

POSTMASTER-GENERAL'S DEPARTMENT, Melbourne.—5th November.—Galvanised iron piping, as per schedule No. 952.

11th November (extended from 4th November).—D. and E. of eight automatic telephone switch**boards at the Ascot, Canterbury, Malvern, Cheltenham, Footscray, Oakleigh, Sandringham, and Wil**liamstown Telephone Exchanges, as per schedule No. 953.

11th November.—S. and D. of motor tubes, covers and solid tyres, as per schedule No. 987.

11th November.—S. and D. of relays, jacks, lamps, etc., as per schedule No. 982.

12th November.—S. and D. of general stores for 2 years, as per schedule No. 913.

16th December.—S. and D. of one common bat**tery multiple switchboard at the Telephone Ex**change, Wills-street, Melbourne, as per schedule No. 968.

30th December.—S. and D. of telephone material, as per schedule No. 976.

POSTMASTER-GENERAL'S DEPARTMENT, Sydney.—5th November.—S. and D. of 100 tons **No. 4 steel wire, schedule No. 344.**

12th November.—S. and D. of motor accessories, as per schedule No. 341.

**12th November (extended from 8th Oc**tober).—S. and D. at the Telephone Exchange, Watson's Bay, Sydney, of 1 automatic switchboard, with all associated equipment as per **schedule No. 234.**

12th November (extended from 22nd October).—S. and D. of 3000 caps for supervisory lamp, **schedule No. 338.**

12th November (extended from 22nd October).—4500 cords, 3 steel conductors, schedule No. 328.

12th November (extended from 22nd October).—500 fuses, 3 ampere, schedule No. 338.

12th November (extended from 22nd October).—250 telephonometers, schedule No. 338.

12th November.—S. and D. of 380 cable boxes, as per schedule No. 342.

**12th November (extended from 22nd October).—S. and D. of 7 miles copper-clad steel wire, as per** schedule No. 335.

12th November.—S. and D. of 363 wooden ladders.

19th November.—S. and D. of 450 bells, magneto, as per schedule No. 333.

**18th March, 1914.—S., D. and E. at the Tele**phone Exchanges, Epping, Ryde, Hunter's Hill, Drummoyne, Wahroonga, Paddington and Waver**ley, Sydney, of seven (7) automatic switchboards, with associated equipment, as per schedule No. 179.**

POSTMASTER-GENERAL'S DEPARTMENT, **Brisbane.—13th November.—S. and D. of all ma**terial necessary to repair 28½ miles telegraph line, **as per stores schedule No. 456.**

**19th November.—Bronze wire, as per schedule** No. 273.

17th December.—S. and D. of insulators, as per **stores schedule No. 280.**

31st December.—S. and D. of insulators, as per **stores schedule No. 282.**

7th January, 1914.—S. and D. of switchboards, **as per schedule No. 274.**

7th January, 1914.—S. and D. of telephone instruments, as per stores schedules Nos. 275, 276 and 277.

7th January, 1914.—S. and D. of protectors, **parts, etc., as per schedule No. 278.**

POSTMASTER-GENERAL'S DEPARTMENT, Perth.—29th October.—S. and D. of C.I. pipes, **spigot and socket, and split bends, as per schedule** No. 309.

19th November.—S. and D. of rectangular dry cells.

10th December.—S. and D. of 60 tons wire (galvanised iron).

POSTMASTER-GENERAL'S DEPARTMENT, Adelaide.—12th November.—One lamp signalling **trunk line switchboard, of five sections, one cable** terminating section and one cable storing section, one two-position recording desk, and one chief opera**tor's desk,** as specified in specification No. 431, **etc., delivered at the Telephone Exchange, Ade**laide, as per schedule No. 296.

POSTMASTER-GENERAL'S DEPARTMENT, Hobart.—1st December.—S. and D. of dry cells, as per schedule No. T. 84.

DEPARTMENT OF HOME AFFAIRS.—Federal Territory.—27th October.—S. of circulating and exhaust pipes and bends, valves, flanges, etc., for Power Generating Station.

26th November (extended from 24th November).—Water supply pumping plant for Canberra.

DEPARTMENT OF HOME AFFAIRS.—Kalgoorlie Port Augusta Railway.—5th November.—M., S., D. and E. of 4 locomotive engines and tenders (N.S.W. "P" type); tender capacity, 4500 gallons of water, and approx. 7½ tons of coal.

5th November.—S. of 100,000 jarrah sleepers (9ft. x 10in. x 5in.).

18th November.—M., S. and D. of six-wheel brake vans, complete.

2nd December.—600 pairs of wheels and axles (9in. x 4½in. journals).

DEPARTMENT OF HOME AFFAIRS.—Quarantine Station, Sydney.—10th November.—S. of laundry equipment.

DEPARTMENT OF DEFENCE.—Small Arms Factory, Lithgow, N.S.W.—29th December.—P. of scrap steel, brass, jute bags, whale oil, etc.

12th January.—S. of iron and steel for manufacture of rifles.

### Victoria.

RAILWAY DEPARTMENT.—23rd October.—S. of rolled steel joists.

23rd October.—S. of steel window sashes.

23rd October.—S. of malthoid coating.

27th October.—S. of C.I. retention valves.

27th October.—S. of gunmetal flanged standpipe valve.

27th October.—Fireproof safe.

28th October.—S. of rail presses and benders.

29th October.—C. and S. of steel verandahs at Oakleigh.

29th October (extended from 8th October).—S. and D. of steel sheet piles for coffer dam. P.D., £10.

29th October.—S. and D. of 150 neutral track relays.

29th October.—S. and D. of 140 tons dog spikes.

5th November.—Copper rod.

5th November.—Locomotive seamless copper tubes.

5th November.—Best Yorkshire iron angle and tees.

5th November.—Best steel boiler plates.

5th November.—Copper plates.

5th November.—100 tons of good machinery cast-iron scrap.

5th November.—S. and D. of mild steel flat bars.

12th November.—Steel channel bars.

12th November.—20 tons steel ingots.

12th November.—Steel blooms, for crank pins.

12th November.—Locomotive boiler tubes.

12th November.—High-speed tool steel.

12th November.—Flame arc lamps.

12th November.—Insulated copper cable.

12th November.—M. and D. of one 60h.p. electric motor and accessories.

12th November.—M., S. and D. of mild steel girders for bridge over Boggy Creek.

19th November.—M., S. and D. or cast steel wheel centres for A2 engines and new truck stock.

19th November.—Brass locomotive tubes.

19th November.—150 tons pig iron.

19th November.—10 tons sulphate of copper, best quality, for electrical purposes, battery material.

26th November.—S. and D. of 1000 cast steel blooms for axles for electric motor bogies.

3rd December.—Steel blooms, for piston rods.

3rd December.—S. and D. of vulcanised rubber electric light wire.

10th December.—M., S. and D. of one 15-ton crane for Ballarat.

7th January (1914).—S. and D. 10,000 porous pots for batteries.

7th January.—S. and D. of best steel boiler plates.

7th January.—S. and D. copper rod.

7th January.—S. and D. copper plates.

7th January.—S. and D. of cast steel wheel centres.

7th January.—S. and D. of steel blooms for crank pins.

7th Jan.—S. and D. of locomotive brass boiler tubes.

7th January.—S. and D. of best Yorkshire iron angles.

7th January.—S. and D. of locomotive seamless copper tubes.

7th January.—S. and D. of steel channel bars.

14th January.—S. and D. of 5 Detroit lubricators.

14th January.—S. and D. of 100,000 lineal yards tarpaulin canvas.

14th January.—S. and D. of high speed twist drills.

14th January.—S. and D. of one concrete mixer.

21st January.—S. and D. of one high speed lathe.

28th January.—M., S., D. and E. of one three-phase alternator, complete, at Newport.

VICTORIAN RAILWAY COMMISSIONERS—STATE COAL MINE.—12th November (extended from 1st October).—S. of rope haulage engine and electrical equipment for McBride Tunnel.

DEPARTMENT OF PORTS AND HARBOURS.—24th October.—S. of machinery for shipyard, Williamstown.

PUBLIC WORKS DEPARTMENT.—23rd October.—Extension breakwater, Warrnambool.

STATE RIVERS AND WATER SUPPLY COMMISSION.—6th December.—M. and S. of one centrifugal pump and quick revolution steam engine about 800h.p. (See advertising columns.)

### States Invited.

### New South Wales.

PUBLIC WORKS DEPARTMENT.—27th October.—M. of steel bridge for Wilson River, Wauchope to Kempsey section, North Coast railway.

3rd November.—S., D. and E. of structural steel and ironwork, Registrar-General's Old Building.

8th December.—M., S. and D. of steel bridges for Cooperbung and Piper's Creeks, on fifth section, North Coast Railway, viz., Wauchope to Kempsey.

RAILWAY DEPARTMENT.—12th November.—S. of three 30-kilowatt motor generator.

26th November.—S. of one 2000 lb. storage battery freight truck.

**P. & O.** COMPANY'S ROYAL MAIL STEAMERS
FOR MARSEILLES, PLYMOUTH AND LONDON.

Leave Sydney on the subjoined dates, calling at usual ports.

FIRST AND SECOND SALOON ONLY.

| Steamer, | Tons. | Commander. | Noon. | Melb., 3 p.m. |
|---|---|---|---|---|
| MOLDAVIA | 10.000 | Gordon | Oct. 29 | Nov. 4 |
| MEDINA | 12,500 | Notley | Nov. 15 | Nov. 18 |
| MONGOLIA | 10,000 | Lewellin | Nov. 29 | Dec. 2 |

PASSAGE MONEY TO LONDON—
Single, £41 16s. to £82 10s.
Return, £69 6s. and £123 4s.

Return Tickets between Inter-State Ports are available for return by Orient, Messageries Maritimes, and N.D.L. steamers having room.

SPECIAL HOLIDAY RETURN TICKETS to COLOMBO are now issued, available for two months. Fares from Sydney, £45 2s. first saloon, and £31 18s. second saloon.

A. GORDON WESCHE, Superintendent IN AUSTRALIA, 63 Pitt-street, Sydney.

**The COLONIAL MUTUAL FIRE Insurance Company Limited.**

Principal Office: 60 MARKET-ST., MELBOURNE.

Branches in all the States.
Transacts Fire, Guarantee, Employers' Liability, Marine, Burglary, and Plate Glass, Accident, Workers' Compensation and Live Stock Insurances.
Send for Prospectus.
W. TUCKER, General Manager.

*Harringtons* LTD

**ANALYTICAL & METALLURGICAL DEPT.**

Highest prices given for all gold, silver or platinum residues, etc.
Lowest fees for all kinds of Assay, Analytical, and Metallurgical work.
Expert Advice on Ore Treatment, Bullion Refining, Smelting, etc., etc., Directed by a qualified Analyst from Messrs. Johnson and Sons, London: Assayers and Refiners to Bank of England, H.M. Mint, The Council of India, etc.

**HARRINGTONS LTD.**
**386 George Street, Sydney.**

**A.U.S.N. Co. Ltd.**

*Fast, Regular, and Comfortable Passenger Steamers*

(also carrying cargo) from and to

MELBOURNE, SYDNEY, ADELAIDE, FREMANTLE, BRISBANE, and all QUEENSLAND PORTS.

Passage Tickets interchangeable, with other Inter State Companies, on certain conditions.

Full Particulars at

**COMPANY'S OFFICES**

**at all principal Australian Ports.**

**The Mount Lyell Mining & Railway**

**CO. LIMITED.**

Purchasers of Ores containing Copper, Gold and Silver. Rates obtainable on application to the Secretary

Manufacturers of Coke for Smelting and Foundry Purposes, Acids, Etc.

HEAD OFFICE—

39 QUEEN-STREET, MELBOURNE.

D. G. LUMSDEN,
Secretary

**When wages go up cut expenses down!**

Dig deep into your power costs. See what that engine is costing you, and if another one would not do the work at less cost. Investigate the

**"ATLAS" DIESEL ENGINE.**

"Atlas" engines burn the very cheapest fuel, and this, combined with their high efficiency, keeps running expenses very low.

**THE CONSUMPTION OF FUEL IS EQUAL TO ABOUT 0.55 LBS. PER B.H.P. HOUR.**

Now, if your present engine burns more than this you are losing money. In many other ways "Atlas" Engines are superior. Let us tell you why. Put your Engineering problems up to us.

**STAWN LTD.,**

**Specialists in Mining Machinery and Tools,**

**343 KENT STREET, SYDNEY.**

METROPOLITAN BOARD OF WATER SUPPLY AND SEWERAGE (341 Pitt-street, Sydney). —3rd November.—M. and D. of 36in. and 30in. sluice valve, at Leichhardt Depot.

15th December.—M. and D. of one turbine centrifugal pumping plant for Crown-street Pumping Station.

## Western Australia.

GOVERNMENT TENDER BOARD.—30th October.—S. moulding machine cupolas and pneumatic hack saw bench for Railway Department.

20th November.—S. of copper firebox tube plates for Railway Department.

20th November.—1000 yards roofing canvas.

20th November.—200,000 yards tarpaulin canvas.

## Queensland.

TREASURY DEPARTMENT.—29th October.—C. and E. of central sugar mill at Babinda Creek, North Queensland.

PUBLIC WORKS DEPARTMENT.—7th November.—S. and D. of electric light material for hospital for insane, Goodna.

## South Australia.

RAILWAYS DEPARTMENT.—28th October. —C. of Decres Bay Railway.

28th October.—S. and D. of 12,000 gallons kerosene oil.

28th October.—S. and D. of 2000 Parabo springs.

4th November.—S. and D. 368 tons coloured or white cotton waste.

18th November.—S. and D. of 1137 bars of copper.

13th January.—C. of 12 bogie goods break vans, with passenger compartments. 3ft. 6in. gauge.

PUBLIC WORKS DEPARTMENT.—16th December.—S. and E. at Renmark of a complete pumping plant.

SUPPLY AND TENDER BOARD.—28th October.—S. and D. of 600 tons pig iron.

28th October.—S. and D. of 100 engine head lamps.

11th November.—S. and D. of 8 india-rubber hosepipes for Pintsch gas, 50ft. long x ⅝ diameter.

25th November.—S., D. and stacking 200 miles galvanised wire netting (100 miles 42 x 1½ x 18 g. and 100 miles 36 x 1½ x 18 g).

MINES DEPARTMENT.—29th November.—P. of mines, plant and machinery. (See advertising columns.)

## New Zealand.

RAILWAYS DEPARTMENT.—31st October.—S. and D. of stores for the period from April 1, 1914, to March 31, 1917.

PUBLIC WORKS DEPARTMENT.—17th November (extended from 31st October).—S. of telephone instruments and accessories for Lake Coleridge power scheme.

TASMANIA.

PUBLIC WORKS, WATERWORKS, SEWERAGE, AND TRAMWAYS DEPARTMENTS, Hobart (W. A. Brain, Town Clerk).—27th October.—S. for 1914 of blacksmiths' work and castings; ironmongery; Waterworks fittings; drain pipes, bricks, and Portland cement, etc.

## General.

PRAHRAN AND MALVERN TRAMWAYS TRUST.—M., S. and D. of points and crossings contract, No. 45.

SHIRE OF NUNAWADING (V.) (J. R. Kefford, Secretary, Box Hill).—25th October (extended from 18th October).—Electrical equipment.

MUNICIPAL COUNCIL OF SYDNEY.—27th October.—S. and D. of curve drawing ammeters.

THURSDAY ISLAND TOWN COUNCIL.—31st October.—S. of a suitable gas lighting plant for street, house, and cooking purposes.

CITY OF PRAHRAN (John Romanis, Town Clerk).—27th October.—P. of one 7ft. dia. mortar mill.

BRISBANE—THE METROPOLITAN WATER AND SEWERAGE BOARD (Albert-street).—11th November.—S. and D. of electric blue printing machine.

13th January, 1914.—M. and D. of material for aerial ropeway.

MACKAY HARBOUR BOARD (Q.) (H. F. McDonnell, Secretary).—29th October.—S. of Portland cement.

ELDERSLIE STATION, Winton, W. Q'land.—19th November.—Sinking and completion of an artesian bore, maximum depth 4500 feet.

CITY OF LAUNCESTON (T.) (C. W. Rocher, Town Clerk).—27th October.—S. of electrical fittings, incandescent lamps, wire and cable.

27th October.—Annual supplies for 1914.

24th November (extended from 13th October).—Section i., S. and D. of transformers, etc.; section ii., S. and D. of feeder cable, etc.; section iii., S., D. and E. of high tension switchboard, etc.

DOMINION PORTLAND CEMENT CO. LTD., Wellington (N.Z.).—Wairua Electric Power Scheme.—31st October.—Section 10, high-tension insulators for 22,000 volt service.

CHRISTCHURCH CITY COUNCIL (H. R. Smith, town clerk). 5th January, 1914.—S. and D. of series street lighting plant and accessories. Specifications may be seen Town Clerk's office, Melbourne.

CITY OF AUCKLAND (N.Z.) (Henry W. Wilson, Town Clerk).—For sale, three 250kw. direct compound steam generators and switch gear. (See advertising columns.)

GRANTON SAWMILLS AND TIMBER SEASONING LTD., Healesville (C. R. Ferguson, Director).—25th October.—C. of about 2½ miles tramway line.

HAMILTON ELECTRIC SUPPLY CO.—13th November.—P., as a going concern, plant, land, rights and business.

SHIRE OF BENALLA (V.) (J. A. Knop, Shire Secretary).—For sale, Muller's Patent Alpha gas-making machine. (See advertising columns.)

MELBOURNE HOSPITAL (B. A. Smith, M.C.E., 352 Collins-street, Melbourne.)—27th October, 1913.—Completion of boiler house and E. of steam and water piping, etc. (See advertising columns.)

FOR SALE BY TENDER.—Tailings heap. Jas. Paton, Main-street, Stawell. (See advertising columns.)

## ACCEPTED.

### Commonwealth.

POSTMASTER-GENERAL'S DEPARTMENT, Victoria.—Item 6, 50 miles wire, two-twisted conductors, £223 15s.; item 7, 5 miles wire, three-twisted conductors, £32 5s.—John C. Fuller and Son Limited.

Item 3, 2½ miles cable, paper insulated, lead covered, 104 pairs, 12½ lbs., conductors, not served, £907 10s.; item 4, 2½ miles cable, paper insulated, lead covered, 104 pairs, 12½ lbs., conductors, served, £945; item 6, 5 miles cable, paper insulated, lead covered, 39 pairs, 12½ lbs., conductors, served, £1055.—Callender's Cable and Construction Company Limited.

Item 9, 10 tons wire, twisted pair, outside distributing, £1450; item 10, 9 tons wire, tinned copper, rubber insulated, and braided, £1515; item 5, 15 miles cable, paper insulated, lead covered, 52 pairs, 12½ lbs., conductors, £3690; item 7, 15 miles cable, paper insulated, lead covered, 26 pairs, 12½ lbs. conductors, £2490.—W. T. Henley's Telegraph Works Company Limited.

Item 2.—20 miles cable, paper insulated, lead covered, 260 pairs, 12½ lbs. conductors, not served, £14,640.—Western Electric Company (Australia) Limited.

Item 12, 2 tons staples, lightning conductor, Clyntax, 1½in., £81; item 10, 10 cwt. solder, to be 50 per cent. lead and 50 per cent. tin.—Briscoe and Company Limited.

Item 1, 45,000 spindles, galvanised iron, swan neck, ½in., £656 5s.—Williams and Company.

POSTMASTER-GENERAL'S DEPARTMENT, Tasmania.—S. of 1 Fordyce motor car, £440.—Fordyce Motor Co. Ltd.

POSTMASTER-GENERAL'S DEPARTMENT, Queensland.—Installation of petrol air gas plant, St. George, £107 10s.—J. Bartram and Son.

Installation petrol air gas plant, Dalby, £89 15s. —Quirk's Lighting and Engineering Ltd.

DEPARTMENT HOME AFFAIRS.—Kalgoorlie-Port Augusta Railway.—50 forty-ton bogie wagons, £18,900.—Gray Bros.

933 tons 80-lb. dog spikes, Port Augusta, £15 11s. per ton; 933 tons 80-lb. dog spikes at Fremantle, £16 1s.; 134 tons 80-lb. fishbolts and nuts at Fremantle, £21 16s.; 49 tons 80-lb. fishbolts and nuts at Port Augusta, £21 6s.—G. and C. Hoskins Ltd.

DEPARTMENT OF DEFENCE.—S. of Stores for Commonwealth—S.A. Factory, Lithgow.

S. of abrasive materials, comprising dressers and grinding wheels, oil stones, files, etc.—Bevan and Edwards Pty. Ltd.

S. of high-speed steel small tools, comprising twist, taper shank, straight shank, and taper length drills; plain milling cutters; milling cutters with nickel teeth; face and side milling cutters; convex cutters; r. and l. hand corner rounding cutters; double corner rounding cutters; cutters grooving taps and reamers; cutters for twist drills; slot cutters; angular cutters; double angle cutters; cutters for spiral and end mills; pin reamers; metal slitting saws, etc.; carbon steel small tools, comprising screw slotting cutters; combination centre drills and counter sinks; centre drills; machine bits; taps, hand, machinists'; plug, taper and bottoming; United States or Whitworth standards; taper pins, etc.—Bevan and Edwards Propy. Ltd.

S. of engineers' tools, comprising backsaw blades, etc.—A Bevington and Sons.

Tiles, all shapes.—B. K. Morton Pty. Ltd.

Dunlop Mining Goods

Are now used with satisfaction in most of the Leading Mines of Australasia — Their QUALITY & WEAR are UNSURPASSED.

Tenders & Samples submitted
Correspondence invited
Send for Illustrated Catalogue

The DUNLOP RUBBER Co. of AUST. Ltd.
108 Flinders St. MELBOURNE
& ALL STATES

Dunlop Rubber Belting

Is more efficient than Leather belting for Outdoor & Wet Work.

Sample & Price on application

**"FIBRO-CEMENT" Fireproofing**

Everyone about to build should obtain full particulars of this cool, acid-proof, ant-proof and fire-resisting material. The slates for roofs and the sheets for walls and ceilings are specially suited for the Australian climate. Used by the Federal and State Governments and by all the leading Architects and Builders.

**ECONOMICAL AND EVERLASTING.**

Full particulars, etc., from Sole Agents and Importers—

**JAMES HARDIE & CO.** Melbourne & Sydney

Saws—Eagle and Globe Steel Co. Ltd.

Couplings, hangers, pulleys.—H. P. Gregory and Co.

S. of electric motors.—Noyes Bros.

Lorry rubber tyres.—Dunlop Rubber Co. of Australasia.

S. of tool steel.—Standard-Waygood Ltd.

S. of alloy steel.—Eagle and Globe Steel Co. Ltd.

S. of bright drawn or rolled steel, drill rod and shafting.—Eagle and Globe Steel Co. Ltd.

S. of 2000 plates, mild steel, 20½in. x 2in., sealed pattern, £3 10s. 10d. per 100.—A. G. Way.

### Victoria.

VICTORIAN RAILWAYS.—S. and D. of locomotive seamless copper tubes, items 1 to 13.—The Broughton Copper Co. Ltd.

M., S. and D. of cast-iron pipes for sprinkler installation at the Newport Workshops. Item No. 1, pipes, cast-iron, 8in. diameter (inside), at £10 per ton.—C. Monteath and Sons.

P. of a quantity of Pintsch gas material, £92.—Pintsch Patent Lighting Co.

P. of certain Westinghouse brake fittings, £792 15s.—Westinghouse Brake Co. of Australasia Ltd.

P. of a quantity of Westinghouse brake material, £9774 12s. 6d.—Westinghouse Brake Co. of Australasia Ltd.

P. of a quantity of coke, £549 19s. 6d.—Metropolitan Gas Co.

P. of a quantity of coke, £137 10s.—Williamstown Gas Co.

Purchase of 2 rail-bending machines, £64.—R. W. Cameron and Co.

STATE RIVERS AND WATER SUPPLY COMMISSION.—S. and D. of cast-iron pipes and fittings for Werribee town water supply (contract No. 1209), £1766 15s. 11d.—C. Monteath and Sons.

S. of cast-iron pipes and fittings for Bendigo water supply (contract No. 1213), £1127 12s.—J. Danks and Son. Pty. Ltd.

### Western Australia.

WATER SUPPLY DEPARTMENT.—S. of meter spares.—G. Kent and Co. Ltd.

S. of cast-iron pipes, £762 10s.—Monteath Bros.

S. of ball hydrants, £82 10s.—J. Tyler and Sons Ltd.

RAILWAY DEPARTMENT.—S. of brass boiler tubes, £677.—W. Adams and Co. Ltd.

### General.

SHIRE OF NUNAWADING (G. B. Lincolne-J. K. MacDougall, engineers)—Contract C.—Wood poles, £488 10s.—S. R. Groom.

Aluminium cable, £1420 6s. 3d.—British Insulated and Helsby Cables Ltd.

MAFFRA WATERWORKS TRUST (B. A. Smith, engineer).—S. and E. of pumps, suction and delivery pipes, and floating arms, £1273.—Geo. W. Kelly and Lewis.

S. of C.I. pipes and fittings, £1919 3s.—Joseph Nixon and Sons.

S. of G.I. pipes and fittings, £287 8s. 10d.—Stewarts and Lloyds.

KAMPONG, KAMUNTAY TIN DREDGING LTD.—S. and D. and E. of 2 bucket dredges and machinery, complete, £40,000.—Chas. Rüwolt Pty. Ltd., Melbourne.

## MIXED MEMS.

Another mineral block on the Hampton Boulder line of lode, held in the name of Charles McKye, at Hampton Plains (W.A.), some twenty five miles from Kalgoorlie, has been successfully floated in Adelaide under the name of the Adelaide Hampton Boulder Gold Mine, N.L., and the shares have been over subscribed. According to the reports of Messrs. Speakman and Nichols, the lode outcrops for a considerable distance and with a width of fully 200ft., giving good gold results wherever it has been tested. Mr. Nichols states that loose gold can be obtained all over the outcrop, and that it is, in his opinion, the biggest gold lode ever discovered in West Australia. The estimated cost of mining and crushing from an open cut at 10s. per ton should leave a handsome profit if the work now being undertaken by the company's manager substantiates their expectations. Mr. J. L. Andrews, of Adelaide, is the secretary.

The half-yearly report of the Royal Bank of Australia appears on another page, showing a net profit for the half-year of £22,637, making, with the amount brought forward, a total of £28,096 available for allocation. £12,000 will go to pay a dividend at the rate of 8 per cent. per annum, £10,000 will be added to the reserve fund, bringing it to £200,000, and the balance of £6096 will be carried forward. The balance-sheet shows paid-up capital £200,000, reserve fund £190,000, and £28,096 to credit of profit and loss account. Deposits amount to £2,121,254, of which £1,370,423 bear interest, and £750,830 are on current account. The assets include coin, bullion, and Australian notes and cash at bankers' amount to £588,993, liabilities of other banks to £14,792, bills, etc., in transit to £429,658, Government, municipal and other stocks to £73,669, bills discounted and other advances to £1,522,921. There are contingent liabilities amounting to £633,926.

The balance-sheet of the Colonial Bank of Australasia Ltd. for the half-year ended 30th September last appears in our advertising columns. The net profit for the half-year amounts to £29,110. A dividend at the rate of 7 per cent. per annum is being paid on both preference and ordinary shares; £10,000 is being placed to the reserve fund, making £20,000 for the year, and raising that fund to £210,000, and the sum of £6630 is being carried forward to next half-year. The bank, as usual, shows great strength in coin, bullion and liquid assets, the total amounting to £1,425,690. This is almost sufficient to cover the non-interest bearing deposits and notes in circulation. Shareholders are to be congratulated on the strong position the bank shows and the continued prosperity of the institution.

One of the most terrible colliery disasters ever recorded in Great Britain occurred last week at the Universal colliery, Senghenydd, near Cardiff. The first news to reach Australia was telegraphed from London at 12.5 p.m. on the 14th inst., the explosion having occurred at 8 o'clock that morning. Two hours earlier 935 men had gone into the pit, including one who had been a steward on the ill-fated emigrant ship "Volturno," which was burnt at sea two or three days previously. The explosion was exceedingly violent, and was of course accompanied by immense clouds of dust and smoke. By the evening 489 men had been rescued and 22 bodies recovered. But the mine was on fire, and the best efforts of the gallant army of rescuers had little effect in opening a way to the entombed men; only after a week's strenuous work was there a hope that success was within measurable distance, though all hope of rescuing any more men alive had been abandoned. There was a previous explosion at the Universal mine in 1901, but on that occasion only 81 perished. The highest mortality in a British coal-mine explosion was 388, which was in connection with the Oaks mine, Hoyle Mill, Yorkshire, in 1866, but three years ago, at the Hulton colliery, Lancashire, 344 men lost their lives.

The Invincible Colliery Limited has been registered in New South Wales, with a capital of £125,000, in £1 shares, to take over a company of the same name at Cullen Bullen. Directors, R. R. Murdock, A. Howard Smith, and W. P. Minell. Office, Sydney. W. P. Minell is appointed liquidator of the old company.

The Budget speech of Mr. Scaddan, Premier of Western Australia, stated that the revenue for 1912-13 was £4,596,658, and the expenditure £4,787,063. The deficit for the year was £190,405, making the accumulated deficit £311,515. The estimated revenue for 1913-14 was £5,393,024, and the expenditure £5,528,230, making a deficit for the year of £135,206, and an accumulated deficit on June 30th, 1914, of £446,721.

During September the Mt. Bischoff Tin Mining Co., Waratah (T.), shipped 100 tons of tin oxide, and 20,806 tons of crude ore were treated by the milling and concentration plant for same period. All the faces are producing average-grade ore.

After an absence in England for three years as High Commissioner for the Commonwealth, Sir George Reid, K.C., arrived in Melbourne by the R.M.S. "Otranto" last Monday, accompanied by Mr. Glynn, the Minister of External Affairs, who met him at Adelaide. Sir George is, of course, accompanied by his family. On reaching Melbourne the High Commissioner was met by the Prime Minister, Mr. Cook. At noon he was accorded a civic reception at the Town Hall by the Lord Mayor, Councillor D. V. Hennessy, members of both Federal and State Parliaments being present. Sir George will spend three weeks in Melbourne and three in Sydney. At the farewell entertainment at the Trocadero on September 8th, given by the Institute of Journalists, Mr. Robert Donald, the president, who occupied the chair, said that Sir George Reid had in three years become one of the most popular men in England. "He is the man who imported a number of bright, fresh jokes," added the chairman. "He had used them well, and we expect that one result of his visit to the Commonwealth will be to bring back several more. He is not unmindful of the uses of advertisements. He came to us, in fact, to advertise Australia—and he has done it. His greatest achievement, however, was that he discovered Australia to the British people. Before Sir George's arrival in this country we knew of Victoria and New South Wales, and of the keen rivalry existing between the two States; we had tasted the fruits of Tasmania, and had heard of Queensland, South Australia, and Western Australia. Our guest, however, came as the spokesman of a united Commonwealth. He has been a most successful commercial traveller, having visited all the important parts of the country."

In a judgment of the West Australian Full Court, recently delivered, it was declared that no bank in that State, with the exception of the Western Australian Bank, was bound by any Act of Parliament. A private members Bill has just been introduced in the State's Legislative Council, and passed its second reading last week, to place the banks in Western Australia on the same basis as in other States, requiring them to furnish weekly statements of liabilities and assets, and to record their charters with the registrar of companies. The measure will now be considered by a select committee of the Council.

Messrs. Crosby, Lockwood and Son, London, have fulfilled a long-felt want in publishing "A Pocket Glossary of English-German, German-English Technical Terms for Engineers and Manufacturers." The glossary has been compiled by Joseph G. Homer, A.M.I. Mech. E., author of a "Dictionary of Mechanical Engineering Terms." The translations into German have been done by Otto Holtzmann. This very handy little book is sold by Melville and Mullen Pty. Ltd., at 3s. 6d.

GREENFINCH PROPRIETARY G.M.
No Liability.

The Sixth Ordinary General MEETING of Shareholders of the above-named Company will be held at the registered offices, 43-46 Royal Exchange, Adelaide, on Thursday, October 30, 1913, at 2.15 o'clock in the afternoon. Business.—To receive directors' report and balance-sheet to Sept. 30, 1913; to transact any other ordinary business. By order of the Board. Adelaide, October 14, 1913.
288,303 J. L. ANDREWS, Secretary.

ENGINES (2), Ransomes, Sims, and Jefferies, 7h.p., 4½ x 8, 100 lb. steam pressure, 260 r.p.m., absolutely new; will sacrifice to clear. Warburton, Franki (Melb.) Ltd., 380-2 Bourke-street.

IN THE SUPREME COURT
OF NEW SOUTH WALES No. 4945A/1913.
IN EQUITY.

IN THE MATTER of The Companies Act 1899
AND IN THE MATTER of CONRAD MINES LIMITED.

NOTICE TO CREDITORS.

By direction of the Acting Master in Equity, the Creditors of the above-named Company are required on or before the Twelfth day of November, 1913, to prove their debts or claims by filing affidavits verifying same at the Office of the Master-in-Equity, Chancery Square, Sydney, or, in default thereof, they will be excluded from the benefit of any distribution made before such debts or claims are proved.

Forms for proving may be obtained from the undersigned.

C. F. W. LLOYD, Official Liquidator.

Denman Chambers, 182 Phillip-street, Sydney, 13th October, 1913.

FOR SALE BY TENDER.

Tailings Heap, in Stawell, containing 200,000 tons of sand and slime. Good water supply. For further particulars apply—
JAMES PATON,
Main-street, Stawell.

TENDERS are invited for the Purchase of Working on Royalty of D. B. Morison's "Improvements in or relating to the method of and apparatus for Condensing Steam and Heating Liquid," covered by Commonwealth Letters Patent No. 814, of 4th April, 1911. The inventor will dispose of the whole or part interest in the patent, or will grant licences to work the same to fulfil the full requirements of the public. Address:—Care PHILLIPS, ORMONDE and CO., Patent Attorneys and Consulting Engineers, 17 Queen-st., Melb.

Y-WATER (EMMAVILLE) TIN CO.
No Liability.

NOTICE is hereby given that a DIVIDEND (21st) of One shilling per share on all the issued shares in the capital of the Company has been declared, due and PAYABLE at the registered office of the Company, No. 360-6 Collins-street, Melbourne, on Wednesday, the 5th day of November, 1913.

Dividend warrants will be posted direct to shareholders.

Transfer Books and Share Register will be Closed from Wednesday, the 29th day of October, until Monday, the 3rd day of November, 1913 (both days inclusive).

By order of the Board,
H. L. SHACKELL, Acting Manager.
Melbourne, 21st October, 1913.

# THE COLONIAL BANK OF AUSTRALASIA LIMITED.

## THE FORTY-FIRST REPORT OF THE DIRECTORS OF THE COLONIAL BANK OF AUSTRALASIA LIMITED.

To be Presented to the Shareholders at the Forty-First Ordinary General Meeting, to be held at the Bank, 126 Elizabeth-street, at Noon, on Tuesday, 28th October, 1913.

### REPORT.

The Directors beg to submit to the Shareholders their Forty-First Report, with a Balance-sheet and Statement of Profit and Loss for the Half-year ended 30th September, 1913, duly audited.

| | |
|---|---|
| After providing for Expenses of Management, Interest Accrued on Deposits, Rebate on Bills Current, Tax on Note Circulation, and making provision for Bad and Doubtful Debts, the net profit amounted to | £29,110 3 6 |
| Brought forward from 31st March, 1913 | 3,894 6 8 |
| | £33,004 10 2 |
| Which the Directors propose to apportion as follows, viz.:— | |
| Dividend at the rate of 7 per cent. per annum on Preference Shares | £10,641 10 9 |
| Dividend at the rate of 7 per cent. per annum on Ordinary Shares | 4,733 5 6 |
| To Reserve Fund (making it £210,000) | 10,000 0 0 |
| To Officers' Provident Fund | 1,000 0 0 |
| Balance carried forward | 6,629 13 11 |
| | £33,004 10 2 |

During the half-year the Honourable Agar Wynne resigned his position as a Director of the Bank upon taking Office as a Member of the Commonwealth Government. The Directors have to express their great appreciation of the valuable services rendered to the Bank by Mr. Wynne during the time he acted as a member of the Board. Under the powers contained in the Articles of Association, the Directors have appointed Mr. Alexander Dyce Murphy to fill up the vacancy.

The Dividend will be payable at the Head Office on and after the 29th October, and at the branches on receipt of advice.

The Forty-First Ordinary General Meeting of Shareholders will be held at the Head Office of the Company, 126 Elizabeth-street, Melbourne, on Tuesday, the 28th day of October, 1913, at noon.

By order of the Board,
SELBY PAXTON, General Manager.

Melbourne, 14th October, 1913.

### BALANCE SHEET OF THE COLONIAL BANK OF AUSTRALASIA LIMITED

For the Half-year ending 30th September, 1913. (Including London Office to 30th August, 1913.)

| Dr. | | |
|---|---|---|
| To Capital Paid up, viz.:— | | |
| 31,184 Preference Shares paid in cash to £3/15 - per share | £304,044 0 0 | |
| 77,278 Ordinary Shares paid in cash to £1/15/- per share | 135,236 10 0 | |
| | £439,280 10 0 | |
| Reserve Fund | 210,000 0 0 | |
| Profit and Loss | 23,004 10 2 | |
| | | £672,285 0 2 |
| Notes in Circulation | | 20,891 0 0 |
| Bills in Circulation | | 302,026 16 10 |
| Balances due to other Banks | | 629 10 11 |
| Government Deposits— | | |
| Not bearing interest, £33,459/5/11; bearing interest, £371,094/3/8 | £404,553 9 7 | |
| Other Deposits, Rebate and Interest accrued— | | |
| Not bearing interest, £1,411,982/16/8; bearing interest, £1,922,504/8/- | 3,334,487 4 8 | |
| | | 3,739,040 14 3 |
| | | £4,734,873 2 2 |
| Contingent Liabilities, as per contra | £194,480 10 6 | |

| | | Cr. |
|---|---|---|
| By Coin, Bullion, Australian Notes and Cash at Bankers, £681,428/9/11; Money at Call in London, £15,000 | £696,428 9 11 | |
| British Consols, £70,668/15/2, at £74 per cent., £52,294/17/7, Victoria Government Stock and Debentures, Metropolitan Board of Works and Municipal Debentures, £55,928/0/4 | 108,222 17 11 | |
| Bills and remittances in transitu and in London | 603,123 17 4 | |
| Notes and Bills of other Banks | 1,067 0 0 | |
| Balances due from other Banks | 15,377 6 8 | |
| Stamps | 1,470 6 4 | |
| | | £1,425,689 18 2 |
| Real Estate, consisting of— | | |
| Bank Premises | | 124,037 12 2 |
| Other Real Estate | | 8,769 13 0 |
| Bills Discounted and Other Advances, exclusive of provision for Bad or Doubtful Debts | | 3,106,375 18 10 |
| | | £4,734,873 2 2 |
| Liabilities of Customers and others in respect of Contingent Liabilities, as per contra | £194,480 10 6 | |

### PROFIT AND LOSS ACCOUNT.

| | |
|---|---|
| To Current Expenses (including Salaries, Rents, Repairs, Stationery, Note Tax, etc.) | £39,223 5 8 |
| Transfer to Reserve Fund | 10,000 0 0 |
| Balance | 23,004 10 2 |
| | £72,227 15 10 |

| | |
|---|---|
| By Balance brought forward | £3,894 6 8 |
| Gross Profits for the Half-year, after allowing for Interest Accrued on Deposits, Rebate on Bills Current, and making provision for Bad and Doubtful Debts | 68,333 9 2 |
| | £72,227 15 10 |

### RESERVE FUND ACCOUNT.

| | |
|---|---|
| To Balance | £210,000 0 0 |
| | £210,000 0 0 |

| | |
|---|---|
| By Balance brought forward | £200,000 0 0 |
| Transfer from Profit and Loss | 10,000 0 0 |
| | £210,000 0 0 |

The customary Auditors' Report and Directors' Statement to comply with the Companies' Act 1896 appear in the Official Report.

---

# THE ROYAL BANK OF AUSTRALIA LIMITED.

Head Office: MELBOURNE, VICTORIA.

## FIFTY-FIRST REPORT.

Presented to the Shareholders at the Ordinary General Meeting, on **29th** October, 1913.

The Directors have pleasure in submitting to shareholders the annexed balance-sheet and statement of accounts for the half-year ending 30th September, duly audited and certified.

| | |
|---|---|
| The net profits (including £5459/2/9 brought from last half-year) amount to | £28,096 4 3 |
| Which it is proposed to deal with as follows, viz.:— | |
| To pay a dividend at the rate of 8 per cent. per annum | £12,000 0 0 |
| Transfer to the reserve fund (making it £200,000) | 10,000 0 0 |
| And to carry forward the balance | 6,096 4 3 |
| | £28,096 4 3 |

During the half-year a Branch has been opened at Geelong, where the Directors are encouraged to hope a good business may be built up.

By order of the Board,
H. T. WILSON, General Manager.

### BALANCE-SHEET OF THE ROYAL BANK OF AUSTRALIA LIMITED.

For the Half-year Ending 30th September, 1913.

| Dr. CAPITAL AND LIABILITIES. | | |
|---|---|---|
| To Capital Authorised— | | |
| 600,000 shares, of £4 each | £2,400,000 0 0 | |
| Capital Subscribed— | | |
| 300,000 shares, of £4 each | £1,200,000 0 0 | |
| Capital paid up | £300,000 0 0 | |
| Reserve fund | 190,000 0 0 | |
| Profit and loss account | 28,096 4 3 | |
| | | £518,096 4 3 |
| Notes in circulation | | 1,174 0 0 |
| Bills in circulation | | 98,082 12 4 |
| Government Deposits— | | |
| Not bearing interest | £32,084 7 8 | |
| Bearing interest | 427,438 0 9 | |
| | | 459,522 8 5 |
| Other deposits—Rebate and interest accrued— | | |
| Not bearing interest | 718,745 19 5 | |
| Bearing interest | 942,985 9 10 | |
| | | 1,661,731 9 3 |
| Balances due to other banks | | 4,964 0 7 |
| | | £2,743,570 14 10 |
| Contingent liabilities, as per contra | | 633,926 0 0 |
| | | £3,377,496 14 10 |

| ASSETS. | | Cr. |
|---|---|---|
| By Coin, bullion, Australian notes and cash at bankers | £538,993 11 11 | |
| Money at call and short notice | 50,000 0 0 | |
| Notes and bills of other banks | 521 13 1 | |
| Balances due from other banks | 14,270 1 5 | |
| Bills and remittances in transit, and payable in London | 429,657 12 10 | |
| Government, municipal and other public stocks, debentures and funds | 73,669 0 0 | |
| Stamps | 624 10 7 | |
| | | £1,157,736 9 10 |
| Real estate, consisting of— | | |
| Bank premises | | 60,000 0 0 |
| Bills discounted and other advances, exclusive of provision for bad and doubtful debts | | 1,522,921 5 0 |
| Bank furniture, fittings, stationery, etc. | | 2,913 0 0 |
| | | £2,743,570 14 10 |
| Liabilities and securities of customers and others in respect of contingent liabilities, as per contra | | 633,926 0 0 |
| | | £3,377,496 14 10 |

### PROFIT AND LOSS ACCOUNT.

| | |
|---|---|
| To salaries, rent income and land taxes and other charges | £13,281 11 6 |
| Balance | 28,096 4 3 |
| | £41,377 15 9 |

| | | |
|---|---|---|
| By balance at 31st March, 1913 | | £27,459 2 9 |
| Less dividend declared 30th April, 1913 | £12,000 0 0 | |
| Transfer to reserve fund | 10,000 0 0 | |
| | | 22,000 0 0 |
| Balance carried down | | 5,459 2 9 |
| Profits for the half-year, after deducting interest accrued on deposits and rebate on bills current, less reserves for bad and doubtful debts | | 35,918 13 0 |
| | | £41,377 15 9 |

### RESERVE FUND ACCOUNT.

| | |
|---|---|
| To Balance | £190,000 0 0 |
| | £190,000 0 0 |

| | |
|---|---|
| By Balance at 31st March, 1913 | £180,000 0 0 |
| Transfer from profit and loss account | 10,000 0 0 |
| | £190,000 0 0 |

The customary Auditors' Report and Directors' Statement to comply with the Companies' Act 1896 appear in the Official Report.

## Commonwealth of Australia.

Department of Home Affairs,
Melbourne, October 16, 1913.

### KALGOORLIE TO PORT AUGUSTA RAILWAY.

### TENDERS FOR BRAKE VANS (6-Wheel), COMPLETE, and BRAKE VAN UNDERFRAMES (6-Wheel).

TENDERS, addressed to the Secretary, Department of Home Affairs, Melbourne, will be received up to 11 a.m. on Tuesday, November 18, 1913, for the Manufacture in Australia, Supply and Delivery of:—

Brake Vans (6-wheel), complete, and Brake Van Underframes (6-wheel).

Specifications, plans, etc., will be on view on and after October 21, 1913, at the following offices:—Commonwealth Railways, 84 William-street, Melbourne; Commonwealth Works Director, Customs House, Sydney; and Commonwealth Works Registrars, Brisbane, Adelaide, Perth and Hobart.

The charge for each copy of specification will be £1 1s., and for each plan 5s., which must be paid before the document can be issued.

Tenders are to be endorsed, "Tenders for Brake Vans and Brake Van Underframes," and are to be accompanied by the deposit mentioned in the form of tender.

JOSEPH COOK,
Minister of State for Home Affairs.

---

Department of Defence,
Melbourne, October 14, 1913.

### MILITARY FORCES OF THE COMMONWEALTH.

TENDERS will be received by the Superintendent of Contracts, Department of Defence, St. Kilda road, Melbourne, until three o'clock p.m. on the days and for the supplies shown hereunder.

Tender forms and all particulars may be obtained at the office of the Senior Ordnance Officer, Ordnance Stores, Victoria Barracks, Melbourne.

The lowest or any tender will not necessarily be accepted.

On MONDAY, JANUARY 12, 1914.—Iron and Steel, for the use of the Commonwealth Small Arms Factory, Lithgow, N.S.W., for the Manufacture of Rods (Iron, wrought, British standard specification, No. 51, grade "A," rolled black; wrought B.S.S., No. 51, grade "B," bright rolled or drawn. Steel, black cast, black mild, mild, black rolled cast, bright cold drawn mild, crucible or Siemens-Martin, bright cold-rolled cast, and bright cold-rolled mild).

E. D. MILLEN,
Minister of State for Defence.

## Government Notices (N.S.W.).

Department of Public Works,
Sydney, October 20, 1913.

### TENDERS FOR MACHINERY, ETC.

Tenders, specified below, will be received at this Department until 2 o'clock p.m., on the dates mentioned:—

MONDAY, NOVEMBER 3, 1913.

Supply, etc., of Structural Steel and Ironwork, Registrar General's Old Building. (Fresh tenders.)

MONDAY, DECEMBER 8, 1913.

Manufacture, etc., of Steel Bridges for Cooperbung and Piper's Creeks, on 5th Section, North Coast Railway.

Further particulars may be obtained from N.S.W. "Government Gazette."

(6a101) ARTHUR GRIFFITH.

---

### METROPOLITAN BOARD OF WATER SUPPLY AND SEWERAGE.

TENDERS for the works specified below will be received up to 2 p.m. on the dates mentioned. For particulars see Government Gazette.

NOVEMBER 3, 1913.

Manufacture and Delivery of 36in. and 30in. Sluice Valve, at Leichhardt Depot.

DECEMBER 15, 1913.

Manufacture and Delivery of One Turbine Centrifugal Pumping Plant, for Crown-street Pumping Station.

WILLIAM HOLMES,
Secretary.

341 Pitt-street,
Sydney, October 10, 1913 (6145)

## Government Notices (V.).

### STATE RIVERS AND WATER SUPPLY COMMISSION.

### PUMPING MACHINERY.

TENDERS, addressed to the Secretary, and endorsed "Tender for Merbein Pumping Plant," will be received until noon of Saturday, December 6, 1913, for the Manufacture and Supply of a Centrifugal Pump and Quick Revolution Steam Engine (of about 800h.p.), with Condenser, etc. Alternatively, tenders may be for:—

(a) The plant all of Australian manufacture.
(b) The same plant, with all parts except the engine of Australian manufacture, and an imported engine of British manufacture.

Copies of specification and forms of tender may be obtained at the offices of the Commission, Treasury Gardens, Melbourne, price 5/- per set. Preliminary deposit, £100.

M. NALLY,
14/10/13. Secretary.

---

### VICTORIAN RAILWAYS COMMISSIONERS.

### STATE COAL MINE.

### MINE ELECTRICIAN.

APPLICATIONS are invited for the position of Mine Electrician. Applicants must be thoroughly conversant with electrical power as applied to mining, and must have a good practical and theoretical knowledge of high tension and low tension three phase work and of direct current work. Applicants must also have a sound knowledge of steam engineering with special reference to high speed engines, turbines and condensing plants. The qualifying certificates for engine drivers in Victoria are essential. Salary, £6 per week. Applications, stating age accompanied by copies only of testimonials, and addressed to the General Manager, State Coal Mines, Wonthaggi, will be received up till noon of Wednesday, November 12.

GEO. H. BROOME.
General Manager, State Coal Mine.

## PAYNE'S FIND DEVELOPMENT Co. No Liability.

The Fourth Ordinary General MEETING of Shareholders of the above-named Company will be held at the registered offices, 43-46 Royal Exchange, Adelaide, on Thursday, October 30, 1913, at 3 o'clock in the afternoon. Business: To receive directors' report and balance sheet to Sept. 30, 1913; to transact any other ordinary business. By order of the Board. Adelaide, October 14, 1913.

288,303 J. L. ANDREWS, Secretary.

## GREAT ZEEHAN DUNDAS SILVER LEAD M. Co. No Liability.

A Special MEETING of shareholders of above-named Company will be held at the office of the Company, 7 Block Arcade (2nd floor), Collins-st., Melbourne, on Friday, October 24, 1913, at 4.30 p.m. To receive and deal with recommendations of directors for future operations. By order of the Board. F. A. TAYLOR, Manager.

## EDNA MAY GOLD MINING CO. N.L.,

Weston, Western Australia.

A Special MEETING of Shareholders will be held in the board room, Broken Hill Chambers, 31 Queen-street, Melbourne, on Friday, October 24, 1913, at 2 p.m. Business:—To consider an option of purchase of two mining leases at Weston; to confirm the minutes of the meeting.

FRED TRICKS, Manager.
31 Queen-st., Melb., Oct. 20, 1913.

## GREAT COBAR LIMITED, COBAR.

### COBAR, COBAR GOLD AND CHESNEY MINES.

Competent MACHINE MINERS WANTED.—Average earnings of contract parties last three months:—Stoping, per shift, 15s.; Development, per shift, 20s. 1d.

Good board and lodging can be obtained within few minutes' walk of mines at 20s. per week. House rents average about 10s. weekly; bread, 3d. 2 lb. loaf; meat, lowest rates in New South Wales, supplied from company's bakery and butchery.

Ample water supply, good school, good dry, healthy climate.

Apply:—GREAT COBAR LIMITED,
Cobar, New South Wales.

## Government Notice (S.A.).

Department of Mines,
Adelaide, South Australia,
October 14, 1913.

### PARAMATTA AND YELTA MINES—PLANT AND MACHINERY—SITUATED AT MOONTA, SOUTH AUSTRALIA.

TENDERS are invited, up to Saturday, November 29, 1913, for the Purchase of the Mines, Plant and Machinery, under either of the following heads:

1. The Mines, together with all the plant and Machinery.
2. All the Plant and Machinery.
3. Any Portion or Portions of the Plant and Machinery.

Further information is obtainable from the Secretary to the Minister of Mines, who will forward catalogues on application.

Neither the highest nor any tender necessarily accepted.

RICHARD BUTLER,
Minister of Mines.

## SHIRE OF BENALLA.

FOR SALE, Cheap, one large Muller's Patent Alpha Gas-making Machine, formerly used for lighting the Shire Hall, Benalla, with gasolene; inspection invited.

Particulars on application.

J. A. KNOX, Shire Secretary.

## CITY OF AUCKLAND.

### ELECTRICITY DEPARTMENT.

### FOR SALE.

Three 250kw. Direct Coupled Steam Generators with Switchgear.

Specifications may be obtained on application to the City Electrical Engineer, Railway Wharf, Auckland, New Zealand.

Offers, endorsed "Tenders for Old Plant," must be addressed to the Town Clerk, Town Hall, Auckland, New Zealand.

HENRY W. WILSON,
September 16, 1913. Town Clerk.

## WANTED.

Horizontal Engine, 18in. Cylinder by 30in. Stroke, with Right-hand Flywheel. Compact. Trunk Engine preferred.

Box 387, G.P.O., Adelaide.

## A SURE AND CERTAIN LAND INVESTMENT.

For mining and city men, mariners, civil servants and sons desirous of investing or establishing agricultural revenue earning homes, who can buy now and expend an amount per annum for improvement through us, as managers for absentee owners, will do well to consult us re Flinders Island, where we can show 10 to 50 acres lucerne paddocks, also splendid sheep, clover, dairy and root crop land. Guarantee your expenses back if we cannot verify our statements. How can you go wrong at the prices—30/- to £3 per acre for new settlement land? Within easy and cheap access to Melbourne and Sydney markets. Conveniences: 5 piers, good steamer, school, doctor, wireless telegraphy, hotel, stores, council, marvellous mild climate, sure rainfall, scenery equal to Sydney Harbour. Write for booklet, Flinders Island Land Settlement Bureau. H. J. HOLLOWAY & CO., 339 Collins-street, Melbourne. 'Phone 8091.

## MELBOURNE HOSPITAL.

TENDERS are invited, returnable to the Secretary at noon, on Monday, 27th inst.:—(1) For the Completion of the Boiler House; (2) for Erection of Steam and Water Piping, etc. Quantities for boiler house by Mr. Arthur Anderson. For plans and specifications, apply to B. A. SMITH, M.C.E., 352 Collins-street.

## THE CARPATHIA TIN MINING CO. No Liability.

NOTICE is hereby given that the directors have this day resolved that a dividend (the 3rd) of One Shilling (1/-) per share be declared on all the shares issued in the Company, payable at the Company's office, No. 109 Pitt-street, Sydney, on and after Friday, October 31, 1913. The transfer books of the Company will be closed from 21st to 31st October, 1913, both days inclusive.

By order of the Board,
R. VERNON SADDINGTON, Secretary.
Sydney, October 14, 1913.

## TECHNICAL EDUCATION (V.).

### The New Scholarships.

The following statement respecting the proposals of the Victorian Government for the promotion of technical education was made last Thursday by Mr. Watt, the Premier and Treasurer, in his Budget speech:—"The success of the Latrobe-street Junior Technical School justified the establishment of similar schools at the Swinburne Technical School, and at Ballarat, Bendigo, Geelong, and Collingwood. There are now in operation six of these junior technical schools, and the experiment so far has proved very satisfactory. During 1912-13 three new technical schools were opened. In each case substantial encouragement was given to the Department by contributions in cash, buildings, and land. At Beechworth a building was bought and transferred to the Education Department by the municipal council. At Collingwood buildings and land were transferred to the Department by the Collingwood city council. At Sunshine five acres of land and a contribution of £2000 were given by Mr. H. V. McKay. Regulations have been prepared for a considerable extension of the scholarship system, involving an ultimate increase in expenditure of between £15,000 and £16,000. Up to the present the holders of scholarships have mainly taken up courses of study in secondary schools, which lead them through the University to the learned professions. Under the proposed scheme provision is made, not only for scholarships of the type hitherto existing, but for scholarships and bursaries advancing boys to junior and higher technical schools. In future every branch of State education will be taken into account, and prizes offered in connection with each class of school established under the provisions of the Education Act of 1910. A proportionate number of scholarships will be awarded to pupils of registered primary schools. All winners of scholarships leading to secondary education will be allowed a choice of attending either a district high school or an approved registered secondary school. Another important alteration provides that a number of the highest prizes, which carry students forward to full courses in higher technical schools and the University, will be open for general competition, and not confined, as formerly, to the holders of junior scholarships. Naturally this important proposal will involve the preparation of new courses of study, and the fixing of corresponding standards and conditions of examination. It would not be practicable nor fair to inaugurate it within the two months which will elapse between now and the close of the school year. The proposal, however, provides for the extension of one type of scholarship already in existence, and, as pupils have during the year been following the necessary course, it is proposed to give effect to this portion of the scheme forthwith. This means that instead of 50 scholarships being available next December there will be 100, and that their value will be increased from £8 to £12. As regards the other new features in the proposal, regulations will be issued shortly, so that the pupils of all schools (both those under the Education Department and registered schools) will have a full year in which to prepare themselves."

That the conditions on which scholarships are to be awarded are still lacking, either in clearness or in acceptability, was made plain at a meeting of secondary teachers held last Friday evening, when Professor H. B. Allen, of the Melbourne University, said that the new system of scholarships would be much more elaborate than the great scheme of exhibitions and bursaries established by the New South Wales Government in connection with Sydney University. It was clear that the Government proposed that the higher scholarships which were open to the public schools and other Departmental schools would be awarded to public competition, so that a fair intellectual standard would be assured. It would be interesting to learn, Professor Allen added, whether the scholarships would be awarded without regard to the need for financial assistance, for on this point differences of opinion would certainly arise.

Mr. L. A. Adamson, head master of Wesley College, said that an important point in the proposals was that there would be exhibitions open for competition to those who had never held Government scholarships, and the system by which the travelling allowances and also board allowances were given in cases of necessity was a better one than the system of bursaries given according to the means of the parents. It appeared that the bursaries proposed, although open to all schools, would be tenable only at higher elementary schools. If that was so, it was a weak spot in the scheme. He could see no reason why the bursaries should not be tenable at any school, just as the scholarships were. Further, he considered that the exhibitions open to non-holders of scholarships should be awarded quite irrespective of the financial position of the parents.

Professor Allen added that the question of scholarships was to him wrapped up a good deal in the question of a free University. They did not want a free University, but they wanted free access to the University to all who were of sufficient intellectual power to reap the benefit of its training. If, then, the Government elected to provide exhibitions that would carry students, male and female, to the University, those who had no funds should have first claim. The one great object should be the removal of the financial barrier.

## BANK CLEARINGS.

The report of the Melbourne Clearing House for the week ended 13th October was:—

| | | |
|---|---|---|
| Total clearance .. .. .. .. .. .. .. .. | | £5,608,761 |
| Balances— | | |
| Settled by certificates .. | £438,000 | |
| Settled in coin .. .. .. .. | 148,111 | |
| | | £586,111 |
| Total clearance for the corresponding week, 1912 .. .. .. .. .. .. .. .. | | £5,749,271 |

The report of the Melbourne Clearing House for the week ended October 20 was:—

| | | |
|---|---|---|
| Total clearance .. .. .. .. .. .. .. .. .. | | £5,131,381 |
| Balances— | | |
| Settled by certificates .. .. .. | £495,000 | |
| Settled in coin .. .. .. | 125,223 | |
| | | 620,223 |
| Total clearance for the corresponding week, 1912 .. .. .. .. .. .. .. | | 5,083,264 |

## DIVIDENDS.

The following dividends and bonuses of mining companies in Australia have been declared, and are payable on the dates noted:—

October.

23rd.—Golden Pyke Q.M. Co., Bendigo (V.), 1s., £1400.

23rd.—Great Southern G.M. Co., Rutherglen (V.), 6d., £900.

23rd.—Spring Gully Dredging Co., Fryer's Creek (V.), 1s., £1200.

23rd.—Ajax Central G.M. Co., Daylesford (V.), 2s., £3000.

23rd.—Wandiligong G.D. Co., Bright (V.), 1s., £300.

27th.—Excelsior Bucket Dredging Co., Freeburgh (V.), 1s., £300.

28th.—Harrietville Star B.D. Co., Harrietville (V.), 1s., £250.

29th.—Ivanhoe Gold Corporation, Kalgoorlie (W.A.), 3s. 6d., £35,000

30th.—Cathcart Central G.M. Co., Ararat (V.), 2s., £5000.

30th.—Blair Athol Coal Co., Rockhampton (N.Q.), 6d., £1250.

30th.—Llanberris No. 1 Company, Ballarat (V.). 6d., £600.

30th.—Renison Bell P. and M. Co. (T.), 6d., £1000.

31st.—Carpathia Tin Mining Co., Ardlethan (N.S.W.), 1s., £6000.

31st. Seaham Colliery, Newcastle (N.S.W.), at rate of 5 per cent.

November.

3rd. — Bullfinch Proprietary (W.A.), 1s., £23,800.

12th.—Amalgamated Zinc (De Bavay's) Ltd., Broken Hill (N.S.W.), 1s., £25,000.

Mr. R. H. Rhodes, the Postmaster-General of New Zealand, in the course of a statement recently prepared showing the progress made by his Department, has the following on the telephone branch:—"The automatic telephone system at Auckland," said Mr. Rhodes, "is being extended by the addition of an equipment for 800 connections, and at Wellington by the addition of accommodation for 500 connections. These are to serve until the installation of the Western Electric Company's plant, for which a tender was accepted two months ago. It is expected that within 12 months a large number of the subscribers will have been provided with automatic telephones at the six centres, for which the contract for the automatic system has been let. The demand for telephone connections continues to be very heavy. During the quarter ended June 30 there were in the Dominion 1892 new connections. Active operations are being carried on in several places in laying the telephone wires underground. So soon as the necessary instruments are to hand the convenience of slot telephones will be more largely extended. At the present time there are in use 50 such telephones, while the erection of 28 additional telephones has been authorised."

That wireless telegraphy will ultimately displace the submarine cable for general commercial use has long been prognosticated, and one of those who quite believe in the triumph of wireless is Mr. S. Swinburne, an English expert, who, on the recommendation of the Admiralty, has been appointed by the Commonwealth Government to inquire into the working of the Australian wireless scheme. Mr. Swinburne arrived in Melbourne by the mail steamer last Monday, but when at Fremantle (W.A.) he made reference to the "All Red" line of wireless stations which has been decided upon, and the contract for which provides for a minimum range of 2300 miles under ordinary weather conditions, while the cost of each high-power station will be about £60,000. When asked whether this was likely to bring about a reduction in cable rates, Mr. Swinburne declined to express an opinion. But he added: "There is very little doubt that it will eventually supplant the cables. You see the cost of installation is so small as compared with the huge outlay involved in the laying down of a cable. When it is completed it will be possible to send a message right round the empire in a few minutes. Wireless, too, has an advantage over cables in that it is possible to send in any direction, while the cable message has to follow one narrow gauge."

**CARL WERNER & CO.,** OPHTHALMIC —OPTICIANS—

The Finest Illustrated Catalogue of Scientific Instruments in Australia mailed on request—comprising

THEODOLITES, LEVELS, LEVELLING STAVES, BRUNTON'S AND VERSCHOYLE TRANSITS, ETC., ETC.

All the Requirements for the Drawing Office in Stock.

336 COLLINS STREET - - MELBOURNE.

250 H.P. Turbine.
Showing Wheel and Guide Vanes.

**G. Weymouth Pty. Ltd.**

Electrical Engineers,

Neptune-street, RICHMOND, VIC.

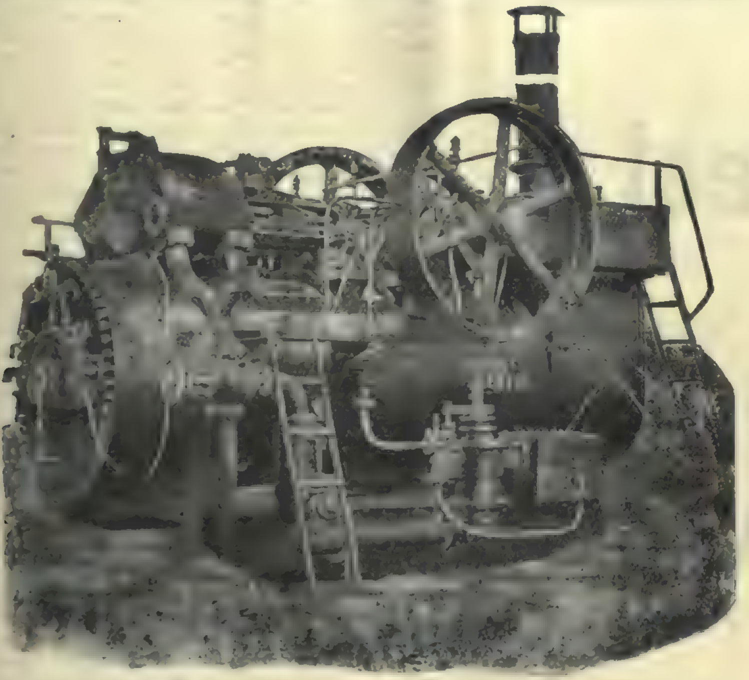
Telephones:—
Office, 2651 Windsor.
Works: 2507 Central.

Manufacturers of all Classes of Electrical Machinery, Turbines, Pumps for Irrigation and Mining, Underground and Surface Mining Locos., Winches, Haulage and Winding Plants, Motors, Generators, etc.

Estimates submitted.

Correspondence invited.

**GARRETT'S**



**This is the Patent Superheated Steam Engine that will settle your Power - - - problem !**

You want to get power economically. You want to be sure of having it when you want it. You want to get it without continual fuss and bother.

For those reasons you should instal Garrett's compound condensing superheated steam engine. It is sound in principle and construction. The material is dependable, and behind it is the seventy years' experience of the famous British makers—Garrett's, of Leiston, England.

The production from this British factory is so great that the first cost of the Garrett is considerably less than you would expect. Concentration and systematisation enable the makers to supply engines at a low margin of profit. The Garrett works are almost a town in themselves—with ideal conditions and homes for the workers. These things tell in the production of good work.

Will you write our expert for details? The engines are supplied in single units up to 500h.p., and we have all information ready to supply immediately. It costs nothing to make the enquiry, and your own judgment will decide the value of the Garrett Superheated.

**We also specialise in High Grade, Fast Tools for Machine Shops and Woodworkers. Easy terms can be arranged if desired.**

**T. M. GOODALL & COY. LTD.,**
*(Universal Machinery Merchants)*,
303-5 KENT STREET, SYDNEY.

**The Metal Market,**

SOME PRESS OPINIONS.

The whole publication affords a convenient means of obtaining quickly a comprehensive view of the world's trade in the chief metals.—Mining and Scientific Press (U.S.A.).

. . . distinctly interesting, as it narrates in a concise form the various factors that have influenced prices during the period covered.—Financial News (London).

. . . admirably compiled by Mr. W. E. Figgis, and embraces a large amount of information that will be of great assistance to mining men generally.—Sydney Morning Herald.

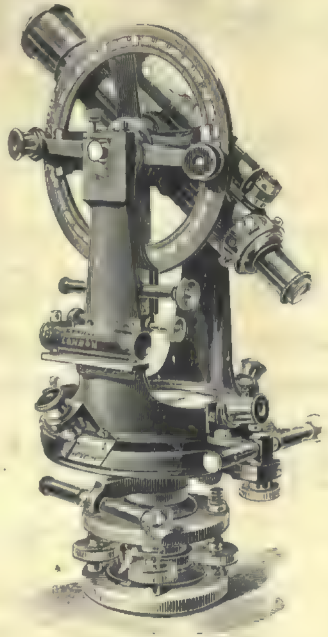
The two charts accompanying the work are about 3ft. x 2ft. in size, and give very clearly an outline of the market positions. —Queensland Government Mining Journal.

. . . the charts are of much interest, and to those for whose use they were designed they must prove of much practical value.—Newcastle Morning Herald.

The charts should hang in every broker's office for the information of their clients.—Mining Standard.

**PAST AND PRESENT METAL MARKETS**
**15/-, posted 16/3, foreign 16/5.**
**Mining Standard, Melbourne and Sydney.**

TRADE **STANLEY** MARK



*Stanley's Theodolite, with circular compass.*

Largest Manufacturers of Surveying and Drawing Instruments in the World

PLEASE SEND FOR OUR K.28 CATALOGUE —POSTAGE FREE— AND COMPARE OUR PRICES WITH THOSE OF OTHER FIRST-CLASS MAKERS.

**W. F. STANLEY & CO.,**
—LIMITED—
286 HIGH HOLBORN, LONDON, ENGLAND.
Agents:—Fairfax and Roberts, Sydney.
Wm. Watson and Sons, Melbourne. Sawtells, Adelaide.

"Allen's"

IMPERIAL

Manganese Steel

FOR

Dredging Pins and Bushes, and all Wearing Parts of
Rock-Crushing Machinery, Points, Crossings, Etc.

SOLE MAKERS OF

THE "STAG" TUBE MILL

For Grinding Grit, or Tailings, and Granular Materials,
to any degree of Fineness.

THE "STAG" BRAND OCTAGON MINING DRILL STEEL

EDGAR ALLEN & CO., LTD.,
Imperial Steel Works, SHEFFIELD.

Stocks on Hand
of
Mining and High Class Tool Steels.

AUSTRALIAN REPRESENTATIVES:
P. T. Taylor Ltd., 141 York Street, Sydney.

## NORTHERN TERRITORY TIN.

The Minister of External Affairs received recently from the Administrator of the Northern Territory, Dr. Gilruth, a 2-cwt. sample of tin ore taken from a claim owned and worked, for only five or six weeks, by Messrs. Sharber and Richardson, at Maranboy, for which £12 was paid as representing approximately the value of the tin contents, which, on the basis of the average price of spot tin in London during the first half of this year (£219), would indicate about 54.8 per cent. of metal. The sample was accompanied by a communication on the new field from Mr. H. J. Jensen, the Director of Mines in the Territory, from which the following extract is taken:—

"The distance between the main camp, which is the southern extremity of the field, and Teece and Elliot's camp is six miles in a N.N.E. direction. Another mile brings us to the edge of the granite, which is probably tin-bearing, and through which payable tin is likely to be found for many miles. The width of the belt ranges from two to four miles, so that the area of tin-bearing country exposed in this vicinity approximates to 20 square miles without considering its probable extension into the granite. The field is likely to be larger than we can at present indicate, inasmuch as payable tin—if a battery were near—was found by O'Shea brothers, of Pine Creek, at the head of the Roper Creek, some years ago, and probably similar tin country exists along the border of the same granites for a long distance. Unfortunately, the tableland sandstones, which we might conveniently call the Arnheim Land series, and which I am inclined to consider of carboniferous age, cover this border zone between the granites and the metamorphic rock in many places.

"The new tinfield is about 110 miles from the Pine Creek terminus by road. It is about 50 miles from the Katherine, and lies almost on the direct line joining the Katherine with Bitter Springs, to which place it is contemplated to extend the railway. In any case, it will not be more than 10 miles from the Katherine-Bitter Springs extension, if this extension be taken the shortest road.

"The discovery is a new one, no other mines having been worked in the district. The nearest mine is the Great Carpentaria Copper Mines at Dorothy Creek, a branch of Maude Creek. The new field was discovered by Messrs. Richardson and Sharber, well-known Northern Territory prospectors, in June last. They were followed to the field by Messrs. Blinmann and Martin, Teece and Elliot, Hunt and Harry Elliot, Smith, Ross, and a few others, all of whom had good claims containing rich pockets of bagging ore in large lodes of battery stone at the time of my visit. No development work has been done, efforts having been directed at getting out as much ore as possible to send away. In the brief period of five or six weeks, after commencing actual work, Messrs. Richardson, Sharber, Blinmann, Martin, and Harry Elliot raised and bagged 12 tons of ore averaging nearly 50 per cent. of concentrates. Up to my passing through Horseshoe Creek, 5 7-8 tons had been treated at the battery for 2 tons 13 cwt. 28 lb. of 70 per cent. concentrates. If a battery is promised, the men on the field are prepared to get out and stack battery ore and do development work. There are now about 15 men on the field, each with a good claim, and about five or six other men on the way out, but a large rush may be expected as soon as a battery is promised."

Mr. Jensen advises the erection of a Government battery on the field, or in some central position, where it might benefit other fields also.

GREAT COBAR LIMITED,
COBAR, N.S.W.

MINE OWNERS, SMELTERS, COLLIERY PROPRIETORS, PURCHASERS
OF COPPER ORES AND MATTES.

VACANCIES FOR COMPETENT MACHINE MINERS.

SYDNEY: Australasia Chambers, Martin Place, And at Lithgow and Singleton. LONDON: 65 New Broad Street, E.C.

PUBLISHERS' ANNOUNCEMENTS.

## Critchley Parker Publications

**Past and Present Metal Markets.** W. E. Figgis. Book and 2 Charts, 15/-. Posted, 16/3; foreign, 16/5.

**Coalfields and Collieries of Australia.** F. Danvers Power. 440 pages, 229 illustrations, demy octavo. 25/- nett. Posted, 25/3; foreign, 26/8. (Size, 9 x 6.)

**High Explosives.** W. R. Quinan. 224 pages, royal octavo, 21/-. Posted, 21/3; foreign, 22/4. (Size, 10 x 7.)

**Power.**
*(Issued under authority Sydney Municipal Council.)*
2/6 nett; post free.

**Australian Mining and Metallurgy.** Donald Clark. 600 pages, royal octavo. 21/- nett. Posted, 21/4; foreign, 22/9. (Size 10 x 7.)

**Gold Refining.** Donald Clark. 134 pages (plates), demy octavo. 12/6 nett. Posted, 12/7; foreign, 13/1. (Size, 9 x 6.)

**West Australian Mining Industry.**
*(By authority W.A. Government.)*
250 pages, crown folio. 10/- nett. Posted, 10/2: foreign, 10/8. (Size, 14½ x 10.)

**New South Wales Mines and Minerals.** 250 pages, crown quarto. 5/- nett. Posted, 5/1; foreign, 5/7. (Size, 10 x 7½.)

**Victoria, and its Mining Resources.**
*(By authority Victorian Government.)*
84 pages, crown quarto. 3/- nett; post free.

**Mining and Railway Map of Australia.** (In preparation.) Cloth, 21/-.

**Ventilation of Mines.** Johann Sarvaas. 60 pages. 2/7 post free.

**Australasian Joint Stock Coy's Year Book.** R. L. Nash (Financial Editor, "Daily Telegraph," Sydney). 500 pages, demy octavo, 10/6 nett. Posted, 10/8; foreign, 11/9. (Size, 9 x 6.)

**Australian Mining Standard, Engineering and Electrical Record.** Issued every Thursday 26/- per annum. British possessions, 32/6; foreign, 34/8; post free.

Size stated in inches.

Order through your Bookseller, or

***AUSTRALIAN MINING STANDARD,***

**Sydney: 12-14 O'Connell-street.**
**Melbourne: 376 Flinders Lane.**
**London:** Hill Publishing Co., 6 Bouverie St., Fleet St.

*Also published by us, but now out of print.*

**Tasmania and its Mineral Wealth.**
*(By authority Tasmanian Government.)*

**Metallurgy of Tin.** P. J. Thibault. Demy octavo. 12/6.

**Resourceful Queensland.**
*(By authority Queensland Government.)*

**New South Wales Mines and Minerals.**

---

ESTABLISHED 1860.

## BONDHOLDERS' REGISTER

Publishes the Actual Numbers of all Drawn Bonds Throughout the World.

PUBLISHED FORTNIGHTLY.

**10s. PER ANNUM.**

73 FARRINGTON ST., LONDON, E.C.

Australian Offices,
376 FLINDERS LANE, MELBOURNE.

---

## Cole's Book Arcade

Melbourne
Sydney
Adelaide

—BOOKS Advertised—
—by Everybody are—
—SOLD AT COLE'S—

Send for **COLE'S BOOK BUYERS' GUIDE** or Catalogues on your Special Subject.

**MINE MANAGER'S** Book-keeping Manual and Office Companion, by Edwin R. Field. 3/6, postage 1d.

**ROUTLEDGE'S EVERYMAN'S CYCLOPAEDIA,** 50,000 items of literary, historical and useful knowledge. Cole's Price: 2/6, postage 4d.

**HEALTH, STRENGTH and HAPPINESS,** a Book of Practical Advice for Men and Women, by Dr. Saleeby. Cloth 3/6, paper 2/-, postage 3d.

**LIFE AND EVOLUTION,** by F. W. Headley, with 100 illustrations. Now 5/-, postage 4d.

**THE MAN FARTHEST DOWN,** a record of Observation and Study in Europe, by Booker Washington. Cole's Price: 3/6, postage 3d.

**BACKBLOCK BALLADS** and Other Verses, by Den (C. J. Dennis) from the "Bulletin" and other live papers. Paper 1/6, cloth 2/6.

**E. W. COLE, Book Arcade, Melbourne, Etc.**

---

## BALLARAT School of Mines

**DEPARTMENTS:**

CHEMISTRY and METALLURGY,
ENGINEERING and SURVEYING
ELECTRICAL ENGINEERING,
GEOLOGY and MINING
MATHEMATICS and PHYSICS

Prospectus on Application.
F. J. MARTELL, Director.

---

## SIAM OFFERS

A splendid new field for Australian Business Enterprise.

## SIAM WANTS

Mining and Agricultural Machinery, Seeds, Hides, Tallow, Meats, Jams, Butter, Cheese, Potatoes, General Manufactures, also Horses, Cattle and Sheep.

**The Siam Observer (Daily),**
**The Siam Maitri**
**The Siam Weekly Mail** | **(Weeklies.)**

Siam's Leading Newspapers, which, with

**The Siam Directory**

are published at the Siam Observer Offices, Bangkok, will put you in touch with this market.

Rates and Particulars from
***GORDON & GOTCH.***

---

A miner's inch is a measure of flow of water, and is a quantity of water that will flow in one minute through an opening one inch square in a plank two inches thick under a head of 6½ inches to the centre of the orifice. This is equivalent, approximately, to 1.53 cubic feet, or 11½ gallons per minute.

---

PROFESSIONAL CARDS.

**GERALD AHERN, A.O.S.M.,**
MANAGER COMET MINE,
DUNDAS, TASMANIA.
Mines Sampled and Reported On.

Tele. Address—Gerald Ahern, Zeehan, Tasmania.

---

**G. H. BLAKEMORE,**
CONSULTING METALLURGIST
For Copper and Lead.
MINING ENGINEER,
CASTLEREAGH CHAMBERS, 10 CASTLEREAGH ST
Telegraph Codes: Bedford McNeill 1908 Edition
Moreing & Neal.
A.B.C. 5th Edition.
Cable Address. Radgarn. Telephone 7124 City

---

**MATTHEW C. COATES, A.M.I.E.E.**
CONSULTING MECHANICAL and ELECTRICAL ENGINEER. Expert Reports given for Power Generating Plants, Factory Installations, Steam, Gas and Electric.
99 QUEEN-STREET, MELBOURNE.

---

**VALENTINE J. CROWLEY,**
CONSULTING ELECTRICAL ENGINEER.
Hydro-Electric Plants and Transmission Lines Designed and Supervised.
Austral Chambers, Telephone 7736.
97-99 QUEEN STREET, MELBOURNE.

---

**GOYDER & HALLETT,**
ASSAYERS AND ANALYSTS.
110 Gawler Place, Adelaide.
Telephone 169.
Metallurgical and Chemical Processes Investigated.
Ores Sampled and Assayed.

---

**T. J. GREENWAY, M.I.M.M., F.I.C.**
MINING AND METALLURGICAL ENGINEER.
60 QUEEN STREET, MELBOURNE.

---

**KAY, MACNICOL & CO.,**
Mechanical, Mining & Electrical Engineers.
BROKEN HILL CHAMBERS.
31 QUEEN STREET, MELBOURNE.
Cable Address: "Engineer," Melbourne.
Telephone, No. 4883.

---

**McCARTY, UNDERWOOD & CO.,**

CONSULTING ELECTRICAL AND MECHANICAL ENGINEERS,

31 QUEEN STREET, MELBOURNE

Telephone, 7096

---

**J. D. AUDLEY SMITH,**
MINING ENGINEER,
9 Bridge-street, Sydney
Telegraphic Address—
Audley Smith,
Mining Engineer,
Sydney
Telephone No.—
City 2677.

---

**WALTER F. SMITH,**
MANAGER FLOATER G.M.
Ravensthorpe, W.A.
Mines Sampled, Valued, and Reported on.
ASSAYS MADE.
Code: Bedford McNeil.
Reliable Information Furnished on the Phillips River Gold and Copper Field.

---

**E. A. WEINBERG,**
MINING AND METALLURGICAL ENGINEER,
19 QUEEN STREET, MELBOURNE.

---

**FRANKLIN WHITE,**
MINING ENGINEER,
CITY MUTUAL CHAMBERS,
62 HUNTER ST., SYDNEY.
G.P.O., Box 1498.
Code: Broomhall Imperial Combination.

# DALGETY & COMPANY Ltd.

**BUYERS AND EXPORTERS OF**

# ORES

HIGHEST VALUES GIVEN.

BEST ATTENTION ASSURED.

LEAD, COPPER, SILVER, GOLD, Etc., Etc.

Ore Sampling.

**Offices and Laboratory; 15-17 Bent St., SYDNEY.**

Purchases of ORES are made by the Company.

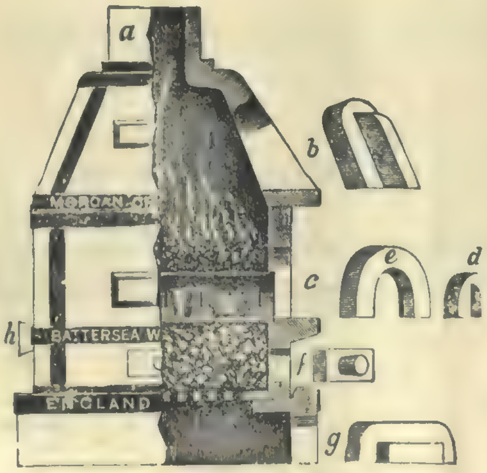
SYDNEY Weights and Assays final.

Check Assays by Sellers and Buyers.

Liberal allowance made on ORES destined for sale on consignment in Europe, when owners prefer this mode of realisation.

Check Weights determined by weighings made on two independent weighbridges.

# ASSAYING AND ANALYTICAL APPARATUS.

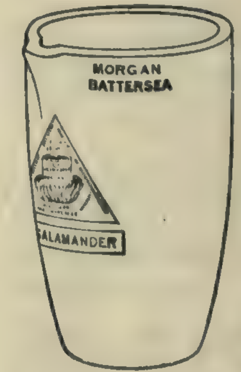


A large assortment of Assay Furnaces, Muffles, Crucibles, Roasting Dishes, Scorifiers; and Cupels of all sizes and makes kept in stock, . . . . .

All apparatus required by Assayers, Metallurgists & Mineralogists supplied, .

**Chemical Glass Ware a Specialty.**

Write for Quotations before ordering elsewhere.



# ELLIOTT BROTHERS LTD.

*O'CONNELL STREET, SYDNEY.*

## CONTENTS

### THURSDAY, OCTOBER 30.

**Editorial—**

A Review of a "Review" . . . . . . . . 355
The High Court's Power . . . . . . 355
Leaderettes . . . . . . . . . . . . . . . . 356
News and Notes . . . . . . . . . . . . . . 357
Personal . . . . . . . . . . . . . . . . . . 358
Sydney Stock Exchange . . . . . . . . . . 358
The Investors' Column—
Bullfinch Proprietary (W.A.)... . . 359
Dunlop Rubber . . . . . . . . . . . . 359
Metal Quotations . . . . . . . . . . . . 359
Brief Comment . . . . . . . . . . . . . . 360
Tasmanian Mining . . . . . . . . . . . . 361
**Mining in Queensland** . . . . . . . . . 361
Mining in New South Wales . . . . . . 362
Western Australian Mining . . . . . . 362
Ore Concentration in America . . . . . 362
**Victorian Mining Activities** . . . . . . 363
Reports of Companies, etc. . . . . . . . 364
**Mineral Returns** . . . . . . . . . . . . 364
**Oil v. Coal** . . . . . . . . . . . . . . . 365
**Oil in South Australia** . . . . . . . . . 365
The Coal Mining Industry . . . . . . . 366
Federal Railways . . . . . . . . . . . . 367
**Railway Electrification** . . . . . . . . 367
**Municipal Council of Sydney** . . . . . . 367
Sydney North Shore Bridge . . . . . . 368
**British and European Developments** . . 368
State Shipbuilding Yard (V.) . . . . . . 369
**Mississippi Power Scheme** . . . . . . . 370
Publication Received . . . . . . . . . . 370
**Miscellaneous** . . . . . . . . . . . . . 370
Invited and Accepted Tenders . . . . . 371

---

**BACK NUMBERS OF THE "MINING STANDARD."**

The following is the rate for back copies more than a month old. Applications by post must be accompanied with cash and postage added. In no case can we guarantee to supply copies, as our storage accommodation is limited.

A postcard will be sent if the number required is out of print.

For copies three months old, ninepence; six months, one shilling; and beyond that period, one penny per month per copy.

As there is a regular demand for back copies of the "Mining Standard," newsagents are requested to send back all returns uncut and in good condition, otherwise they will not be accepted.

All Returns from Newsagents must reach us by the end of each month (the whole paper must be sent). No credit will be allowed beyond this term.

Postage British, 1d.; Foreign, 1½d.; Australasia, ½d. per copy.

Stamps will be accepted as pre-payment.

Address communications: Publishing Department "Mining Standard."

---

**FIRE. . BRICK** Our Products have proved their superiority.

**FIRE CLAY GOODS** For Every Purpose.

Darley Fire Bricks will withstand the most intense heat, and will not shrink. Our bricks are made near Bacchus Marsh, Victoria, and we supply all the States.

Specialities

**High-Grade Firebricks & Retorts.**

*Prompt Delivery.* *For Prices, etc., write to—*

**DARLEY F. B. Co.,**
**Oliver's Lane, Flinders St. Melbourne**

**MINING STANDARD.**
PUBLISHED EVERY THURSDAY.
Forwarded Post Free to any Address.

| | Per annum. |
|---|---|
| Australasia | 26/- |
| British Possessions | 32/6 |
| Foreign | 34/8 |

Payable half-yearly or yearly, in advance.
All amounts should be made payable to order of "CRITCHLEY PARKER, Bank of Australasia."

12 O'Connell-street,
Sydney.
Tel. City 8103
P.O. Box 331.

376 Flinders-lane,
Melbourne.
Central 7931 & 1838
P.O. Box 253.

---

**CASUAL ADVERTISEMENTS.**

The rate for this class of advertisement is governed by the position it occupies.

If it appears on leader page or amongst or next to reading matter, the rate is 15s. per inch (nonpareil) per insertion.

Towards end of reading section—
Brevier, 16 ems width, 6s. per inch per insertion.
Nonpareil, 8s. per inch per insertion.

For the convenuience of advertisers, we might state that—Brevier has approximately 7 words to a line, and 8 lines to the inch—6s. Nonpareil has approximately 8 words to the line, and 11 lines to the inch—8s.

**ALTERATION TO ADVERTISEMENTS.**

As our publishing arrangements necessitate the "Mining Standard" being issued simultaneously in Sydney, Melbourne and Adelaide on the same day each week, advertisers wishing to change their advertising matter must supply same ten days in advance of publication.

**ADVERTISEMENT PROOFS.**

Proofs are submitted to advertisers in order to give them an opportunity of going over the advertisements before printing.

Advertising Copy must be typed and so arranged as to clearly indicate the display required for the more important features of the advertisement.

Any departure from the original copy will be charged for. Advertisers are specially requested to instruct their publicity departments to give us clear and definite instructions respecting changes of matter or new copy in order to avoid incurring unnecessary charges.

---

AUSTRALIAN
**MINING STANDARD.**
PUBLISHED EVERY THURSDAY.
ESTABLISHED 1888

It is requested that all business communications be Addressed to Critchley Parker.

THURSDAY, OCTOBER 30, 1913.

## A REVIEW OF A "REVIEW."

The issue of the South Australian "Review of Mining Operations" for the half-year ended June 30th (the publication of which has been greatly delayed owing to pressure of work in the Government Printing Office) reminds us that, some six months ago (to be precise, on April 24), we had occasion, in these columns, to comment somewhat severely upon this publication and upon the methods of the State Mines Department generally. Enquiries made by our representative in Adelaide have not caused us to modify in the very slightest degree our exception to the publication as one that is inferior to the regular publications of the Mines Departments of all the other States in the extent and value of the information which it gives; but, if we retain the old opinion about the publication, we yet feel that there is a word to be said for the Mines Department. We are not going to say that that department is entirely free from blame, or that it makes the best use of its opportunities, but we are inclined to think that by far the greater amount of blame for the unsatisfactory character of the publication rests with the Treasury. The Mines Department is, in fact, starved. It is so ludicrously under-staffed that it is only with the greatest difficulty that it can, in any way, keep abreast of the requirements. The returns given showing the output in value of the mineral production of the State are only approximate, it being stated that the figures given indicate the returns "so far as can be ascertained." Of course in every State the figures are more or less approximate, more or less inaccurate. There is always bound to be some metal that is won without any return being made of it, and there is always certain to be a fair amount of gold stolen; but in the other States they do at least make reasonable efforts to attain to accuracy, and they do give figures which are not mere approximations, but are definite statements of definite returns made to the Department. In South Australia this is not the case. The returns are not scientifically collected. There are no wardens responsible for the gathering in of these returns and their transmission to the Department, which, in fact, has to get its figures for gold as best it can from banks and jewellers. In these circumstances one feels that the gold returns are not only inaccurate, but that they are very far from representing the whole output. As regards other minerals, there is much the same difficulty; but, even allowing for all this, we hold that the Review should be very much better than it is. It is too obviously issued for the benefit of the man in the street. It might also be held to have an eye to the instructing of people who may be awaiting the publication of Government notes in regard to various enterprises before seeking capital for their development, were it not for the fact that most of this information is given to the public before it appears in the Review. What is wanted mainly is a half-yearly report containing a precise statement of the output of the State during that period. This Review contains no such detailed information later than the end of the year 1912; and its particulars regarding the work done in 1913 are fragmentary and incomplete. The figures are not tabulated anywhere, because, apparently, they are not available for tabulation. What, then, is wanted is for the South Australian Government to lay aside a sufficient sum of money to enable the Mines Department to do its work thoroughly and accurately, as the work is done in the other States of the Commonwealth, so that it may obtain and give to the public as soon as possible returns which will, at least, offer some approach to reliability. One can only regard the present state of affairs as discreditable to the State Government.

## THE HIGH COURT'S POWERS.

It is no new thing to have a division of opinion in the High Court, and therefore it will not have caused any great surprise to note that consideration of the facts in the claim of the Brisbane and Adelaide tramway employees to wear a distinctive Union badge while on duty resulted in the Acting Chief Justice, Sir Edmund Barton, giving a minority judgment, and the law being set out by four other members of the High Court acting in opposition to his conclusions. We are not concerned, for the moment, with the question of what the law would be if common sense prevailed; all the judges of the High Court have to do is to interpret the law as it exists, and, where it is in any way vague, to endeavour, so far as they can, to ascertain the intention of the Parliament which makes our laws or of the Convention which framed the constitution. Sir Edmund Barton was the leader of that Convention, and he is certain that the Convention had no intention whatever of "the setting up of a tribunal for the consideration of matters quite extraneous to the work to be done, and quite unconnected with the relations of employers and employees"; but Sir Edmund's colleagues either know a great deal better than he does what was the intention of the Convention or do not care two straws what that intention may have been. The fact is that the majority of the Judges of the High Court are mainly intent upon extending the powers of the Court. That intention was shown very markedly when the Court decided that the disputes occurring in entirely disconnected tramway businesses in different States, if they occurred simultaneously in two or more States, constituted a dispute extending beyond the borders of the State and, therefore, coming within the jurisdiction of the High Court. That was a judgment that would seem, in the eyes of the unprejudiced. to be absolutely opposed to common sense, and to have no other purpose than an unwarrantable extension of the High Court's jurisdiction.

---

In order to make the Patents Law of the Commonwealth effective without being at the same time a source of discouragement to inventive talent, the congress of the Associated Chambers of Manufactures passed a resolution, moved by Mr. O. C. Beale (N.S.W.), and seconded by Mr. J. M. Joshua (V.), in the following terms:—"That it be the subject of strong representation to the Federal Government that when Commonwealth letters patent of monopoly for any invention made outside of the Commonwealth are granted it shall be a condition that the invention be used in the case of processes, or manufactured in the case of machinery, or merchandise, or parts thereof, within three years, otherwise the monopoly be ipso facto void." This is substantially the same as the "working" section of the Act passed by the British Parliament in 1907, and the public interest in it was so great as to lead to all the other clauses and sections of the Bill being practically ignored, which section 27 was a topic of general comment. The reason for this was that for the first time "compulsory working of patents" was being provided for in British law, and the innovation was welcomed as a sure remedy for unemployment and trade depression, inasmuch as foreign patentees would be compelled to manufacture their wares in Great Britain, instead of making them in their own country, and shipping them ready made to London. It may be of interest to quote here the words of the President of the Board of Trade, Mr. Lloyd George, in introducing the measure. Mr. Lloyd George said: "The main object of this Bill is to prevent the patent law from being used for the hindrance and suppression of British industrial developments. The object of the Patent Laws is to reward ingenuity and by so doing to encourage invention and to promote British industry. Unfortunately, however, they have been used in many respects to discourage the British inventor and to destroy many British industries." The only important difference between the proposal of the Chambers of Manufactures and the present British law is in the period within which the use or manufacture must be commenced, the British law making it four years and the Chambers three years.

* * *

Cancer, one of the most terrible scourges of mankind, is continually receiving attention at the hands of those professions which undertake the study of the health and life of the community, in the hope of finding a cure for it, if possible, without resort to the surgeon's knife. Hence, the large amount of attention given of late to the emanations from radium bromide and, quite recently, to mesothorium. But whilst one section of scientific workers is dealing with remedies, another section is further investigating the causes from which cancer springs, and one of the most startling pronouncements on that point yet made is that of Mr. Charles Green, of Gracemount House, Midlothian, N.B., the author of "A Theory of Cancer Origin." Mr. Green's theory is that there is a distinct relation between the occurrence of cancer and the kind of fuel used for domestic purposes. His investigations were made in the county of Nairn, which has an abnormally high death-rate, and he shows that the incidence of cancer was apparently limited strictly to those districts of the county in which coal was consumed as fuel, and that only one death from this affection had been observed within 10 years in the other portion of the district, in which peat was the only substance burnt. A further series of researches were next undertaken into the cancer mortality of the county of Orkney, an area made up of a large number of islands, in some of which peat alone is used as fuel, in others coal. In the whole district the deaths from cancer formed 1 in 14 of the total number of deaths. But while in some islands the cancer rate is 1 in every 7 of all deaths, in others it is only 1 in 27 or 28, and in Stennis it is 1 in 42. At first sight the relationship of the disease to the consumption of coal was well borne out, islands with a low relative mortality being found to be peat-consuming districts, while those with a high percentage were users of coal. Additional significance is given to this theory by the fact that it now has the support of Sir William Bennett, president of the Smoke Abatement Society, who, in his presidential address about three weeks ago, stated that the incidence of cancer is limited to those areas where coal is the staple fuel, while it is almost non-existent where ordinary peat alone is used. The only exception discovered by the speaker was in the districts where peat was a hard, black substance which crackled like coal and was quite unlike smouldering peat. Sir William spoke strongly in favour of gas as a fuel substitute for coal. Mr. Green attributes the ill-effects of coal fires to the action of the sulphur dioxide formed in the process of combustion.

* * *

The suggestion having been made that the West Australian Government's steamer Kwinana, which is about to be sent on a voyage to Durban (S. Af.), is really being got away so that she may undergo her annual Lloyd's survey under less rigorous conditions than obtain in Australia, has brought forth a denial from the Colonial Secretary, Mr. J. M. Drew, who, however, admits that the ship is being used for purposes other than those for which she was originally purchased. When she was bought, it was with the idea of bringing fat beeves from Kimberley, in the far north, in order to supply Perth with cheap meat, and Perth had the benefit of reduced prices for beef, though there was a heavy loss on each shipment, which, of course, had to be made up out of general revenue and helped to swell the growing deficit in the State's finances. According to Mr. Drew, the coming trip of the Kwinana is to be a commercial undertaking pure and simple; she is to take a cargo of timber to Durban, and a full cargo has already been secured for her return journey, so that there need be no delay. It has been arranged, however, that she shall be docked, cleaned and painted at Durban, though Mr. Drew did not vouchsafe any reason for having that necessary work done away from Australia. He is satisfied to state she has been surveyed by Lloyd's surveyors three times—in October, 1911, at Sydney; in June, 1912 (Lloyd's special No. 2 survey), at Sydney; and in April, 1913, at Sydney; so that her next survey is not due until April next year. Her next voyage is to be merely a new development in State enterprise, which may or may not turn out more profitable than her previous engagements. It is just possible that her cargo of timber will be the produce of the State timber reserves, but it would be interesting to know the nature of the cargo she is to bring back from Durban.

* * *

A deputation has been arranged by the Ballarat (V.) Trades and Labour Council to wait upon the State Attorney-General (Mr. J. Drysdale Brown) and draw his attention to comments made by a metropolitan journal on the cowardly and brutal conduct of certain of the strikers at Beaufort, who went thirty strong to a house where were sleeping four free labourers, who had been working at the Beaufort Deep Leads mine, and, when they found that two of them had escaped and taken to the shaft for safety, followed them and threw after them a variety of missiles, including the door which closed the shaft. Their complaint is that the newspaper's comments are calculated to prejudice the case against the men now under arrest and charged with attempted murder. The Attorney-General will, of course, form his own opinion as to whether the article complained of really passes beyond a fair recital of facts and the legitimate expression of abhorrence of such conduct as that reveals. It may be pointed out, too, that, according to a contemporary, when Mr. J. Harrison moved that the deputation be arranged. he said that the men had certainly broken the law, "but only in some trivial affair." It is not to be supposed that in thus extenuating their crime Mr. Harrison was endeavouring to "prejudice" the case in favour of the accused men, for whom, apparently, he pleads guilty; for to suppose such an intention would argue little confidence in the common-sense of the community whom it was intended to prejudice. If, however, it so be that such brutality as was displayed, even though not included in the original plan of campaign, was merely "some trivial affair" of the law, the law itself must need somewhat severe handling.

* * *

The true Christian spirit is something so rare. even outside of the churches, that when one does encounter it one is inclined to welcome it with both hands. It is such a spirit, so beautiful in its unselfish simplicity, that has been displayed by the body of Australian architects. It will be remembered that, in the matter of the calling for designs for the Federal capital, they set themselves against Mr. O'Malley. when that gentleman was Minister for Home Affairs; but their subsequent actions have shown them to be utterly free from any spirit of paltriness or of vindictiveness. It was, of course, obviously to their worldly interest to pooh-pooh the abilities of Mr. Griffin. the successful designer, and to convince the people of Australia that he was very much inferior to themselves. On the contrary. with noble magnanimity, they met him with open arms. lauded him to the skies, declared him to be a heaven-born genius, and generally welcomed him with a great effusion of flattering terms. It may or may not be a result of the nobly unselfish attitude they adopted that Mr. Griffin has now been appointed by the Federal Government to supervise for three years the work at the Federal Capital, and it is quite on the cards that at the end of that period his appointment will be made permanent. To suppose that the Australian architects did not foresee this would be not only ungenerous but a reflection on their common sense and their power of prevision. No, it is their truly Christian charity that must get the credit for the spirit of self-abnegation they have displayed throughout.

* * *

Those who despair of the profitable utilisation for agricultural and pastoral purposes of land which has been dredged in search of gold may find comfort in the success which has attended actual trials of such areas. It will be remembered that some years ago, when the demand for the resoiling of dredged land was at its height, the chairman of the Tewksbury Amalgamated Gold Dredging Co., whose property is at Porepunkah on the Ovens River (V.). experimented with the sowing of black wattle seeds on land which had not been resoiled after dredging, and at the end of a couple of years was able to report that some of the young trees were 7ft. 6in. in height, and, at a distance of 6in. above the ground, were an inch and a quarter in diameter. Similar success was also met with in growing walnut and certain other trees on the same ground. The system of silt-distribution introduced leaves the ground level, with the finest material on the surface, and about 250 fruit and walnut trees were planted on these tailings, and the result was so encouraging that it was decided to continue planting as the dredge advanced, by which means, it was calculated, by the time the ground was worked out as far as gold was concerned, there would be several thousands of trees in full bearing to be counted among the assets of the company. The example does not appear to have been very generally followed in other parts of Victoria; but what can be done at Porepunkah can be done elsewhere. None know better than agriculturists and orchardists that all soils will not suit all crops; that it is necessary to select a crop suitable to the soil available, and to keep the soil at its best by cultivation and feeding. But, if Victorians have not been sufficiently enterprising in this matter, and have contented themselves with sitting by and grumbling, men in other parts of the world, who perhaps never heard of Porepunkah and the experiments tried there, have obtained similarly satisfactory results from the cultivation of land previously dredged for gold. For example, towards the end of last July, Mr. J. H. Leggett, of Oroville, California, U.S.A., was able to send to the Eastern States, from such land, the earliest Tokay grapes of the season, beating last season's record by seven days and the previous record of the State by over a fortnight. In the same soil, Mr. Leggett has orange and eucalyptus trees thriving well. Surely, with the assistance which would readily be forthcoming from the State Agricultural Department, some enterprising Victorian should find no difficulty in winning a handsome reward by following up the suggestions offered by these two successes.

---

## NEWS AND NOTES.

The New South Wales Minister of Mines has instructed the Chief Inspector to make an examination of the district 25 miles south of Hillgrove, where some samples of silver, copper and lead ore were found some time ago of such a promising character as to occasion an examination being made by Mr. J. F. Godfrey, the district inspector. Mr. Godfrey reports that the find is in an unfrequented, mountainous locality, near Hall's Peak, and that the deposits appear to be so promising as to warrant the belief that the district will develop into an important one if prospected.

In pursuance of his announcement made some time ago that the Government intended to amend the Railway Act and allot the work to several commissioners, each to be responsible for his particular branch of administration, Mr. Holman, Premier of New South Wales, stated last week that, as the term of office of the Chief Commissioner, Mr. Johnson, expires in March next, that gentleman will probably be permitted to retire on leave and full pay some months earlier, in recognition of his valuable services. This is of course contingent on Mr. Holman's party being returned to office. Some few weeks ago the Agent-General was instructed by cable to appoint a board to inquire into the qualifications of gentlemen eligible and likely to be applicants for a seat on the Railways Commission. Mr. Holman states that no decision has yet been arrived at, but that immediately anything is done Mr. Johnson will be advised.

It was announced last week, the telegram having been delayed in transmission, that the last four weeks' work of the Philippine Dredges Ltd. produced 799 oz. of gold, the old dredge contributing 213 oz. and the new one 586 oz. The capacity of the new plant is 20,000 yards per week, while the old dredge is capable of treating 5000 yards weekly. Two other dredges are under construction, and the first, which will have a larger capacity than that now at work, is expected to be in operation by March next. The other will have a capacity of 15,000 cubic yards, and should be at work three months later. Plans are being prepared for a fifth dredge, having a capacity of about 25,000 yards weekly. It is proposed to build this dredge in Melbourne, as well as the pontoon, which will be of iron. A saving of time is expected thereby, as the pontoon will only need be put together and rivetted at Paracale.

The 21st dividend of the Y-Water (Emmaville) Tin Co. (N.S.W.), one shilling per share, will be payable on November 5, and amounts to £2000, making the total paid to shareholders in dividends and bonuses £46,000.

The West Australian Supreme Court last week granted on order for the winding-up of the Lancefield Gold Mining Co., Laverton (W.A.). The company's total indebtedness was £40,000. The company has no assets beyond those required to meet the mortgagee's claim.

The following additional names are given as having accepted invitations to join the British Association congress, which is to be held next year at various centres in the Commonwealth:—Mr. Alfred Gibbs Bourne, F.R.S., Director of Public Instruction in Madras; Dr. Ernest W. Brown, F.R.S., Professor of Mathematics at Yale University; Dr. Swale Vincent, Professor of Physiology in the University of Manitoba, and Dr. Duerdin.

The Tongkah Compound N.L., Puket, Siam, has declared a dividend of 1s. and a bonus of 1s., payable on November 14, absorbing together £5000, and bringing the total return to shareholders to £92,500, equal to 37s. per share. The directors have exercised the option of purchase held over an additional area of 16 acres adjoining the company's original concession on the north at a cost of £3200. The acquisition of further areas is under consideration.

The positive beauty of Australian gem stones is not adequately brought out until they are as artistically mounted as those produced in other countries; but when this has been done for them they are well able to hold their own as ornaments in the world's markets. This is not to say that finer stones of many kinds are not to be found elsewhere, nor that Australia can produce every kind of jewel; but undoubtedly there is a much greater variety of beautiful stones in the Commonwealth than is generally believed. Messrs. Fairfax and Roberts, jewellers, of Sydney, in a nicely illustrated catalogue, go further, and say that "jewel discoveries up to the present time would indicate Australasia as one of the richest in its variety of precious stones of all the gem-producing countries of the world. No other country has proved to have such an astonishing variety of gems as Australia." The opals are so familiar to everyone in the Commonwealth that many regard them as being the one gem which is worthy of note, and this may perhaps be true of the black variety, though the sapphires, tourmalines, emeralds, amethysts, diamonds, and a good many others, are too beautiful to be overlooked when tastefully mounted, alone or in appropriate combinations. And the fact that the stones are not only produced, but cut and mounted in Australia, will lend an additional value in the minds of many.

The half-yearly balance-sheet of the National Bank of Australasia, published elsewhere in this issue, shows a net profit for the term ended on September 30, after deducting all charges, including £6893 for taxes, amounting to £89,283, and by adding £16,208 brought forward, a total of £105,491 is made available for distribution. It is proposed to strengthen the reserve by adding £30,000 (making the total £465,000), to write off £5000 from bank premises, to add £2000 to the Officers' Provident Fund, to pay a dividend at the rate of 7 per cent. per annum on both preference and ordinary shares, making the total dividend £52,438, and to leave a balance of £16,054 to carry forward. As the net profit of the previous six months was £98,632, the total for the year was £187,915. The amount on deposit at the end of this half-year was £10,113,897, as against £10,448,630 in March and £10,521,798 in September, 1912, while advances stand at £8,570,499, compared with £8,818,171 in March and with £9,273,439 for the previous half-year. The falling-off in deposits to the extent of £407,901 is more than accounted for by a decline in Government deposits of £438,014. The half-yearly meeting will be held on November 5.

The Silverton Tramway Co. (N.S.W.) will pay a dividend of 1s. and a bonus of 2s. per share on December 1, together requiring £37,500. The directors wish this increase to be regarded as a Christmas distribution, and is not to be taken as indicating a permanent increase from the usual 1s. bonus.

In the South Australian House of Assembly last week the Minister of Mines, Mr. Butler, said that the Government would seek to secure the services of Dr. Wade, the Commonwealth expert, to report on the supposed oil-fields in various parts of South Australia, which had been condemned by the Government geologist.

Mr. Cosmo Murray, metallurgist and assayer of the New Gold Amalgamating Machine Limited, has reported as follows:—"In connection with the commercial demonstration of your gold amalgamating machine, on the Long Beach Hydraulic Elevating Claim, at Chaslands, South Island, New Zealand, I have to report that this test was a complete success, and proved the correctness of the claim made in the company's prospectus, that 'by this machine an extraction of from 90 to 100 per cent. of the gold in New Zealand beach, or other similar sands, is obtained.' The machine easily dealt with all the concentrates obtainable at the claim, and made a complete recovery of the gold contents, a result never previously obtained by any of the methods hitherto employed. There is undoubtedly a great future for your machine in the treatment of propositions carrying free gold."

Edmund Thomas, a miner employed at the Nuggety Ajax mine, Daylesford (V.), was blown to pieces last week through sending a jack-hammer drill into an unsuspected charge, which had been left unexploded, in the face of the shaft 34ft. below the 700ft. level. Deceased was in the prime of his life, being 46 years of age. His mate, John Friday, escaped with his life, but had his right arm shattered, and was otherwise seriously injured. Both men were married, and each had several children depending upon him. It is stated that Thomas had a wonderful escape from death in the mine on October 6. When the fuse was fired he and his mate were left at the bottom of the shaft, owing to one of them having given the wrong signal. Thomas had to scale the ladders to escape the full force of the explosion.

"The Times" last Saturday stated that the stock market for the past month had been depressed by a congestion of capital and the recent increase in the bank rate. A list of 387 representative stocks on the London Stock Exchange showed an aggregate depreciation of £56,000,000, thus establishing a low-water mark record.

Following the lead of the Virginia G.M. Co., Bendigo (V.), the directors of the New Prince of Wales Co. have voted £50 to the employees who remained loyal to the company during the recent strike. The manager (Mr. T. Taylor) is to receive £24, and the shift bosses £5 each.

The Defence Department has entered into a contract with the British Imperial Oil Co., Liverpool Buildings, Melbourne, for the supply of oil fuel to vessels of the fleet at the ports named, and at the following rates:—Adelaide, 85s. per ton of 2240 lb.; Melbourne, 90s. per ton; Sydney, 85s. per ton. The period of contract is from May 10, 1913, to May 9, 1915. At present the destroyers are the only vessels using oil fuel, but the submarine vessels, to arrive in Australian waters next year, will burn oil.

The directors of Austral-Malay Tin Ltd. have exercised their option over tin-bearing land at Kota, near Taiping. The total area is 170 acres, averaging 41 feet deep, and values as a result of 170 bores by Mr. T. W. Horton are slightly over one pound of tin oxide per cubic yard. It is proposed to form a company at an early date, to be known as the Larut Tin Dredging Co., in order to equip and work the property. Mr. A. W. Freeman advises that the company's option areas at Tupai, Klang, Semenyeh, Serdang, and a further area of 288 acres at North-west Kamunting recently secured, have been examined and bored by Mr. Horton and declined. The Renong options held by the company are reported as looking promising, and close-boring these areas has been started.

The slum dams left by the defunct dredging companies in the Castlemaine district of Victoria are (writes our correspondent) promising to be more payable in their last condition than they were in the first. An influential Ballarat syndicate has spent much time, and several thousands of pounds, in experimenting with the clays left behind, seemingly valueless. It has been demonstrated that such slum is capable of being converted into several forms of potteryware of a high grade. One of the difficulties found was that it was too good. The syndicate have a keen desire to produce a roofing tile that will supersede iron at market price, and the clay under the first treatment produced a highly-polished tile. This, of course, was not a desirable quality for Australian roofs, and a good deal of time was occupied in eliminating the sheen. This has now been accomplished, so it is said. Hollow bricks can be made of a first-class nature, and in addition to the coarser articles of potteryware, casseroles of beautiful texture and polish have been produced. The original syndicate some weeks ago decided to enlarge the share list, and no trouble was experienced in placing all the shares. A full plant of machinery is said to have been ordered from France, but whether it is to be erected at Campbell's Creek (Castlemaine) or in the Ballarat district is not yet known. The company has acquired at least three of the best slum dams for the purpose, at Castlemaine, and the contents of the Cumberland dam (in its now dry state) is being trucked by rail from Campbell's Creek for treatment.

"The town of many clubs and many complaints" is the apt phrase by which a Tasmanian contemporary refers to Wonthaggi, the Victorian State coal mine township.

The customary quarterly dividend of the Broken Hill Proprietary Co. (N.S.W.) will be payable on November 19, but once more it will be at the reduced rate of 1s. per share, amounting in all to £48,000.

There is a likelihood that the freezing works which it had been proposed to erect at Port Darwin (N.T.) at the public expense, will be left to private enterprise. Last year's estimates provided £25,000 for their erection, but this year there is no such provision, and Mr. Glynn admits that negotiations are well forward under which an English company will undertake the work.

Two large obelisks are to be erected by the New Zealand Mines Department at the forthcoming Auckland exhibition, standing about 24ft. 9in. in height, the framework being of steel. A panel, 3ft. 6in. by 1ft. 9in., is to be sunk on each of the pedestals, on which the following inscription is to be placed:—"These obelisks, erected by the Department of Mines, together represent 64,462 imperial tons of standard gold, value £82,000,000, the production of the gold mines of New Zealand.

The Minister of External Affairs, Mr. Glynn, is somewhat uneasy about the cost of maintaining the three Government steamers at present in use in the Northern Territory—the Stewart, the Leichhardt, and the Gregory—and is endeavouring to gather from "independent sources"—that is, from men who have recently come direct from the Territory—what these steamers are doing, and what it costs to run them. His impression is that they may be too expensive, and he states that if he saw that he was justified in that course, he would not hesitate to sell these steamers, and to revert to some other arrangement. All the same, Mr. Glynn is asking for tenders for the building of a single screw steamer, clipper bow, elliptic stern, and schooner rigged, for use in the tropics, which looks as though his trouble is not very deep-rooted.

As announced in the Tenders column of our last issue, the Kampong Kamunting Tin Dredging Ltd. has placed the contract for the erection of two bucket dredges with the firm of Chas. Ruwolt Pty. Ltd., Melbourne, after careful consideration having been given to the tenders received. The specifications and design are the work of Mr. J. S. Henry, and the dredges contracted for will easily be the largest ever built in Australia. Tte material and workmanship will be, as far as possible, Australian. The latest improvements found necessary as a result of tin dredging experience in Malaya, including the most recent type of revolving screen, have been designed, and will be fitted in these dredges. Very large tin saving tables are another special feature —the pontoon being specially large, viz., 130ft. x 44ft. x 8ft. 6in. deep to carry them. The dredges will be fitted with close connected 6ft. buckets, which will have a theoretical capacity of 35,000 yards per week for each dredge, and an effective capacity of 20,000 to 25,000 yards of tin-bearing material per week. The plant specified is a powerful one, and is designed to dredge 45ft. below water level. The main engine is 120 brake h.p., and the pump installed for sluicing has a delivery of 6000 gallons of water per minute. The total weight of the dredges with machinery will be over 625 tons, considerably over 100 tons heavier than the largest dredge yet sent from Australia to the East. The contract time for delivery f.o.b. for the first dredge is eight months, and for the second eleven months from date of contract. The cost of the dredge erected in good going order on the mine, together with the necessary spares, tools, tin-dressing sheds, and buildings, will exceed the sum of £40,000.

Our Lithgow correspondent writes that a conference of representatives of the New South Wales Northern, Southern and Western coal miners has been held. Mr. Murphy, general secretary of the Victorian Coal Miners' Association, was present. The conference was called for the purpose of considering the question of closer union. Mr. A. C. Willis, secretary of the Southern miners, occupied the chair, and the other delegates present were:—Messrs. D. Watson, Northern; F. Gregory and W. Delaney, Western; R. Cameron and R. Kirkwood, Southern.

As the result of the boring which has been conducted by the Mines Department in the East Langi Logan lease, at Ararat (V.), a good lead has been proved. It is announced that good prospects of gold were obtained in some of the cores. The drill has now been moved to the north-east to test the Larne Gerin lead, and the drill, which was recently employed on the Langi Logan South, has now been moved to bore the Upper Langi Logan lease.

During the four weeks ended on the 18th inst., the Sulphide Corporation milled 13,972 tons of crude ore at the Central mine, Broken Hill, producing 2338 tons leady concentrates, 4433 tons of zinc concentrates. During same period, at Cockle Creek works, 5926 tons leady concentrates, purchased ores, etc., smelted, yielding 2402 tons lead, containing 3305 oz. gold, 184,704 oz. silver. During the four weeks ended September 20 there were treated at the Central mine 15,905 tons of crude ore, producing 2864 tons leady concentrates and 5390 tons zinc concentrates. At the Cockle Creek works during the same period 3871 tons Central mine leady concentrates and purchased ore, etc., were treated, yielding 1251 tons lead, containing 3226 oz. gold and 109,435 oz. silver.

The finding of a gold nugget weighing 13 oz. 12 dwt. in virgin ground at Slug Flat, near Bulong, on the East Coolgardie goldfield (W.A.), has caused all the ground in the vicinity to be hurriedly pegged out.

At last week's conference of the Victorian Municipal Association, the following motion, put forward by the Borough of Eaglehawk, was agreed to: "That the association should offer a protest against the responsibility of keeping abandoned mining shafts in a proper state of safety being placed upon municipal councils, considering that the Government receives the lease rent of mines and an income tax on their dividends, and is of opinion that regulations should be made by the Mines Department to require that all shafts shall be securely protected by an approved form of covering before a lease is abandoned or forfeited."

The gold received at the Melbourne branch of the Royal Mint during the week ended on the 25th inst. amounted to 8899.85 oz.

An explosion occurred last week at the Stag Canyon Fuel Co.'s mine, Dawson, New Mexico, which resulted in a very large loss of life; it is believed that the number will ultimately be found to exceed two hundred.

When the tinfield mentioned in our last issue was discovered in the Northern Territory, about 25 men were working there. Last week the Minister of External Affairs, Mr. Glynn, was informed by telegram that 25 more had arrived at Darwin, from Western Australia, on their way thither. As the field is about 70 miles from Horseshoe Creek battery, the Minister is considering the proposal of Mr. Jensen, to erect a battery on the ground.

## PERSONAL.

After an absence of 18 months in London, the Hon. W. L. Baillieu, M.L.C., ex-Minister of Public Works, etc., in the Victorian Cabinet, and still a Minister without office, returned to Adelaide by the R.M.S. Medina last week and travelled by rail to Melbourne, arriving last Sunday morning.

Mr. F. M. Calcutt and Mr. E. C. Blazey, of the Victorian Railways department, who have been in England for some months investigating electrical matters in connection with railway working, have returned by the R.M.S. Medina.

Mr. Phillip Simmonds Williams, for the past ten years secretary of the Bendigo (V.) branch of the Federated Mine Employees' Association, died at his residence at Eaglehawk on the 22nd inst., after a few days' illness. The cause of death was pneumonia. Deceased was 68 years of age; arrived at Adelaide in 1865 and at Bendigo in 1867. After serving on the committee of the Miners' Association for many years, he was elected president in 1885, and in 1903 was appointed its secretary. Mr. W. J. Treleven will fulfil the secretarial office until the end of the current term.

The death was announced last week of Mr. Arthur Chamberlain, chairman of the directors of Kynoch Ltd., military and sporting ammunition manufacturers, of Birmingham. Deceased was a younger brother of the Rt. Hon. Joseph Chamberlain.

Mr. T. M. Owen, mill superintendent and experimentalist at the Junction North Broken Hill mine, has accepted an appointment in the United States, where, it is hoped, his large knowledge of flotation processes will stand him in good stead. Before he left the Barrier the foremen and shift bosses of the ore-dressing mill presented him with a gold watch, chain, etc., as a mark of personal regard.

Mr. J. N. Reeson, now engineer at the Beckton gas-works, owned by the Gaslight and Coke Co. Ltd., London, has been appointed chief engineer to the Metropolitan (Melbourne) Gas Co. in succession to Mr. P. C. Holmes Hunt, resigned.

Mr. W. McNeilage has been elected President of the Associated Chambers of Manufactures of Australia for the ensuing year.

Mr. Edwin Sharpe Grew, M.A., formerly editor of the "Illustrated Scientific News," and of "Knowledge," has been appointed official secretary to the Australian congress of the British Association for the Advancement of Science, 1914.

## SYDNEY STOCK EXCHANGE.

Doings at the Sydney Stock Exchange during the week have continued largely commonplace. The investment stock market, however, has been characterised by a firm tone. Bank shares have received a good deal of support at generally improved levels. Buyers of brewery shares have also been in evidence, evidently in anticipation of obtaining some of the profits likely to accrue from the summer thirst of the population. Taking the miscellaneous companies all through, they have experienced a better week, and the tendency of prices has generally been in sellers' favour. But there have been no stand-out transactions nor momentous movements. Government stocks have met a stronger market.

The mining situation has mostly been flat, stale and unprofitable. The trend of London prices towards the middle of the week was distinctly favourable, especially for copper and silver-lead shares, while industrial metals were firmer. But those movements did not galvanise the Sydney market into fresh activity, and commission cheques for mining sales each day left much to be desired from a broker's standpoint. Rather more attention was devoted to Broken Hill stocks, the most pronounced movement being in Block 10 shares, British (old), B.H. North and South. All gained something in value during the week, though at the close irregularity again set in. Among the gold mines there has not been the faintest flutter of interest, both sales and price variations having been practically nil. In the copper section, Hampden-Cloncurry, Mount Lyell, Lloyds and Mt. Elliott have attracted a good deal of support. The Sydney market has been stimulated by the improved prices cabled from London from copper interests. The Ardlethan group have continued mostly out of favour. Carpathia shares, both paid and contrib., have changed hands daily, but the inclination of the market has been more favourable to "bears" than to "bulls." The candid report issued by the Ardlethan Options Ltd., in turning down propositions at one time thought so full of promise, has given the field another kick down hill.

The New South Wales banking averages for the past quarter afford at least two striking features as compared with the previous quarter. The first is a shrinkage of £1,264,000 in deposits, and the second an increase of £1,600,000 in the coin and bullion held. The major portion of the falling off in the deposits is explained in the fact that close upon £1,000,000 of the Government's Sydney balances have been withdrawn from the banks during the year, so that the reduction in private deposits has only been about £300,000. The withdrawals of the Government balances during the past two years has been very material to the Sydney banks. At the close of the September quarter, 1911, they amounted to £2,701,527, at the corresponding date in 1912 they had been reduced to £1,223,565, and now they only represent £285,022. Private deposits have certainly not proved as elastic as previously, but then it was not possible for the expansion of the past few years to continue. Besides which the private banks have had increased competition from the various Government Savings Banks to contend against. And that brings us to another totally fresh item in the averages—the inclusion of the Commonwealth Bank figures. The increasing of capital issued by so many of our large companies has proved a pretty strenuous drain upon the purses of ordinary investors, and doubtless has been responsible for lessening the deposit totals. However, when the wool and the wheat have been paid for, and the rest of our season's primary products marketed, there should be an increased flow of money into the coffers of the banks. In the September quarter last year the coin and bullion held by the banks amounted to £11,324,987, while this year that item has been swelled to £12,947,634, or an increase of £1,622,647, which has raised the proportion, i.e., cash to deposits and notes from 23.22 per cent. last year up to 26.51 per cent. this year. It is not a matter of surprise to note a further decrease in the advances. The cry of the farmer, pastoralist and commercial man alike throughout the past 12 months has been about the great difficulty experienced in obtaining financial accommodation from their bankers. Under present circumstances the banks have been wise to pursue a cautious policy. Straightened Government finances, the operations of the Commonwealth Bank, and the compulsory carrying of Government notes have all been a tax upon commercial banking resources. Then, too, there is an increased wool clip, and probably a record harvest to finance. Still the banks can carry caution too far and that would mean a cutting down of their profit earning capacity. The advances now stand at £45,996,315, as against £48,043,245 at the corresponding date last year. Compared with two years ago, the advances have increased over £1,000,000.

# THE INVESTOR'S COLUMN.

## Some Companies Attracting Attention To-day.

(By Our Exchange Reporter.)

### Bullfinch Proprietary (W.A.).

The course of the quotations for this stock has been contrary to expectation, for it had been generally supposed that on the declaration of the dividend, which is payable early in November, the London market in the shares would have improved. It was partly this assumption and partly the returns from the mine itself which caused the prices to gradually rise until they stood at just about 16s. 6d., this being the highest range of value attained for a fairly long period. It was not, however, long maintained, and a sagging tendency became more and more pronounced until to-day the best buying offer is a little over 14s.—a fall of 2s. 6d. per share. As there are 500,000 shares in the company, the loss in the market value of the stock comes to £60,000, a serious decline, and there is naturally a considerable amount of enquiry as to what may be the cause. The returns continue to be satisfactory, and bear testimony both to the capacity of the 20-head mill and the good quality of the ore, the last month's return being 4083 oz. of bullion, valued at £14,417, from 5545 tons of stone. The working expenses for the same period came to £5003, which is equal to slightly over 18s. 6d. per ton. The net profit, therefore, was £9413, less development costs, which amounted to £804. As far as can be judged from the results so far obtained, it does not seem unreasonable to estimate the annual profit at somewhere about £100,000, and as the market capitalisation of the stock, that is at 14s., comes to £350,000, the present price is equivalent to a three and a half or four years' purchase. This should, of course, be a sound enough basis on which to buy, even a mining investment, especially as the company is a gold producer, and its product is not therefore subject to the fluctuations in value similar to those for silver, lead, copper and tin, and which are occasionally very severe. This form of estimate of any mining stock is, however, notoriously unsafe unless the quantity and quality of the ore reserves are known and established upon an absolutely assured basis. These questions of quantity (?) and value (?) are always difficult to answer, and particularly so in the case of a mine like the Bullfinch, for in these respects the mines producing the other metals undoubtedly seem to have the advantage. It appears to be much easier for many reasons to make a correct calculation of the value of a silver-lead or copper ore body than it is that of a gold-bearing formation. Such, at least, is the opinion of the writer, based upon the history of the different classes of mines during the last 20 years. Under these circumstances the decline in the price of Bullfinch shares may be ascribed to anxiety as to whether the present monthly rate of return will be maintained over a period of, say, two or three years. As is generally known, there are bodies of stone in the mine of a quality varying from payable to remarkably rich, and the management has endeavoured to maintain an output based upon the average value of the payable ore. Although it is possible that the estimate is too high, it is not likely to have been so, as it would have been arrived at after careful sampling, and the cause of the fall will probably be found in some other direction. It is quite possible that some of the shareholders now regard the stock as too much like an investment, and feel that the returns, although sound enough, are not sufficiently exciting to create a market rise. This latter assumption will probably correctly account for some of the decline in value of the stock, for it is certain that a number of those persons who have become shareholders during the last twelve or eighteen months did so under a well-founded belief that the trend of the quotations must be an upward one, inasmuch as the mine was approaching the stage when it would come into full bearing as a gold producer. These speculators have since held on to their shares while they steadily improved in price, but the moment the advance was checked, which was somewhere in the vicinity of 16s. 6d., they sold out. The uneasiness which has been manifested has been increased to some extent by a rumour that fairly heavy realisations were taking place in Adelaide, as it recognised that the mining operators on the Stock Exchange of that city are as a rule better posted in the developments of Western Australian mines than the Melbourne dealers.

But although the market operations do not at present indicate an advance in prices, it should be remembered that the recent decline has been well pronounced, and under normal conditions, and the absence of any unfavourable reports from the mine, it may reasonably be expected that the next swing of the pendulum will be in the opposite direction. A dividend is just falling due, and another should be fairly well advanced in the making. Taking these facts into consideration, the shares at existing quotations appear to be better buying than selling, either for a small rise or a mining investment. This opinion is not based upon any special knowledge or inside information with regard to the position of affars at the mine: it is founded rather upon a belief that the official estimates of the quantity and quality of the ore reserves which were made public some months ago are approximately correct. No allowance has herein been made for the prospective value of the stock, but it must be plain to anyone acquainted with mining in a new field that the chances of fresh discoveries in the different lode channels in the company's extensive holding are very far from being exhausted.

### Dunlop Rubber.

One of the rather surprising features of the market during the last year has been the falling off in the transactions in this stock, for although a year or two ago it was one of the centres of Exchange interest, and large parcels of shares frequently changed hands, a sale of 50 or 100 per week seems now to represent the amount of public attention. Several reasons might be given for the above change, but perhaps the most important is the high rates of interest now ruling in the financial world both on stocks and mortgages; in other words, the rise in the price of money. A good illustration of the altered state of affairs is afforded by the quotations for Melbourne Tramways, Silverton Tramways and Metropolitan Gas, which, although stocks of a high character, now give a return on their present market price equal to 9½, 7½ and 6½ per cent. respectively, and there are other almost as typical investments which give equally good returns. This change in financial matters has to some extent told against Dunlops, inasmuch as they have to compete for public favour against first-class stocks which are giving high returns. The net profits of the company for the last year's business amounted to a little under £73,000, and the balance brought forward from the previous period was £2137. This highly successful result enabled the payment of half-yearly dividends at the rate of 10 per cent. on both the Cumulative Preference and Ordinary shares, while those on the Deferred Non-Cumulative Preference were at 9 per cent. After providing for these disbursements, which amounted to £51,100, there remained a sum of £23,923, which was disposed of by placing £20,000 to the reserve fund, bringing it up to £35,000, and the balance was carried forward.

This is a very handsome record for the year, and so long as such results continue to be obtained the shares must be regarded as worthy of the position they hold in the market. There are, however, some items in the balance-sheet which should not be overlooked when consideration is given to the value of the shares as a permanent investment Among the assets, which amount to £691,681, is that of "goodwill" £180,000. As the market capitalisation of the stock is now about £776,000, it is at a premium of £85,000, but when it is noted also that goodwill amounts to so large a sum as £180,000, it is evident that the existing assets would be considerably inadequate in the event of a sale of the company's estate to realise the existing market valuation. The obvious answer to such a contention is a statement that there are few occurrences more improbable than that the company should wish to realise its estate and secondly that its profitable business more than justifies the valuation of the goodwill at its present price. Such statements are no doubt perfectly justifiable and correct, but all the same a person with capital to invest should examine a stock from every point of view, and it cannot be said that a company whose shares are at a high premium and whose assets include a substantial sum for goodwill, is intrinsically as sound an investment as one whose assets if realised would be equal to the market valuation. Such an objection is perhaps a technical one; still it is there, and it may have been its recognition by investors which has prevented the shares from going higher. On the other hand, it is only fair to point out that the ascribing of too much importance to this class of defect in a company's position occasionally causes the loss of an opportunity to acquire an improving investment.

Some years ago the shares (paid up to 20s.) in a prominent local stock were quoted at about 18s., and were not very strong at that, owing to the fact that a very large proportion of the assets was made up of goodwill. These shares are to-day worth 40s., the earning power of the company having been so strong that while substantial dividends have been paid the reserves and undivided profits have accumulated until they exceed the amount of the goodwill. Other items of importance among the assets of the Dunlop Company are freehold property, £58,046; plant, furniture and fittings, £59,088; stocks on hand and in transit, £295,819—all of these being at valuation; sundry debtors, after provision for bad and doubtful debts, £86,826; shares in other companies, £5000. It may be assumed that this investment is for the purpose of obtaining some trade advantage. Cash at bank and in hand, £1250. On the other side of the balance-sheet the liabilities at the date of taking accounts, other than to capital, included: Reserve fund, £15,000 (now £35,000); profit and loss, £49,473; mortgages, £10,000; bank, amount of overdrawn account secured by general lien and mortgage, £32,895; deposits with accrued interest, £48,187; sundry creditors on open accounts, £16,065. Such are the principal items in the balance-sheet, and the conclusion derived from them seems to be that although the company has had a remarkably successful career, and its business last year was very profitable, yet the prices of the different classes of the shares are standing high enough, that is until its more important liabilities are wiped out and the reserve fund materially increased.

---

# METAL QUOTATIONS.

(From Our Correspondent.)

## By Cable.

### London, Tuesday.

There was greater steadiness in metal transactions during last week, but no satisfactory increase in prices. Copper was the only one which showed improvement, but there was nothing remarkable in the prices even with this metal (if electrolytic be excepted), especially if it be borne in mind that the growing shortage in visible supplies was expected to result in a considerable appreciation as the end of the year drew nearer. Tin was far from making up the leeway made lately, the highest quotation for spot during the week being £185 5s. Lead began the week with a halfcrown rise, but went downwards daily after Monday. There was no movement in spelter, and silver went backwards almost from day to day.

COPPER.—The opening quote for spot showed a rise of 27s. 6d. as compared with the previous Friday, the price being £74 10s., advancing on Tuesday to £75 5s., but subsequent daily rates were £74 12s. 6d., £74 5s. and £74 7s. 6d.

For three months' delivery the prices were £74 5s. (a rise of 25s.), £74 15s., £74, £73 10s. and £73 7s. 6d.

Electrolytic was quoted at £77 15s. and £78, yesterday opening the new week at £77 15s.

TIN.—Monday's rate for spot, £184 12s. 6d., or 32s. 6d. lower than on Friday; then came £184 5s., £185 5s., £184 17s. 6d. and £185.

Three months' orders were booked at £185 7s. 6d. (a fall of 17s. 6d.), £184 15s., £185 15s., £185 12s. 6d. and £185 15s.

LEAD.—Opening with a drop of 2s. 6d. per ton, that is, to £20 11s. 3d., the market went successively to £20 10s., £20 8s. 9d., £20 7s. 6d. and £20 5s.

SPELTER was stationary at £21.

SILVER was quoted at 28 5-16d. (a fall of 1-16d), 28¼d., 28 3-16d., 27 13-16d. and 27 7-8d.

ANTIMONY.—"Star" brand receded to £29, but 50 per cent. ore remained at the previous week's reduced rate of £6 5s. per ton.

WOLFRAM (70 per cent. ore) had an advance of 6d. per unit, bringing the price to 34s., equal to £119 per ton.

MOLYBDENITE was still unchanged at 2/8 per lb., equal to £298 13s. 4d. per ton.

MANGANESE (50 per cent. ore) recovered to 10d. per unit, equal to £2 1s. 8d. per ton, as compared with 9 3-8d. and £1 19s. 1d. a week ago.

---

As the result of recent examinations conducted in Melbourne certificates have been granted for mining and factory engine-drivers and boiler attendants, as follows:—First-Class Mining.—W. M. Adamson. First-Class Factory.—J. Waite, G. M. Bennett, T. J. Sharke, P. T. Garrett, A. W. Bacon, C. Incledon, T. E. New, A. R. Talbot, F. Tate, junr. Second-Class Factory.—F. L. O'Brien, W. B. Howe, J. Cleary, T. M. Meyers, H. S. Heather, J. G. Castelow, R. Wood, G. M. Kingsbury, W. J. Sloan, E. W. Coombes, J. F. Townsend, H. Collins, A. V. Haoust, C. Holm, F. Cooper. Third-Class Factory.—J. H. Vale. Boiler Attendant.—F. E. Day, S. L. Richards, S. Weeks, J. M'Manus, J. P. Siddall.

An examination for managers and undermanagers' certificates of competency under the N.S.W. Coal Mines Regulation Act, 1912, was held at the Technical College, Newcastle, on 14th, 15th and 16th inst. Eleven candidates presented themselves for managers' certificates and six for undermanagers' certificates, the following being successful:—Managers, J. B. Brown and S. Carson; undermanagers, H. T. Baxter, G. Embelton, D. P. Middleton and S. J. Sawyer. The examiners were Messrs. Humble, Hardie and Jeffries.

## BRIEF COMMENT.

The alleged creep in the Mount Elliott Mine, Cloncurry (Q.), has been satisfactorily explained away by the district Inspector of Mines. Nevertheless, he admits that certain sections of the mine present difficulties. This means that great care must be exercised in providing adequate supports to prevent subsidence. In the case of a mine with a large ore body, large openings are the rule, against which stout timbering and proper filling is the general precaution. According to the inspector, this precaution is taken, and he ridicules the suggestion of a wholesale creep. It does not seem likely that the management would take any risks in this connection, apart from that in which life and limb is involved, as the loss of a level, or any section of a level, is no joke, the cost of picking it up again certainly rendering any chance of profit from that source quite hopeless. Fortunately, under modern mining methods, collapses are comparatively rare, although isolated falls of earth are frequent enough to put mining out of court as an alluring occupation for the worker.

The Great Zeehan Dundas Silver Lead Mining Co. (T.) held an extraordinary general meeting of shareholders on Friday last in order to decide on the matter of raising fresh funds for development work by the issue of reserve shares. The chairman (Sir H. Weedon), in stating the object of the meeting, said he considered the prospects of the company so encouraging that he did not think the opportunity would go beyond the present shareholders, who would have the option for fourteen days of taking up 200 of the 700 reserve shares at £2 per share, after which any not subscribed for by shareholders would be offered to the public. The managing director explained to the meeting the position of affairs at the mine, and the estimated cost of the proposed tunnel to be put in to intersect the four lodes now exposed. One obvious advantage about the proposed tunnel is that it will be deep enough to enable a good quantity of ore to be broken down for treatment when the lodes are reached; and it is hoped that the revenue from the ore thus exposed will provide adequate funds to carry on with. As much depends on the value and size of the lodes where it is expected they will be cut, no more than sufficient money is necessary at this juncture to reach them; and, as the cost of 380 feet of tunnel is estimated not to exceed £350, including administration, the amount to be raised by the issue of reserve shares, viz., £400, should be ample to determine the prospects of the mine, which, even now, are undoubtedly encouraging and such as to warrant the expenditure provided for.

The Austral Malay Tin Co. has exercised its option over certain tin-bearing ground at Kota, near Taiping. The area is 170 acres, and, according to tests made by 179 bores, its average value is slightly over one pound of tin oxide per cubic yard for an average depth of 41ft. Judging by the results obtained elsewhere in the Settlement, these figures are not likely to be highly profitable unless the scale of operations is such as to render low working costs a certainty, or the price of tin mends to an extent to which costs are a secondary consideration. It is proposed to form a company, to be known as the Larut Tin Dredging Co., to work this area. Other areas held by this company under option have not been found satisfactory, and turned down, with the exception of one at Renong, which is said to be promising. Whatever else may be said of these foreign ventures with Australian capital, they at least return some benefits to Australia, as is evidenced by the order lodged by the Kampong Kamunting Tin Dredging Co. with the Ruwolt Pty. Ltd., Melbourne, for the supply of bucket dredgers complete. If all these companies are also successful in returning substantial benefits in the shape of interest, the patriotic economist should be mollified by the reflection that things are not so bad after all.

The report of the Greenfinch Pty. Co., Weston (W.A.), for the half-year ended September 30, although otherwise showing a satisfactory enough state of affairs, does not evidence a remarkably active developmental policy. During the period 550 tons from the Recovery lease were treated for a return of 166 oz. gold, and 3700 tons of sands, slimes and residues for 994 oz., which, after payment of £564 for value left in sands from public crushings, gave a total revenue of £3251. The net profit, after deducting £2247 for mining and administrative expenditure, and £200 for depreciation, was £1059. Unfortunately, the outlook is not very bright for this company, but, obviously, every effort is being made to fortify it against the hard times which are pending, as, according to the manager, there is about nine months' profitable work ahead of the company, which may be improved by subsequent development. The total assets of the company can be reckoned at about £5597, of which actual cash represented £2213. The financial position is considerably stronger than on March 31 last, but unless some developments occur in the mine, the company can only live a hand-to-mouth existence on its resources and on public crushings until then.

At an extraordinary meeting of shareholders of the Edna May G.M. Co., Westons (W.A.), held at 31 Queen-street, on Friday last, it was decided to take an option on Duff's leases, on the northern boundary of the Edna May, the terms being £8000 cash at the end of six months, 10 per cent. deposit being payable in the proportions of £100 down and £700 in six weeks. The proposal met with a good deal of opposition at the outset of the proceedings, and one shareholder who had seen the leases stated that Duff had been advised if he wanted to sell them never to do any opening out. As a matter of fact, Duff, long ago, was supposed to have cut a reef in his leases. The importance of this may be gauged from the fact that nothing has since been heard of it. No mention was made at the meeting of what is already exposed in Duff's property, but as the proposal was made in view of the possibility of Duff getting the underlay of the Edna May reef at depth, it may be assumed that otherwise his leases are valueless. To anyone familiar with the local conditions, the Edna May Co. has not made a good bargain; but, having taken the option, the sooner the company ascertains the value of Duff's the better. In view of the lay of the country, to bore from the Edna May would be unwise, the sensible thing to do being to make a clean job of it and bore across Duff's leases at an angle which will intersect the boundary line at a vertical depth of not less than 500ft. By this procedure not only will the company determine the fate of the Edna May reef, but prove if there is anything else of value in Duff's leases. It will also have the excellent effect of throwing some light on the future of the field; and, so long as the Edna May shareholders don't mind doing it, it is alright. Their benevolence, however, is worthy of some aid, and the company would be well advised to endeavour to make some arrangement with the W.A. Government whereby the work can be subsidised, in order that it may be made more extensive. The benefits will thus be manifold.

The directors of the Annan River Co. (Q.) have found it necessary to formulate a proposal for raising additional capital, which is to be effected by the issue of 24,000 preference shares, at £1, to shareholders, which, being at a premium of 10s. each, will rank equally with the existing 12,000 preference shares until 12s. 6d. per share has been paid in dividends, when all shares will rank alike. The present situation has been brought about by the hitherto inadequate water supply, and the necessity for installing a pumping plant to ensure about 6 million gallons daily being made available from Wallaby Creek. It is also proposed to instal a bucket dredge to treat the company's dredging lease, 42 acres of which is estimated to contain 745,000 cubic yards of an average value of 1.104 lbs. The total cost of the foregoing proposals is estimated at £27,000. The chief difficulty is undoubtedly the want of a permanent and abiding water supply, and without it the position of the company remains unsatisfactory and operations can only be carried on in a fitful fashion. The company has ample cash in hand to make up the balance required over and above the £24,000 to be realised by the issue of the preference shares, and on the estimates of tin-bearing ground available, viz., over 2,000,000 cub. yards, varying in value from 1.104 lbs. per yard on the dredging lease to 1.6 lb. on lease No. 218, the company should have a long run of profitable work once it can get going continuously, which there is no reason to doubt the present proposal will effect.

During the half-year ended June 30 the North Tambin Tin Mines, N.L., Perak (F.M.S.), treated 84,000 cubic yards for a yield of 70½ tons of tin, or an average of 1.87 lbs. per cubic yard, won at an average cost of 1s. 4.34d. The working account shows a total revenue of £8766, and a total expenditure of £5963, leaving a profit of £2803 for the period. Taking into consideration the fall in the price of tin, these results compare favourably with those of the previous period, in which 66¼ tons of tin were won, which realised £9099. Also, in spite of hard and puggy ground being met with, working costs show a reduction of nearly £400. A visit to the mine was made by Mr. W. M. Currie, M.E., in order to see if some improvement could not be effected in working conditions; and, as the result of this, the directors are hopeful that better results will be achieved during the current term. It may be assumed, however, that costs are not far from bedrock, so that much of the improvement looked for will have to come from a hardening in the price of tin.

For the year ended September 30 the Maori Queen Pty. Gold Dredging Co., Bright (V.), won 98 oz. 7dwt. of gold, valued at £8105, which, with the balance brought forward, and proceeds of plant sold, enables the company to show a total revenue of £8870 for the year, during which dividends totalling £1646 were paid. Dredging operations during the period were accompanied by some difficulties which adversely affected the returns, but the directors announce that both dredges are about to advance to better ground, of sufficient extent to promise profitable work for some years to come. The cash position of the company, according to profit and loss account, is not so good as it was 12 months ago, when the amount in hand was £1294. This has been trenched upon somewhat on account of the difficulties mentioned and to pay dividends, but with £700 in hand, and better prospects ahead for an unhampered run, improved results should be shown for the current term.

According to the statement of accounts of the Broken Hill Junction Lead-Mining Co. (N.S.W.), for six months ended July 31 last, an actual loss of £900 was sustained, while a distinct drift is evident in certain items of the accounts which will take some recovering. The revenue for the period was £43,852, which was inadequate to meet mining and administrative expenditure by £900, in addition to which liabilities to sundry creditors have increased (by £7215) to £31,190, bank overdraft from £2692 to £3912, while the cash balance of £800 brought in to the period has entirely disappeared. On the assets side, the company has stores valued at £2598, concentrates worth £4196, and is owed the sum of £6148 by sundry debtors.

As the result of six months' work to October 2, the Duke and Main Leads Consols mine, Maryborough (V.), was able to show a profit of only £328 over a total expenditure of £12,092, receipts being £12,420. The quantity of wash treated was 5143 fathoms, for a yield of 2970 oz., the average value of the ground being 47s. 10d., and the cost 46s. per fathom, including development. In order to pay dividends amounting to £1250, the balance of £1668 brought into the term was reduced to £747 at the close, in addition to which other small assets, fuel and laths, total £609. Compared with the previous half-year the foregoing figures show unfavourably, costs being 2s. 9d. per fathom higher, and the average value and quantity treated being lower. The manager explains, as a reason for the small quantity treated, that about 2000ft. of lead developed in the north end of the mine was too poor to pay expenses, necessitating a reduction of the working parties from 15 to 12. Since entering wash the company has developed a course of 10,200ft. of lead, of which 8500ft. has been panelled, leaving about 7000ft. yet to be worked.

News is to hand from London that Messrs. Lionel Robinson and Co. are having an inspection made of Lawrie's find at Tanami (N.T.). It will be remembered that Tanami subsided rapidly from public notice, which is hardly to be wondered at, considering its situation. At the time of the rush, Tanami (which was jocularly dubbed in the Kimberleys the Cattleman's goldfield) was reached from Wyndham (W.A.) by means of the Hall's Creek track, the track from the creek to Tanami being just on the Territory side of the border. No doubt, this route is still the easiest. It is quite evident that without capital the field must remain undeveloped, as prospectors as a rule don't live exclusively on air; and, unless they are fortunate enough to find gold in lumps, in order that they may buy provender, they may just as well leave remote places, such as Tanami, severely alone. In one way, it is a fortunate circumstance for the field that numbers of cattlemen took up ground there, as, being cattlemen, they were able to pursue their vocations, and still retain their leases. It is impossible to conceive how the field would survive for long without the aid of capital; but even if Lawrie's find, or any other show on the field, does stand the test of expert examination, the situation of the field will remain the greatest obstacle to its successful exploitation. It may, of course, have the saving grace of being exceptionally rich, but this is by no means certain, as three years ago an examination was made of the field by Mr. E. Horn, on behalf of some capitalists, when it was in the stage of being secured at any price, but it was not considered good enough. It may be assumed that Messrs. Lionel Robinson and Co. know what they are about, and that, if they acquire any properties there, their local advantages will more than compensate for any disadvantage the field may labour under by reason of its situation.

The ore reserves of the Ivanhoe Gold Corporation Ltd., Kalgoorlie (W.A.), on June 30 last, were estimated by the management at 1,045,500 tons, of an average value of 39s. 4d. per ton. The estimate of the consulting engineers, Messrs. Bewick, Moreing and Co., at the same date, was 1,059,418 tons, of an average value of 39s. 9d. per ton. That bedrock grade has not yet been reached is apparent from the fact that the major portion of the reserves are actually below the average grade, and are confined to the east lode, in which there are 781,884 tons worth 37s. 5d. The middle lode accounts for another 185,764 tons, worth 42s. 9d., which leaves only two comparatively small blocks of considerably greater value, viz., the new lode, 53,936 tons, worth 45s. 4d., and the Boulder lode, 23,916 tons, worth 61s. 9d., and which are mainly responsible for keeping the grade up above low water mark. It is noteworthy in this connection that the directors have already notified shareholders of their intention to reduce the monthly profit to £10,000 from the beginning of next year.

This will necessitate a reduction in the rate of dividend.

The vendors of the Gitsham gold extraction process are still being kept in suspense as to the result of the demonstration on which will be decided the purchase of the rights. According to advices received by vendors, the result of the tests will not be known for at least another week, but meantime it is understood that everything points to a satisfactory conclusion. It seems rather unusual that purchasers should agree to take up the process, in accordance with the terms whereby vendors receive £15,000 cash and 33 per cent. of the company formed, on laboratory tests alone. But this is their look-out; and, as the company will afterwards undertake demonstrations on a large working scale, the vendors have every reason to be satisfied with the deal they have made.

For six months ended 30th September last the Cathcart Gold Mines, Ararat (V.) treated 2790 fathoms of wash for a yield of 4190¾ oz. The total revenue for the period was £15,846 and expenditure £11,319, showing a profit of £4527. Dividends totalling £5275 were paid, which amount, being excess of profits, was made up by receipts from sale of old plant. The credit balance at the close of the term was £3619, in addition to which an amount of £1130 for gold and stock on hand figures in the assets. Among liabilities the sum of £927 appears under the head of sundry creditors. The result of development work in the souhtern end of the property was generally disappointing, but recently some good ground has been proved, which may improve the situation. A considerable amount of development has been done in the northern end, as the result of which payable wash, at one point 250ft. wide, will be made available.

During six months ended 8th October the Great Southern Gold Mining Co., Rutherglen (V.), treated 5995 fathoms of wash for a yield of 4617 oz. of gold, valued at £18,859. The average value was 62s. 11d., and the cost 54s. 10d. per sq. fathom. During the period £1800 was paid in dividends, and since the books were closed a further dividend amounting to £900 has been declared, which practically absorbs the amount of cash in hand at the close of the term, which totalled £986. This company publishes a progressive balance-sheet, which shows that, to date, gold valued at £558,288 has been won, and dividends totalling £67,950 have been paid. As to the future of the mine, the directors report that beyond No. 16 cross drive the results of development have been unfortunately, discouraging, and until further developments have been made beyond No. 17 shoot it is impossible to say what the life of the mine may be. As the south end of the mine has been closed, the future of the property depends entirely on developments in the north end, and the manager is confident that, once clear of the hard sandstone bottom at present being traversed, payable wash will be encountered again.

---

## TASMANIAN MINING.

### Mount Lyell District.

(From Our Correspondent.)

Queenstown, October 24.

Everything in connection with the Mount Lyell Company's operations continues to progress most satisfactorily; and, as there is no sign of disturbance on the industrial horizon, it is confidently expected that the present gratifying state of affairs has come to stay.

At the North Lyell mine they are gradually increasing the output, and an average of about 425 tons a day—2550 tons a week—and unless any unforeseen interruption occurs this is pretty certain to be maintained for a long time to come. At the 850ft. level, No. 22 stope, which for a considerable period has been beaten out on the ground floor towards the Lyell Comstock lease, has reached the boundary, and the ore body here is of good size and grade. At the 1000ft. level, No. 40 stope was long ago proved by boring to extend into the Comstock ground, and it is just about as certain as anything in mining can be that the ore body of No. 41 stope at the 1100ft. level will be found to do likewise. The extension of the ore bodies into the Comstock lease at two, and probably three, different levels is from the point of view of the life of the mine of great importance, as it naturally adds largely to the already known ore reserves at and below the 850ft. level.

From the Mount Lyell mine they are shipping about 750 tons a day to the reduction works. The bulk of this is being won from the three underground levels, over which an aggregate of 13 stopes is being exploited.

Work at the Comstock mine is pretty well restricted to prospecting and exploring the various levels. During the progress of the work an enrichment of good grade ore is occasionally met with, but up to the present any discovery of this character has not been extensive enough to be of any appreciable importance.

At the reduction works the furnaces are being kept in regular commission, and there is every prospect of a good long campaign on these lines. As, however, only two furnaces were running during the first week of the period, it is doubtful whether the output for the current four-weekly period will be as good as for the previous one, but it is not anticipated that it will be much less, and they are pretty sure to get close to a furnacing run of 1000 tons a day.

According to present arrangements, Mr. R. Sticht, general manager of the Mount Lyell Company, will leave Australia some time in January next on an extended holiday trip through Europe and America. Mr. Sticht will be accompanied by Mrs. Sticht and family, and his absence will cover almost the whole of next year. In order to remove any misconception which may exist in regard to Mr. Sticht's departure, it may be mentioned on first hand authority that the report in circulation to the effect that Mr. Sticht is severing his connection with the Mount Lyell Company is absolutely incorrect. At the conclusion of his trip Mr. Sticht will return to Queenstown, and he will afterwards spend the principal part of his time here. It will be 19 years next March since Mr. Sticht came to Queenstown from America as manager and chief metallurgist for the Mount Lyell Company, and during the whole of that time it is pretty safe to say that he has not taken a total of six months' actual holiday. Therefore it will be willingly conceded that he is fairly entitled to something like a year's holiday.

---

## MINING IN QUEENSLAND.

### North Queensland Fields.

(From Our Correspondent.)

Mareeba, October 17.

The Chillagoe Co. does not intend to allow its reduction works at Forsayth to become a white elephant. Already its demolition has commenced, and the boilers, etc., have been sent to Mt. Mulligan, where they will be put to a more profitable use. The officers' quarters have also been removed. The power plant at the Havelock works, Forsayth, was greatly in excess of what was necessary, and we understand that the company intend, if circumstances so warrant, to instal a suction gas plant at the works. Opinions are divided regarding the Queenslander mine being the salvator of the Forsayth end of the Etheridge field. Some say the development is a very good one, and others say that it is only a repetition of previous finds in that mine.

Experience has now proved that the Etheridge district is a prospector's country, and that batteries and not reduction works are sufficient for the district's requirements. Mr. John Candlish's "Dry Hash" mine is being worked in a desultory sort of way, which is a great pity, as it is apparently the best mine on the field. It is handy to the railway terminus, and has been developed to a fair depth. Levels have been driven disclosing a large extent of backs, and there must be considerably over 800 tons of ore on the surface. This ore is estimated to be worth about £10 per ton gross. The owners recently sent away 400 tons of stone for treatment. It is stated that the nett return to the owners was £6 per ton. If the Chillagoe Company and the owner of the Dry Hash mine could come to terms, then there would be a supply of stone for the reduction works.

Walter Colley, who is managing the Chillagoe Company's Percyville properties, has completed the erection of the 5-head stamper battery and concentrating plant at that place.

The erection of the plant removed from Forsayth to Mount Mulligan coal mine is being proceeded with under Mr. J. F. Watson's supervision. Parts of the machinery are on the ground, and other parts are on the road and at the railway terminus, Dimbulah. There are three Babcock and Wilcox boilers which will furnish the steam power required at the coal mine. A Belliss-Morcom engine will generate electricity, which will be used for all purposes in the mine, such as fan-driving, haulage purposes, driving coal-cutters, boring machines, etc. Electricity will also be the motor-power at the coking works. The latter are to be erected on a very large scale, as the management will not try to pick out the best coal from the seams for coking purposes. The seams will have to be taken as a whole if profitable results are to be secured.

Good progress is being made with the excavations for the power plant, but those for the coking works are not yet under way. A scarcity of water is apparent right from Dimbulah to Mt. Mulligan, for six months or more each year, and this year is no exception, so a small concrete dam is being erected in a gully below the site of the works. This will serve temporarily, pending the selection of a better site and the erection of a dam on more comprehensive lines.

With regard to the coal mine the main tunnel is now in 350ft., and the carboniferous strata was entered a few feet earlier. At time of writing, a few small bands of coal are showing, but the bottom seam (No. 3) will be cut next week. To cut the No. 2 seam, the tunnel will require to be extended about 150ft. further. The tunnel has been well constructed and timbered throughout, being exactly level all the way. The tunnel is 10ft. wide by 8ft. high. On the outside incline, a double line of rails has been laid to the site of the power plant and coking works. In the Cooktown district, tin mining was very quiet during September owing to the dry weather. The various alluvial mining companies have, however, taken advantage of the dry spell to erect flumings and enlarge water races, etc.

The Annan River Company is constructing a dam at Angus Gully with a capacity of three million gallons. The Lode Hill Company, at China Camp, had 28 men employed during the past month on their flumings and water races. It is expected that at the end of October large shipments of tin will be going forward from this mine to Cooktown. The Cooktown district is receiving a lot of attention from tin miners. At Mt. Amos the erection of a battery has been completed, and in a trial run of 8½ hours, 2½ tons of stone were crushed for a return of 4½ bags of concentrates.

For the month of September the returns from the Warden's office, Cooktown, show that 28 tons 13 cwt. of tin, valued at £3483, were won. The Annan River Company was the principal producer with 11½ tons of tin, valued at £1400. Cannibal Creek, on the Palmer goldfields, was next with 5½ tons of tin, value £671 10s. Mt. Romeo produced 3½ tons, and Mt. Amos, 2 tons 2 cwt. The returns from the goldfields are not very large, although a very good crushing was put through by Messrs. McEvoy and Lauder, of 5 tons stone from the Hanging Rock claim, Coen, which gave a return of 91 oz. 19 dwt. of gold, or over 18 oz. to the ton.

At the Batavia River the fossickers are still picking up nuggets, the latest to meet with success being Edwin Bergin, who found a 96-oz. slug of gold.

Mr. David Morgan, manager of the Tyrconnel Gold Mine, at Kingsborough, was a visitor to Mareeba last week, and he stated that the development in the mine was very satisfactory. The main shaft is down 212ft., but the manager decided to crosscut from the reef from the 150ft. mark in the shaft. At 88ft. in the crosscut a 6-in. vein of quartz was met with. This is worth 1 oz. to the ton. At 91ft. a reef 3ft. wide was struck, and the crosscut passed through 6in. of flucan and then encountered the footwall reef, which is 2ft. 6in. wide, then followed 2ft. of formation, and then the true footwall. The distance between the two walls is, therefore, 8ft., of which 6ft. is good quality stone which will bulk from 1½ to 2 oz. to the ton. The manager is of opinion that he now has the Keating and Tyrconnel reefs in a N.E. and S.W. direction. In about four weeks time, the manager estimates, he will be in a position to break about 150 tons of stone per week. He should have no difficulty in doing this, considering the size of the reef. The mine is well equipped with a good winding plant, air compressors, and rock drills. The shaft is a three chambered one, well timbered. The battery is a 10-head stamper mill, which is almost completed, and with the installation of a suction gas plant will be ready for the mine stone. The suction gas plant is now en route from Sydney. Ten men are at present employed at the mine, but more will be put on now that the development work has been so successful. The shares in the Tyrconnel are mainly held by mining investors in Sydney and Melbourne, but during the past few days there have been many enquiries for shares by local residents.

The reserve shares (16,000) in the New Minnie Moxham G.M. Co., N.L., are being issued to shareholders only. With the money received from the issue of these shares, the directors intend to immediately proceed with the erection of a 10-head stamper battery. The engineer's report was most favourable, and he recommended the immediate erection of either a 10-head stamper battery or its equivalent in rolls. There are ample backs to warrant the erection of this mill. There are 425ft. of backs from the bottom level to the surface, and levels have been driven 40ft. easterly and 50ft. westerly on gold-bearing stone of an average width of 18 inches. This stone will easily average 4 oz. to the ton, so that the shareholders have something to look forward to. With the developments in the Tyrconnel and the Moxham mines, the Hodgkinson and Northcote fields are attracting a good deal of attention, and it is likely that several other old shows, which have not been worked for over 20 years, will be given a trial. A development syndicate has been formed, with a capital of £2500, to test the old Just-in-Time mine, which is about three miles from the New Minnie Moxham.

A crushing of 100 tons of stone from the Prince Alfred Tin Mine was started at the Gurrumbah battery last Wednesday, and it is estimated to yield about 10 per cent. tin. If results are up to expectations, the company should receive about £1000 nett for this crushing.

## MINING IN NEW SOUTH WALES.

### Broken Hill.

(From Our Correspondent.)

Broken Hill, October 24.

Within a few hours of my writing my last notes to the "Mining Standard" two things occurred in connection with the Broken Hill mines—the North mine struck the lode at the 1400ft. level and Block 10 shares rose in value nearly one-third per cent.

The striking of the North lode was expected, though it was met with a few feet before anticipated. The drill holes met it at about 360ft. Directly the drill bores showed metal the news was flashed over the wires, well before anything official was sent away. Mr. Weir, the general manager, as cautious as ever, wished proof, and the fact had to be more than confirmed before he would commit himself in any way. The ore body might easily have been a mere stringer. The size and value of the new ore body has yet to be determined, and only time will answer those questions. The level above has proved good enough, and there is no reason why this 1400ft. body shouldn't be bigger. The main point of satisfaction is that the ore in the mine lives down.

Whether the developments in the 615ft. level or the prospects of the half-yearly report put Block 10 so far forward on the market only the operators know. Mr. O. B. Ward, the general manager, in a first-hand report he gave me, concisely sums up the position:—"The position with regard to the west lode development at the present time is (Wednesday):—Total distance driven on the lode at the 615ft. level, 120ft. The first 100ft. was through ore, assaying 3 oz. silver, 11.9 per cent. lead, and 8.8 per cent. zinc. A crosscut was then put in, which showed a width of 28ft. of ore, assaying 2.7 oz. silver, 10.6 per cent. lead, and 6.7 per cent. zinc. The last 20ft. of the drive is on the footwall side of the lode, and values have not been payable, although there is still a strong well-defined ore body. A winze and rise between the 515ft. and 615ft. levels on this west lode were in ore for the whole distance, assaying 4 oz. silver, 15 per cent. lead, and 8 per cent. zinc. So far as proved, this west lode is an ore body averaging about 20ft. in width, underlaying rapidly to the west and dipping south, and somewhat patchy in values."

Very little has been done at depth (Block 10). The mill, however, is pleasing enough, four weeks' work showing 7493 tons treated for 1023 tons ready concentrates. The concentrates for the period averaged 65.6 per cent. lead, 31.8 oz. silver, and 6.0 per cent. zinc. The last Junction North the concentrates went 50.4 per cent. lead, 32.7 oz. silver, and 14.9 per cent. zinc (for which a second treatment had to be allowed). The North's weekly figures showed 69.0 per cent. lead, 23.5 oz. silver, and 6.6 per cent. zinc. These figures, of course, are very useful for a rough comparison. For years an attempt has been made to get the mines to prepare their figures in an agreed-on way, but the attempt has proved unavailing—the conditions in each case are different, and X does not equal X in a single instance. The figures of the two big treatment plants (Zinc Corporation and Amalgamated Zinc) can never be put one against the other—one company has a mine of its own whose figures are incorporated.

The Proprietary directors have agreed to the usual 1s. dividend, payable November 19. There lately hasn't been much to say about the company from this end—the steel works are claiming most attention. But the Proprietary remains the Proprietary—it is like the British Lion in one respect: it is master of the situation.

The half-yearly report of the Junction Co. was issued to shareholders the other day. It is replete with figures, which shareholders had better digest themselves. I am not going to attempt to dilate upon them. The crudes for the six months are put down as—

Assaying—

| Lead. | Silver | Zinc. |
|---|---|---|
| 14.0 | 9.9 | 9.8 |

And the concentrates as—

| | | |
|---|---|---|
| 56.9 | 25.4 | 5.7 |

The concentrates for last week averaged—

| Lead. | Silver | Zinc. |
|---|---|---|
| 54.6 per cent. | 24.1 oz. | 4.7 per cent. |

On the company's own figures work is not improving. Financially the company does not seem among the No. 1 grades. But the slimes flotation plant is under experiment, and the whole of Broken Hill would be pleased if the management did put the mine on a solid commercial basis.

Some of the ore in the South (lucky South) strikes in its development operations:—

| | Lead. | Silver. | Zinc. |
|---|---|---|---|
| 825ft. winze (C2) . . . | 17.6% | 8.9 oz. | 13.1% |
| 825ft. winze (H1) . . . | 15.2% | 4.0 oz. | 10.2% |
| 1170ft. west xcut (D3). | 17.2% | 7.1 oz. | 10.3% |
| 970ft. diamond drill (I4) | 24.7% | 4.2 oz. | 11.7% |

The passing through of 19ft. of rich ore in the north-west bore augurs well for the future of western lode. This mine holds its rank, and will continue to do so.

South Blocks (Zinc Corporation) continues to give handsome results from development in the main lode, but exploration in the zinc lode results in only fair grade ore, which is a pity, though proven bodies are thoroughly pleasing.

South Extended is doing nothing at present but pump water for the South Blocks' plant.

Metal prices are fair enough, and were it not for the trouble the "red raggers" threaten at the end of the year Broken Hill would have little to fear.

### Bathurst District.

(From Our Correspondent.)

Bathurst, October 24.

At the Hawkins' Hill Reward mine the level going north from abreast of Exhibition shaft is in very kindly country, and the hanging wall portion of the reef shows nice coarse gold, and if crushed separately should go easily 4 oz. to the ton. The footwall portion of the reef is a solid proposition and improving in value as the Robert Emmett crosscourse is approached. The total length of this drive, which was commenced less than two years ago, is close on 1000ft., and, including new shafts and crosscuts, some 1700ft. of ground has been cut out in the time mentioned, all by hand labour and without any Government assistance. When it is borne in mind that the ground overhead is all intact, and that further south they have the mammoth Frenchman's reef (½-oz. proposition) to blend with the richer stone now being raised, a "sweeter" thing would be hard to find in any other mine in New South Wales to-day. Graham's reef has been sunk on for 145ft., and values are carrying down and the reef becoming more solid as depth is attained. This reef runs from end to end of the Reward, and has just been picked up in the Rowley's Reef Co.'s ground a little north of the Crown Prince shaft. It is too soon to say much about it other than that dish prospects show excellent coarse as well as fine gold. A crushing is being raised. Rowley's Co. appear to occupy the key position on Hawkins' Hill to-day, lying as it does between the Reward on the northern and Amalgamated on the southern end. The latter company is breaking exceptionally good ore from its low level tunnel, but the trouble will be to get it crushed except at heavy expense, as the company's plant is 300ft. higher up the gorge, and the tapping of the Star of Peace old workings now runs the water down that way that formerly ran through the top tunnel and augmented the water supply for steam purposes from the Reward Co.'s dam. There appears to be only one thing for it, from a practical point of view at any rate, and that is to shift the present plant to the mouth of the bottom tunnel or else leave the present battery where it is and instal a good modern milling plant; but that is going to cost some money, as it is a difficult place to get machinery into.

McKellar's reef, near Trunkey, is looking well, the ore going down the full width of the two shafts and prospecting better than ever. People are beginning to move about them, and prospectors are everywhere, whilst a Victorian party is on the look out for something good. As soon as the leases come through the field will be an active one. As matters now stand, the other fellows are waiting on McKellar Bros.; but no one can blame a man for sitting tight until his lease is approved. A good few blocks have been taken up on private property, where there is a very big formation 100ft. to 200ft. wide, and said to be worth over 5 dwt. per ton, but this sounds a bit too good to be true.

Rich gold is being won from a small leader at Craig Lee mine, which had some sensational yields some years ago, and it is reported also that alluvial gold has been discovered in the vicinity.

## WESTERN AUSTRALIAN MINING.

(From Our Correspondent.)

Kalgoorlie, Oct. 20, 1913.

The recent developments in the Associated Northern's Victorious leases are so promising that a new era appears to be dawning for that much neglected district, Ora Banda. Although the lodes there have been classified by such eminent geologists as Prof. David and Mr. Larcombe as very similar to those of Kalgoorlie and Boulder, the ore shoots in the oxidised zone have proved so low grade and erratic that investors have been rather dubious about the district. So long ago as 1907 the late Mr. Graham Price, on behalf of the Hampton Plains Estate Co., took a six months' option on the Slippery Gimlet mine, but abandoned it, as the ore developed averaged only 30s. per ton. Since then the mine has been under option to Broken Hill Block 14, Oroya Links, Gwalia South and Messrs. Lionel Robinson, Clark and Co., and has been rejected by all, although the ore shoot in the sulphide zone has proved both longer and richer than in the oxidised levels. Owing to the rich developments now disclosed in the Victorious, the Slippery Gimlet is likely to be shortly taken in hand by a strong financial group. At the No. 5 level in the Victorious, after driving east for 32ft. in unpayable ore, 108ft. of sulphide rock, assaying 59s. per ton for the full width of the drive, was disclosed. For the next 90ft. soft oxidised ore, assaying 19s. per ton, was met with. Then very solid hard sulphide was again encountered, carrying free gold and telluride, assaying 95s. per ton for 10ft. and 30s. per ton for the next 20ft. The present face is very rich for the full 7ft. of the drive, and for another 3ft. in the wall. If this class of ore continues for any distance capital is bound to be attracted to the district, which has been very much neglected by capital for the last six years.

A parcel of 245 tons from the Benjamin George mine of 245 tons for a return of £2180, irrespective of 50s. per ton in the residue, may have the result of again drawing attention to the much neglected Coolgardie district. This mine is two miles south of Coolgardie, and was owned in the early days by a French Co., represented by Mr. Raymond, and known as the Australasian. It was equipped with a dry-crushing plant, and, for a few months, treated stone yielding 3 oz. per ton. The pay shoot was then alleged to have petered out, and the mine lay abandoned for years. Last year a dry-blower, named Edwards, struck the cap of a reef, from which six parcels have since been treated for a return of £6800, with 60s. per ton left in the residue. This ore has all been treated at the Government mill, so that the figures quoted are official.

The Golden Ridge Co. has abandoned most of its options at Yerilla, and now only holds the Yerilla King and an adjoining block pegged by the manager. The reef is far too small to be any good to a company, as in nine years the Viola has only produced £13,400 from 2500 tons, and the Yerilla King £15,500 from 2600 tons. The company is still on the outlook for a new property, and is examining a show on the Hampton Plains, which has recently been receiving a good deal of attention from Melbourne investors, but has yet to be proved. The directors have resolved to reduce the grade of ore in the Golden Ridge to 28s. per ton, and the monthly profit to £500.

## ORE CONCENTRATION IN AMERICA.

A striking feature in the development of modern concentrating practice in America is the increasing use being made of an Australian machine, the Hancock jig, which was first introduced there less than ten years ago, and has already superseded other jigs in many important mills, including some of the largest in that country. The chief advantages which this machine is found to possess over the Hartz and other plunger jigs are its great capacity (in some cases up to 800 tons per day of 24 hours), and its ability to handle an unsized feed. This greatly reduces the number of jigs required, and also simplifies the whole plant by dispensing with elaborate sizing and other subsidiary arrangements, and thus economises in floor space and in the cost of attendance, power and maintenance. A series of articles now appearing in the "Engineering and Mining Journal" of New York furnishes interesting examples of the successful treatment of large deposits of low-grade lead ores made practicable by the adoption of the Hancock jig.

At the Federal Mill, S.E., Missouri, U.S.A., 4000 tons of ore are treated daily. The oversize from 1¼ m.m. trommel is dealt with by Hancock jigs, special care being taken to produce a clean concentrate, and the middlings product, after recrushing by rolls, is treated on other Hancock jigs. Each 25ft. jig is handling 350 to 400 tons of original feed per day in sizes down to 1 m.m. It requires 5h.p. to drive one of these machines. The life of the screens is from 6 to 8 months. The upkeep, exclusive of screens, is about 33s. per month, or ½d. per ton of crudes treated. The tailings are removed from the jigs by drag belts, which enables the consumption of water to be kept down to 200 gallons per minute per jig. The average assay of the jig feed is 3.5 per cent. lead, while the tailings assay is about 0.65 per cent. The grade of concetrate made is about 75 per cent. lead, although at times they have averaged 77 per cent.; approximately 58 per cent. of the concentrates recovered from the mill come from these jigs. Considering the low value of the crude material, this is very good work indeed. The cost is only 1½d. per ton of total mill feed, 75 per cent. of which is treated on the Hancock jigs. At the Doe Run mill on the same field each Hancock jig is treating daily 600 tons of material ranging in size from 9 m.m. down to 1 m.m., the concentrates assaying 65 per cent. lead and the tailings 0.6 per cent. Most of the lead in the tailings is attached to gangue and could not be recovered without finer grinding.

# VICTORIAN MINING ACTIVITIES.

## Ballarat and District.

(From Our Correspondent.)

The Woah Hawp Canton are breaking stone from an ore body 10 to 12ft. wide in the 950ft. level. This is on the western slates' line, and hopes are entertained that it will develop into a fairly profitable lode. The last crushing averaged about 5 dwt. per ton; and another large crushing of 160 tons has been put through. Should the reef open up satisfactorily, it is intended to extend the lower levels to the same line. A good deal of developmental work has been accomplished in the past year or two, the value of which is expected to be apparent ere long.

The east crosscut at the Victoria United's 1400ft. level is still opening up stone, and a good width has been proved. A rise has been started in a big body of quartz at the 1000ft. level, which had not been touched during the past 12 or 13 years, and was abandoned at that time on account of a big fall of reef. A trial crushing from this is being raised. The big stopes in the north end of the 1300ft. level are showing stone of healthier appearance.

The drive in the break at the Llanberris No. 1 picked up stone, and this has been driven on for about 12ft.; a fair face of ore is presented. It is expected that this drive will ere long pick up the downward continuation of the good stone worked in the levels above beyond the break. These levels, 1030ft. and 1130ft., continue to keep the mill well supplied with payable stone. The face of the 1130ft. level is in large veins close up to he boundary, which are payable. A good face of payable quartz is showing in the middle section at the same level, where they are working east of the main north drive. At three points in the 1030ft. veins and makes of solid stone of payable grade are being broken out. As this lode channel has given the mine a new lease of life, the board has given instructions to crosscut east at the 1330ft. level to command the same line. This is the deepest level in the mine, and work has not been carried on for a long time, owing to the expense of lifting the water while operations in the neighbouring mine, the Last Chance, were restricted to shallower depths, the Llanberris management maintaining that its pumps were lifting the water in the adjoining mine as well as the local water.

The Scarsdale mine is developing generally fair grade stone, and in parts the ore values are pretty good. A crushing of about 200 tons is being aimed at, and a satisfactory return is expected.

The south drive at the Williams' Fancy No. 7 level is rather slow in picking up the payable stone beyond the break. At latest, about 3ft. of stone, almost payable, as it prospects about 3 dwt. per ton, was showing in the face, and it was liberating a drop of water. The good stone should not be long in being revealed in the drive, as in the No. 2 rise, at the same level, stone prospecting 6 dwt. gold per ton is being carried, which is said to be pitching south 1 in 2. The future of the mine is largely dependent on the existence of payable stone in the bottom level, and the fate of the South Williams' Fancy Syndicate show is likely to depend on the early appearance of payable ore in the south drive, as the Minister of Mines, a fortnight ago, gave the syndicate six weeks in which to complete the flotation of the company, and no announcement has yet been made as to the progress of the flotation. Should the lease fall into the company's hands, it is considered likely that a subsidiary company will be floated to immediately enter on a shaft-sinking programme.

Strong efforts are being made by the managements of several of the Beaufort mines to secure a resumption of work, if not by the strikers, by enlisting the services of men not associated with any particular industrial body. It is felt that the mines have been hung up long enough, and it is believed that many of the men are, in their hearts, not averse to resuming work. The Hope board expects the new winding engine, to replace the one damaged in the recent mysterious fire, ready in the course of five or six weeks. Nearly £400 was received from the insurance people, and of this almost £200 will go for the new engine.

The Beaufort Deep Leads directors are hopeful of being able to drive the main east drive by tender. There is about 400ft. of driving to command the main lead; but perhaps a rise will be put up to the old Waterloo gutter on the way out, a payable wash bed of 300ft. having been proved by the former English management.

The stopes at the 1500ft. level at the North Woah Hawp continue to produce good half-ounce stone. This drive is being pushed ahead by way of the New Normanby south drive. Fair stone is showing in the intermediate stopes above 1400ft. and at the 1060ft. level. The east crosscut at the 1500ft. level should get the western indicator line in the course of a few days or a week. Prospecting for indicator nuggets is being steadily prosecuted at the shallow levels, and the west indicator drive at 740ft. level is looking more promising.

The well has been sunk in the New Normanby shaft, and crosscutting should now be in full swing. As a big crosscourse was met in shaft-sinking, the lode should be cut much sooner than was anticipated. Payable ore is being mined west at the 1500ft. level, and gold is showing in the intermediate stone. While the stone in the east section is of indifferent grade, it is pretty fair in the south drive.

Fair faces of stone are showing north and south off the winze at the Central Plateau. These drives are 55ft. below the 600ft. level, and about 10ft. above the slide that was recently found to cut off the lode; and the wize was stopped at this point. Interest will be keenest as regards the north drive off the winze, as it will be in the direction in which the lode is pitching; and in any case will serve to expedite the work of opening up the mine, as a rise may be started when the main drive below is further advanced to connect with the intermediate drives. The main drive has not yet revealed any change in the country; but the lode may be found down in the face any day. The No. 1 rise has been holed through to the winze, and the men who have been stripping stone from the hanging wall of the lode at 600ft. have been transferred to the intermediate drive.

The only work now being carried on at the Sebastopol Plateau No. 1 is that at the 900ft. level, where crosscutting west off south in firm country they met the western lode, consisting of a narrow make of stone with black slates. A winze has been sunk at the end of the north drive off west, and went through stone at 7ft. The winze on the western leg of the reef is down 15ft. in nearly 3ft. of mineralised stone pitching fast.

Beyond the slide cut in the 800ft. south drive at the New Jubilee the country is virgin for a considerable height. More stone is making in the back, and the presence of payable ore in this direction would prove of the utmost importance to the company. The purely prospecting crosscuts at this level and at the 200ft. level are being maintained. They have started rising over the 900ft. south drive, and also over the intermediate drive, to get the stone that went underfoot in the level above.

## Bendigo and District.

(From Our Correspondent.)

The gold production for the week ending October 25, 1913, amounted to 3002 oz. 1 dwt. The principal producers were:—Central Red, White and Blue, 303 oz. 11 dwt.; Golden Pyke, 265 oz.; South New Moon, 175 oz. 19 dwt.; Great Northern, 118 oz. 12 dwt.; Carlisle, 113 oz. 7dwt.; Johnson's Reef, 105 oz. 11 dwt.; Ironbark, 103 oz. 5 dwt.; Clarence United, 98 oz. 2 dwt.; Catherine Reef, 97 oz.; Koch's Pioneer, 94 oz. 4 dwt. Central Red, White and Blue announced a 2s. dividend, equivalent to £3200, and making the company's total disbursements to date £137,600.

South New Moon put through a trial crushing from the 1140ft. south workings, obtaining the unlooked-for profitable return of 44 oz. 17 dwt. from 77 tons. The stone was broken where the reef channel is slightly faulted by a slide, and the intrusion of a dyke at the intersection of a crosscut off the 1140ft. south level, at 300ft. from the shaft. Some months ago, this crosscut was driven through the reef channel from a level near the western turnover, opening up irregular quartz and a number of spurs. A few payable returns were obtained, though very little gold was seen. Eventually becoming of low value, this portion of the formation was discarded, and a level extended another 250ft. in the eastern limits of the faulting, on the east side of centre. These operations revealed a large quantity of stone, chiefly of a well mineralised character, but low value. It was then further tested by crosscutting 35ft. west from the end of the level, work that disclosed quartz of similar character throughout. A return was then made to the first crosscut, where the previous payable averages were got, and the yield last week is from the first crushing. This particular shoot seems to exist overhead southward, conforming to the pitch of the beds and the faulting. It is, therefore, probable that a rise will be extended in centre, along the lava, from the last crosscut off the end of the south level. From where the profitable crushing was broken, to the south boundary, is a matter of over 500ft. Northward very little seems to be known of this portion of the reef channel, and it is not considered likely by the management that the auriferous quartz will extend far in this direction. There does not appear to be much to support this theory, however. At 500ft., the crosscut on the north boundary has been stopped, and a rise started on the quartz associated with a fault, passed through a week or two ago.

Unity development in driving through the Carlisle fault at 1018ft. is not turning out as favourably as anticipated, but there is still plenty of scope for better results. The trial crushing produced an unpayable average. The intermediate north level is in 73ft., leaving about 60ft. to reach the Carlisle lease. Above the fault the stone is solid and well mineralised, and continues to show a little gold. As the company have a greater length of ground southward, a level will be extended in that direction above the slide; the previous limited prospecting having been under the break. This work, however, is likely to be deferred till the connection is effected with a crosscut at 920ft. At the latter depth the crosscut has just passed through a 16in. west leg, of which nothing is known in this mine. It will take some time to reach the Victory back and link up the rise on the latter above 1018ft. After holing through, it will be possible to work two systems of auriferous spurs to greater advantage. On the Paddy's Gully line the 1145ft. crosscut has been stopped in order to prospect a small formation at a depth of about 830ft.

Golden Pyke directors very quietly realised on the 550 trust shares during the term, without the least suspicion of the packet being on the market. Buyers absorbed the scrip at an average value of 37s. 4d., cum 1s. div., values afterwards improving. Had investors been conversant with the action of the board of management, it is probable that prices would have eased slightly instead of hardening. The amount obtained from the sale, nearly £1050, has been placed to the company's credit, and will be a substantial set-off for the recent liability incurred by the installation of modern machinery. The mine is still looking well, and the 730ft. crosscut is very shortly expected to reach the downward extension of the reef.

New Prince of Wales have brighter prospects below 690ft. In extending the north intermediate level a short distance from the No. 1 winze, more gold is visible in 7ft. of good-looking stone. This is apparently the north pitch of the payable shoot seen in the stopes, and the development is, therefore, of some importance, as the reef is unprospected for several hundred feet ahead. The stopes at this point, between the Nos. 1 and 2 winzes, are taking up to 10ft. of crushing material of payable quality. The average of last week's yield was more profitable, and a still better return is confidently looked forward to from the next milling, when the output will be increased. From the south winze, an intermediate level will be driven to the boundary, a matter of about 90ft., in expectation of locating the lower portion of the shoot seen in the south Prince of Wales. The company distributed £50 amongst the employees who remained at work during the "non-unionist" strike.

South Prince of Wales are in 80ft. from the New Prince of Wales north boundary with the 690ft. level from that end. There is 1ft. of stone in the face, showing a few colors of coarse gold. The rise is up 45ft., and will shortly hole through to the winze below the 611ft. main north level. Nothing of value is disclosed in the rise, but the stopes reveal fair gold in 6ft. to 10ft. of stone. Above 590ft. similar prospects are reported in 6ft. to 10ft. of stone. The south level off the main crosscut has been resumed, and is showing up to 2ft. of promising quartz, containing a colour or two of gold. There is a small sum to credit.

Ulster United have adopted an active policy in the shallow ground, from which early developments of a favourable character are expected. At 320ft. there is about 10ft. of highly mineralised quartz in driving south along a faulted back, which, it is anticipated, will shortly prove auriferous. This stone is under a northerly pitching fault. The 410ft. south level is also opening up 2ft. of mineralised quartz, which apparently represents the neck of a reef, the west back of which the company have risen to 15ft. on, above the 500ft. crosscut. As yet, no gold has been seen. At 170ft. spurs are being encountered in rising on the west back of another unprospected formation.

Carlisle 1140ft. south level has not shown so much gold of late, the spurs being scarcely payable at 291ft. from the shaft. The best stone appears to have risen overhead. Fair gold is still showing in the western side stopes, a little gold being visible in stoping for a width of 25ft. above the timber. Closer to the shaft the spurs abutting on a fault contain a little gold. The 1200ft. north intermediate has not yet reached this slide at 314ft. in. A few colours of gold are visible here in a full width of stone. Driving has been temporarily suspended at 1264ft., in order to rise through to the 1140ft. workings for better ventilation.

Golden Age had a decided set back with a big drop in the yield from the 853ft. and 665ft. levels; only a small proportion came from the latter depth. With the increasing height of the 853ft., operations are getting above the shoot that exists in conjunction with the break in the hanging wall. The reef is also smaller overhead, and does not appear to possess a cap of any dimensions. At 665ft. in the north shaft, the north level and stopes are opening up stone of a more favourable character and a little gold. The shaft on the Paddy's Gully line is being deepened, in expectation of meeting an east leg shortly.

### Blackwood.

(From Our Correspondent.)

The quarterly returns from the Blackwood mining district for the quarter that ended on September 30 is as follows: Quartz, 530 oz. 2 dwt.; alluvial, 35 oz. 13 dwt. 22 gr.; total, 565 oz. 15dwt. 22gr. This is 48 oz. 12 dwt. less than the previous quarter. March quarter was 167 oz. in advance of June.

During this quarter New Sultan Reefs Company treated 1035 tons of stone, and the net result was 473¼ oz. gold, which was sold for £1880. In the No. 5 level the south end stopes average about 12in. of stone, without alteration in values. No. 2 level, in the south main face reef is 5in. wide, and gold was seen in breaking. No. 1 level is being stoped on stone 5in. to 6in. wide, showing payable gold. The new boiler is just about ready for work. Another contract has just been let for sinking the main shaft a further depth of 100ft.

Stephens and Sons have put one parcel of 8 tons through the Government battery at Blakeville for the high return of 56 oz. 10 dwt. They report that payable stone is still being broken out.

Easter Monday Gold Reefs Co. have erected a 10in. winch plant to continue sinking the main shaft, which is now down 270ft. A crosscut west of the north drive off the bottom tunnel has been continued to connect with the shaft, and another contract has been let to sink the third section of the main shaft to 350ft. This will connect the shoots of gold working on the tunnel levels, which have been proved to be going down strong underfoot, and of a payable character.

The Golden Hope Company has almost finished the erection of their winch plant on the old Undaunted shaft. This was a good show in the "seventies."

The old Morning Star lease has been taken up again, and the promoters hope to float it on the English market.

At Metcalfe, Bennie Bros. sent a parcel of 9 tons to Reid and Keath's battery for return of 23 oz. 17 dwt. The reef is still looking well.

### Maldon.

(From Our Correspondent.)

Nothing could show more plainly the decline of the Maldon field than the tabulated returns for the quarter ending 30th September. From alluviums came 40 oz. 6 dwt.; from quartz reefs, according to actual returns, 2504 oz. 18 dwt.; and from quartz reefs not specified, 916 oz. 5 dwt., a total of 3461 oz. 9 dwt. This shows a decrease on the previous quarter of 1642 oz., the figures then reading 5103 oz., an increase on March of 746 oz. Sometimes a holding of residues by a big mine helps to make this difference. On this occasion Oswald's Gold Mine has not treated any concentrates for the term. For the quarter their yield showed 591 oz. less than for the previous one, but the treatment just at the beginning of the present month resulted in over 300 oz. coming from the chlorination plant. The position in this great mine is that stoping is being carried on on payable stone, between the 500ft. and 600ft. levels, on two distinct shoots of stone, one of which has been worked from the 500ft. to 700ft. levels for a width of from 5ft. to 8ft., and worth about half an ounce. The other has been traced from the 400ft. to the 5000ft. level, and is 100ft. long, and from 6in. to 4ft. wide, worth over an ounce to the ton. Prospecting work is being done at 400ft., 600ft., and 1100ft. levels. Already for the current term the battery has crushed 366 tons for 219 oz. 4 dwt.; chlorination plant, 19 tons, 305 oz. 3 dwt.

South German yield was:—Battery, 1036 tons, 436 oz. 18 dwt.; concentrates, 20 tons, 171 oz.; cyanide, 2043 tons, 174 oz. 11 dwt.; total, 782 oz. 9 dwt., valued at £2994 4s. Tributers have been crushing from 700ft., 1000ft., and 1750ft. levels, from which nearly all the stone in the return has been taken. Baxter's tribute has been worked for 50ft. north of the winze at 1750ft., and to an average height of 35ft., most of the dirt being worth 17 dwt. per ton. Good ore is being obtained south of the winze by the same party, who will continue on into the company's ground. The company itself has extended the intermediate level for a distance of 197ft., and the stone has assumed a more settled appearance. A crosscut has been put in at the north end of the 2000ft. level, where stone has been cut carrying almost payable values. The gold yield was 283 oz. ahead of June quarter.

Derby United yield was 96 oz., valued at £366 7s. 8d., made up of 78 oz. 14 dwt. from crushing 500 tons and cyaniding 166 tons for 18 oz. 2 dwt. June term was worth 412 oz., valued at £1623. They have been rising at the crosscut east off the 680ft. level. Crosscuts have also been put in at 825ft. and 440ft. levels, but so far results have been poor.

Maloney's Red, White and Blue crushed 369 tons for 103 oz. 7 dwt., valued at £412, as against 74 oz. for June. There is no improvement to report.

There are no returns at all from the Newstead end, and many familiar names have dropped out of the list. The Maldon Prospectors complain strongly that the absence of a battery for small parties amounts to a pressing need. So many companies have sold off their machinery, and the existing ones monopolise their own batteries. Several parties have crush dirt awaiting treatment, and are in an awkward position. If their stone is not crushed they can get no guide as to whether their show is good enough to prosecute any further. The number of miners, prospectors, etc., employed on the field is reliably set down at 276.

Last week Derby United cyanided 250 tons for 27 oz. 10 dwt. smelted gold. Maloney's Red, White and Blue crushed 31 tons for 6 oz. 12 dwt. Blow Reef (Newstead) have crushed the first parcel of stone from the north rise at 280ft. level, on the western reef. The result is encouraging, 64 tons yielding 25 oz. 15 dwt., exclusive of concentrates.

---

There is said to be promise of a revival of mining at Hillsborough, nine miles from Yackandandah, a good deal of encouragement for this hope being derived from recent developments at the Homeward Bound-Bon Accord mine, which was prominent in the "sixties." Prior to the "seventies," 46,000 tons were crushed for an average of 11¾ dwt. free gold, and the sand, since assayed, has gone several dwts. Tunnelling operations have now resulted in the old reef being cut 300ft. below the old workings, and the prospecting since done has disclosed a body of stone from 2ft. to 6ft. wide in the shoot, which is expected to crush well. A trial crushing was taken, which showed payable results, but subsequent driving showed this to be a low-grade end of the shoot. Tunnelling has also been carried out on the Birthday reef, in the same district, with the result that a mineralised reef 4ft. thick is now being driven upon, in the hope of picking up a rich shoot.

---

## REPORTS OF COMPANIES AND CORPORATIONS.

### Broken Hill Block 10 (N.S.W.).

The production and assay value of concentrates by the Broken Hill Proprietary Block 10 Co. for the last two four-weekly periods was:—

| | Four weeks ended— | |
|---|---|---|
| | Sept. 17. | Oct. 15. |
| Ore treated, tons | 8378 | 7493 |
| Assaying— | | |
| Silver, oz | 9.8 | 9.2 |
| Lead, per cent. | 12.1 | 12.1 |
| Zinc, per cent. | 13.4 | 12.6 |
| Concentrates, tons | 1157 | 1022 |
| Assaying— | | |
| Silver, oz. | 32.9 | 31.8 |
| Lead, per cent. | 64.4 | 65.6 |
| Zinc, per cent. | 6.7 | 6.0 |

### Broken Hill Proprietary (N.S.W.).

The output of the refinery of the Broken Hill Proprietary Co. Ltd. for the last two four-weekly periods was as follows:—

| | Four weeks Ended. | |
|---|---|---|
| Silver, fine, oz.— | Sept. 24. | Oct. 22. |
| From company's ore | 118,660 | 194,874 |
| From purchased ore | 195,604 | 128,712 |
| Soft lead, tons— | | |
| From company's ore | 1,737 | 3,116 |
| From purchased ore | 5,188 | 2,981 |
| Antimonial lead, tons (estimated)— | | |
| From company's ore | 58 | 31 |
| Zinc concentrates produced, tons | 6,750 | 6,950 |
| Contents— | | |
| Silver, fine oz. | 86,797 | 90,853 |
| Lead, tons | 504 | 520 |
| Zinc, tons | 3,096 | 3,175 |

### Chillagoe Ltd. (Q.).

The smelting returns of Chillagoe Ltd. for the last two four-weekly periods was as follows:—

| | Four weeks Ended | |
|---|---|---|
| | Sept. 12. | Oct. 10. |
| Ore treated, tons | 3,404 | 4,729 |
| Recoveries— | | |
| Copper, tons | †46 | ‡328 |
| Lead, tons | †313 | — |
| Silver, oz. | 26,172 | 16,477 |
| Gold, oz. | 359 | 155 |

†Copper and lead furnaces ran respectively 5 and 22 days.

‡Copper furnace ran 28 days.

### Mt. Morgan G.M. Co. (Q.).

The smelting returns of the Mt. Morgan Gold Mining Co. for the last two four-weekly periods were as follows:—

| | Four weeks Ended | |
|---|---|---|
| Smelters— | Sept. 21. | *Oct. 18. |
| Copper ore, tons | 20,089 | 20,091 |
| Many Peaks ore, tons | 2,578 | 4,625 |
| Blister copper, tons | 700 | 611 |
| Copper contents, tons | 694 | 605 |
| Gold contents, oz. | 8,827 | 7,584 |
| Proportion Many Peaks ore (approx.)— | | |
| Copper, tons | 30 | 67 |
| Gold, oz. | 18 | 35 |
| Secondary products (approx.)— | | |
| Copper, tons | 25 | 27 |
| Gold, oz. | 298 | 349 |
| Working time, days | 28 | 28 |
| Estimated value, blister (copper at £60) | £<br>78,784 | £<br>68,213 |

*Reductions chiefly due to smelting lower-grade ore and higher siliceous ores.

---

## MINERAL RETURNS.

The return furnished by the Under-Secretary for Mines shows that the gold yield of New South Wales for September was 13,303 oz. crude, equal to 10,577 oz. fine, valued at £44,928, as compared with 19,507 oz. crude, equal to 16,426 oz. fine, valued at £69,774, for the same month in 1912. The yield for the first nine months of this year amounts to 133,871 oz. crude, equal to 107,152 oz. fine, valued at £455,155, as compared with 147,542 oz. crude, equal to 131,925 oz. fine, valued at £517,903, for the corresponding period in 1912, showing a decrease of 14,773 oz. fine and £62,748 in value.

The Victorian gold yield for September was 40,473 oz. gross, or 37,736 oz. fine, valued at £160,295. Compared with the yield for September of last year a decrease of 2998 oz. fine has occurred. The yield for the last nine months was 351,263 oz. gross, or 326,720 oz. fine, valued at £1,386,910. This shows a decrease of 29,043 oz. fine, compared with the quantity won during the corresponding period of last year.

The Queensland gold yield for September amounted to 22,220 fine oz., valued at £94,385, as compared with 29,257 fine oz., valued at £124,276, showing a decrease of 7037 oz., worth £29,891. During the month the Mt. Morgan G.M. Co. paid £50,000 and the Gympie field £431 in dividends. The yield for the nine months ended September 30 was 200,418 oz., valued at £851,321. In the corresponding period last year the quantity was 260,677 oz., valued at £1,107,285—a decrease of 60,259 oz., valued at £255,964. The dividends for the nine months were £178,360—a decrease of £14,913.

The West Australian output of gold during September was 115,168 fine oz., the value being £489,204. as compared with 111,106 fine oz., valued at £471,949 for the same month last year. The total output for the expired nine months was 972,503 fine oz., the value of which was £4,130,928, of which 910,736 fine oz., valued at £3,868,558, went to the Royal Mint.

The value of minerals other than gold produced from West Australian mines during August was £14,291, and the total for eight months was £181,561. Detals for August were:—Copper, £703; tin, £5793; silver-lead ore, £3868;. coal, £3927.

The gold produced from mines in New Zealand during September amounted to 37,173 oz. gross, or 34,474 oz. fine, valued at £146,437, as against 27,516 oz. gross, or 25,117 oz. fine, valued at £106,692 for September, 1912. The total for the past nine months was 287,922 oz. gross, or 265,879 oz. fine, valued at £1,129,382, against 279,383 oz. gross, or 257,848 oz. fine, valued at £1,095,267 for the corresponding period last year, the increase for the term being 8539 oz. gross, or 8031 oz. fine, valued at £34,115. The production of silver during September was 92,020 oz., valued at £9706, as compared with 113,669 oz., valued at £12,587 in September, 1912, the decrease being 21,649 oz., valued at £2881. For the nine months the silver output was 766,094 oz., valued at £80,940, as against 719,510 oz., valued at £75,269 for the corresponding period in 1912.

---

The value of minerals and mineral products exported from Broken Hill (N.S.W.) during September was £402,720, as compared with £382,242 in August, and with the record total of £409,024 in September, 1912. Details for the two Septembers were as follows, those of last year being in parentheses: — Silver-lead concentrates, 30,158 (25,065) tons, value £304,527 (£299,217); zinc concentrates, 35,881 (31,973) tons, value £90,498

(£100,978); silver-lead crudes, 2614 (2511) tons, value £6244 (£8606); silver-lead slimes, 1384 (441) tons, value £958 (£221); zinc slimes, 299 (—) tons, value £493.

The Board of Trade returns showing imports and exports of metals to and from Great Britain during August, and for the first eight months of this year, were as follows, the corresponding figures for 1912 being added in parentheses:—August —Copper, imports, 13,898 (15,554) tons; exports, 5509 (5629) tons. Tin, imports, 3002 (3278) tons; exports, 3651 (3403) tons. Lead, imports, 17,189 (16,650) tons; exports, 4984 (5708) tons. Spelter, imports, 13,138 (11,209) tons. Pig-iron, imports, 12,579 (18,011) tons; exports, 102,447 (111,624) tons. Iron and steel, imports, 77,193 (98,747) tons; exports, 185,572 (191,303) tons. Galvanized iron, exports, 57,601 (55,547) tons. Tin plates, exports, 35,274 (48,402) tons. For eight months.—Copper, imports, 108,022 (105,020) tons; exports, 47,729 (40,100) tons. Tin, imports, 30,275 (27,658) tons; exports, 29,527 (30,476) tons. Lead, imports, 136,704 (138,651) tons; exports, 40,924 (35,799) tons. Spelter, imports, 88,517 (86,571) tons. Pig-iron, imports, 143,259 (120,151) tons; exports, 747,299 (870,045) tons. Iron and steel, imports, 662,181 (663,291) tons; exports, 1,704,008 (1,459,324) tons. Galvanized iron, exports, 498,073 (402,273) tons. Tin plates, exports, 333,459 (314,652) tons.

The Transvaal (S. Af.) gold output for August and for the first eight months of the year was as follows, the figures in parentheses being those for the corresponding periods last year:—August, stone milled, 2,217,390 (2,170,079) tons; gold produced, 728,096 (764,737) fine oz., valued at £3,092,754 (£3,248,395), the average values being 6.44 (6.82) dwt., and 27s. 4d. (29/-) per ton milled. Working costs amounted to £1,957,615 (£2,045,955), averaging 17s. 9d. (19/-) per ton, and working profits to £1,069,747 (£1,093,158), the average being 9s. 8d. (10/2) per ton. Last August dividends amounting to £505,737 were paid, but none in August, 1913. Eight months. Stone milled, 18,031,909 (17,215,574) tons; gold produced 6,023,906 (6,073,982) fine oz., valued at £25,587,927 (£25,800,637), the average values being 6.59 (6.93) dwt., and 28s. (29s. 5d.) per ton milled. Working costs were £16,231,485 (£16,354,795), averaging 18s. 1d. (19s.) per ton, and working profits £8,660,490 (£8,633,567), the averages being 9s. 8d. (10s. 1d.) per ton. Dividends paid amounted to £4,456,980 (£3,903,903).

The production of minerals other than gold from mines in the Transvaal for July was as follows, figures for July, 1912, being given in parentheses:—Coal (sold), 461,212 (408,656) tons; silver, 69,464 (81,489) fine oz.; copper ore 457 (239) tons; tin ore, 302 (290) tons. For the seven months the totals were:—Coal (sold), 3,025,870 (2,708,186) tons; silver 573,867 (570,740) fine oz.; copper ore, 2567 (799) tons; tin ore, 1952 (1816) tons

---

## OIL V. COAL.

### Testing Newcastle Coal.

(From Our Correspondent.)

Newcastle, October 25.

Recently (as mentioned in our last issue) a big Newcastle firm received a letter from their San Francisco house, drawing attention to the keen competition of oil with coal as fuel on the Pacific Coast of America, and the possibility of the competition extending to the West Coast of South America. In Newcastle the matter has not caused any great concern to those who are not interested in the foreign coal trade until recently; but now attention is being given to the matter because of the possibility of some of the coals mined in the Newcastle and Maitland districts yielding oil for power purposes on a commercial scale.

A few weeks ago a shipment of 10 tons each of Teralba, Hetton, and Rothbury coal was sent to England to be tested under the Del Monte process for the production of motor oils, and the result of the test is being awaited with interest. The coal from Rothbury colliery, which is situated about 35 miles up the Hunter Valley from Newcastle, is said to be particularly rich in oil, and those concerned in the matter are hoping that it, if not the other coals sent home, will yield good results. If the test is satisfactory, steps will be taken to erect a plant to treat the coal here for the production of oil and by-products. The Rothbury colliery contains a large seam of coal, and estimates of the quantity under the area which is being worked vary from 50,000,000 to 100,000,000 tons. The seam is thickening as it goes under cover, and so it may be that the larger quantity will be yielded by the mine. In any case, there is an enormous quantity of coal of the same nature as that sent home to be tested, and if it is oil-bearing, then there is enough of the mineral at Rothbury and under the adjoining country to supply Australia with oil for many years to come.

## OIL IN SOUTH AUSTRALIA.

### Interview with Dr. Basedow.

Dr. H. Basedow, M.A., formerly Assistant Government Geologist of South Australia, and afterwards consulting geologist in the Northern Territory, whose opinions in regard to the presence of petroliferous areas in South Australia were referred to in our last week's issue, has given an interview on the subject to a representative of the "Mining Standard." The following is a report of the views enunciated by Dr. Basedow in the interview:—

I have already reported favourably on the prospects of finding oil at several places in South Australia, and pointed out that I am aware of no feature which at the outset would preclude the possibility of finding petroleum. Whether there are any positive indications of commercially payable quantities of oil occurring in the formations referred to is really a matter that can be decided by practical test alone. The geological structure of the country is not unfavourable, and it would be a scientific mystery if so extensive a system of fossiliferous Tertiaries would ultimately be proved to be devoid of subterranean reservoirs of petroleum.

To put matters into a nutshell, the position is this. Australia possesses one of the greatest Tertiary systems of the world. It extends roughly from Cape Leeuwin in the west to about Cape Otway in the east, and can be traced northwards of the Great Australian Bight, across the Nullarbor Plains, and alone the course of the River Murray to beyond the New South Wales border, and southwards to Tasmania. The series includes beds of different ages—Eocene, Oligocene, Miocene, Pliocene, Pleistocene and Recent. The strata are richly fossiliferous and consist of limestone, sandstone, claystone, and conglomerate, with intercalations of lignite at various depths. They are for the most part gently folded, or have a tendency towards monoclinal or horizontal deposition. Tertiary systems in other parts of the world have been proved to be petroliferous. Australia alone has done nothing to prospect these beds for likely reservoirs of subterranean oil. Many of the known oil fields of the world have been accidently discovered where there were no surface indications of oil. The only way to explore likely lands is by means of systematic deep boring. In South Australia we have several phenomena and indications which either point to the proximity of crude petroleum or are at least favourable for the occurrence of ore at depths. Briefly stated they are:—

1. The regular appearance of several bitumens on our beaches after every gale; e.g., asphaltum, paraffin, hatchettine (or mountain tallow) and retinite. There seems no doubt that the specimens have a sub-marine origin within the limits of the great continental shelf. Professor Hoefer, the famous Austrian oil expert, emphatically states that if the origin of these specimens is submarine, it certainly is not at a very great depth. In other words, the very beds that form the cliffs along the shore might in that case be found to contain oil at a deeper level; several of the bitumens being the direct residual product of petroleum subjected to evaporation and oxidation processes. Mr. Whaley, an American oil expert, claims to have discovered bitumen in situ in the Tertiary rocks of Tasmania.

2. The corroborative reports by disinterested, honest and intelligent pioneers, who claim to have seen crude oil oozing from the rocks in the early days. We must recollect that several fields in other parts of the world were discovered by investigating the statements made by primitive savages.

3. Films of oily matter have recently been reported by competent men (Dr. Stevenson and Mr. Durwood) to periodically occur on the sea at certain points named by them.

4. Traces of oily matter have been extracted from certain rock formations by chemical means and seepages of oil found in lignite deposits overlying the older Tertiary system.

5. A mud volcano on Kangaroo Island has been described as evolving sulphuretted hydrogen.

6. Bright lights are occasionally seen in the south of Kangaroo Island, near Murray's Lagoon and Lake Ada. These are regarded by some to be incandescent petroleum.

7. The occurrence of numerous salt lagoons, deposits of salt and gypsum.

8. The occurrence, at various depths, of brown coal and lignite.

9. Also that of foetid limestone and organic limestone.

10. Coorongite, elastic bitumen or mineral caoutchouc is found in several localities. When viewed under the microscope this substance contains numerous small vegetable organisms, and on that account a vegetable origin has been assigned to it. Many crude oils that have been produced at no great depth, by destructive distillation at low temperatures contain microscopic organisms. The latter may or may not take part in the formation of oil. Is there not a possibility of an original oily seepage or medium inducing the minute vegetable organism to live and thrive on the Coorong and elsewhere instead of resorting to the opposite theory above mentioned?

The present controversy originated through the official report by the Government Geologist, who a few months ago spent a few days in the field. In some respects his Bulletin is a very creditable production. The setting out of it and the included sketch plans are good. The most important matter, however, the substance of the report, needs considerable comment. As a report which is intended to guide the public, it is indefinite. A case in point is "An outcrop of granite is reported to exist at Cape Gantheaume." Yet that outcrop is definitely included as such in the geological plan that accompanies the report. Even if this granite or other rock did occur at Cape Gantheaume and other points, it by no means follows, as Mr. Ward remarks, that the sedimetary deposits which occupy so large an area in the south-eastern part of Kangaroo Island are necessarily "shallow" and "rest on a gently sloping shelf"; for Mr. Ward on the previous page referred to the older formations on Kangaroo Island as a "Geographical outlier of the Mount Lofty Ranges." Many miles of country separate these few outcrops of older rock that I know of. By applying Mr. Ward's argument to the Mount Lofty Ranges further north along its axis we could not have expected to find any depth of sedimentary rocks, say, at Kent Town, where the Water Works Department bored through several hundred feet without striking bottom. Personally, I should not like to predict the depth of any subterranean valley that existed many million years ago. Then again, the problematical granite at Cape Gantheaume might be an igneous intrusion in very much younger rocks. It would then be on a par with the igneous intrusions occurring right in the heart of the New Plymouth Oil fields in New Zealand. The old rocks are said to be covered by a "calcareous sand formation" covered by a "crust of travertine limestone" traversed by many cracks. "The argillaceous material which contributes to the bulk of the formation is neither abundant nor regularly distributed. This fact is of great importance in the consideration of the possibilities of the storage of petroleum in the rocks." This statement seems to imply that Mr. Ward expected to find reservoirs of oil underlying the superficial crust of travertine. The productive zone in the New Zealand Tertiaries is at a depth of 3000 feet. That Mr. Ward saw "no continuous argillaceous beds" along the few cliff sections he examined is no criterion. We know that argillaceous beds occur throughout our Tertiary beds, and the Government Mineral Surveyor (Mr. Trewartha) found such beds at a moderate depth below the level at Vivonne Bay as far back as 1850. I quite agree with Mr. Ward that parts of the formation are "false bedded," but the coarseness of the deposit is more in favor of deposition in disturbed water than by wind. As regards the absence of fossils in the formations along the cliffs, I have personally collected a number of Miocene species, and Mr. Trewartha, in his report, refers to a "floor of shells" discovered by him at about 70ft. depth by boring. Coxiella bargerensis is, strictly speaking, not a fossil species at all, since it is found living to-day. There is no reason why Eocene beds should not occur on the South side of Kangaroo Island. They occur on the north of the island in the south-east, Yorke Peninsula and many places. Mr. Ward's theory regarding the salt in the Lagoons may be correct so far as it goes, viz.:—that it is "formed by the isolation and subsequent desiccation of arms of the sea" or by being "supplied to the atmosphere during the process of evaporation (from the sea) to be brought to earth by every shower of rain." It would, however, be advisable not to overlook the analysis of the brine discovered in the Kingscote bore, and the salt springs found on Kangaroo Island, as well as the possibility of solution by percolating waters of deposits of salt in the extensive Tertiary beds themselves. I shall for the present refrain from commenting on the theoretical discussion of the "general structural features" of the Island. They do not affect the petroleum question.

Referring next to the geological features of Eyre's Peninsula. The official Bulletin conveys the idea that the geological structure of the west coast consists of (i.) Primary rocks, (ii.) recent sediments. This is perhaps one of the most misleading statements contained in the publication. Mr. Ward writes: "The recent sediments constitute a horizontally bedded series which lie unconformably upon the tilted ancient rocks." In other words, there are no formations other than "recent" and "ancient" or "Primary" to be found. I have personally examined the basal portions of cliff sections along the south of Eyre's Peninsula and collected numerous fossils of older Tertiary age. I have at the present moment specimens in my waiting room of a large "cockle" embedded in a hard subcrystalline limestone. By a curious coincidence it is a species named by me some years ago "Meretrix" Sphericula. The type specimen was discovered near Edithburg. It is there found in the Miocene limestone underlying recent traverlime and marl. Eyre's Peninsula, therefore, only repeats the stratigraphical sequence of beds found elsewhere in South Australia. We may, therefore, expect also to find Eocene beds to occur beneath the Miocene on Eyre's Peninsula. Along the south-eastern shores of Port Lincoln proper, moreover, raised beds of Pleistocene age occur, which are richly fossiliferous, and contain several species extinct or foreign to the district. Phosphatic, fossiliferous, Pleistocene limestones also occur in the Coffin's Bay district. In the same district, moreover, underlying the last-named limestone, there are extensive deposits of lignite, more or less completely carbonised, and in parts retaining their woody and fibrous vegetable structure. In this respect, therefore, Mr. Word's description of the geology of the west coast is very meagre, since it omits some of the most important and salient features from an oil-prospector's point of view. The Government Geologist has unhappily selected a bad heading in "The Recent Sediments," since the bulk of the "covering" consists of "redistributed carbonate of lime," and is therefore not a "sediment" in the true geological sense of the word, but a chemical precipitate. The "concretions," which, acording to the same authority, are "left strewn on the surface as disintegration of the formation proceeds, "are not the remnants of disintegration of the rocks in situ at all. Their concretionary structure alone suggests that the carbonate of lime is drawn to the surface by capillary forces from underlying calcareous strata, and is there precipitated. The process of their formation is therefore the exact opposite to that described by the Government Geologist, and has its equivalent in the formation on the plains of Morocco described by Hooker and Ball.

The farmers of South Australia know only too well that the "Limestone-Nodules" are continually growing, and are by no means the product of disintegration of the superficial beds. If the latter were the case the troublesome "stones" would not so readily reappear after their removal from the surface. It is a well-known fact that such concretions at times include empty bottles, horseshoes, etc., and so prove that the rock is in process of construction, not disintegration. The official report further states that this "covering" of recent chemically formed rocks "obscures so large a part of the ancient foundations of this region" (Eyre's Peninsula). The Geologist does not, however, adduce any evidence in support of his argument. Nor does he state why these conditions should be different on Eyre's Peninsula to those on Yorke's Peninsula, the south-east, the head of the Australian Bight and elsewhere, where such a "covering" overlies a vast thickness of older Tertiary beds. In those districts, at any rate, the "covering" does not directly overlie the "ancient rocks," and there is no reason why the conditions should be different on Eyre's Peninsula. Without substantial proof to support his statement, the Government Geologist has published an "individual opinion" only, no more. In writing quite recently on the subject of oil-prospectus Mr. Cunningham Craig is very severe in his criticism of the wording of reports. He says, "Facts should be supplied and the opinion relegated to a secondary position."

As regards the opinions of other men quoted, the geologist does not quote the statements which might not assist his cause. For example, we find that Mr. Howchin is referred to repeatedly. The public is not, however, told that this gentleman in the very paper referred to by Mr. Ward writes as follows:—"With regard to the main object of my visit the results were disappointing, but at the same time I cannot claim that they were absolutely conclusive." And again, "Whilst the geological evidence is decidedly unfavourable the peculiar conditions under which mineral oil is sometimes found imposes on us a measure of caution in affirming that it is impossible to occur on our shores as a natural product."

The bibliography attached to his report is not complete. The important work of Professor Hooper, the Austrian oil expert, is not mentioned, and the fact that Sir Boverton Redwood marks D'Estree Bay as oil-land is also omitted. For reasons not known to me, Mr. Ward does not refer to my report on Kangaroo Island, which was really the cause of his hurried visit to that area. My report was published, together with an explanatory sketch plan, in London on September 14th, 1912, and the Government report was transmitted on January 24th, 1913, over 4 months later.

---

# THE COAL MINING INDUSTRY.

## Victoria.

### Powlett River District.

(From Our Wonthaggi Correspondent.)

Trouble has again arisen at the State mine between the management and the men, and at the time of writing the outlook is gloomy. The cause of the friction is the putting off of a party of six men by the mine manager, Mr. McLeish. The reason given for men's discharge was that they had absented themselves from work without giving him a reason. The men say that reasons were given, and that there is more behind their discharge than what has been stated. It appears that recently two members of the party were fined for having 400 lbs. of splint in two skips of coal. They objected to this, as they contended that there was no splint in the bord in which they they had been working. They obtained samples of the splint said to have been found in the skips, and the scrutineers, when they made an inspection, could not find any like it in the men's bord. Subsequently the men complained that the air in the bord in which they were working was bad, but, although they made the complaints to the under-manager, overman and deputies, they did not do so to the mine manager. They contend that those to whom it was reported should have done so. However, they went to work on three or four occasions, and had to return home again on account, they say, of the bad air. The mine manager maintained that the air was good and more than double the quantity required by the Act. Subsequently he discharged the men because they had absented themselves from work. The union officials, together with the men affected, have had interviews with the mine manager. He refused to reinstate the men, saying that the air question was only a side issue, and that the men were put off for remaining away from work without acquainting him with the reason. Owing to the absence of Mr. Broome, the general manager, no settlement could be arrived at until his return. On Sunday a special meeting of the miners was held to discuss the matter. The whole of the facts, from the men's point of view, were related by the men put off. They contended that they had committed no breach of the rules of the mine, as they did not absent themselves the specified time allowed before their tokens were stopped. They said they could not work in the place on account of the bad air. One of the scrutineers said that when he went into the place on Wednesday a man who had been sent into it to work stated to Mr. McLeish that he wished to go up to the surface, as his head was spinning round. Mr. McLeish said he would give him an order to go up if he said he was sick, but not if he said it was owing to bad air. The meeting discussed the position for nearly three hours. The opinion amongst the men was unanimous that those put off had not been treated fairly, and that the union should stand behind them and see that they were put back and compensated for lost time. It was, however, agreed that no definite action should be taken until the executive officers interviewed Mr. Broome on Monday. The conference was held on Monday, and Mr. Broome agreed to reinstate the men, as the air in their work-place was bad, inasmuch as although tests showed it to be right, there was something in it which affected the men after they had been working a short time; but he would not agree to compensate the men, as he considered the action of the mine manager in dismissing them was justifiable, as they had left their work without notifying him.

## New South Wales.

### Northern District.

(From Our Correspondent.)

Newcastle, October 25.

An ominous word comes from the South Maitland coalfield, to the effect that the demand of the Pelaw Main miners for an increase of threepence winning of machine-cut coal (to which reference was made last week) is likely to be followed by unrest on that field. Other conditions are also said to point to approaching trouble of a somewhat per ton on the rate paid at that colliery for the general character. The latest word from the district is that the chief trouble is in connection with the continued working of the afternoon shift at some of the mines. The men are tired of working it, without getting any extra pay—the proprietors say that the claim for extra pay is not a fair one—and the possibility of trouble lies in that direction. However, steps have been taken in responsible quarters to prevent trouble, and it has been pointed out to the men that at the end of the year another colliery, Neath, will be working only one shift, and that then it can be only a question of a short time when the rest of the mines will fall into line, and do away with the afternoon shift. It is understood, however, that the machine-men of the field are likely to take a leaf from the Pelaw Main men's book and make a general demand for an increase in pay and for better conditions. Some of the colliery proprietors would be willing to raise the price of Maitland coal to 12s. per ton, and give the men what they are asking for; but there two or three owners who have contracts at a certain figure, and as those contracts have a few years to run they are not inclined to consent to an increase in price, carrying with it additional payments to the different classes of labour, knowing that they would have to supply many thousands of tons of coal per month at the lower (contract) rate. The position is one which is causing colliery proprietors and shippers some concern, for they know that big industrial troubles have started in the past in the district from causes much less significant.

Reference has been made to the complaints of miners in this district concerning the risks they run through dust and gas in mines. The matter has been revived by the terrible disaster at the Universal Colliery, Wales, and it was brought before the Labour Congress in Sydney this week by Mr. Willis, secretary of the Southern Miners' Association. The Minister for Mines, Mr. Edden, says he has made arrangements for a conference on the subject between himself, Mr. Atkinson, Chief Inspector of Collieries, Mr. D. Robertson, manager of the Helensburgh colliery (South), and Mr. R. A. Harle, manager of the Hebburn colliery (North). He said he recognised the importance of the matter, and appreciated what the miners, particularly those of the Southern district, had said. The conference would consider the best means of combating the danger, and, if possible, of overcoming it. The miners of the Northern district are not satisfied with the personnel of the conference. They say that they do not question the ability of the men who have been asked to confer with the Minister, but they contend that some of the working miners could tell the Minister more about the true conditions of the mines than could the managers or the inspectors. Probably the Minister will be asked to hear the views of the men on the subject before he comes to any decision.

The output of coal from the Newcastle and Maitland collieries for the week ended to-day was over 150,000 tons, and of this quantity 109,000 tons were sent to other States or to foreign ports. The export was 15,000 tons greater than for the same week of last year. However, the output is greatly interfered with owing to the blocking of trains on the different railway lines leading to the port. This week, some of the coal trains were nearly 48 hours late, and many of them were 25 hours behind time. The result was that several collieries lost time and many vessels were delayed in getting loading. There were strong complaints amongst the coal and shipping people, and the matter is to be brought before the Railway Commissioners and the Government by means of a large deputation from those directly concerned.

A deputation from the Northern, Southern, and Western miners this week urged the Minister of Mines to authorise increases in the payments made to men and their families under the Miners' Accident Relief Fund. The matter has been strongly urged by the Newcastle and Maitland miners on several occasions during the past few years. The Minister said he was in sympathy with the requests, but that certain increases had been made of late, and it was not possible for him to make any promise in that direction at present. However, if he were returned to office after the elections, he would have an actuarial statement prepared, to see the true position of the fund, and also to ascertain whether the increases asked for could be granted.

### Western District.

(From Our Correspondent.)

Lithgow, October 23.

The Railways department is still handicapping the Lithgow and district coal trade, and yesterday was one of the worst days in this respect among the many recently experienced on the Western coal fields. Two of the largest collieries—Lithgow Valley and Hermitage (both owned by the one company)—were unable to get a start at all, with the very unsatisfactory result that orders had to go unfinished, and hundreds of miners lost a full day's work. A similar condition of affairs existed at the Zigzag colliery, where the men only worked a couple of hours. At the Oakey Park pit only a couple of hours were lost, while the Vale of Clwydd management and men were still more fortunate, no time at all being lost. The situation appears to be getting worse every day, and it is time drastic steps were taken to ensure a more regular and adequate waggon service. This morning the trouble was again very pronounced, and half of the miners at the Lithgow and Hermitage collieries had to return home, after waiting about the pits' mouth a reasonable time. Later in the day the Zigzag miners were unable to fill the afternoon shift, owing to no trucks being available. A local colliery manager states that the prosperity of Lithgow is being held back by the inefficiency of the Railways department. The coal trade, he declares, was never better than at present, and if an adequate supply of trucks could be guaranteed, there would not only be enough work for the whole of the miners now in the district, but additional men would speedily be employed.

# ENGINEERING AND ELECTRICAL SECTION

Australian
General Electric Co.
217 Clarence Street, Sydney.
Tel.—Central, 3495, 4397; City, 2381.
"Penfold House," Cr. Queen and Little
Collins Sts., Melbourne.
Tel.—Central, 2647.
Representing—
GENERAL ELECTRIC CO., U.S.A.
The
BRITISH THOMSON-HOUSTON
CO. LTD., of Rugby, England.
The GUARANTEE of EXCELLENCE on GOODS ELECTRICAL

## FEDERAL RAILWAYS.

### East-West and North-South.

Senator McColl made a statement in Parliament last Thursday respecting the work on the Trans-Australian (East-West) railway. Excellent progress, he said, is being made as regards earthworks and surveys from the Kalgoorlie end. The permanent way was still waiting for rolling stock. Twelve 40-ton bogie waggons had been sent to Kalgoorlie, and would probably be erected within ten days. The tracklayer would be attached to the waggons, and, when completed, platelaying would go on. It was expected that ten or twelve more 40-ton waggons would leave Sydney for Kalgoorlie this week. Replying to questions as to the number of men now employed on the railway, and how many had been dismissed, Senator McColl stated that, on 29th May last, 272 men were employed at Kalgoorlie, and on the 16th inst. 256 men were at work. From the end of July to 11th September, the number dropped to 207, on account of water not having been provided. The number at present had risen to 256, and a further increase was to be expected, particularly when platelaying commenced. Senator McColl added that, as soon as the tracklayer and the railway trucks were available, the work would be pushed on with at a rapid rate.

At the Port Augusta end of the line very satisfactory progress is being made, now that the tracklayers are at work. Yorkey's Crossing, at the head of Spencer's Gulf, has been bridged, and the track has been laid for a good distance past that erstwhile obstacle. As further supplies of trucks arrive the work done by the tracklayer is being increased. The first use of the machine was attended with some ceremony, the Mayor of Port Augusta, Cr. J. Roberts, forming one of the party who accompanied it to what was then the rail-head, over 30 miles out. When Yorkey's Crossing had been passed, the two engines had a load of 300 tons to deal with, and had some difficulty in mounting the rise on the portion of the route just beyond there. The tracklaying machine, which is mounted on a truck, is always left at the rail-head, and on arrival of the train it becomes the "pioneer car." No time was lost on the first day in equipping the train with the necessary gear. This consists of "runways," which are fixed full length on either side of the material trucks. In a very few moments the sleepers and rails were travelling over the "runways," and the operation of tracklaying was in full swing. On the first day half a mile of track was laid in 3½ hours, but there was not sufficient material on hand to allow of work being continued. Some doubt is expressed, however, whether the forecast of two miles a day will be realised, owing mainly to the practical certainty that there will be frequent intervals when material will not be available.

It was notified last week that the Department of Home Affairs has decided on an extension of the time for the receipt of tenders for the supply and delivery of locomotives until November 26.

Being in Adelaide last week, Mr Glynn, Minister of External Affairs, said that the Ministry was determined to push on with the north-south railway, but at present the work will be mainly at the northern end, where railways are immediately wanted to open up the country. The Government was awaiting an opportunity of introducing a Bill to authorise the construction of the railway from Pine Creek to the Katherine. Provision was also being made for a survey to Bitter Spring. He added that he did not think that a Bill was likely to be introduced this session dealing with the line from Port Augusta, but it was intended to sanction a permanent survey for 337 miles to Alice Springs.

The Royal Commission appointed many months ago to investigate and report upon the best route for the north-south railway to follow, and at what points it would most suitably connect with the Queensland and West Australian borders, was asked lately by the Minister when its work would be completed, and replied that it could not finish before March, 1915. Mr. Glynn has now telegraphed to the chairman of the commission, Mr. Frank Clarke, asking him to send in the report as soon as possible, and intimating that it need not continue its examination after reaching the Katherine. He says the Government will not wait for a year and a half to get a report on country which may almost be said to have been over-explored already. On the same subject the Prime Minister, Mr. Cook, said last week:—"Before the next estimates are furnished the Government will, if in office, lay down a definite constructive policy with regard to the Territory, though I am afraid, speaking now, that it will consist of nothing but a vigorous railway policy to open up the country and provide facilities. When we provide these facilities, we must give every possible encouragement in the shape of big rewards before men will go there. Why should they go there when they have more moderate latitudes in which to bring up their families? The only thing to do is to make it worth their while to go there."

At the conference of the Associated Chambers of Manufactures last week, on the motion of Mr. O. C. Beale (N.S.W.)—to whom, by the way, it was left to point out the curious fact that the gaps to be bridged respectively by the east-west and the north-south railways were each 1063 miles—the following was agreed to:—"That the Commonwealth Ministry be urgently recommended to lay before Parliament plans for the creation of townships in the interior upon both lines of railway, and for the settlement of immigrants (as well as present citizens) upon lands near these lines that are considered suitable for such occupation. It is suggested that the example of the Canadian Transcontinental Railways be followed, where practicable, to the end of making these vast Australian enterprises commercially and socially successful. The associated chambers are apprehensive that if energetic measures of the kind indicated be not taken from the start upon a comprehensive scheme, the gigantic initial expenditure and subsequent cost of running will end in severe national loss. Systematic organisation is urged, rather than trusting to a chance development."

## RAILWAY ELECTRIFICATION.

### Gigantic Canadian Scheme.

An important announcement was made last week by Sir Thomas Shaughnessy, President of the Canadian Pacific Railway, namely, that, if the experiments now being carried out on the Rocky Mountains section of the line prove successful, the entire service across the continent, a distance of over 2900 miles, would be electrified, and Mr. E. P. Groves, who is representing the firm of Merz and McLellan in conjunction with the electrification of the Melbourne suburban railways, agrees with other engineers, that there is nothing to prevent such a huge scheme being successfully carried out, the supply of water-power being so abundant in the Dominion. In a statement made last week, Mr. Groves said that the scheme would entail practically no alteration of the permanent way and the old rolling stock would certainly be utilised, with electric locomotives. Electrification of railways is being undertaken extensively, both in America and England, and it will not be long before electric haulage is utilised for the greater part of the goods work. The North-Eastern Co. (England) is now equipping a line, used mainly for the haulage of coal from Newport to Childern, with electric locomotives, and the Lancashire and Yorkshire Railway Co. is also experimenting in the same direction. In America the Pennsylvanian railway is being prepared for electrification as far as Pittsburg. "The news of the Canadian-Pacific Co.'s experiment has come a little sooner than I expected," added Mr. Groves, "but I am not altogether surprised to hear of the proposals. I am at present, however, inclined to think that at first, at any rate, it will be confined to the Rocky Mountains, where the value of electrification, in view of the tremendous grades, is obvious."

## MUNICIPAL COUNCIL OF SYDNEY.

At last week's meeting of the above it was desided, on the recommendation of the Finance Committee, that tenders be invited for the provision of switchboards from which to control auxiliary motors in connection with the refrigerating plant at the Council's Markets, in accordance with specification submitted by the City Electrical Engineer.

It was also decided to carry out the following recommendations of the Electric Light Committee:—

That with regard to a proposal for the Council to purchase the undertaking of the Palace Electric Light Company, such proposal be not further proceeded with.

That supply of electricity to low level pumping station of Board of Water Supply and Sewerage at Mascot be approved, the Council to supply at 415 volts, at the rate of 1½d. per unit, available for 24 hours per day, except on emergency or where the mains are disconnected for a few hours for a special purpose, of which 24 hours' notice to be given. The Board to undertake to continue the use of supply for ten years, and to house the transformers and switchgear. The load to be approximately 250 e.h.p., and this load to be in use not less than an average of seven hours daily, the estimated cost to the Council being £1500. Also a supply to a similar station at Homebush, the Board to erect a building for the housing of transformers and switchgear.

That the stock of switchgear and transformers be replenished by purchase under existing contracts as follows:—From the Australian General Electric Co.—Four 5000 v. feeder panels, £348; two 10,000 v. feeder panels, £174; six 5000 v. 200 k.w. transformer panels, £426; two 10,000 v. 200 k.w. transformer panels, £142; ten 415 v. 200 k.w. transformer panels, £480; four 415 v. summation panels, £320; seven 415 v. 200 k.w. distributor panels, £329; six £200 k.v.a. 5000/415 v. 3-phase transformers, £1476; total, £3695.

From Messrs. Ferranti Ltd.—One 10,000 200 k.w. transformer panel, £81 10s.

From Messrs. Noyes Bros.—Two 10,000 feeder panels, £204 14s.; one 10,000 v. 200 k.w. transformer panel, £94 11s.; one 415 v. 200 k.w. transformer panel, £46 10s.; total, £345 15s.

Also from Messrs. Noyes Bros., under their last contract—Five 100 k.v.a. 2-phase transformers, 10,000/415 volts, £700.

That authority be given for the rental from the Australian Jockey Club of a building to be provided by the Club on the Randwick Racecourse for use as a sub-station for the supply of electricity for pumping water for the racecourse, at an annual rental of £5 4s., subject to eight months' notice of intention to terminate the agreement; also the expenditure of £480 in providing equipment for the sub-station.

That pending the arrival of flame arc lamps under contract, 50 8 amperes A.C. flame arc lamps (Excello), 50 compensators for same, and 18 line resistances be obtained from stock from the last contractors, the Union Electric Co., at an estimated cost of £301 18s. 6d., providing the company supply at the rates appearing in the contract recently completed.

That the oil fuses on the high tension feeders and interconnections at sub-stations be replaced with circuit breakers, at an estimated cost of £810, this expenditure to be allocated to revenue.

That three dozen iron-clad three-pole combined switch and fuses be obtained for the isolation of the distributing networks of the City, at an estimated cost of £180.

That works at various sub-stations be authorised as follow:—Storey Street, sub-station at Government Quarries, Maroubra, provision of earthenware pipes in floor, at an estimated cost of £11. Storey Street Sub-station, provision of 10,000 volt switch point and pole transformers to supply sub-station, at an estimated cost of £108. Town Hall Sub-station, provision of additional 3-pole L.T. switch between the 1500 K.W. rotary convertor and the bank of transformer. Messrs. Siemens to supply this switch mounted on marble base and erected in position as an extra on their contract, at an estimated cost of £27. Pearl Street, No. 8 Sub-station, installation of additional 100 k.v.a. transformer with panels and one additional distributor panel, at an estimated cost of £95.

That tenders be invited, in accordance with specifications submitted by the City Electrical Engineer, for a drilling machine for workshop in the Electric Light Department's building. Also for pipe work for fixing and connecting additional water meter at the power house, the necessary valves of Messrs. Hopkinson's make with bronze bodies to be purchased from Messrs. Noyes Bros. at a cost of £234, and the erection of pipe work and valves to be carried out by the Council's employees, the estimated total cost being £500, such total cost to be allocated to capital.

Authority was also given for numerous extensions of existing electricity supply mains.

## SYDNEY NORTH SHORE BRIDGE.

Mr. Holman, Premier of New South Wales, on the eve of going before the people at a general election, has made a definite announcement in regard to the North Shore bridge. Replying to a deputation which, headed by the Lord Mayor of Sydney, waited upon him in connection with the bridge proposal, Mr. Holman said:—"The question of finding capital to go on with the work is, to my mind, not a large one. It is only a matter of providing £300,000 or £400,000 for each of the six years it will take to build. The difficulty arises when you attempt to ascertain and apportion the payments of the municipalities. You ask me for some guarantee of good faith. You have now the definite recommendations of the Works Committee. The tunnel scheme has been put on one side, and it now remains to determine the final question of finance. Along the lines I have suggested. I think I can see a solution of the problem, and the Government can justify itself in commencing the erection of the bridge as one of the schemes of public works in the next year. The amount for the bridge is small, and may be met by slackening up in some other directions. The scheme I put forward is merely a tentative one. The finding of capital presents no practical difficulty. We would only have to find a million in the first three years, and that is neither here nor there. The policy of this Government is to build the North Shore bridge. I announce that definitely now. We have a long programme before us to determine, and we have to determine which item will come first, and which will come second. If at any time consideration of the bridge was postponed, so that other urgent works could be proceeded with, the Government never had a thought of abandoning it."

This is all the satisfaction the deputation got, and subsequently the Lord Mayor submitted a proposal to the Sydney City Council. This in effect provides for a Bill being promoted by the Council for introduction to Parliament, in which provision shall be made for the City Council being vested with the requisite statutory powers and authority to construct and maintain such bridge. As a corollary to this, however, it would be necessary for the City Council to be vested with power to levy a special rate throughout the whole of the metropolitan area, such rate to be supplemented by a toll charge on all railway, tramway, vehicular and passenger traffic using the bridge. In support of this proposal the Lord Mayor said that the burden should not fall upon the inhabitants of the immediate foreshores; for almost the whole county of Cumberland would benefit by the bridge. A rate of ½d. in the £ on unimproved land values within a 20-mile radius would produce £100,000 a year, which would amply provide for sinking fund and interest upon a capital of £2,000,000. The advantages reaped by the Railway department would be worth one-third of the value of the structure—another £50,000 a year. That would provide interest and sinking fund upon the third million needed. He thought the Government would give a contribution for the upkeep of the bridge, but, if not, the upkeep might be met by means of a toll.

The proposal was discussed by the General Purposes Committee, and Ald. Richards moved in amendment, "That in view of the statement made by the Premier as to the construction of the North Shore bridge, and in the absence of definite decision in respect of the constitution of a Greater Sydney, upon which a Royal Commission is about to submit its report, so far as the Council is concerned, the question remain in abeyance pending the development of the circumstances herein indicated." The amendment was carried by 7 votes to 6.

## BRITISH AND EUROPEAN DEVELOPMENTS.

(From Our Correspondent.)

London, September 26.

From the numerous and sweeping criticisms to which the Electrical Supply Publicity Committee has been subjected during the last year or two, it may have been gathered that there could not be a real forward movement of electric supply advertising until some new and more energetic organisation was set up. It may be remembered that there was some expectation that the ''Point Fives'' would take the matter up energetically, but movements of this kind cannot be hurried, especially where the co-operation of representatives of a number of municipal undertakings is essential. Furthermore, the summer months followed close upon the announcement that led us to expect Point Fives posters, etc., so it cannot be said that things have materially improved. The need for energetic action to be taken if the competition of gas supply authorities was to be met has been expressed in various quarters, and as a result an effort is being put forth of which some details are now made public. At the White City at Shepherd's Bush there is to be a big gas exhibition; it will be opened by the Lord Mayor in the early days of October, and, according to advance information, it will be characterised by neither niggardliness nor lethargy, for the gas companies indifferent or supercilious as they may appear to be when they refer to electricity as an illuminant or as a cooking agent, suggesting that electrical men were setting themselves a hopeless task in trying to bring down the walls of their stronghold, they have been very careful and thorough in establishing a gas publicity organisation, and very generous in providing that organisation with the necessary funds to clear electrical fallacies out of the public mind. It is said that this exhibition, which some of us hope soon to have the privilege of submitting to the test of our olfactory organs, will be a striking example of the length to which the co-operative spirit may be carried by an industry all of the components parts of which seek no self-glorification or success save what shall follow upon an ''all together all-the-time'' effort to drive into the muddled brain of the world and his wife that gas is cheaper and better than anything else for every conceivable purpose. Those who saw this event as it grew in proportions on the horizon cried out for electric supply men to rise in all their glory and unitedly slay the monster, or, at any rate, to counteract the influence of his misrepresentations which an exhibition period does so much to disseminate. If only these electric supply men could come together and push for all they were worth! What would they not do? But the time is not yet, it seems, for any combined attack in which the full weight of electrical influence will be brought to bear upon this situation. We are, however, going to do something, and we can at least be permitted to hope that it will be something which will do credit to a business which in the metropolis alone has many millions of capital behind it. By a fortuitous concourse of circumstances, may we say, does it happen that the Ideal Home Exhibition at Olympia, arranged by the ''Daily Mail,'' opens only a few days after that gas display at the White City. A number of the electric supply companies have seized upon this time and place for the purpose of holding an electrical display, which, if it does not defeat altogether the object of that White City exhibition, will at any rate be a thorn in its gas-pipe, and serve as an electrical counter-attraction for several weeks. Unfortunately for some reason or other—we need not try to suggest precisely what, for we have already mentioned the disfavour into which the Publicity Committee has fallen—the movement has not received that measure of support that a strong effort ought to have, if it is to be sustained, impressive and lastingly effective. What the few authorities who have co-operated in the matter are going to do will be done through the said Publicity Committee, and it will consist of the running of La Maison Electrique in one part of the Ideal Home Exhibition. The most striking features of the electric house which has been so successful in Paris are being brought to London, and the principal of these will be the electric servantless dining table with its combination of electrophone, periscope, service lift, travelling rails, and decorative details. La Maison is to be a building in old English style, with apertures through which the public may see inside the various rooms. We shall enter and leave the house through a garden forecourt, with its climbing roses, floral plants, and ornamental fountain with coloured lights. There will be a pantry, kitchen, business office, dressing and bathroom, bedroom, and dining-room, and an army of trained electrical attendants will escort parties of the public through these apartments, ultimately seating them at the servantless dining table and impressing them at close quarters with the merits of electric service in supersession of the domestic service that most people are now unable to obtain, because factory life and free evenings in the towns and cities at Home or married life in the colonies provide greater opportunities of sorts. The reader will imagine, without being told, all that this wonderful electric house will contain in demonstration of electric lighting, heating, cooking, ventilating, laundry service, cleaning, polishing, and so forth. Something like 100 different electrical appliances will be in evidence, and a staff of thirty attendants and instructors should prevent anybody who comes from going away without falling under the spell of the publicity man. There will also be a generous provision and distribution of appropriate posters and literature, and if the hopes and aspirations of the Publicity Committee are fulfilled, many people will undoubtedly have to think more kindly of it in the future, and give it a new lease of life.

Mr. A. R. Fearnley's presidential address to the Municipal Tramways Association at Sheffield, on Wednesday, contained many points of immediate interest to those concerned with tramway management and engineering. He says that the applications now before Parliament show that municipalities have not come to a standstill either with their extension schemes or in regard to improvements in actual operation. There is a tendency on all systems to improve "running time," and large sums are being spent in removing small equipments with which cars were fitted 12 or 14 years ago, and replacing them with equipments double the size and of an improved type—the interpole motors having proved a success and now being generally adopted as more capable of coping with the heavier traffic requirements of to-day. In those towns which were early in the field with electric traction, car bodies are already being re-designed and re-constructed, giving easier and safer access, covered top decks and increased carrying capacity. Speeds are gradually being increased, with the consequent result that calls have been made upon the power house and permanent way branches of the department earlier than they would have been under the old condition of things. As a result of the experience gained, better work is being put into tramway tracks to-day than at any time previously, it being particularly noticeable in connection with this work that the mechanical joint is rapidly becoming obsolete and welded joints, either electrical, Thermit or cast, being almost universally adopted. The idea of isolating the tramway power house from the other supply stations in the district is, in consequence of the experience gained in many different parts of the country, now being abandoned. At Sheffield, where Mr. Fearnley is city tramway manager, it is hoped that before the end of this year arrangements will have been completed by which any of the three power houses will be available for tramway supply in case of heavy load and at other necessary times. In other words, the plant which is being used during 5½ days in the week to supply power to the large works in the east end of the city will be available for week-end, bank holiday and football traffic. The arrangement promises to work out in an economical manner for both the tramway and electric supply departments, is in the best interests of the city as a whole, and is certainly a necessary insurance for the continuity of the electric supply service of the city. All these improvements mean that large sums are being spent on renewals and that additions are being made to capital account. Simultaneously, demands for more frequent services bring about reduced receipts per car mile, so that only a small margin per mile between total expenses and total receipts remains. Small margins, however, when multiplied by the ever-increasing number of car miles produced, all things considered, are undoubtedly satisfactory results. Having considered these and a number of other current topics of the traction world, Mr. Fearnley proceeded to discuss the immediate outlook which, as tramway operators, was of paramount importance to those assembled at the meeting. "Electric tramways, in the accepted order of things, should have, by this time, got through about half their life, that is, taking the life of their predecessors—horse and steam tramways—as guides. Many people appear to have made up their minds already that electric street traction is going to have no longer life than either the horse or steam tramway. If the motor enthusiasts are any guide, electric tramways are going to have a somewhat shorter life than either of their predecessors. If some sections of the daily and weekly press are to be believed, the day of trams is already over, and has been so announced in heavy type." "It is quite clear, however, that whatever the results of present developments may be, the leading municipalities, at any rate, intend still to control the systems of traction, and it remains for us to see that our sinking funds are in such a healthy condition that we are in a position to take advantage of any change that may be found to be advisable."

Mr. Fearnley said that the question of the motor-'bus loomed very large in the minds of most tramway operators, and no excuse was needed for making it one of the important matters for consideration at this year's conference. At the moment, the unfairness of its competition with the tramway was its most serious phase. The president, however, advocated trying to keep an open mind when considering the question of the motor-'bus and the tramway. He thought there was little likelihood of the motor 'bus taking the place of the tramcar for heavy traffic, yet it must be remembered that great improvements were likely to be made in the efficiency of the present vehicles. He did not suppose for a moment that they would continue very long using a gallon of petrol per 7½ miles' run, and if that figure could be increased so that it compared in a reasonable way with the cost of electric power per passenger carried, and home-produced motor spirit, free of duty, obtained, considerable impetus would be given to the adoption of the motor-'bus in the provinces. He did not understand the hesitation of the London 'bus companies in declining to give publicity to the details of their working expenses. Mr. Fearnley believes it to be most advisable for all tramway systems to make some experiments with the motor-'bus. His own experience at Sheffield showed that there need be no hesitation in doing this, even if the 'buses were only used as feeders to the tramways. He had 'buses at work on four routes; they had proved reliable in service, and had now run over 100,000 miles. Before adopting such a change, trackless trolley cars, "which one supercilious person describes as those crosses between tramcars and motor omnibuses which retain none of the best points of either parent," must have the serious consideration which they undoubtedly deserved; there was now ample reliable experience and data to be obtained.

Our readers will agree that Mr. Fearnley gave his fellow managers an informing lead in a valuable address from which the foregoing principal topics have been selected for mention. Several papers (the titles of which we have already given) followed at yesterday's and to-day's sittings of the conference, to some of which we may allude later.

During the British Association meeting full printed information was circulated among members with reference to next year's Australian visit. It is proposed that the main party shall leave London by direct steamer (via Suez) on July 3. The advance party will leave London on June 19 or 26, and will carry out a programme of excursions of particular interest to geologists, zoologists and botanists. A third section will consist of members travelling by New York, Vancouver, trans-Pacific steamer and Sydney, or by Cape Town, South Africa, to join the above two sections. The third section is to leave England about June 22-24, or by New York, San Francisco, trans-Pacific and Sydney about June 6-11. The united party will meet in Adelaide on August 8, at Melbourne on August 13, at Sydney on August 20, and at Brisbane on August 27. Many visits to gold and coal mines are included in the list of excursions, but doubtless all particulars are already known in Australia. The English party will leave Brisbane on the homeward journey on September 1, reaching London by October 10 by steamer, or by October 4 overland. In regard to my previous comments on the subject of a meeting for those who cannot come, so far it is practically settled, I hear, that there will be a gathering at Havre by invitation of French scientists, arranged under the Association's auspices.

Some months ago I mentioned the steps taken by Mr. Ayton, the borough electrical engineer of Ipswich, to secure that his own corporation, at any rate, should be made alive to the coming importance of the electric vehicle load for public supply systems. That Mr. Ayton's interest was not purely a local one appears this week in a very marked way, for he is acting as hon. secretary of the Electric Vehicle Committee of the Incorporated Municipal Electric Association, which is about to settle down to very important duties in furthering the use of the electric battery vehicle. The Committee was appointed as the result of a decision arrived at by the Association at its London meeting in June, when a very lengthy paper on electric vehicles was read. Mr. R. A. Chattock, of Birmingham, is chairman of the Committee, which has authority to co-operate, in addition to its seven municipal electrical representatives, ten others representing company supply systems, battery makers, battery vehicle makers, and the automobile associations. The ambitious list of duties which the Committee has announced for itself include:—

1. To get into communication with electric supply authorities throughout the United Kingdom, and to impress upon them the desirability of taking energetic steps to encourage the use of the electric vehicle by (a) Agreeing to supply electric energy for charging purposes at a reasonable price; (b) calling meetings of the motor-car traders and hotel proprietors in their districts in order to induce them to provide charging facilities; (c) at the outset, giving assistance to motor-car traders when the latter may be confronted with difficulties in connection with electric vehicles; (d) advertising the whereabouts of charging stations at all main road entrances to each town; (e) impressing upon municipal bodies, and others employing means of transport in their respective areas, the advantages attending the use of the electric vehicle; (f) distributing information and literature among likely users; (g) providing charging outfits on hire.

2. (a) To decide upon the best arrangements to recommend for charging; (b) to decide upon the most suitable sizes of a line of charging outfits: (1) for D.C. systems; (2) for A.C. systems; which, in order to eventually reduce cost of manufacture, could be recommended as standard sizes; (c) to secure, as far as possible, simplicity, clearness and uniformity in battery charging instructions.

3. To consider the issue of rules for the proper use and maintenance of electric vehicles.

4. To consider and make recommendations for the standardisation of the technical details connected with the design of electric vehicles:—(a) Standard ratings for motors; (b) standard voltages; (c) standard ratings for commercial vehicles (carrying capacity and speeds); (d) wiring details; (e) standard charging terminals; (f) standard battery units; (g) electric lighting on electric vehicles, etc.

5. To approach the insurance companies with a view to inducing them to quote specially favourable rates for insuring electric vehicles in consequence of the reduced fire risk, etc.

6. To arrange, if possible, for periodical parades and exhibitions of electric vehicles.

7. To collate useful information in regard to electric vehicles and to publish same from time to time.

8. To take up with the authorities concerned the question of the rating of electric vehicles for taxation purposes.

9. To arrange for the issue of maps with charging stations indicated, together with list of the latter and tariffs.

10. To consider any other matters connected with the electric vehicle.

The oil-electric ship "Tynemount," concerning which much interest has been aroused in electrical and engineering circles since Mr. H. A. Mavor gave his British Association papers on electric marine propulsion in 1911 and 1912, has been completed at the yards of Messrs. Swan Hunter and Wigham Richardson, on Tyneside. She has been built by this firm and equipped on the system of the Electric Marine Propulsion Co. Ltd., of Glasgow, invented by Mr. Mavor, and a few days ago the members of the Newcastle Local Section of the Institution of Electrical Engineers were allowed to pay a visit of inspection. The event was, of course, one of some interest owing to the novelty of the "exhibit" and owing to the confidence with which many men are looking forward to a fine future for electricity in the department of marine propulsion. The "Tynemount" has to do service on the lakes and canals of Canada, and by reason of the numerous locks, efficiency of the electrical system for frequent and rapid starting, stopping and control generally was a matter of great consequence. The Mavor system is claimed to possess special virtues in this respect. The boat is 256ft. in length, 42ft. 6in. in breadth; has a tonnage of 2400, and a speed of nine knots. From Mr. Mavor's descriptive accounts of the vessel, it appears that the electrical particulars are as follow:—

The electric equipment consists of two three-phase generators, each giving about 235 k.v.a at 500 volts alternating. The generators have six and eight poles respectively, giving frequencies of 20 and 26.6 per second. Connected to the shaft of each generator is an exciter which, in normal working, gives about 30 amperes at 100 volts, but is capable of a considerable overload. A single three-phase motor is coupled direct to the propeller shaft. The motor develops 500 shaft h.p. The rotor is of the simple squirrel-cage type, without any electrical or mechanical connections other than its rigid attachment to the propeller shaft. The stationary part of the motor has two separate windings, for 30 and 40 poles respectively. The windings are mutually non-inductive, so that, except for slight possible leakage of magnetism, they exercise no influence whatever on one another, and operate independently on the magnetic circuit of the motor. When each of these two windings is connected respectively to the appropriate generator the synchronous speed due to each is 80 r.p.m., or actually about 78 r.p.m. when at full speed. By changing the connections the direction of rotation as reversed, and by connecting the 40-pole winding of the motor to the six-pole generator the synchronous speed drops to 60 r.p.m. or actually to 58 r.p.m., giving about threequarters of the full speed of the ship under this condition. One generator may be stopped and the other left running at full revolutions under governor control, and, therefore, at approximately its full economy, because the power required to drive the ship at three-quarter speed is about half of that required to drive it at full speed. If either of the generators is left attached to its own windings, the other generator being shut down either by intent or by accident, the ship is propelled by either engine at a little over half speed, the speed of the ship falling with the speed of rotation of the engine until an automatic adjustment of power and speed is reached. This occurs at about half speed. The control gear is very simple. In the first instance, it is not proposed to operate the control from the bridge, but arrangements are made by which this can easily be done if required. There are five positions on the switch corresponding to the ordinary positions on the engine-room "telegraph." They are "full speed ahead," "half speed ahead," "stop," "half speed astern," and "full speed astern." Each position of the controller is definitely fixed by means of cams and roller, so that stopping at intermediate positions is prevented. For half speed No. 1 generator is coupled to No. 2 winding of the motor, and No. 2 generator is running light or stopped. For full speed each generator is connected to its own winding on the motor respectively. The controlling gear provides for the interruption of the excitation of the generators while the switch is being moved from one step to another. This mode of operation renders the electric circuits "dead" while the switching-over operation is being accomplished, and thus injurious sparking is avoided.

The British Westinghouse Electric and Manufacturing Co. Ltd. has now circulated particulars of its proposed scheme for writing down the capital, and to-day meetings are being held to consider it. That such a step would have to be taken before either the resumption or maintenance of dividends could occur has been inevitable for some time past, and the directors promised to draw up proposals as soon as they knew finally the full extent of the losses connected with the London Underground Railways arbitration respecting the Lot's Road plant. The final pronouncement having been in the company's favour on certain points, the loss is less than was at one time expected, being only £52,049. But there are other matters needing attention when dealing with this sum, so that it has been considered necessary to reduce the capital by £725,000, from £1,875.000 to £1,150,000, by cancelling £1 on each preference and £3 on each ordinary share. Both classes of share will then stand at £2, and in order to maintain the same relative positions of both classes as at present, the rate of dividend on the preference will be increased from 10 to 15 per cent., and that on the ordinary from 12 to 30 per cent., any surplus going as to one-fourth to the preference and as to three-fourths to the ordinary. The above scheme provides for writing down patents and goodwill to £150,000, the remainder being for depreciation of buildings, plant, machinery, investments, etc., and the Lot's Road loss already mentioned.

## STATE SHIPBUILDING YARD (V.)

An agreement has been come to between the Melbourne Harbour Trust and the Ports and Harbours department for the building at the Victorian State shipbiulding yard, Williamstown, of a trailing suction dredge and a powerful tug, which will be used in connection with the deepening of the approaches to the port. The chairman of the Harbour Trust, Mr. G. F. Holden, stated last week that the Ports and Harbours department would build a hopper dredge for a little over £93,000, and a tug of 1000h.p. for £26,000. According to the specifications, the tug had to be constructed before August 1, 1914, and the dredge before March 1, 1915. The Engineer of Ports and Harbours, Mr. C. W. Maclean, stated that the department had been anxious to secure the contract for the construction of the Harbour Trust plant, because it would materially extend the scope of work at the shipbuilding yards. When the new work was properly in hand, about 300 additional workmen would be required at the yards. The construction of the tug, which would be the largest in the bay, would be begun at once, but the designs would have to be completed before the building of the dredge was commenced. It was hoped that the necessary machinery could be procured in the State, but some of the material for the dredge would have to be imported. The dredge would be built to carry about 2000 tons, and would be used to clear the channels.

The department has already in hand, and well advanced, the building of a steel hopper barge for the Public Works Department. This is 125ft. long, with a 28ft. beam, and will be driven by twin compound engines of 400h.p., supplied by Thompson and Co. (Castlemaine) Pty. Ltd., and the barge will be fitted with two Priestman dredgers, having a combined capacity of 500 tons an hour. It is quite on the boards that the works of the Ports and Harbours Department will shortly be enlarged by the addition of a new and extensive machine shop. A great deal of other work is going on very satisfactorily at the yard, including the almost completed renovation of the barquentine "Aurora," which will shortly be returning to Adelie Land, to the relief of Dr. Mawson and his colleagues.

## MISSISSIPPI POWER SCHEME.

### 300,000 Horse-power.

A great dam across the Mississippi River (U.S.A.), by means of which 300,000 horse-power of electricity is generated, was recently dedicated for use. The dam spans the river between Keokuk, in the State of Iowa, and Hamilton, in Illinois, joining those two towns. It will supply power for manufacturing and lighting purposes to scores of towns within a radius of several hundred miles, ministering particularly to the inhabitants of Iowa, Illinois, and Missouri. With the one exception of the irrigation structure across the Nile at Assouan, it is the longest bank-to-bank dam in the world. Its length is 4568ft.; it represents the labour of three years, and an expenditure of slightly over £5,000,000. It is built of solid concrete. The width is 19ft. at the top, and 42ft. at the base, and the total height is 53ft. Transmission lines are already operating from the dam to St. Louis, a distance of 137 miles south. Since the project was taken up the growth of cities and towns in this section of the Mississippi Valley has been marked. Scores of manufacturers have sought and obtained sites where they can be certain of a cheap and never-failing power to run their machines. Hundreds of miles of electric railway have been built to be operated with power from the dam, and even the smallest villages along the river now have their electric light companies. The power-house is a gigantic affair, 2000ft. long, and as high as the ordinary 12-storey building.

## PUBLICATION RECEIVED.

"Igneous Rocks: Composition, Texture and Classification; Description and Occurrence." By Joseph P. Iddings. Vol. II. (Wiley and Sons, New York; Chapman and Hall, London. 1913. Price, 30s.)—It is just four years since we welcomed the first volume of Mr. Idding's very able book, which at once attracted attention amongst petrologists by its original method of treating the particular rocks with which it deals. The first volume covered the ground indicated by the first half of the title, while the present one is divided into two parts, dealing respectively with description and occurrence. The author's method has been to ascertain and emphasise the chemical and mineral characteristics of igneous rocks in attempting their description; chemical analyses "have been employed as a basis of definition and of correlation of rocks that differ in texture and to a greater or less extent in apparent or actual mineral composition. Igneous rocks have been treated as though they were portions of continuous series of mixtures of mineral compounds varying in numerous ways, and not as specific, though somewhat ill-defined compounds possessing individual entities to be reckoned with in their grouping or classification." One of the drawbacks incidental to making a new departure and inaugurating a new method of treatment, as Mr. Iddings has done in this work, is that he finds himself, in order to be intelligible, compelled to employ terms generally understood, although he entirely disapproves of their conventional use and application. "Beginners (he says) would obtain much clearer conceptions of petrology if they learned its principles free from the confusion of its present haphazard nomenclature whose terms are being constantly redefined and often misapplied, new instances of which operations will be found in subsequent pages of this book." Again, the want of uniformity in rock nomenclature amongst petrologists has been a source of trouble, "since it is not possible in most instances to discover the actual characters of the rocks in order to re-name them according to a more definite system, and the names already given may be justified by the extremely vague and illusory definitions in common use." Mr. Iddings adheres to his quantitative system of classification, though he recognises that it "has excited criticism by some petrographers, who consider it arbitrary, artificial and not 'natural.'" To one critic he replies, "The objection that measured precision condemns a classification of igneous rocks, because it makes evident 'its aloofness from the scheme of nature, based not on arithmetical but on physical and chemical principles,' suggests a lack of appreciation of the mathematical precision of stoichiometric chemistry, and a failure to grasp the definiteness of quantitative physics, whose natural expression is found in higher mathematics. Both of these sciences are fundamental to that of petrology, and as mathematics is the language or expression of quantitative relationships, the more direct the knowledge of the quantitative factors and relationships obtaining in igneous rocks, the more natural will become their expression in mathematical terms." In order to combine the definiteness of the quantitative system with the familiar and ill-defined groups and nomenclature of the quantitative system, the whole series of igneous rocks is treated in six divisions, as characterised by (1) quartz, (2) quartz and feldspar, (3) feldspar, (4) feldspar and feldspathoids, (5) feldspathoides, (6) mafic minerals, and it is the elaboration of this classification which forms the first, or descriptive, half of the volume. The second part, as already stated, treats of the occurrence or geographical and topographical distribution of igneous rocks, which, he says, "must exist at or near the surface of the earth as extrusive or intrusive bodies" in well-defined shapes. Advanced students of geology, mineralogy and petrography will find Mr. Iddings's new volume an exceedingly interesting complement to the one published in 1909.

## MISCELLANEOUS.

Mr. Griffith, the N.S.W. Minister for Works, last week performed the ceremony of turning the first sod at Botany in connection with the Botany-Sydenham railway. In the course of his speech, he said that the line was to be pushed forward until completed in the shortest time that energy and capital could do it, although it might run into a couple of hundred thousand pounds. No work was so urgent or pressing as that one.

* * *

The Victorian Railways Commissioners advertise in another column for a mine electrician in connection with the State coal mine at Wonthaggi, at a salary of £6 per week. Applications will be received until November 12.

* * *

The fifth annual general meeting of the Northern Engineering Institute was held in the Council Chambers, Newcastle, N.S.W., on October 18. The president (J. L. C. Rae) occupied the chair, there being a good attendance. Mr. P. Allan, Deputy Director-General of Public Works, Sydney, was duly elected as an honorary member of the Institute, and Messrs. R. Borland, A. I. Davies, A. K. Hacke, W. B. Hudson, H. Shaw, A. Wilson, student J. J. McDermott as members. The principal business of the evening was the discussion on Mr. J. Ewing's paper, "The Flow of Water Through Pipes," Messrs. J. B. Henson, J. Y. Rutter, J. Barr (of Messrs. Glenfield and Kennedy Ltd., Kilmarnock, Scotland), R. Borland, A. W. Torunay-Hinde, D. N. Morison and the president taking part. Mr. Ewing replied to the various points raised during the discussion, and added a considerable amount of valuable information to his paper. The annual report and balance-sheet showed that the membership had increased by 11 during the year, the total number of members now being 175—viz., honorary member, 1; members, 161; students, 13. That the gross receipts amounted to £162 16s. 3d., expenses £136 6s. 8d., the total excess of assets over liabilities was £219 3s. 5d. Nine general meetings were held, and the average attendance 32. Six papers were read and discussed during the session. A library has been established, and exchange of proceedings arranged with other societies. The following were declared duly elected as Council for the year 1913-1914:—President, Mr. A. Gardiner; vice-presidents, D. N. Morison and H. J. Thomas; Councillors, J. M. C. Corlette, J. B. Henson, E. M. Hughes, J. MacKenzie, W. R. Pulver, J. L. Grant, R. H. Findlater, T. J. Pepper; Treasurer, T. L. Bates; secretary, H. G. Trenchard. A vote of thanks was accorded to the Mayor and Town Clerk for granting the use of the Town Hall for meetings. The various officers were also accorded votes of thanks for services, and a honorarium of £10 was voted to the secretary.

* * *

Our Lithgow (N.S.W.) correspondent writes:—Senator Millen, Minister for Defence, has declared that a matter in which he is greatly interested is the new British rifle. Although he has not yet seen a sample of the weapon, he is soon to receive a report about it. Until that document comes to hand he cannot express any opinion or give any clue as to the intentions of the department. The Senator does, however, express himself as far from satisfied with the weapons being made at the Commonwealth Small Arms Factory at Lithgow, the number of rifles turned out being far too small; but, beyond making that statement, he does not care to express his opinion further on the subject at present. When interviewed concerning the matter, Mr. A. C. Wright, manager of the factory, stated that he had nothing to say that would be of public interest.

* * *

A cable message received from New York last week stated that an explosion had wrecked the electric light and power plant on Staten Island, in New York Harbour. Six employees were killed and many were injured. The island was wrapped in darkness at night, and the tramway services were suspended.

* * *

An army field-telephone apparatus has been pressed into service to secure the safety of search and rescue parties at the Universal Colliery, Senghenydd, South Wales, where heroic efforts are being made to reach the bodies of the men entombed by the explosion a fortnight ago. All hopes of rescuing any of them alive were abandoned many days ago.

* * *

The Postmaster-General has entered into a contract with the British Insulated and Helsby Cables Ltd., who will supply 15 miles of cables, "insulated, lead covered, 416 pairs, 12½lb., conductors, not served," for a total sum of £16,500; and also 15 miles of cable, "paper insulated, lead covered, 26 pairs, 12½lb., conductors served," for £2490.

* * *

Professor J. T. Morris has recently given the world the benefit of details of a year's experience of cooking and heating by electricity in London, the apparatus being a Jackson (Marylebone) electric cooker having three hot plates, one grill, and a fair-sized oven. Hot water is obtained by means of a coke boiler, which required lighting in the morning and stoking twice a day or so. The daily consumption of Board of Trade units ranges from 5 to 15. The annual expenditure is as follows:—Annual "telephone" charge, £6 10s. 8d.; hire of cooker, 15s. per quarter, £3; cooking, 2934 units at ½d., £6 2s. 3d.; heating, 2068 units at ½d., £4 6s. 2d.; lighting, 200 units at ½d., 8s. 4d.; total, £20 7s. 5d. Added to that was coke and wood for the boiler, £4 11s., making a total of £24 18s. 5d. The so-called "telephone" charge was really a first payment of a lump sum, with an addition of so much per unit after a certain amount. It is difficult to give a direct comparison for cities where it is not possible to hire a cooker. Cookers can be obtained ordinarily by purchase or on the hire-purchase systems only. The hire purchase is a three-years' system, and on that basis (he says) the annual costs would be as follows for Birmingham:—Cooker, £6; cooking, £12 4s. 6d.; heating, £8 12s. 4d.; lighting, £2 7s. 6d. That made a total of £29 4s. 4d., or, including coke and wood, as before, £33 15s. 4d.

* * *

Under the order nisi granted a fortnight ago in the Practice Court, Melbourne, by his Honour Mr. Justice Hodges to review a finding of the magistrates at Cheltenham (V.) under which Edward Withers was fined for having driven a motor 'bus in that locality without holding a stage coach licence, the appeal of defendant came before the Chief Justice, Sir John Madden, last week. After hearing argument, his Honour held that a stage coach was a vehicle which habitually ran from one terminus to another, with the names of the places between which it plied painted conspicuously upon it. In this case, in which the motor omnibus appeared only at intervals, it was merely a casual plying for hire. If a motor omnibus could be a stage coach in any circumstances, in this particular case it did not come within the meaning of the act. He therefore allowed the appeal, and set aside the decision of the magistrates.

* * *

At the annual conference of the Municipal Association of Victoria last week several speakers spoke strongly of the need for protecting the roads against the heavy wear arising from motor traffic, whether of private cars or motor 'buses. On the motion of Councillor H. J. Richards (Coburg), seconded by Councillor McLorinan (Mulgrave), the following resolution was carried by a large majority:—"That for the protection of municipalities in which motor 'buses run for passenger traffic, authority should be given to councils by act of Parliament to levy a local tax, to be applied towards the maintenance of such roads."

* * *

The quarterly report of the Chief Commissioner for Railways (N.S.W.) to September 30 shows that revenue from passengers and merchandise amounted to £1,833,956, as against £1,541,714 for the September quarter last year, an increase of £292,242. The expenditure was £1,327,981, as against £1,065,948, an increase of £262,033. The number of passengers carried was 20,486,565, an increase of 1,613,425. The tramway revenue was £430,012, as against £401,439 in September, 1912, an increase of £28,573. The expenditure was £386,880, as against £345,982, an increase of £40,898. The passengers numbered 72,592,137, an increase of 4,260,260.

# Invited and Accepted Tenders

It is particularly requested that the information regarding contracts open, and the successful tenderers, be forwarded to The Editor not later than Monday of each week.

The following contractions are used throughout:—S—supply; D—delivery; M—manufacture; C—construction; E—erection; P—purchase; I—installation; R—removal. Where no contractions appear, supply and delivery is understood. The date at the beginning of each paragraph refers to the closing of tenders.

## INVITED.

### Commonwealth.

Specifications, tender-forms, etc., for tenders invited for the Postmaster-General's Department of the various States under this heading may be had as follows:—Victoria—Various State G.P.O.'s. New South Wales—Departmental Stores, Sydney, and various G.P.O.'s in other States. South Australia—Adelaide, Melbourne, Sydney and Brisbane G.P.O.'s. Western Australia—Departmental Stores, Perth, and various G.P.O.'s in other States. Queensland—Various State G.P.O.'s. All States—Various G.P.O.'s. If the specifications, etc., may be had elsewhere, in addition, the places will be given in parentheses.

POSTMASTER-GENERAL'S DEPARTMENT, Melbourne.—5th November.—Galvanised iron piping, as per schedule No. 952.

11th November (extended from 4th November).—D. and E. of eight automatic telephone switchboards at the Ascot, Canterbury, Malvern, Cheltenham, Footscray, Oakleigh, Sandringham, and Williamstown Telephone Exchanges, as per schedule No. 953.

11th November.—S. and D. of motor tubes, covers and solid tyres, as per schedule No. 987.

11th November.—S. and D. of relays, jacks, lamps, etc., as per schedule No. 982.

12th November.—S. and D. of general stores for 2 years, as per schedule No. 913.

16th December.—S. and D. of one common battery multiple switchboard at the Telephone Exchange, Wills-street, Melbourne, as per schedule No. 908.

30th December.—S. and D. of telephone material, as per schedule No. 976.

POSTMASTER-GENERAL'S DEPARTMENT, Sydney.—5th November.—S. and D. of 100 tons No. 4 steel wire, schedule No. 344.

12th November.—S. and D. of motor accessories, as per schedule No. 341.

12th November (extended from 8th October).—S. and D. at the Telephone Exchange, Watson's Bay, Sydney, of 1 automatic switchboard, with all associated equipment as per schedule No. 234.

12th November (extended from 22nd October).—S. and D. of 3000 caps for supervisory lamp, schedule No. 338.

12th November (extended from 22nd October).—4500 yards, 3 steel conductors, schedule No. 328.

12th November (extended from 22nd October).—500 fuses, 3 ampere, schedule No. 338.

12th November (extended from 22nd October).—250 telephone meters, schedule No. 338.

12th November.—S. and D. of 380 cable boxes, as per schedule No. 342.

12th November (extended from 22nd October).—S. and D. of 7 miles copper clad steel wire, as per schedule No. 335.

12th November.—S. and D. of 363 wooden ladders.

19th November.—S. and D. of 450 bells, magneto, as per schedule No. 333.

18th March, 1914.—S., D. and E. at the Telephone Exchanges, Epping, Ryde, Hunter's Hill, Drummoyne, Wahroonga, Paddington and Waverley, Sydney, of seven (7) automatic switchboards, with associated equipment, as per schedule No. 179.

POSTMASTER-GENERAL'S DEPARTMENT, Brisbane.—13th November.—S. and D. of all material necessary to repair 28½ miles telegraph line, as per stores schedule No. 456.

19th November.—Bronze wire, as per schedule No. 273.

17th December.—S. and D. of insulators, as per stores schedule No. 280.

31st December.—S. and D. of insulators, as per stores schedule No. 282.

7th January, 1914.—S. and D. of switchboards, as per schedule No. 274.

7th January, 1914.—S. and D. of telephone instruments, as per stores schedules Nos. 275, 276 and 277.

7th January, 1914.—S. and D. of protectors, parts, etc., as per schedule No. 278.

POSTMASTER-GENERAL'S DEPARTMENT, Perth.—19th November.—S. and D. of rectangular dry cells.

10th December.—S. and D. of 60 tons wire (galvanised iron).

POSTMASTER-GENERAL'S DEPARTMENT, Adelaide.—12th November.—One lamp signalling trunk line switchboard, of five sections, one cable turning section, and one cable storing section, one two-position recording desk, and one chief operator's desk, as specified in specification No. 431, etc., delivered at the Telephone Exchange, Adelaide, as per schedule No. 296.

POSTMASTER-GENERAL'S DEPARTMENT, Hobart.—1st December.—S. and D. of dry cells, as per schedule No. T. 84.

DEPARTMENT OF HOME AFFAIRS.—Kalgoorlie-Port Augusta Railway. 28th November (extended from 5th November).—M., S., D. and E. of 4 locomotive engines and tenders (N.S.W. "P" type) (tender capacity, 4500 gallons of water, and approx. 7½ tons of coal.) (See advertising columns.)

5th November.—S. of 100,000 jarrah sleepers (9ft. x 10in. x 5in.).

18th November.—M., S. and D. of six-wheel horse vans, complete. (See advertising columns.)

2nd December.—600 pairs of wheels and axles (9in. x 4½in. journals).

DEPARTMENT OF HOME AFFAIRS.—Quarantine Station, Sydney.—10th November.—S. of laundry equipment.

DEPARTMENT OF DEFENCE—Small Arms Factory, Lithgow, N.S.W.—29th December.—P. of scrap steel, brass, jute bags, whale oil, etc.

12th January.—S. of iron and steel for manufacture of rifles.

### States Invited.

### Victoria.

RAILWAY DEPARTMENT. 30th October.—S. and D. of rolled steel joists.

31st October.—S. and D. of portable electric lampholders.

3rd November.—Steel or iron cattle troughs.

5th November.—M., S. and D. of wrought iron side brackets.

5th November.—Copper rod.

5th November.—Locomotive seamless copper tubes.

5th November.—Best Yorkshire iron angle and tees.

5th November.—Best steel boiler plates.

5th November.—Copper plates.

5th November.—100 tons of good machinery cast-iron scrap.

5th November.—S. and D. of mild steel flat bars.

5th November.—S. of forge fire steel pressure blower.

12th November.—Steel channel bars.

12th November.—20 tons steel ingots.

12th November.—Steel blooms, for crank pins.

12th November.—Locomotive boiler tubes.

12th November.—High-speed tool steel.

12th November.—Flame arc lamps.

12th November.—Insulated copper cable.

12th November.—M. and D. of one 60h.p. electric motor and accessories.

12th November.—M., S. and D. of mild steel girders for bridge over Boggy Creek.

12th November.—M., S. and D. of mild steel girders for Nicholson River.

19th November.—M., S. and D. or cast steel wheel centres for A2 engines and new truck stock

19th November.—Brass locomotive tubes.

19th November.—150 tons pig iron.

19th November.—10 tons sulphate of copper, best quality, for electrical purposes, battery material.

26th November.—S. and D. of 1000 cast steel blooms for axles for electric motor bogies.

3rd December.—Steel blooms, for piston rods.

3rd December.—S. and D. of vulcanised rubber electric light wire.

10th December.—M., S. and D. of one 15-ton crane for Ballarat.

7th January (1914).—S. and D. 10,000 porous pots for batteries.

7th January.—S. and D. of best steel boiler plates.

7th January.—S. and D. copper rod.

7th January.—S. and D. copper plates.

7th January.—S. and D. of cast steel wheel centres.

7th January.—S. and D. of steel blooms for crank pins.

7th Jan.—S. and D. of locomotive brass boiler tubes.

7th January.—S. and D. of best Yorkshire iron angles.

7th January.—S. and D. of locomotive seamless copper tubes.

7th January.—S. and D. of steel channel bars.

14th January.—S. and D. of 5 Detroit lubricators.

14th January.—S. and D. of 100,000 lineal yards tarpaulin canvas.

14th January.—S. and D. of high speed twist drills.

14th January.—S. and D. of one concrete mixer.

21st January.—S. and D. of one high speed lathe.

21st January.—S. of hydraulic jacks.

28th January.—S. and D. of 200 forges and rolled steel disc wheels.

28th January.—M., S., D. and E. of one three-phase alternator, complete, at Newport.

VICTORIAN RAILWAY COMMISSIONERS—STATE COAL MINE.—3rd November.—Turbine oil.

3rd November.—Receptacles and holders for street series lamps.

3rd November.—Stocks and dies, round fibre.

12th November (extended from 1st October).—

**P. & O.** COMPANY'S ROYAL MAIL STEAMERS
FOR MARSEILLES, PLYMOUTH AND LONDON.

Leave Sydney on the subjoined dates, calling at usual ports.

FIRST AND SECOND SALOON ONLY.

| Steamer, | Tons. | Commander. | Noon. | Melb., 3 p.m. |
|---|---|---|---|---|
| MOLDAVIA | 10,000 | Gordon | Oct. 29 | Nov. 4 |
| MEDINA | 12,500 | Notley | Nov. 15 | Nov. 18 |
| MONGOLIA | 10,000 | Lewellin | Nov. 29 | Dec. 2 |

PASSAGE MONEY TO LONDON—
Single, £41 16s. to £82 10s.
Return, £69 6s. and £123 4s.

Return Tickets between Inter-State Ports are available for return by Orient, Messageries Maritimes, and N.D.L. steamers having room.

SPECIAL HOLIDAY RETURN TICKETS to COLOMBO are now issued, available for two months. Fares from Sydney, £45 2s. first saloon, and £31 18s. second saloon.

A. GORDON WESCHE, Superintendent IN AUSTRALIA, 63 Pitt-street, Sydney.

**The COLONIAL MUTUAL FIRE Insurance Company Limited.**

Principal Office: 60 MARKET-ST., MELBOURNE.

Branches in all the States.
Transacts Fire, Guarantee, Employers' Liability, Marine, Burglary, and Plate Glass, Accident, Workers' Compensation and Live Stock Insurances.
Send for Prospectus.
W. TUCKER, General Manager.

**Harringtons LTD**

**ANALYTICAL & METALLURGICAL DEPT.**

Highest prices given for all gold, silver or platinum residues, etc.
Lowest fees for all kinds of Assay, Analytical, and Metallurgical work.
Expert Advice on Ore Treatment, Bullion Refining, Smelting, etc., etc., Directed by a qualified Analyst from Messrs. Johnson and Sons, London: Assayers and Refiners to Bank of England, H.M. Mint, The Council of India, etc.

**HARRINGTONS LTD.**
**386 George Street, Sydney.**

**SPECIAL NOTICE !**

**The Mount Morgan Gold Mining Co. Ltd.**

ARE PREPARED TO PURCHASE Ores, Concentrates and Furnace Products, containing Gold and Copper, at most favourable rates.

ALSO TO INSPECT MINING PROPERTIES with a view to Developing, Financing, or Purchasing same.

Address:—MR. B. MAGNUS, GENERAL MANAGER, MOUNT MORGAN, QUEENSLAND.

**A.U.S.N. Co. Ltd.**

*Fast, Regular, and Comfortable Passenger Steamers*
(also carrying cargo) from and to
MELBOURNE, SYDNEY, ADELAIDE, FREMANTLE, BRISBANE, and all QUEENSLAND PORTS.

Passage Tickets interchangeable, with other Inter State Companies, on certain conditions.

Full Particulars at
**COMPANY'S OFFICES**
**at all principal Australian Ports.**

**The Mount Lyell Mining & Railway**
**CO. LIMITED.**

**Purchasers of Ores containing Copper, Gold and Silver. Rates obtainable on application to the Secretary**

**Manufacturers of Coke for Smelting and Foundry Purposes, Acids, Etc.**

**HEAD OFFICE—**
**39 QUEEN-STREET, MELBOURNE.**
**D. G. LUMSDEN,**
**Secretary.**

THE
**-PACIFIC CABLE BOARD-**

Best route to Great Britain, Canada, New Zealand, Germany, etc.

New Direct Cable to Auckland from Board's Sydney Office opened December, 1912.

A Week End rate is now available between Great Britain and Australasia. Rate 9d. per word, with minimum of 18/- (24 words). Week End Cable Letters are accepted up to midnight on Saturday for delivery in Great Britain on the following Tuesday morning.

TARIFF PER WORD "VIA PACIFIC."

| | Ordinary. | Daily Deferred. |
|---|---|---|
| GREAT BRITAIN .. .. .. .. | 3/- | 1/6 |
| GERMANY .. .. .. .. .. .. .. .. | 3/- | 1/6 |
| NEW ZEALAND .. .. .. .. .. | 4½d. | — |
| CANADA .. .. .. .. .. .. .. .. | 2/4 | 1/2 |
| U.S.A. .. .. .. .. .. .. .. .. .. .. | 2/4 to 2/8 | 1/2 to 1/4 |
| ARGENTINE, BRAZIL, CHILI and PERU .. .. .. .. | 5/8½ | 2/10¼ |

West Indies, Central America, and other rates, on application.

Cable forms, Deferred and Week End Regulations, may be obtained at—

**THE PACIFIC CABLE BOARD,**
**77 Pitt Street, Sydney.** Tel., City 1346 (3 Lines).
**408 Collins Street, Melbourne.** Tel., 2588.

J. Milward, Manager in the Pacific, 77 Pitt Street, Sydney.

S. of rope haulage engine and electrical equipment for McBride Tunnel.

17th December.—S. of one motor-driven ventilating fan. (See advertising columns.)

STATE RIVERS AND WATER SUPPLY COMMISSION.—6th December.—M. and S. of one centrifugal pump and quick revolution steam engine about 800h.p.

MINES DEPARTMENT.—31st October.—S. of 1000ft. each of 5in. and 6in. casing for coal boring, flush jointed, 5-16in. thick.

## New South Wales.

PUBLIC WORKS DEPARTMENT.—3rd November.—S., D. and E. of structural steel and iron work, Registrar-General's Old Building.

8th December.—M., S. and D. of steel bridges for Cooperbung and Piper's Creeks, on fifth section, North Coast Railway, viz., Wauchope to Kempsey.

RAILWAY DEPARTMENT.—12th November.—S. of three 30-kilowatt motor generator.

26th November.—S. of one 2000 lb. storage battery freight truck.

METROPOLITAN BOARD OF WATER SUPPLY AND SEWERAGE (341 Pitt-street, Sydney).—3rd November.—M. and D. of 36in. and 30in. sluice valve, at Leichhardt Depot.

10th November.—S. and E. of steel coal bunker, Ryde Pumping Station.

15th December.—M. and D. of one turbine centrifugal pumping plant for Crown-street Pumping Station.

SYDNEY HARBOUR TRUST. 3rd November.—S. and D. of C.I. mooring bollards for general wharf equipment. (See advertising columns.)

## Queensland.

TREASURY DEPARTMENT.—(Babinda Central Sugar Mill)—24th November.—S. D. and E. of small electric generating plant, motive power, and all accessories. Shafting, brackets, and travelling crane for 30 cwt. Tools for fitting shop. Bar iron and piping. One locomotive, about 12 tons loaded, 2ft. gauge.

6th January, 1914.—S. and D. of 23 miles of steel rails, 28 lb. per lineal yard, with all fastenings, to be delivered at Cairns Wharf in July, 1914.

PUBLIC WORKS DEPARTMENT. 7th November.—S. and D. of electric light material for hospital for insane, Goodna.

## Western Australia.

GOVERNMENT TENDER BOARD.—20th November.—S. of copper firebox, tube plates for railway department.

20th November.—1000 yards roofing canvas.

20th November.—200,000 yards tarpaulin canvas.

20th November.—S. of sewerage fittings.

## South Australia.

SUPPLY AND TENDER BOARD.—11th November.—S. and D. of 8 indiarubber hosepipes for Pintsch gas, 50ft. long x 5/8 dia.

11th November.—S. and D. of 130 tons of moulders' blacking.

11th November.—S. and D. of 20 cwt. zinc alloy, which must analyse 83.0 per cent. pure aluminium, 14.25 per cent. pure zinc., and 2.75 per cent. copper.

25th November.—S., D. and stacking 200 miles galv. wire netting (100 miles 42 x 1½ x 18g. and 100 miles 36 x 1½ x 18g.).

RAILWAY DEPARTMENT.—4th November.—S. and D. 368 tons coloured or white cotton waste.

18th November.—S. and D. of 1137 bars of copper.

18th November.—C. of bridge for Millswood subway.

13th January.—C. of 12 bogie goods break vans, with passenger compartments, 3ft. 6in. gauge.

PUBLIC WORKS DEPARTMENT.—4th November.—C. of reinforced concrete tank at Renmark (50,000 gallons capacity).

4th November.—C. of pumping station and residence at Renmark.

16th December.—S. and E. at Renmark of complete pumping plant.

MINES DEPARTMENT.—29th November.—P. of mines plant and machinery. (See advertising columns.)

## New Zealand.

RAILWAYS DEPARTMENT.—31st October.—S. and D. of stores for the period from April 1, 1914, to March 31, 1917.

PUBLIC WORKS DEPARTMENT.—17th November (extended from 31st October).—S. of telephone instruments and accessories for Lake Coleridge power scheme.

PUBLIC SERVICE TENDER BOARD.—17th November.—1000 bolts, double "J."

17th November.—1 mile cable, D.C.L.C., armoured, 104 pairs.

17th November.—2 miles cable, D.C.L.C., armoured, 78 pairs.

17th November.—1 mile cable, D.C.L.C., armoured, 52 pairs.

17th November.—1 mile cable, D.C.L.C., armoured, 26 pairs.

17th November.—¼ mile cable, lead-covered, silk and cotton insulated, 312 pairs.

17th November.—¼ mile cable, lead-covered, silk and cotton insulated, 624 pairs.

17th November.—4000 castings, 53 lbs., 6 hole.

17th November.—4000 castings, 40 lb., 6 hole.

17th November.—3000 clamps, Messenger, with coach screws and bolts.

17th November.—2400 covers, bicycle (more or less).

17th November.—2400 tubes, bicycle (more or less).

17th November.—600 covers, motor-cycle (more or less).

17th November.—600 tubes, motor-cycle (more or less).

17th November.—Motor-cycles and bicycles, spare parts for—4 gross chains, Renold's, ½in. by 3/16in., 114 links; 150ft. chain, Renold's, 5/8in. by ¼in.; 1 gross pairs mudguards, steel, with screw in stays; 1½ gross outfits, Woolgate's Patch-quick; 72 pairs pedals, rubber, 4in., genuine B.S.A.; 2 gross plugs, sparking, Bosch, single point; 72 saddles, Brook's B10; 3 dozen stays, spare, for mud-guards.

17th November.—100,000 insulator bolts, Sinclair.

17th November.—100,000 insulator cups, Sinclair.

17th November.—2 tons metal, jointers'.

17th November.—200 reams paper, brown.

17th November.—2500 plugs, single current.

17th November.—5000 porous pots, Leclanche No. 1.

17th November.—1000 telephones, table.

17th November.—5 tons wire, copper, annealed, binding, 60 lb. per mile.

17th November.—100 tons wire, copper, hard-drawn, 200 lb. per mile.

17th November.—100 tons wire, iron, galvanised, 200 lb. per mile.

17th November.—100 tons wire, iron, galvanised, 150 lb. per mile.

17th November.—7000 zincs, Leclanche No. 1.

## General.

KORUMBURRA MUNICIPAL POWER HOUSE (Jas. D. Batty, engineer-in-charge).—17th November.—P. of 130 Hart Accumulator Cells.

BALLARAT WATER COMMISSIONERS (V.) (Alex. Fraser, Secretary).—5th November.—S. of 20 tons of 3in. and 4in. C.I. water pipes.

BRISBANE—THE METROPOLITAN WATER AND SEWERAGE BOARD (Albert-street).—11th November.—S. and D. of electric blue printing machine.

13th January, 1914.—M. and D. of material for aerial ropeway.

ELDERSLIE STATION, Winton, W. Q'land.—19th November.—Sinking and completion of an artesian bore, maximum depth 4500 feet.

CITY OF LAUNCESTON (T.) (C. W. Rocher, Town Clerk).—24th November (extended from 13th October).—Section i., S. and D. of transformers, etc.; section ii., S. and D. of feeder cable, etc.; section iii., S., D. and E. of high tension switchboard, etc.

DOMINION PORTLAND CEMENT CO. LTD., Wellington (N.Z.).—Wairua Electric Power Scheme.—31st October.—Section 10, high-tension insulators for 22,000 volt service.

CHRISTCHURCH CITY COUNCIL (H. R. Smith, town clerk).—5th January, 1914.—S. and D. of series street lighting plant and accessories. Specifications may be seen Town Clerk's office, Melbourne.

HAMILTON ELECTRIC SUPPLY CO.—13th November.—P. as going concern, plant, land and rights of business.

CAMERON'S AJAX MINING CO. N.L. (W. Lascelles, 90 William-street).—P. of winding plant and Sundries at Daylesford.

SHIRE OF BULN BULN (W. Young, secretary).—S. and D. of a crushing plant. (See advertising columns.)

CITY OF MELBOURNE.—7th November.—S. and D. of one cast-iron spiral stairway

G. Ahern, Zeehan (T.).—For sale, machinery. (See advertising columns.)

Quotations wanted for Huntingdon plant. (See advertising columns.)

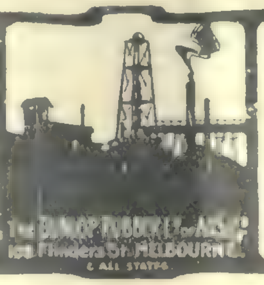
## ACCEPTED.

### Commonwealth.

POSTMASTER-GENERAL'S DEPARTMENT, VICTORIA.—100 iron letter boxes, 17s. 6d. each; 25 iron receiving pillars, £8 10s. each—Peters Brothers.

3 "Peerless" Motor Cycles, 3½ h.p., £62 each—A. G. Healing and Co. Prop. Ltd.

250 keys, switching, three-position, 6s. 1d. each; 10 generators, ringing, £6 10s. each; 300 indicators, gravity, 3s. 10d. each; 50 jacks, operators, 1s. 2d.


Dunlop Mining Goods
Are now used with satisfaction in most of the Leading Mines of Australasia—Their QUALITY & WEAR are UNSURPASSED.
Tenders & Samples submitted
Correspondence Invited
Send for Illustrated Catalogue

The Dunlop Rubber Co. of Aus. Ltd.
108 Flinders St., Melbourne
& all States

Dunlop Rubber Belting
Is more efficient than Leather belting for Outdoor & Wet Work.
Sample & Price on application

Note this on every belt.

Be sure you get
**"DICK'S"**
We know there are numerous imitations. Dick's maintains its high reputation for strength and efficiency. Every belt guaranteed. Sole agents:
**JAMES HARDIE & CO.**
Melbourne and Sydney.

**Surveyors - Architects - Engineers**

will be interested to know that

**W. F. Stanley & Co. Ltd.,**

the greatest instrument-makers of Britain, are now adequately represented in Sydney. We have an enormous stock of every necessity in connection with your profession. We are selling these goods at the English Catalogue Prices, plus only duty and importing expenses 15 per cent.

*We will forward Catalogues upon application.*

**Fairfax and Roberts Ltd.,**
Sole Agents in New South Wales,
**23 and 25 Hunter Street, Sydney.**

each; 20 magnets, horseshoe, 7s. 3d. each; 4000 plugs, three-part, 1s. 5d. each; 1500 plugs, two part, 11½d. each. 1000 pairs, protectors, in strips of 50, 26 per strip; 250 relays, 250 ohms., for common battery switchboards, 5s 3d. each; 75 rosettes, for table telephones, 10d. each; 250 sockets, for supervisory lamps, 5½d. each; 6000 terminals, nickelled, £1 2s. per 100; 500 translators, multiple, 9s. 6d. each; 1000 keys, combined listening and ringing, 4s. 5d. each; 350 keys, switching, three position, 6s. 1d. each. 4000 plugs, three-part, 1s. 5d. each; 4000 pairs protectors, as under—1000 pairs in strips of 50 (20 strips) £6 per strip. 2000 pairs in strips of 20 (100 strips) £2 13s. per strip, 1000 pairs in strips of 10 (100 strips) £1 12s. 6d. per strip. 4000 terminals, nickelled, £1 6s. per 100—J. Bartram and Son Proprietary Ltd.

25 tons sulphate of magnesia, £6 5s. per ton; 10 tons sal-ammoniac crystals, £34 10s. per ton—Theodore Zalder and Co.

2000 jacks, five-part, 8s. 11d. each; 500 keys, combined listening and ringing, 3s. 0½d. each; 15 miles cable, paper insulated, lead covered, 416 pairs twelve and a half (12½) lbs., conductors, not served, £1100 per mile. 15 miles cable, paper insulated, lead covered, 26 pairs, twelve and a half (12½) lbs., conductors, served, £166 per mile—The British Insulated and Helsby Cables Ltd.

200 waterproof coats, 36s. 9d. each; 10 waterproof coats with sleeves, 42s. 3d. each; 50 waterproof capes, 18s. 3d. each; 50 waterproof capes, cyclists', 25s. 3d. each—The Pioneer Rubber Co. Prop. Ltd.

200 brooms, bass, No. 5, 1s. 5d. each; 300 brooms, hair, No. 8, 2s. 8d. each; 6 brooms, hair, 24-inch, 7s. 6d. each; 144 brushes, clothes, lettered "P.M.G.," 2s. 5d. each; 240 brushes, hand banister, No. 4, 1s. 5d. each; 100 brushes, stencil, 6d. each; 300 brushes, battery, 5½d. each—Messrs. John [illegible] and Co.

POSTMASTER-GENERAL'S DEPARTMENT, N.S.W.—440 Lodge arresters at 17s. 6d. each—E. H. Kirby.

POSTMASTER-GENERAL'S DEPARTMENT, SOUTH AUSTRALIA.—S. of 3500 footplates, iron, for rails, 2s. 2 7-8d. each; 4000 bevelled washers, ½d. each—A. Simpson and Son.

S. of 1000 iron spindles for top of rail poles, 1s. each—H. Dennis.

S. of 1 ton G.I. bolts and nuts, 4½ x ⅜in.; 2 tons G.I. bolts and nuts, 4 x ⅜in., £40 per ton; 1 ton iron bolts and nuts, 9in. x 5-8in., £22 10s. per ton; 2 tons bolts and nuts, 10in. x 5-8in. and 2 tons bolts and nuts, 11in. x 5-8in., £20 per ton—Thos. McPherson and Son.

S. of 17,000 malleable G.C.I. brackets, 1s. 2d. each—Commonwealth C. and Malleable Iron Works.

S. of 8500 galv. steel spindles, 5-8in., 6d. each—Williams and Co.

1000 G.I. bands, shackle, 1 7-8d. each; 4500 G.I. bands, shackle, small, 1 3-8d. each—Theodore [illegible].

DEPARTMENT OF DEFENCE, MELBOURNE.

500 feet 2¼in. round iron bars, 1s. 1d. per foot—Bell's Asbestos Aust. Agency Ltd.

S. of concrete mixer, £422 10s.—Geo. Russell Pty. Ltd.

S. of two 3-ton stationary hand cranes, £98 each—[illegible] Coates.

S. of one 10-ton steam roller, £560—Welch, Perrin and Co.

S. 3500 tons coal, £1 4s. per ton—McIlwraith, McEacharn and Co. Pty. Ltd.

## Victoria.

VICTORIAN RAILWAYS.—M., S. and D. of 8in. wood stave pipes for the Lang Lang Water Supply, at 2s. 9d. per lineal foot—The Australian Wood Pipe Co. Ltd.

M., S. and D. of crimped wires (coppered steel) for maintenance of cars. Crimped wire (coppered steel), all to samples and as specified—Item No. 1, 7ft. 4½in. long x 7 gauge, to fit groove No. 16, at £1 10s. per gross; Item No. 2, 5 ft. 11 7-8in. long x 7 gauge, to fit groove No. 1, at £1 5s. per gross; Item No. 3, 1ft. 1½in. long x 6 gauge, to fit groove No. 4, at 10s. 6d. per gross; item No. 4, 1ft. 4in. long x 6 gauge, to fit groove No. 11, at 10s. 6d. per gross—Morris and Bone.

M., S. and D. of steel castings for 30-ton wrecking crane—Charles Ruwolt Pty. Ltd.

S. and D. of 1 hydraulic flanging press for Newport workshops—Strachan, Murray and Shannon Pty. Ltd.

S. and D. of Kerosene Oil for use in oil engines, 8 7-8d. per gallon—Vacuum Oil Co. Pty. Ltd.

S. and D. of N.S.W. coal to 30th June, 1914, 17s. 3d. per ton—Jas. and Alex. Brown.

S. and D. of 1 automatic horizontal hollow chisel mortiser, £311—J. O. Smith and Co.

S. and D. of galvd. teleg. wire, No. 12, £13 1s. 3d. per ton—C. S. Green and Son.

MINES DEPARTMENT.—S. and D. of 1 suction gas producer at Creswick, £155—Cambridge Gas Power Co. Pty. Ltd.

PUBLIC WORKS (PORTS AND HARBOURS).—S. of 36 tons 14cwt. 12lbs. steel plates, £385 8s. 2d.—Stewarts and Lloyds (Aust.).

## New South Wales.

METROPOLITAN BOARD OF WATER SUPPLY AND SEWERAGE.—Iron and steel work, for throttle valve and recorder chamber, Penshurst Reservoir, £34 15s.—Wearne and Breakspear, Sydney.

RAILWAY DEPARTMENT.—Supply of pneumatic ash handling plant, Babcock and Wilcox Ltd., Sydney.

PUBLIC WORKS DEPARTMENT.—S. and D. of iron and blacksmith's work for knocking down pens at new abattoirs, Homebush Bay, £374—Structural Engineering Co., Erskineville.

## General.

MELBOURNE AND METROPOLITAN BOARD OF WORKS.—M., S. and D. of ironwork for O'Shannassy Water Supply Scheme, Items Nos. 2 and 3—Geo. W. Kelly and Lewis Pty. Ltd. Items 1 and 4—Mephan Ferguson Pty. Total amount, £456 11s. 6d.

M.C. OF SYDNEY.—S. and D. of testing transformer, £27 10s.—Australian General Electric Co., Sydney.

Steel ladder for power house, £53 10s.—A. and J. Rowlandson.

Copper for busbars, 500ft. 3in. x ¼in., £63; 250 ft. 2in. x ¼in., £21, subject to market fluctuations—British Insulated and Helsby Cables Ltd.

## BANK CLEARINGS.

The report of the Melbourne Clearing House for the week ended 27th October was:—

| | | |
|---|---|---|
| Total clearance | | £5,001,253 |
| Balances— | | |
| Settled by certificates | £423,500 | |
| Settled in coin | 125,177 | |
| | | 548,677 |
| Total clearance for the corresponding week 1912 | | 4,727,290 |

---

### CITY OF AUCKLAND.

ELECTRICITY DEPARTMENT.

FOR SALE.

**Three 250kw. Direct Coupled Steam Generators with Switchgear.**

Specifications may be obtained on application to the City Electrical Engineer, Railway Wharf, Auckland, New Zealand.

**Offers, endorsed "Tenders for Old Plant," must be addressed to the Town Clerk, Town Hall, Auckland, New Zealand.**

HENRY W. WILSON,
September 16, 1913. Town Clerk.

---

### TO MINE-OWNERS, SAWMILLERS AND Others.

FOR SALE.

Two Robey Boilers, loco. type, carrying 120 lb. steam; 64 tubes, 10ft. long; 500ft. heating surface; in first-class condition. Price, £200 each, at Adelaide Mine, or £215 in the truck at Zeehan Railway Station.

Also

Boiler, similar type, but smaller, carrying 80 lb. steam, 54 tubes. Price, £130 at Mine, £145 in Zeehan Station.

Also

A Tandem Loose Eccentric Jet Condensing Engine, 4ft. 9in. stroke, 13ft. flywheel geared one in four, and 16in. Cornish lift 300ft. of columns.

Also

A Quantity of Magnificent Specimens of Crocoisite (chromate of lead), suitable for Museums or School of Mines.

For further particulars apply—
G. AHERN, Zeehan.

---

### WANTED.

Quotations for Huntingdon Plant, new or secondhand, 25 to 50 tons capacity. Reply, with full particulars, to Fine Gold, "Australian Mining Standard," Sydney.

---

### WANTED.

Young Man requires position as a Metallurgical Chemist or Assayer, or in any capacity in a mill. Good testimonials, and thorough practical experience. Apply—A.Z., Office of this Paper, Melbourne.

---

### SHIRE OF BULN BULN.

TENDERS are invited, and will be received up to 12 noon on Friday, November 7, 1913, subject to the conditions of tendering, for the Supply and Delivery of a Crushing Plant. Specifications can be seen at office of Municipal Association, 369 Collins-st. Deposit with tender, £20.

W. YOUNG, Shire Secretary.
Drouin, October 23, 1913.

---

"COMPANIES ACT, 1890."

TWELFTH SCHEDULE.

MEMORIAL FOR REGISTRATION OF THE

### RUSSELLS FREEHOLD GOLD ESTATES, NO LIABILITY.

I, the undersigned, hereby make Application to Register the Russells Freehold Gold Estates as a No Liability Company, under the provisions of Part II. of the "Companies Act 1890."

(1) The name of the Company is to be "Russells Freehold Gold Estates No Liability." (2) The place of operations is at Carngham. (3) The registered office of the Company will be situated at 230 Collins-st., Melbourne. (4) The value of the Company's property, including claim, is £2400. (5) The number of the shares in the Company is 1200, of £5 each. (6) The number of shares subscribed for is 800. (7) The name of the manager is Henry William Malloch. (8) The names and addresses and occupations of the shareholders and the number of shares held by each at this date are as below:

| Names, Addresses and Occupations. | No. of Shares. |
|---|---|
| Allan Bowler, Barwon Grange, Geelong, investor | 5 |
| Rowland Egerton Warburton, 145 Collins-st., Melbourne, importer | 5 |
| Ive Scott, Victoria-pde., Geelong, accountant | 5 |
| Alfred Clark, 472 Nicholson-st., North Fitzroy, manufacturer | 5 |
| John Madden, Bannockburn, orchardist | 5 |
| Henry William Malloch, 230 Collins-st., Melbourne, manager of companies (in trust for shareholders) | 775 |
| Henry William Malloch, 230 Collins-st., Melbourne, manager of companies (in trust for company) | 400 |
| | 1,200 |

Dated this twenty-eighth day of October, 1913.

(Sgd.) HENRY W. MALLOCH, Manager.
Witness to signature—(Sgd.) S. R. Dickson.

I, Henry William Malloch, do solemnly and sincerely declare that:—(1) I am the manager of the said intended Company; (2) the above statement is, to the best of my belief and knowledge, true in every particular, and I make this solemn declaration conscientiously believing the same to be true, and by virtue of the provisions of an Act of the Parliament of Victoria rendering persons making a false declaration punishable for wilful and corrupt perjury.

(Sgd.) HENRY W. MALLOCH.

Taken before me, at Melbourne, this 28th day of October, 1913—(Sgd.) W. H. Quick, J.P.

Arthur Phillips, solicitor, 60 Queen-st., Melbourne.

## Commonwealth of Australia.

### FIFTY POUNDS REWARD.

A REWARD of £50 is offered by the Commonwealth Government for information leading to the conviction of the forger or of any person criminally concerned in the circulation of the forgery of an Australian Note, the Bank number of which is S994460, and the Treasury number K041541, recently passed into circulation at Sydney, New South Wales. The paper purports to be that of the National Bank of Australasia.

GEO. T. ALLEN,
Secretary to the Treasury.

---

Department of External Affairs,
Melbourne, October 13, 1913.

APPLICATIONS are invited for Building a Single-screw Steamer, clipper bow, elliptic stern, schooner rigged, for use in the tropics.

The vessel to be built and equipped to Lloyd's 100 A1 class. Transverse number, 43; longitudinal number, 7500; length to depth, 11 and under 12; depth, 12 and under 13. Builders to pay all classification fees and supply all certificates required for a passenger steamer ready for deep sea service.

General Dimensions:
Length B.P., 174ft. 6in.; Beam, 28ft.; Depth, 15ft.

The vessel throughout to be built, equipped, and furnished ready for deep sea service in all respects.

The builders to guarantee that if, within a period of six months after date of delivery of the vessel, any defects shall appear therein as regards material or workmanship, the same shall immediately be replaced at their sole cost to the satisfaction of this department.

Plans and specifications may be inspected at the Department of External Affairs, Spring-street, Melbourne.

Tenders, accompanied by a deposit of five hundred pounds (£500), should be enclosed in a sealed envelope, marked "Tenders for a Single-screw Steamer," and forwarded to the Secretary, Department of External Affairs, Melbourne, before the 20th December, 1913.

The lowest or any tender not necessarily accepted.

(Sgd.) ATLEE HUNT,
Secretary.

---

Department of Home Affairs,
Melbourne, October 22, 1913.

### KALGOORLIE TO PORT AUGUSTA RAILWAY.

### LOCOMOTIVE ENGINES AND TENDERS.

It is hereby notified that the closing date for the receipt of Tenders for the Supply and Delivery of "P" Type Locomotives, referred to in "Commonwealth Gazette" No. 66 of October 4, 1913, has been extended from the 5th to the 28th November, 1913.

JOSEPH COOK,
Minister of State for Home Affairs.

---

Department of Home Affairs,
Melbourne, October 22, 1913.

### KALGOORLIE TO PORT AUGUSTA RAILWAY.

### ANALYTICAL AND BIOLOGICAL CHEMIST.

Applications are invited from persons competent to fill the position of Analytical and Biological Chemist in connection with the Western Australian Powellised Sleeper Contract. The position will be under the Kalgoorlie to Port Augusta Railway of 1911, which provides that the appointment will be during the pleasure of the Minister, and may be for any period not extending six months beyond the date on which the line shall be declared open for traffic.

Salary, £500 per annum.

Applicants must be thoroughly capable of conducting analyses of all classes of materials, and must have a knowledge of timber and its diseases.

The successful applicant will have to reside in Western Australia, and will be immediately responsible to the Engineer-in-Chief for Commonwealth Railways.

Applications, accompanied by copies of diplomas and testimonials, and addressed to the Secretary, Department of Home Affairs, Melbourne, will be received until noon on Tuesday, 25th November, 1913.

The age of the applicant must be stated.

W. M. KELLY,
For Minister of State for Home Affairs.

---

Department of Home Affairs,
Melbourne, October 16, 1913.

### KALGOORLIE TO PORT AUGUSTA RAILWAY.

### TENDERS FOR BRAKE VANS (6-Wheel), COMPLETE, and BRAKE VAN UNDERFRAMES (6-Wheel).

TENDERS, addressed to the Secretary, Department of Home Affairs, Melbourne, will be received up to 11 a.m. on Tuesday, November 18, 1913, for the Manufacture in Australia, Supply and Delivery of:—

Brake Vans (6-wheel), complete, and Brake Van Underframes (6-wheel).

Specifications, plans, etc., will be on view on and after October 21, 1913, at the following offices: —Commonwealth Railways, 84 William-street, Melbourne; Commonwealth Works Director, Customs House, Sydney; and Commonwealth Works Registrars, Brisbane, Adelaide, Perth and Hobart.

The charge for each copy of specification will be £1 1s., and for each plan 5s., which must be paid before the document can be issued.

Tenders are to be endorsed, "Tenders for Brake Vans and Brake Van Underframes," and are to be accompanied by the deposit mentioned in the form of tender.

JOSEPH COOK,
Minister of State for Home Affairs.

---

## Government Notices (N.S.W.).

Sydney Harbour Trust Office,
Circular Quay, October 24, 1913.

### TENDERS FOR CAST IRON MOORING BOLLARDS.

TENDERS will be received at this office up to 2 p.m. on Monday, the 3rd proximo, for the Supply and Delivery to the Trust of Cast Iron Mooring Bollards for general wharf equipment.

Full particulars and forms of tenders may be obtained on application to the Engineer-in-Chief of the Trust.

E. W. AUSTIN,
(7a28) Acting Secretary.

---

### METROPOLITAN BOARD OF WATER SUPPLY AND SEWERAGE.

TENDERS for the works specified below will be received up to 2 p.m. on the dates mentioned. For particulars see Government Gazette.

NOVEMBER 10, 1913.

Supply and Erection of a Steel Coal Bunker; also of 3 Steel Roof Principals, at the Board's Pumping Station, Ryde.

DECEMBER 15, 1913.

Manufacture and Delivery of One Turbine Centrifugal Pumping Plant, for Crown-street Pumping Station.

WILLIAM HOLMES,
341 Pitt-street, Secretary.
Sydney, October 21, 1913. (6149)

---

**TENDERS INVITED**

For the Purchase of Electric Lift Gear (Automatic), including D.C. motor, about 10h.p.; worm gear and winding drum, electric controller, switch boards, etc. Apply—

Manager, METHODIST BOOK DEPOT,
288 Little Collins-street.

---

NOTICE is hereby given that the Patentee of Australian Letters Patent No. 1680/1911, dated July 3, 1911, for "Improvements in Smoke Consuming and Fuel Economising Apparatus for Furnaces and the Like." is prepared to satisfy any demands and all requirements of the public respecting said invention. Further information and particulars obtainable from Edward Waters & Sons, Patent Attorneys, 414-418 Collins-street, Melbourne, and 7 Moore-street, Sydney.

---

### WILLIAMS FANCY GOLD MINING COMPANY, Berringa, No Liability.

A Dividend (the 44th) of Sixpence a share has been declared, payable at the office of the Company, Lydiard-street, Ballarat, on Wednesday, November 5, 1913. Transfer books close on Saturday, the 1st, at 12.30 o'clock p.m.

October 24, 1913. S. STRETCH, Manager.

---

### THE CENTRAL RED, WHITE AND BLUE Mining Company No Liability.

A Dividend (the 43rd) of 2s. per share has been declared, payable at the Company's office, City Chambers, High-st., Bendigo, and at the Bank of Victoria, Collins-st., Melbourne, on Thursday, October 30, 1913. Transfer books close on Tuesday, at 10 o'clock a.m.

J. H. McCOLL (McColl and Rankin), Manager

---

## Government Notices (V.).

### VICTORIAN RAILWAYS COMMISSIONERS.

### STATE COAL MINE.

### MINE ELECTRICIAN.

APPLICATIONS are invited for the position of Mine Electrician. Applicants must be thoroughly conversant with electrical power as applied to mining, and must have a good practical and theoretical knowledge of high tension and low tension three phase work and of direct current work. Applicants must also have a sound knowledge of steam engineering with special reference to high speed engines, turbines and condensing plants. The qualifying certificates for engine drivers in Victoria are essential. Salary, £6 per week. Applications, stating age accompanied by copies only of testimonials, and addressed to the General Manager, State Coal Mines, Wonthaggi, will be received up till noon of Wednesday, November 12.

GEO. H. BROOME.
General Manager, State Coal Mine.

---

### VICTORIAN RAILWAYS COMMISSIONERS.

### STATE COAL MINES.

### VENTILATING FAN.

TENDERS (endorsed "Tender for Ventilating Fan") to be addressed to the General Manager, State Coal Mines, Wonthaggi, and delivered at his office at Wonthaggi, not later than 12 noon of Wednesday, December 17, are invited for the Supply of One Motor-driven Ventilating Fan. P.D., £2. Particulars at the Melbourne office of the State Coal Mines, Robb's Buildings, Collins-street, and at the office of the General Manager, Wonthaggi.

No tender will necessarily be accepted.

G. H. BROOME,
General Manager.

---

### ENGINEDRIVERS AND BOILER ATTENDANTS.

EXAMINATIONS for granting certificates to Mining and Factory Enginedrivers and Boiler Attendants will be held in Melbourne, commencing on December 1 next. Applications should be lodged at this office by November 13. Forms of application and copies of the regulations may be obtained at this office, or from Inspectors of Mines and Inspectors of Factories.

R. U. BIRRELL,
Secretary to the Board of Examiners.

Office of Mines,
Melbourne, October 24, 1913.

---

TENDERS are invited up to 12 noon on Friday, the 31st instant, for the Supply of 1000 feet each of 5-inch and 6-inch Casing for Coal Boring, flush jointed 5-16-inch thick. Immediate delivery required. A preliminary deposit of £20 must accompany each tender. The lowest or any tender will not necessarily be accepted. Tenders, addressed to the Secretary for Mines, and endorsed "Tender for Casing," to be placed in the Tender Box for the Mines Department, Public Offices, Treasury Gardens, or sent by post.

W. DICKSON.
Office of Mines, Secretary for Mines.
Melbourne, October 23, 1913.

---

### ANNAN RIVER COMPANY NO LIABILITY.

NOTICE is hereby given that Half-yearly General Meeting of the shareholders of this Company will be held at the registered office, No. 375 Collins-street, Melbourne, on Friday, October 31, at 12 o'clock noon. Business: General. By order of the Board. S. J. WARNOCK, Manager.

Melbourne, October 23, 1913.

---

### THE SILVERTON TRAMWAY COMPANY LTD.

An Interim Dividend of 1s., and Bonus of 2s. per share will be payable at this office on and after Monday, December 1, 1913. By order of the Board.

C. F. MACDONALD, Secretary.

Equitable Building, 314 Collins-street.

The transfer books of the Company will close 4 p.m. on Thursday, November 13, 1913, for above dividend, but will be open again for transfers on Friday, November 14.

# THE BANK OF AUSTRALASIA.

(Incorporated by Royal Charter, 1835.)

| | |
|---|---|
| PAID UP CAPITAL | £1,600,000 |
| RESERVE FUND (£500,000 is invested in 2½ per cent. Consols, the remainder being used in the business of the Bank) | 2,060,000 |
| RESERVE LIABILITY of PROPRIETORS UNDER the CHARTER | 1,600,000 |
| | £5,260,000 |

### HALF-YEARLY REPORT of the DIRECTORS of THE BANK OF AUSTRALASIA,

With the Accounts for the Half Year to 14th April, 1913.
Presented to the Proprietors at the Half Yearly General Meeting, held on
THURSDAY, 2nd OCTOBER, 1913.

### REPORT.

The Directors submit to the Proprietors the Balance Sheet as at 14th April last, with the Profit Account for the half-year to that date. After providing for rebate on bills current, for British and Colonial rates and taxes, for a 10 per cent. bonus to the staff, and for all bad and doubtful debts, the net profit for the half year amounted to £206,643 14s. 4d.

To this sum must be added £28,548 9s. 5d. brought forward from the previous half year, making a total of £235,192 3s. 9d., out of which the Directors have declared a Dividend for the half year at the rate of 14 per cent. per annum, or £2 16s. per share, and a Bonus at the rate of 3 per cent. per annum, or 12s. per share, together £3 8s. per share, free of income tax.

The Dividend and Bonus will absorb £136,000, and the Directors have further appropriated £50,000 to the Reserve Fund, and £20,000 in reduction of the cost of Bank Premises. There will then remain £29,192 3s. 9d. to be carried forward to the next Account.

The Dividend and Bonus will be payable, in London, and in the Colonies, on the 3rd October.

The £400,000 of new capital issued has been fully subscribed, and the interest on the instalments will be payable on the 1st October.

The Directors have to record with deep regret the deaths of their esteemed colleagues, Mr. W. R. Arbuthnot and the Rt. Hon. Alfred Lyttelton, K.C., M.P.

To fill the vacancies thus created, the directors have appointed Mr. Frederick V. C. Livingstone-Learmonth and the Hon. Michael Hugh Hicks-Beach, M.P. The names of these gentlemen will be submitted for the approval of the proprietors at the annual general meeting in 1914, in accordance with the provisions of the deed of settlement.

4 Threadneedle-street, London, 22nd September, 1913.

ALDENHAM, Chairman.

### PROFIT ACCOUNT, From 14th October, 1912, to 14th April, 1913.

| | | | | |
|---|---|---|---|---|
| Undivided Profit, 14th October, 1912 | | | | £164,548 9 5 |
| Less Dividend and Bonus, 4th April, 1913 | | | | 136,000 0 0 |
| | | | | £28,548 9 5 |
| Profit for the half year to 14th April, 1913, after deducting Rebate on Bills Current at Balance date (£11,619 19s. 6d.), and making provision for all bad and doubtful debts and for a 10 per cent. Bonus to the staff | | | £388,765 12 7 | |
| LESS: | | | | |
| I. Charges of Management. | | | | |
| Colonial— | | | | |
| Salaries and allowances to the Colonial Staff, including the Superintendent's Department, and 204 Branches and Agencies | | £109,402 4 10 | | |
| General expenses, including rent, repairs, stationery, travelling, &c. | | 28,369 7 5 | | |
| London— | | | | |
| Salaries | | 10,636 12 6 | | |
| General Expenses | | 4,141 15 4 | | |
| | | £152,550 0 1 | | |
| II. Rates and Taxes— | | | | |
| Colonial | £14,442 12 10 | | | |
| London | 15,129 5 4 | | | |
| | | 29,571 18 2 | | |
| | | | 182,121 18 3 | |
| | | | | 206,643 14 4 |
| Total amount of unappropriated profit | | | | £235,192 3 9 |
| From which deduct | | | | |
| For transfer to Reserve Fund | | | £50,000 0 0 | |
| For reduction in cost of Bank Premises | | | 20,000 0 0 | |
| | | | | 70,000 0 0 |
| Leaving available for dividend | | | | £165,192 3 9 |

### BALANCE-SHEET.—14th APRIL, 1913.

| Dr. LIABILITIES. | | | ASSETS. | Cr. |
|---|---|---|---|---|
| Circulation | | £188,472 0 0 | Specie, bullion, Government notes and cash balances | £4,995,754 14 10 |
| Deposits | | 18,515,034 18 6 | Loans at call and at short notice | 2,195,000 0 0 |
| Bills payable and other liabilities including provision for contingencies | | 2,751,471 8 2 | British Government securities | 838,261 11 1 |
| | | £21,454,978 6 8 | India and Colonial Governments securities, and other investments | 546,061 13 10 |
| Capital | £1,600,000 0 0 | | Bills receivable, advances on securities and other assets | 17,192,666 9 5 |
| New share account | [illegible] 0 0 | | Bank premises in Australia, New Zealand and London | 21,626 1 3 |
| Reserve fund | 2,060,000 0 0 | | | |
| Profit account, undivided balance | 165,192 3 9 | | | |
| | | 4,334,392 3 9 | | |
| | | £25,789,370 10 5 | | £25,789,370 10 5 |

E. W. JEANS, General Manager. F. H. BLOGG, Accountant.

We have examined the cash and securities in London, and the London books, and have verified the transfers from the several branches in the Commonwealth and New Zealand, and we beg to report that, in our opinion, the foregoing is a full and fair balance sheet of the bank, and that it exhibits a true and correct view of the state of the bank's affairs as shown by the books. The investments are valued at market price or under.

London, 17th September, 1913.

WELTON, JONES & CO., Auditors.

---

REPORT OF THE DIRECTORS OF

# THE NATIONAL BANK OF AUSTRALASIA LIMITED.

The Balance-sheet of the Bank as on 30th September last, and the Profit and Loss Account for the Half-year which then terminated, are now submitted to the Shareholders.

The net profit, after deduction of all expenses, including £6892 15s. for Note, Income, and Land Taxes,

| | |
|---|---|
| Amounted to | £89,283 10 3 |
| Add balance brought forward from previous half-year | 16,207 17 6 |
| Leaving available | £105,491 7 9 |
| Which it is proposed to appropriate as follows:— | |
| Transfer to Reserve Fund Account, making it £435,000 | £30,000 0 0 |
| Reduction of Bank Premises | 5,000 0 0 |
| Grant to Officers' Provident Fund | 2,000 0 0 |
| Dividend at the rate of 7 per cent. per annum on Preference Shares | 10,702 6 0 |
| Dividend at the rate of 7 per cent. per annum on Ordinary Shares | 41,735 8 0 |
| | £89,437 14 0 |
| Carry forward | 16,053 13 9 |
| | £105,491 7 9 |

During the Half-year the Branches at [illegible], in Victoria, Cuballing, in Western Australia, and the Receiving Office at Gymbowen, in Victoria, were opened. Agencies were opened at [illegible] and Denmark, in Western Australia.

The Ordinary General Meeting will be held at the Head Office of the Bank, Collins-street, Melbourne, on Wednesday, 5th November, at noon.

The National Bank of Australasia, Limited,
Head Office, Melbourne, 23rd October, 1913.

By order of the Board of Directors,
E. H. WREFORD, Chief Manager.

### BALANCE-SHEET OF THE NATIONAL BANK OF AUSTRALASIA LIMITED

For the Half-Year Ended 30th September, 1913
(Including London Office to 30th August, 1913, and Western Australian Branches to 15th September, 1913.)

| Dr. CAPITAL and LIABILITIES. | | | ASSETS. | | Cr. |
|---|---|---|---|---|---|
| To Proprietors' Capital— 30,578 preference shares paid in money to £10 per share, £305,780; 238,488 ordinary shares paid up to £5 per share, £1,192,440 | £1,498,220 0 0 | | By coin, bullion, Australian notes, and cash at bankers | £2,523,916 13 9 | |
| To Reserve Fund Account | 435,000 0 0 | | By Government, municipal and other public stocks, debentures, and funds | 557,042 2 0 | |
| To Profit and Loss Account | 105,491 7 9 | | By bills and remittances in transitu | 684,385 1 11 | |
| | | £2,038,711 7 9 | By notes and bills of other banks | 2,532 14 1 | |
| To notes in circulation | £12,864 10 0 | | By balances due from other banks | 84,101 9 0 | |
| To bills in circulation | 432,905 2 8 | | By duty stamps | 5,344 3 0 | |
| To Government Deposits— Not bearing interest, £88,539 11s. 1d.; bearing interest, £526,541 15s. 11d. | 615,081 7 0 | | | | £3,857,322 3 9 |
| To Other Deposits— Not bearing interest, £3,711,961 6s. 10d.; bearing interest, £5,786,854 1s. 9d. | 9,498,815 8 7 | | By real estate, consisting of bank premises | | 398,464 4 10 |
| To interest accrued and rebate on current bills | 107,986 5 7 | | By other real estate | | 40,222 13 1 |
| To balances due to other banks | 130,144 10 1 | | By bills discounted and other advances, exclusive of provision for bad and doubtful debts | | 8,570,499 10 0 |
| | | 10,827,797 3 11 | | | |
| | | £12,866,508 11 8 | | | £12,866,508 11 8 |
| To contingent liability, as per contra, £378,686 | | | By liability, in the form of a guarantee of certain shire and municipal debentures (Victoria) sold in London, and which are being duly provided for by sinking funds, in terms of the act authorising their issue, £75,100; and liabilities of customers and others on letters of credit and drafts, £303,586, as per contra, £378,686. | | |

### PROFIT AND LOSS ACCOUNT.

| | | | |
|---|---|---|---|
| To expenses at head office, 165 branches, and 44 agencies | £94,451 1 9 | By balance brought forward | £16,207 17 6 |
| To note, income, and land taxes | 6,892 15 0 | By gross profits, including recoveries, less rebate on bills current, interest paid and accrued on deposits, repairs to premises, and rent | 190,627 7 0 |
| Balance | 105,491 7 9 | | |
| | £206,835 4 6 | | £206,835 4 6 |

### RESERVE FUND ACCOUNT.

| | | | |
|---|---|---|---|
| To balance | £435,000 0 0 | By balance last half-year | £405,000 0 0 |
| | | By transfer from profit and loss | 30,000 0 0 |
| | £435,000 0 0 | | £435,000 0 0 |

The Statutory Auditors' Report and the Statement of the Directors and Chief Manager to comply with the Companies Acts (Victoria) appear on the official report.

E. H. WREFORD, Chief Manager.

## PROFESSIONAL CARDS.

**GERALD AHERN, A.O.S.M.,**
MANAGER COMET MINE,
DUNDAS, TASMANIA.
Mines Sampled and Reported On.

Tele. Address—Gerald Ahern, Zeehan, Tasmania.

**G. H. BLAKEMORE,**
CONSULTING METALLURGIST
For Copper and Lead.
MINING ENGINEER,
CASTLEREAGH CHAMBERS, 10 CASTLEREAGH ST
Telegraph Codes · Bedford McNeill 1908 Edition.
Moreing & Neal.
A.B.C. 5th Edition.
Cable Address. Radgarn. Telephone 7124 City

**MATTHEW C. COATES, A.M.I.E.E.**
CONSULTING MECHANICAL and ELECTRICAL ENGINEER. Expert Reports given for Power Generating Plants, Factory Installations, Steam, Gas and Electric.
99 QUEEN-STREET, MELBOURNE.

**VALENTINE J. CROWLEY,**
CONSULTING ELECTRICAL ENGINEER.
Hydro-Electric Plants and Transmission Lines Designed and Supervised.
Austral Chambers, Telephone 7736.
97-99 QUEEN STREET, MELBOURNE.

**GOYDER & HALLETT,**
ASSAYERS AND ANALYSTS.
110 Gawler Place, Adelaide.
Telephone 169.
Metallurgical and Chemical Processes Investigated.
Ores Sampled and Assayed.

**T. J. GREENWAY, M.I.M.M., F.I.C.**
MINING AND METALLURGICAL ENGINEER.
60 QUEEN STREET, MELBOURNE.

**KAY, MACNICOL & CO.,**
Mechanical, Mining & Electrical Engineers.
BROKEN HILL CHAMBERS.
31 QUEEN STREET, MELBOURNE.
Cable Address: "Engineer," Melbourne.
Telephone, No. 4883.

**McCARTY, UNDERWOOD & CO.,**
CONSULTING ELECTRICAL AND MECHANICAL ENGINEERS.
31 QUEEN STREET, MELBOURNE
Telephone, 7096

**J. D. AUDLEY SMITH,**
MINING ENGINEER,
9 Bridge-street, Sydney
Telegraphic Address—
Audley Smith,
Mining Engineer.
Sydney
Telephone No.—
City 2677.

**WALTER F. SMITH,**
MANAGER FLOATER G.M.
Ravensthorpe, W.A.
Mines Sampled, Valued, and Reported on.
ASSAYS MADE.
Code: Bedford McNeil.
Reliable Information Furnished on the Phillips River Gold and Copper Field.

**A. A. SUMMERHAYES,**
CONSULTING MECHANICAL ENGINEER.
1 VIADUCT BUILDINGS, MELBOURNE.
TELEPHONE 4528.
Supervision or Erection Mining and Metallurgical Plants.

**E. A. WEINBERG,**
MINING AND METALLURGICAL ENGINEER.
19 QUEEN STREET, MELBOURNE.

**FRANKLIN WHITE,**
MINING ENGINEER,
CITY MUTUAL CHAMBERS,
62 HUNTER ST., SYDNEY
G.P.O., Box 1498.
Code: Broomhall Imperial Combinatio

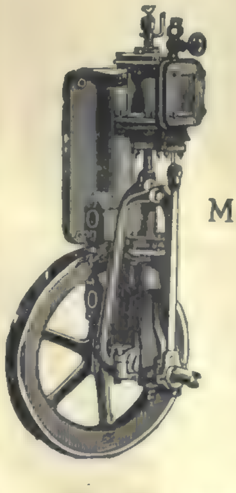
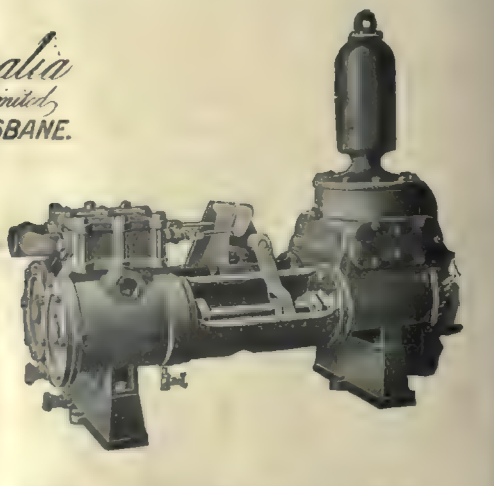
The quarterly report of the Prahran-Malvern (V.) Tramway Trust shows that during 16 weeks from June 4 to September 24 the passengers carried on the tramways controlled by the Trust numbered 3,639,994, the receipts amounting to £24,053, and the car run being 428,818 miles. The average weekly revenue has been £1538 3s. 10d., and the average number of passengers 231,175. The cost of electrical power for the quarter has averaged 1.086d. per unit, and is the lowest since the opening of the lines for traffic. The Trust anticipates that 53 cars will be in use next month, and ten additional cars are to be constructed. During the quarter contracts have been let to Messrs. Duncan and Fraser for 10 drop-frame car bodies at £815 each, and Mr. W. J. Osborne six rest-houses for £449.

**SOUTH** THE AUSTRALIAN GAS RETORT & FIRE BRICK MANUFACTURING CO., TOORAK ROAD, SOUTH YARRA—
For Fire Clay goods for all purposes.
Send for Catalogue. **YARRA**

**SHAW'S Steel Wire Ropes**
**FOR ALL MINING PURPOSES.**
Large Stocks always on hand at HEAD AUSTRALASIAN DEPOT
**JOHN SHAW Australia, Limited,**
**445 KENT STREET, SYDNEY.**
*Victorian Agents: Welch, Perrin and Co., and Inglis, Smith and Co.*
*Brisbane: Engineering Supply Co. of Australia Ltd.*

**CARL WERNER & CO.,** OPHTHALMIC -OPTICIANS-
The Finest Illustrated Catalogue of Scientific Instruments in Australia mailed on request—comprising
THEODOLITES, LEVELS, LEVELLING STAVES, BRUNTON'S AND VERSCHOYLE TRANSITS, ETC., ETC.
All the Requirements for the Drawing Office in Stock.
**336 COLLINS STREET - - MELBOURNE.**

**SIAM OFFERS**
A splendid new field for Australian Business Enterprise.
**SIAM WANTS**
Mining and Agricultural Machinery, Seeds, Hides, Tallow, Meats, Jams, Butter, Cheese, Potatoes, General Manufactures, also Horses, Cattle and Sheep.
The Siam Observer (Daily),
The Siam Maitri | (Weeklies.)
The Siam Weekly Mail |
Siam's Leading Newspapers, which, with
**The Siam Directory**
are published at the Siam Observer Offices, Bangkok, will put you in touch with this market.
Rates and Particulars from
**GORDON & GOTCH.**

Engineering Supply Company Australia Limited
**E.S.C.A.**
BRISBANE.
MACHINERY AGENTS, and ENGINEERS,
IRON AND STEEL MERCHANTS.
Specialists in Engineers' Requisites.
Offices and Show Rooms:
Corner Edward and Charlotte-streets,
Bulk Stores and Iron Yard.
Corner George and Charlotte-streets,
Telegrams: ENGINEERING SUPPLY CO., BRISBANE.

## CONTENTS

THURSDAY, NOVEMBER 6.

EDITORIAL—
Peace, Industrial Peace .. .. .. .. .. 377
Leaderettes .. .. .. .. .. .. .. .. .. .. 377-8
Sydney Stock Exchange .. .. .. .. .. 378
Metal Quotations .. .. .. .. .. .. .. 379
Investor's Column—
Hercules and Energetic (V.) .. .. 379
Langi Logan South (V.) .. .. .. .. 379
Our Big Mines .. .. .. .. .. .. .. .. 380
Personal .. .. .. .. .. .. .. .. .. .. 380
Brief Comments .. .. .. .. .. .. .. 381
Queensland Mining .. .. .. .. .. .. 381
Victorian Mining Activities .. .. .. 383
New Zealand Mining .. .. .. .. .. .. 383
Mining in New South Wales .. .. .. 383
Amalgamated Zinc (De Bavay's) .. .. 383
The "Devastating Dredge" .. .. .. .. 383
The Coal Mining Industry .. .. .. .. 384
Substitutes for Petrol and Benzine .. 385
Queensland's "Biggest Mining Proposition" .. .. .. .. .. .. .. .. .. .. 385
Northern Territory Mineral Fields .. 385
Industrial .. .. .. .. .. .. .. .. .. 386
Conapaira Tin Field .. .. .. .. .. .. 386
"Premier Goldfield of the World" .. . 386
Ore Deposition at Mt. Lyell (T.) .. .. 386
British Association .. .. .. .. .. .. 387
Local Government Engineers (V.) .. 387
Sydney Tramworks Electric Power Station .. .. .. .. .. .. .. .. .. .. 387
Melb. City Council's Electric Supply Undertaking .. .. .. .. .. .. .. .. 387
Enginedrivers' Award .. .. .. .. .. .. 388
Hydro-Electric Scheme (T.) .. .. .. 388
Ulivi's "F" Rays .. .. .. .. .. .. .. 388
Important Advance in Gas Engine Design .. .. .. .. .. .. .. .. .. .. 389
Motor Traction .. .. .. .. .. .. .. 389
Wind Power .. .. .. .. .. .. .. .. .. 390
British and European Developments .. 391
Postal Electric Supplies .. .. .. .. .. 392
Miscellaneous .. .. .. .. .. .. .. .. 392
Western Australian Mining .. .. .. .. 395
News and Notes .. .. .. .. .. .. .. .. 395
Publications Received .. .. .. .. .. 395

**BACK NUMBERS OF THE "MINING STANDARD."**

The following is the rate for back copies more than a month old. Applications by post must be accompanied with cash and postage added. In no case can we guarantee to supply copies, as our storage accommodation is limited.

A post-card will be sent if the number required is out of print.

For copies three months old, ninepence; six months, one shilling; and beyond that period, one penny per month per copy.

As there is a regular demand for back copies of the "Mining Standard," newsagents are requested to send back all returns uncut and in good condition, otherwise they will not be accepted.

All Returns from Newsagents must reach us by the end of each month (the whole paper must be sent). No credit will be allowed beyond this term.

Postage: British, 1d.; Foreign, 1½d.; Australasia, ½d. per copy.

Stamps will be accepted as pre-payment.

Address communications, Publishing Department, "Mining Standard."

**HENLEY'S**
**Electric Wires and Cables**
**AND INSULATING TAPES**
**ARE THE BEST.**
**W. T. HENLEY'S Telegraph Works Co. Ltd.**
546 COLLINS ST., MELBOURNE.
61 YORK ST., SYDNEY.

**BELTING!**
Largest stock of all kinds of Machine Belting in the Commonwealth.
Conveyor and Elevator Belting for all purposes.
**HOPKINS BROS. & ODLUM PY. LTD.**
LEICESTER ST., CARLTON, MELBOURNE.
Phone, Central 754 and 5202. Box 377 G.P.O.

**MINING STANDARD.**
PUBLISHED EVERY THURSDAY.
Forwarded Post Free to any Address.

| | Per annum. |
|---|---|
| Australasia | 26/- |
| British Possessions | 32/6 |
| Foreign | 34/8 |

Payable half-yearly or yearly, in advance.
All amounts should be made payable to order of "CRITCHLEY PARKER, Bank of Australasia."

12 O'Connell-street,
Sydney.
Tel. City 8103
P.O. Box 331.

376 Flinders-lane,
Melbourne.
Central 7931 & 1838
P.O. Box 253.

**CASUAL ADVERTISEMENTS.**

The rate for this class of advertisement is governed by the position it occupies.

If it appears on leader page or amongst or next to reading matter, the rate is 15s. per inch (nonpareil) per insertion.

Towards end of reading section—
Brevier, 16 ems width, 6s. per inch per insertion.
Nonpareil, 8s. per inch per insertion.

For the convenience of advertisers, we might state that—Brevier has approximately 7 words to a line, and 8 lines to the inch—6s. Nonpareil has approximately 8 words to the line, and 11 lines to the inch—8s.

**ALTERATION TO ADVERTISEMENTS.**

As our publishing arrangements necessitate the "Mining Standard" being issued simultaneously in Sydney, Melbourne and Adelaide on the same day each week, advertisers wishing to change their advertising matter must supply same ten days in advance of publication.

**ADVERTISEMENT PROOFS.**

Proofs are submitted to advertisers in order to give them an opportunity of going over the advertisements before printing.

Advertising Copy must be typed and so arranged as to clearly indicate the display required for the more important features of the advertisement.

Any departure from the original copy will be charged for. Advertisers are specially requested to instruct their publicity departments to give us clear and definite instructions respecting changes of matter or new copy in order to avoid incurring unnecessary charges.

AUSTRALIAN
**MINING STANDARD.**
PUBLISHED EVERY THURSDAY.
ESTABLISHED 1888

It is requested that all business communications be Addressed to Critchley Parker

THURSDAY, NOVEMBER 6, 1913.

## PEACE, INDUSTRIAL PEACE.

Apparently the Victorian Wages Board, which dealt recently with the wages to be paid by mining companies in the State, does not meet with the approval of that somewhat unusual person, Mr. Justice Higgins. The Board proved to be actuated by a spirit of marked common sense. It came to the conclusion that the Victorian mining industry might quite easily be crushed out of existence by an award such as was asked for by the workers. It argued that it was no use fixing the wages at a higher rate than employers would be able to pay, because, if that were done, there would cease to be employment. That, as we have said, is a common-sense view. It does not appeal to Mr. Justice Higgins. He is a doctrinaire, as much an unpractical doctrinaire as Robert Owen or Fourier or Babœuf. We do not wish, of course, to institute any real comparison between him and any of the three visionaries we have named. He lacks the revolutionary spirit of Babœuf, the idealism and the love of humanity that characterised Owen and Fourier. His decisions seem not so much to be based upon love of the worker as upon hatred of the employer. Hence, however philanthropic he may be in intention, he never impresses one as a philanthropist, but only as a partisan. In his award delivered last week in the Commonwealth Arbitration Court on the plaints of the Federated Engineers and Firemen's Association of Australasia, he went very much out of his way to say that in most cases the mines "were kept going by the voluntary contributions of shareholders, hoping against hope"; and he proceeded to argue thus: "If the shareholders in these companies are willing to stake their money on a speculation, why should they stake part of the employee's proper wages also, the employee not taking any of the profit if the speculation be successful?" A more one-sided or unpractical way of looking at the matter can scarcely be imagined. Mr. Higgins seems to be constitutionally incapable of understanding that, if a man be told that he will have to pay £10 for an article from which he can hope to obtain only £8 worth of usefulness, he will, in nine cases out of ten, decide to go without it, and that those who have the article to sell will thus be practically deprived of their market. So it is with the mining industry. If Mr. Justice Higgins succeed in what we cannot suppose to be his intention to close down the mining industry, he may deal a very awkward blow at the employers of labour, but he will not benefit the workers one iota, but will, on the contrary, inflict on them an injury well nigh irreparable. But that will not matter to Mr. Justice Higgins, who asserts that the ideal of his Court is, in his own words, "peace, industrial peace." That sounds quite sweetly poetical, but what does it mean? We have "peace, industrial peace" on too many of the early goldfields of Australia. It is the peace of the abandoned mining camp. Mr. Justice Higgins may give us that, but by doing so he will not be doing any favour to the workers. To consider their present interests and shut one's eyes to their ultimate good is not the part of a friend of the labouring classes, or, at least, not the part of one whose good will is fortified by wisdom.

---

If Mr. Mackey had timed the introduction of his Court of Criminal Appeal Bill into the Victorian Legislative Assembly so that a really live case should be engaging the public attention at the moment of its presentation he could hardly have chosen a more opportune time than the present for bringing it forward. The case of a miner named Benjamin Hall, who was sentenced recently to two years' imprisonment for doing something with intent to steal gold, is causing a good deal of attention especially at Bendigo, near which (namely, at Eaglehawk) the offence was committed, but its probable effect upon the passing of Mr. Mackey's Bill was produced by the matter being discussed in Parliament with a view to securing a re-opening of the case or an alteration of the sentence. It is always matter for regret that Parliament should be moved to override the verdict of a jury or a judge, and the creation of a court of criminal appeal will do much to make such reference unnecessary. Those who addressed the Assembly on the Hall case last week had only an "ex parte" view to put forward, and the same is the case on nearly all similar occasions. Against this there is the fact that a jury had presented to them the evidence adduced by both sides, besides the assistance of a judge to direct them as to the bearings of the evidence and the provisions of law. Another point which is not without significance is the fact that a few years ago it was unusual to get a Bendigo jury to convict in charges of gold-stealing, so that, unless the evidence produced for the prosecution in this instance was exceptionally strong, or the defence uncommonly weak, a great change must have come over the spirit of the district to lead to a conviction. Hall is said to have been a skilled and useful miner, just the sort of man a manager would rather keep than lose any day, so that a prosecution would not have been lightly launched. It is said, too, that he was a man who had always borne a good character. Unfortunately, the public are frequently shocked by the discovery that things are not what they seemed, and that men whose character had been considered beyond reproach have been proved guilty, not merely of a solitary lapse, but even of systematic peculation spread over many years. Characters are good as far as they are known, but no farther, though, as we are all human, the law of England considerately takes for granted that a man is innocent until proved guilty. It is surely late in the day now to produce evidence which was kept back from the jury, and to say that a conviction should not have been found. The accused was represented by counsel at his trial, and there are certain now historical facts associated with the recent annals of Bendigo which should have shown his friends that no item of evidence which could be found to establish his innocence had been omitted. Bendigo had become notorious through the frequency of convictions for gold-stealing from the mines, and that fact should have impressed everybody interested in proving the innocence of an accused person with the need—not of showing that he had always been thought honest, but of proving that the case as stated by the prosecution was untrue. The jury acted upon the assumption that each party had put its whole case before them, and convicted this accused, while acquitting his companion. If Hall was wrongly convicted, clearly someone else was to blame, and not the jury, for, after going through the evidence taken down in the court, the Attorney-General, Mr. J. Drysdale Brown, cannot find any reason for interfering with the finding.

* * *

It is to be regretted that just as the Stock Exchange Company, of Melbourne, appears to be emerging from the clouds which have hung over it from its commencement, fresh trouble should have arisen from another source. The Stock Exchange Company is the owner of the premises occupied by the Stock Exchange, in fact the Exchange's landlord, and its twenty-sixth annual meeting was held last Friday. Mr. Frank W. Were was in the chair, and in moving the adoption of the directors' report and accounts, he said that the mortgage had been reduced to £82,500. This was accomplished through the amount received from calls £1,560 4s., and the balance from profits. The company had now met its engagements with the mortgagee up to May 1st next, from which date they would pay the mortgage off at the rate of £78 2s. 6d. per quarter, reducing the principal to £80,000 at the expiry of the mortgage (in about eight years). The committee had been at some trouble to decide the financial position of shareholders who had not paid their calls, and had found that of the amount due on September 30 £310 is good, £300 doubtful, and the rest bad, and it had been decided to deal with these shares as provided for in the Companies Act 1910; then the company would be in the position to write off £13,830 6s. from property account. The directors would then ask approval to make an application to the Court to write off some of the capital, and reduce the property account to a fair valuation. After making ample provision for doubtful debts, the balance from working expenses was £556 18s. 4d. After outlining the early history of the company, Mr. Were said that he became at director in 1894, with instructions to wind it up if he could not make it pay. From that time forward (he said) the company had gradually improved its position. There had been many conferences to secure signatures on behalf of the Stock Exchange to the fifty years' lease, but all had proved abortive. The company was not going to be dictated to by the Stock Exchange committee, nor was he any longer prepared to accept the secretary's signature to the lease. If the lease was to be signed, he would want every one of the committee to sign it. As so many situations might arise between the company and the committee, he was strongly opposed to members of the latter being on the board of the former. This observation was elicited by the fact that the committee of the Stock Exchange had nominated its chairman, Mr. W. J. Roberts, and Mr. Forster Wood for two vacancies which were to be created by the ordinary retirement of two directors, who, however, were eligible for re-election and offered to renew their services. Those two gentlemen assured the meeting that there was nothing personal in their nomination, but that the committee had thought to strengthen the board, but on a show of hands the retiring directors, Messrs. G. S. Vowell and F. C. Tricks, were reelected. Then a ballot was demanded, whereupon the re-elected dirctors both resigned, and the directorate, for the time being, presents two vacancies. It is suggested by a remark by Mr. Tricks that his conduct on the board had not quite pleased the committee of the Stock Exchange; he said that in 1904, when he was elected, the Stock Exchange had asked him to take a certain line of action. It had not been wise, however, to deal with the matter of calls in other than a reasonable manner. The directors had proceeded cautiously, and were gradually bringing the company into a properous position. Why did not Mr. Tricks go a little further and inform the public what that "certain line of action" really was? This would have enabled the shareholders and the public to have judged between the directors and the committee.

* * *

The Commonwealth Small Arms factory at Lithgow (N.S.W.) has been established for some time now, with the object of manufacturing all the small arms required for the defence forces, but apparently it is no greater success than the other State enterprises. A large amount of money was expended on buildings, the very latest pattern of machinery was put in at still greater expense, a competent man was selected to manage it, but it was a very long time before Parliament could get anything more than a general assurance that things would soon be all right. That time, however, has not yet come, for the Minister of Defence is fain to confess disappointment, that after all this time only 500 rifles have been completed. It has to be remembered that the men had to be trained to do this special work, to which all of them were previously strangers, and that, of course, means delay. But the most unsatisfactory part of the whole business is the explanation given by the Minister. There is an objection on the part of the men to living at Lithgow; consequently, when a man has been in training for some time he leaves, and a new trainee has to be sought, when the same process is repeated. Australian taxpayers are anxious enough that any occupation their Governments can find shall be offered in the first place to men who are already identified with Australia, whether by birth or by long residence, and they were willing to listen to assurances, which no one really needed, that young Australians were quite able to learn the work of the factory. But the position, as stated by the Minister of Defence, will have a strong tendency to produce regret that a special staff was not introduced from the mother country to carry on the work. Yet, although the Government employees will not stay there, other Lithgow employers can keep their men. There have been iron and steel works there for many years, mining operations are continuous, and there is a settled population of about 7000, so it is not easy to understand the unpopularity of Government employment on the part of those in whose interests this has been made a special preserve. The only hope, apparently, of making the Small Arms factory a success is the creation of another new branch of Government enterprise; if the Prime Minister would erect a picture-show, or subsidise a troupe of minstrels, or do something else to cater for the Australians' appetite for amuseemnt, he might get the young men to submit to living even at Lithgow.

## SYDNEY STOCK EXCHANGE.

Although business on the Sydney Stock Exchange has not loomed large during the week, there has, nevertheless, been a sound market experienced for investments. The great stimulus has been the recent bounteous rainfall, which has rendered a good season practically assured. The chances are that the N.S. Wales wheat harvest will eclipse all previous records, and there is an increased wool clip, while production in other directions has expanded under the favourable conditions which have prevailed. From the wheat field or wool shed to the Stock Exchange may seem a long distance, but the relationship is close —very close, indeed. A good season means added wealth to the country and consequently more money to be invested, a large percentage of which is allocated per medium of the Stock Exchange. But season's prospects also have a great influence upon prices. The undertakings of the large pastoral and commercial companies will be enlarged, profits increased, and their financial risks lessened. The barometer of the investment stock market can he said to be bank shares, as upon their resources hinges the financing of our great primary industries. They are, therefore, very susceptible to adverse conditions. The past week has seen appreciation in a number of banks, more particularly Bank of New South Wales and Commercial Banking Co. of Sydney, which have been dealt in at distinctly higher figures. Buyers have likewise been operating in pastoral companies' shares, Dalgety and Co., Goldsbrough Mort, Pitt Son and Badgery shares having commanded attention at higher figures. As a rule, shipping companies have kept very quiet, and such a circumstance as the strike now going on in New Zealand has rendered the market somewhat nervous. Sydney Ferries have, however, improved in price during the week. The change in managership has evidently not created uneasiness amongst the shareholders. Colonial Sugar Company's shares on Thursday were quoted ex the dividend. The same old rate of 10 per cent. was distributed, and a bonus of equal to 2½ per cent. per annum. But we deal with the accounts later on.

In the mining section matters have altogether been quiet, copper and silver-lead shares providing most of the business. Broken Hill shares have met with a very distinctly firmer market, the chief appreciations being in B.H. Proprietary, British B.H. (old), Junction North and B.H. North. At the close of the week the Junction North shares were in favour. Naturally, the finding of the recent lawsuit was a stimulating factor, but over and above that was the persistent rumour as to an amalgamation. That should be a good thing for the shareholders, for economy in the administration of the company's concerns has been badly needed. Copper interests have been in fair request. Hampdens have proved a popular stock among the speculators, and following the London market, local values have advanced. A good deal of buying on account of London has been reported. The Ardlethan group has remained out of favour. The "bears" have failed to break the market for Carpathias. After all is said and done, Carpathia has justified its existence, and seems destined to exist for some time to come. There seems to have been a shortage in the shares. There is a regulation of the Stock Exchange that for a cash sale the scrip should be delivered the same day, excepting if it is effected in the afternoon, when the scrip should be forthcoming the next morning. But from all accounts that rule has become moribund. In some cases buyers have had to wait weeks for their scrip. There has been altogether too much juggling in scrip here lately.

Shareholders of the Colonial Surgar Refining Co. have received their usual comfortable dividend of 10 per cent. and bonus of 2½ per cent., but during the past couple of months that company has increased its capital by a further bonus of £250,000, so the shareholders are so much the more in pocket. The profit-making is due quite as much to Fiji and New Zealand as to Australia. A comparison of the leading items in the accounts is given hereunder:—

| | Sept. 30, 1912. | March 31, 1913. | Sept. 30, 1913. |
|---|---|---|---|
| Net profit .. .. .. | £229,629 | £233,530 | £255,440 |
| Brought forward .. | 161,545 | 203,674 | 249,704 |
| Available .. .. .. | £391,174 | £437,204 | £505,144 |
| Dividend, 10 p.c. .. | 150,000 | 150,000 | 162,500 |
| Bonus, 2½ p.c. .. .. | 37,500 | 37,500 | 40,625 |
| Transfer to capital | — | — | 250,000 |
| Carried forward .. | £203,674 | £249,704 | £52,019 |
| Capital .. .. .. | £3,000,000 | £3,000,000 | £3,250,000 |
| Reserve .. .. .. | 500,000 | 500,000 | 500,000 |

# THE INVESTOR'S COLUMN.

## Some Companies Attracting Attention To-day.

(By Our Exchange Reporter.)

### Hercules and Energetic (V.).

A fortnight ago there was a very sharp rise in the price of shares in this company, somewhere about 15s. being touched both in Bendigo and Melbourne, and hopes were generally expressed that an era of success was about to set in from which not only the shareholders, but the mining interests of Bendigo generally, would benefit. There was some warrant for such anticipations, for the company has many points in its favour, the first and one of the most important being that its very extensive holding is situated both on the New Chum and the Sheepshead lines of reef. The former, as is well known to most mining investors, was very successful in past years, and from it the Hercules and Energetic Company returned its shareholders nearly £125,000 in dividends—the latest being payable about 18 months ago. Speaking generally, the saddle reefs on this line have not, however, given many instances of success for some time, and it appears that the most payable of them have been exploited by the comprehensive prospecting work which has been carried on during the last 30 or 40 years, and although it is by no means improbable that fresh discoveries of payable stone will be made, yet it is in some newer or less prospected line of reef that hope for the future must be placed. For this reason the main attention as far as this company is concerned has been centred for some time in the operations on the Sheepshead line, which runs parallel with that of the New Chum, and from which it is distant only about six or seven hundred feet. The work done on this line is recent, as compared with that on the other Bendigo main lines, and therefore there is much more scope for exploration. So far it has been established that the reefs are large and persistent, and when gold bearing, their value well maintained. A good evidence of these characteristics is to be found in the formation now being opened up in the Hercules and Energetic mine itself. This reef is identical with one worked with decidedly payable results in Lazarus's Little 180 mine, at a point some 4500ft. distant. In the Victoria Consols, the adjoining mine to Little 180, it has not been so good as in the Ironbark, which comes next and adjoins the Hercules and Energetic; nevertheless, the reef is about payable, and further development work may disclose stone of a better quality.

The Ironbark Company, although working until quite recently under great disadvantages, has paid 10s. per share in dividends out of the same reef, and also provided funds for sinking and equipping a new shaft for a depth now of 1500ft.

As the first report from the Hercules and Energetic, after the continuation of this reef had been intersected, was to the effect that it was two or three feet thick and carrying payable gold, a very strong inquiry set in for the shares, but although subsequent crosscutting showed that there was considerably more gold-bearing stone ahead, the value was under expectations, two crushings since then returning about 30 oz. from 200 tons, which can hardly be payable.

The gold-bearing character of the stone has, however, been well demonstrated, and it will be strange if it does not prove to be of better quality in some portion of the formation. General disappointment was expressed on the returns being made known, and the price of the shares receded to 9s., which is about their present quotation.

They should be worth this price as a promising mining investment, the following facts being worth noting. The number of shares on the present register, about 20,000, is unusually small, while on the other hand the holding, as already mentioned, is extremely large, so that if the reef prove payable the dividends should be easily earned, and of long continuance. As the shaft is 100ft., or slightly more, from the Ironbank boundary, gold-bearing stone is already practically proved for that distance, so that there will be plenty of crushing dirt available for some time to come. The continuation of the massive formation from which the Central Red, White and Blue Company has paid £131,000 in dividends will probably be found in the Hercules and Energetic mine some 200 or 300ft below the present workings, but although there must be important possibilities in this connection, they may be disregarded for the present.

### Langi Logan South (V.).

The long period of waiting which is associated with deep alluvial mining in Victoria has not been escaped by the Ararat group of mines, but it appears to have been accepted by the shareholders with a feeling of confidence that sooner or later they would receive a good reward for their perseverance.

And both for the sake of the investor and of a great Victorian industry which is sadly in want of a substantial measure of success it is sincerely to be hoped that the most sanguine anticipations will be realised. For several reasons it was generally expected that the first of the alluvial mines on this old Victorian goldfield to get into the wash on the main trunk lead would be the New Langi Logan, whose dead work is well advanced, nearly 40 bores having now been put up into the wash and the water very materially reduced by the continued pumping. This belief would either have been justified, or very nearly so, and a rise perhaps put up into the wash by now if an accident had not occurred to the pumping plant about two months ago. This accident threw the New Langi Logan back considerably, and it is a question now whether the wash will be entered before the end of the year. The South Langi Logan mine is situated some distance lower down the lead, and as the preliminary boring operations had shown that there was a large amount of drift in the alluvial deposit overlying the gutter, it did not seem likely that the shareholders would learn the value of the Langi Logan lead until the older company had entered the wash. Under these circumstances the shares in the South Langi Logan Company have, until quite lately, been very much neglected "On Change," and although about a year ago they were worth nearly 20s., have since steadily declined until it would have been difficult to sell a fair parcel at 8s. This decline is all the more pronounced owing to the fact that since the date when the shares reached their high-water mark there have been steady calls of 6d. per month—34 calls altogether having been made—and the shares, that is, the contributions, being now paid up to 15s. 7d. During the last fortnight there has, however, been a slightly better improved inquiry, the latest quotation being in the vicinity of 9s., that is, 8s. 9d. buyer, 9s. 3d. seller, although a sale had taken place previously at 7s. 6d.

Although this improvement in price is perhaps not very great, there is a much better feeling for the shares in the market, and it is just possible that before long there may be an increased activity in Ararat stocks generally.

The reason for this change in the market feeling is the fact that the company has apparently forestalled the New Langi Logan and has been the first to rise up into the wash-dirt of the great trunk lead of the district, for although sufficient work has not yet been done to prove that it is the main lead, and there is a possibility that the run of wash encountered may be merely that of a tributary channel, the indications are strongly in favour of the former contention—namely, that it is a reef wash on a higher ridge of the Langi Logan gutter.

This run of wash was first met with when the shaft was being sunk, and it is several feet above that in the main channel, the depth of the latter having been proved by means of a number of bores, which were put down from the surface with very satisfactory results. Since then the shaft has been sunk to a depth of 340ft., which will be sufficient to command the deeper channel, and a main ~~and intermediate~~ level driven, the former being ~~now 400ft.~~ from this deeper run of wash, which is the principal objective of the company. After the remaining distance has been driven, and the width of the gutter proved, the main reef drive under the gutter and following its course will be put in—similar work at the intermediate level being also carried on. Bores will then be put up into the gutter in order to drain the wash. In other words, a campaign of dead work similar to that which has been carried on by the New Langi Logan Company during the last eighteen months will have to be completed before the South Langi Logan miners will be able to enter the deep channel of wash-dirt. This is not a very inviting prospect for the shareholders, whatever their confidence in the ultimate result may be, and, under these circumstances, it is fortunate that the work at the higher level, already referred to, is meeting with promising indications. The wash was entered a few days ago, and the first trial of its value gave ½ grain of gold from a small dish of dirt, which is satisfactory; it is of a coarser character than that met with in the shaft, and is dipping as the drive is being continued. In the Cathcart mine, on the same field, highly payable returns were obtained from the high reef washes, which are distinct from those in the deeper channel, and it is not wildly improbable that the South Langi Logan Company will win sufficient gold from this higher run of ground to help to reduce the calls, although it will be some time before this change of affairs can be expected. That such a change would be highly acceptable to the shareholders can be gathered from the last half-yearly report, for it therein is shown that up to the present time well on to £40,000 has been sunk in the mine, without any return whatever, and it appears fairly certain that unless the higher run of wash or tributary gutter now being opened up relieves the financial pressure by giving payable yields, another 12 or 18 months of call paying is ahead. When the further contingency is considered, that the value of an alluvial deposit can never be said to be absolutely proved until it has been mined and put through the puddlers, it is evident that whatever profits the shareholders may make will be well deserved. But although there is always a strong chance of disappointment in connection with any mining venture, yet in the case of this and the New Langi Logan Co. it may be said that the indications of ultimate success are very promising, and the reward which is being sought is on a scale commensurate with the risk and the expense. The substantial rise in the price of the Cathcart Central shares which took place on the announcement of the result of the first puddling operations, and which has been well maintained ever since, will be remembered by mining investors when the South Langi Logan Company rises into the main channel of wash, for both the Langi Logan and the Cathcart gutters traverse its property.

---

## METAL QUOTATIONS.

(From Our Correspondent.)

### By Cable.

London, Tuesday.

"From bad to worse" would fairly represent the story of the metal markets last week. Spot copper opened with an advance of 10s., and ended 10s. below the rate of the previous week end, and three months' parcels of the same metal lost 15s. in the course of the week, while electrolytic ended, in spite of a small intermediate rise, as it had begun the week. Tin closed the week 47s. 6d. lower for spot than on the previous Friday, and there was a fall of 35s. for three months' delivery. Lead, however, rose consistently day by day. Spelter took a turn, but in favour of buyers. Silver also went back.

COPPER.—Monday's price for spot delivery was £74 17s. 6d., showing a rise of 10s.; by Wednesday this had fallen to £74 12s. 6d., followed by £73 17s. 6d. and £73 7s. 6d.

For three months metal the rates were £73 10s. (a rise of 2s. 6d.), £73 7s. 6d., £72 12s. 6d., and £72.

Electrolytic, which had opened the week at £77 15s., rose on Wednesday to £77 17s. 6d., but fell back to £77 15s., and then to £77 10s.

TIN.—Spot opened badly with a fall of 15s. to £184 5s., the later rates being £182 10s., £183 10s., £182 12s. 6d. and £182 5s.

Three months parcels brought £185, showing a fall of 15s., £183 15s., £184 10s., £184, and £183 10s.

LEAD opened with a rise of 2s. 6d., the rate being £20 7s. 6d., and rose successively to £20 8s. 9d., £20 10s., and £20 12s. 6d.

SPELTER, which had for weeks been stationary at £21, fell on Thursday to £20 15s.

SILVER.—The quotations were 27 13-16d. (a fall of 1-16d.), 27 5-8d., 27½d., 27 5-8d., and 27 9-16d.

---

Messrs. Henry R. Merton and Co. (London), in a recent circular showed the remarkably low state of supplies of copper in the following words:—"Three years ago the world's total visible supplies of copper amounted to 179,000 tons, two years ago to 170,000 tons. On March 1, 1913, they were 100,000 tons, and to-day they stand at the record figure of 49,042 tons. Barely 30,000 tons of this are available for immediate consumption (about one-half being in America, and the other half in Europe), while the remaining 20,000 tons are in shape and quality which would have to undergo a preliminary process of smelting and refining before they could be put to practical use. Taking both the supplies from producers and the deliveries to consumers in recent months as a nominal basis for the near future, we estimate that, by the end of this year, the entire stock of refined copper will have disappeared and the trade will be left with the small remnant of raw copper as its only reserve."

# OUR BIG MINES.

## Examinations of their Yearly and Half-Yearly Reports.

(By a Mining Accountant.)

### The Broken Hill Proprietary Block 10 Co. Ltd.

Half-year ending September 30, 1913.

There is a decidedly more cheerful tone about this report, arising mostly out of the improved prospects underground. The new lode being opened up in the western portion of the lease is giving encouraging results, a pleasant feature after the long run of disappointments. In addition to the underground promise, the achievement of the half-year was satisfactory. A good output was attended by excellent prices for metals, especially lead. The net profit amounted to £37,481, and £20,000 in dividends passed into the pockets of shareholders. The financial position has improved to a surplus of £108,434 over liabilities, as compared with £82,181 six months ago.

Development work for the period resulted in the discovery of a western lode, close to the main shaft. This is probably identical with that met with on the boundary of the Central mine in April, 1912. The lode is opening up in a most promising fashion, having been proved for a depth of over a hundred feet at both the 515ft. and 615ft. levels, these levels being connected by a rise and winze in the ore body. The average width of the lode is estimated at 20ft., and the average of the ore so far developed is estimated at 13 per cent. lead, 3½ oz. silver and 9 per cent zinc. This ore is higher in lead content than the average of the remaining ore in the mine. Development work is being pushed forward as rapidly as possible. Unfortunately, it cannot be said that deep-level developments have been at all satisfactory. At the 1715ft. level little work was done, but that little was only in accordance with what has been happening with monotonous regularity for the last eighteen months or two years.

Table A.—Underground History.

| | |
|---|---|
| Ore Raised | 49,174 tons. |
| Development work:— | |
| Raises | 306ft. |
| Winzes | 93ft. |
| Crosscuts | 76ft. |
| Drives | 463ft. |
| | 938ft. |

In addition to this there was 359ft. of picking-up work in old crosscuts and drives. The report does not give an estimate of ore reserves, but holds out a promise of this being done next half-year.

Milling results continue to show a steady improvement. The position of metallurgist on a mine such as this is no bed of roses. With rapidly-vanishing ore reserves the mill is fed with ore raked in from the various working places in the mine, as opportunity offers. Consequently there is little regularity of grade from day to day, and mill adjustments need to be frequent. The silver assay of the ore treated shows a slight decrease, but on the other hand metal recoveries show an improvement. This improvement is to some extent due to supplies coming forward from the development work on the new lode, the ore from which is more amenable to treatment than that hitherto available. It is interesting to note that a careful calculation of the economies effected by the new mill, as compared with the work done by the old mill, has been made, and that, after making due allowance for the lower grade of the crude ore now available, and bringing into account the greatly improved recoveries and decreased smelting costs, the result shows that the whole of the cost of reconstruction was redeemed within the first twelve months' operation of the new mill. In other words, the increased profit earned by the new mill in that time was £37,250, on a basis of similar metal prices. The following is a summary of the concentration results since the start of the new mill:—

Table B.—At the New Mill.

| | Half-year ended | | |
|---|---|---|---|
| | Sept., 1912. | March, 1913. | Sept., 1913. |
| Crude ore treated, tons | 47,954 | 46,119 | 49,174 |
| Average assay value:— | | | |
| Lead, per cent | 12.6 | 11.9 | 11.9 |
| Silver, oz. | 11.95 | 10.20 | 9.7 |
| Zinc, per cent. | 14.53 | 13.1 | 13.5 |
| Lead Concentrate Produced, tons | 6,361 | 5,961 | 6,437 |
| Average assay value— | | | |
| Lead, per cent | 65 | 64.9 | 64.6 |
| Silver, oz. | 37.98 | 35.80 | 33.60 |
| Zinc, per cent. | 6.54 | 6.5 | 6.7 |
| Percentage of Metal Reserves— | | | |
| Lead | 68.42 | 70.28 | 71.20 |
| Silver | 42.17 | 45.16 | 45.27 |

In addition to the lead concentrate, the mill turned out 42,737 of "by-products," assaying 3.9 per cent. lead, 6.1 oz. silver, and 14.6 per cent. zinc. The term by-products is magnificently general. They are probably made up of current tailing, slime, and vanner middling, as indicated in the table of despatches. These latter amounted to 67,914 tons, including the products named, the concentrate, and 19,446 tons of dump tailings. Apropos of dump tailings, an interesting history is being evolved. When the present manager took control of operations at the mine, he had the unpleasant duty of telling shareholders that their assets, represented by certain tailing dumps, were considerably less than they imagined. Consequently, some severe writing-down resulted, and great was the sorrow thereof. Now, however, shareholders have an unexpected windfall, as the manager advises that a careful survey reveals a considerable surplus in one of the dumps. The contingency fund that was created to meet any possible claim for amounts overpaid has now been reduced by £9660 to £7508. This £9660 has been credited to profit and loss account.

The report supplies a schedule of costs, as under:—

Table C.—Working Costs.

| | Cost per ton Milled. s. | d. |
|---|---|---|
| Ore extraction, mining | 15 | 10.19 |
| Ore extraction, development | 1 | 9.99 |
| Milling and treatment (including breaking and transport) | 5 | 8.01 |
| General expenses | 0 | 10.96 |
| Total ordinary working costs . . £1 | 4 | 3.15 |

Many companies do not draw the distinction between ordinary working costs and the total cost. The total of the former often masquerades as the latter—an evil practice, The working costs above bear an unusually high proportion to the total cost to shareholders, being over 80 per cent. The remainder consists of administration and head office charges, taxes, and depreciation. The grand total cost is 28s. 11.4d. per ton of ore milled. It includes "cessation expenses £893," and £1379 expenditure incurred on properties under option.

The Broken Hill companies do not include realisation as a cost. This item, naturally enough, is made a deduction from the revenue, on the credit side of the accounts. But never, by any chance, is it actually shown there. For some curious reason, that cannot be defended on any sensible grounds, it is a jealously-preserved secret. It is really one of the essential things that a shareholder should know, to properly appraise the value of his holding after making the necessary assumptions as to probable metal prices. This latter factor cannot be pre-told; but all factors that can be reduced to an actuarial basis with any degree of exactness should certainly not be withheld. Another matter in which there is a deplorable lack of information is the amount of unsold products on hand at the end of each period, and the valuation that has been placed upon them. These may play a big part, but the knowledge of exactly what that part is seems to be reserved for the exclusive benefit of certain persons, who not only thus place themselves in a position of advantage as compared with the ordinary mass of shareholders, but are actually paid by these self-same shareholders for such ill-performed duties. Perverted duties may not, in some instances, be too strong a term to use. These remarks, be it understood, are not specially inspired by the case under review. It cannot be too often insisted upon that in the conduct of an enterprise such as mining is, there is no room for that badly-balanced, but oft-used, plea, "protection of shareholders," by concealment of facts that are really essential to be known.

The working account is credited by concentrates £80,479, tailings and slimes £10,937, sundry receipts £7. Profit and loss contains a credit for 48,000 tons of by-products (final settlement), and £9660 dump shortages over-estimated. Interest amounts to £1596. Total revenue, £108,259. The balance-sheet calls for no particular mention, except that the item on the debit side, "production suspense account £3870," represents the valuation of the surplus of 387 tons of concentrate that has accumulated during the last three half-years, but not included in the reported output. The reserve, to provide against a fall in the price of metals, still exists, and is shown at £19,814. The average metal prices for the half year were:—Lead, £19.1008; silver, 29.6406d.; spelter, £22.3447. The following table will show the leading financial features:—

Table D.—Financial History.

| | |
|---|---|
| Revenue | £108,259* |
| Expenditure | 64,362 |
| Depreciation | 6,416 |
| Net profit | 37,481 |
| Dividend | 20,000 |
| Carry forward | 102,138 |
| Paid capital | 965,000 |
| Capital expenditure | 1,128 |
| Liquid assets | 115,734 |
| Liabilities | 7,300 |
| Surplus of liquid assets | 108,434 |

*Includes £9660 transferred from reserve.

# PERSONAL.

Dr. Gilruth, Administrator of the Northern Territory, accompanied by Mr. T. G. Oliver, Inspector of Mines, is just now making an overland trip, by motor, from Cloncurry (Q.) to Darwin (N.T.), and finds it by no means easy travelling, the roads being extremely rough. The season had been a very dry one, and for one stretch of 80 miles no surface water was seen. They had been compelled to put all their baggage off the car about 60 miles from Powell's Creek, their water supply gave out, and they had to walk the last 25 miles of their journey with the temperature 110 deg. in the shade. The party of three (including the chauffeur) are reported by telegram to be all well.

The death was announced last Thursday of the death, on the 29th October, of Mr. W. Grant Meudell, accountant and legal manager, a son of the late Mr. William Meudell, formerly of the Bank of Victoria, and brother of Mr. George D. Meudell, legal manager, of Melbourne. Mr. Meudell was born at Bendigo, and began his business life as an officer in the Union Bank. Besides being a prominent accountant, deceased had for many years taken an active interest in the Legal Managers' Association, the Chamber of Mines of Victoria, the Corporation of Practising Accountants, the Incorporated Institute of Accountants, and the local branch of the Society of Accountants and Auditors of London. He was chairman of the first-named institution for 12 years, and was on the council of the Chamber of Mines for 15 years. He was also a founder of the Honorary Justices' Association.

The remains of the late Mr. William Knox, which were brought from England for burial, were interred at the Boroondara cemetry, Kew (V.), on the 29th October. The body was conveyed to Australia by the steamer "Muritai," which arrived on October 24th, Mrs. Knox and her family arriving by the R.M.S. "Medina" three days later.

Mr. R. Ditchburn has been appointed manager of the Ajax North mine, Daylesford (V.), and took charge last week.

Mr. Herbert Patten, chief electrical engineer at the Victorian State coal-mine at Wonthaggi, was accidentally killed by the winding-plant on the 30th ult. He was making an examination of the plant while it was running, and in some way got caught and dragged in. His injuries were so terrible that death must have been instantaneous. Deceased was about 32 years of age and unmarried. A pitiful circumstance is that he had resigned his position, and was to have left the mine less than 48 hours later, with the view of going into business in Melbourne.

Mr. William George, who is leaving the service of the Junction Dredging Co., Porepunkah (V.), to take charge of the plant of the Adelong Gold Estates (N.S.W.), was entertained by residents of the Bright district last Friday. Mr. George was a member of the Bright Shire Council, and a public recognition of his services took the form of a presentation of plate. The staff of the Junction Company also presented a gold chain and locket, and Mrs. George received souvenirs.

Mr. Wm. Bartlett has been appointed to succeed Mr. Wm. George as manager for the Junction Dredging Co. at Porepunkah (V.).

Mr. J. Saunders has been appointed to succeed the late Mr. H. Wills as manager of the North Bendigo mine, Bendigo (V.). For some years Mr. Saunders has been underground manager at the Johnson's Reef mine.

Mr. David Thompson, managing director of Thompson and Co. (Castlemaine) Proprietary Ltd., returned to Castlemaine (V.) last week from a business visit to Great Britain and Germany.

Another successful experiment with the German Telefunken wireless system is reported from the United States. During a series of experiments, carried out on July 12, in connection with the high frequency machine designed by Count Arco, it was noted with surprise that only 6 kilowatts were required in transmitting to the Nauen station, near Potsdam, two telegrams of 28 words, whereas during former experiments conducted in Germany more than 100 kilowatts were required for sending messages to the United States.

## BRIEF COMMENT.

The report of the New South Wales Chief Inspector of Mines (Mr. Jaquet) on the Conapaira tinfield is rather illuminating. The field is situated about 60 miles due west of Wyalong, and about the same distance north-west of Ardlethan. Unfortunately, too little development work has been done to warrant any conclusion being arrived at, although surface prospecting has evidently been very extensive. The Chief Inspector, however, is apparently not troubled by such considerations as inadequate evidence. He himself admits that the amount of prospecting done is insignificant. For all that, the general characteristics of the field must be highly favourable or he would hardly commit himself to such an expression of opinion as that the most important feature of the field is the occurrence of undoubted fissure lodes, and that the geological conditions are identical with those of the great tinfields of Cornwall. The latter fact is not of great consequence at this juncture, but the occurrence of tin-bearing quartz along the line of junction of granite and slate country is a feature which has probably led the inspector to express the opinion that the lodes are likely to be permanent, and in describing the lode in [illegible] shaft, which is down 50 feet, as being 5 feet wide, with well-defined walls, he is saying something for this field which no one has yet been able to say for Ardlethan. Also, he is of opinion that the country is somewhat too tough for poor parties, and that the field wants capital to develop it. As, however, arrangements have been made to instal a battery there at an early date, the value of the field will soon be determined by the crucial test of actual treatment.

The syndicate which was formed to unwater the old Golden Springs mine, near Blayney (N.S.W.), has been well rewarded for its pains. There can be very little doubt that a good deal of ore has been left standing above the 250ft. level; and, indeed, it would appear from Mr. Fawcett's report that much of the work has been done off the lode, and further work may reveal a continuous run of ore which will well repay the syndicate to mine without taking into consideration the continuity of the ore body in depth, which yet remains to be determined. All the samples taken by Mr. Fawcett gave excellent values, and as the workings are apparently in good order, there is nothing, once arrangements have been made to keep the water down, to prevent everything being made shipshape for the early undertaking of such work as will prove the extent of the ore remaining. It is also stated that the plant—a 60-head battery—is in fair order considering the time it has been idle, and no difficulty is apprehended in gradually restoring it to good working order, with some additions. It is doubtful, however, considering the sticky [illegible] nature of the material to be treated, if battery treatment is likely to give the best results, but this is a difficulty which should readily enough be overcome. The first thing to decide is the extent of ore available without having to resort to further development work, and once this is decided the future of the mine should be assured, particularly if the values are found to approximate to those proved in Mr. Fawcett's samples, which varied from about 6 dwt. to 17 dwt. gold per ton. The silver contents, however, are hardly worth taking into consideration.

The outlook for the Payne's Find Development Co. (W.A.) is not bright. Financially, it is in very straitened circumstances, while developments in the mine show the gold to be contained in small narrow shoots, and, combined, these two factors do not make the situation reassuring. During the half-year ended September 30th, the company won only £615 of bullion, against which mining and administration cost £940, the difference swelling the debit to profit and loss account to £2497. In addition to which the company owes sundry creditors a trifle over £1000. Assets in the shape of machinery, stores, leases, and cash in hand are reckoned at £2460, of which cash represents only £190. There is also about £70 due on the third call. The chief difficulty besetting the company is the fact that the Government plant in the vicinity entails [illegible] treatment, for which there is very little water available, but the directors anticipate having pretty well the full use of this plant in about a month.

For some time past the petroleum deposits of Comodoro Rivadavia, in the Argentine, have been the subject of a good deal of investigation and it is reported that the Government of that republic has in view a project for the development of these oilfields, which will involve the expenditure of over £1,000,000. It is also proposed to modify the mining laws in order to aid the development of the proved petroliferous zones by giving concessions thereon of a maximum superficial area of 500 acres, and 1200 acres in zones not hitherto examined and reported on. The concession will entail a small payment to the Government, and, if oil be found, a royalty of 10 per cent. on the oil won. This shows how world-wide is the recognition of the potential wealth in oil, and brings us back to the situation in Australia. Now, Australia is rather a big country, and it may be taken for granted that its particular geological structures will take a long time to ascertain, whatever might be accepted regarding its general geological formation. The promoters of the Australian Oil Wells Co. submit the argument that petroleum belongs to no particular geological age, and that one must go beneath the anticlinals, the impervious structure of which alone makes it possible for oil to exist. The policy of this company is briefly this: To secure all the likely country on which it can lay hands, and to then float another company, in which it will retain an interest by leasing it the necessary land, which shall actively search for oil. If the subsidiary company be successful in finding oil in one bore the parent company stands on velvet, as it will hold all the likely land in the Commonwealth, which would then be the storehouse of enormous potential wealth. Of course, the whole project reeks with the elements of speculation, and the promoters don't pretend that it is anything but a gamble; but they argue that the possibilities of enormous benefits being realised in the event of success are such as to more than compensate for the risks taken. This much can at least be said for the venture: the policy is right, and if carried out as projected will effectually settle the argument, either one way or the other, as to the existence of petroleum in Australia.

That some people have faith in the oil shale business of Australia is evidenced by the fact that a new company, with a capital of £300,000, has been registered in London with the object of acquiring the works of the British Australian Oil Co. at Murrurundi and Newcastle (N.S.W.). According to report, the company will employ between 500 and 600 men, and will commence operations at an early date in the directions of manufacturing crude and refined oils, sulphate of ammonia, candles, and all the products and by-products of oil shale. The new company will retain the name of the British Australian Oil Co. Ltd.

The announcement of the values exposed at the 2100ft. level of the Lake View and Star Co., Kalgoorlie (W.A.), gives rise to the hope that the development will prove to be an important one. In the combined properties there must be fully twenty miles of workings, and one would conclude from this that there is very little of the ground which has not been prospected. When the amalgamation of the Lake View and Hannan's Star Companies took place it looked, on the face of it, rather a poor bargain for the latter company, as the Lake View ground had been pretty thoroughly exposed down to 1900ft., whereas the Star property had not been worked to half that depth. Prior to the amalgamation, some rich ore was exposed in the 1900ft. level of the Lake View, but it was found to be not very extensive, and this diminished the hope of the life of the Lake View being prolonged beyond the known ore reserves. According to the announcement, the value of the face in the north drive at the 2100ft. level is 77s. over a width of 34 inches, a borehole in the east side of the drive indicating a greater width of ore, but the value is not given.

Mr. J. E. Dodd, Honorary Minister, in explaining the provisions of the Mines Regulation Bill in the Legislative Council (W.A.), spoke truly when he said that no shareholders in West Australian mining companies had done anything to alleviate the distress brought about by the conditions of mining, and therefore it was up to the worker, through his representative, to legislate in such fashion as would safeguard his health, life, and limb as much as possible. No one with the first instincts of decency would deny the miner that right; but in what way the contract system is responsible for increasing the risks passes all understanding. Mr. Dodd argues that, when contracting, men rush the work, and not only risk their health by swallowing dust, but deliberately go into danger, and risk life and limb for the sake of the extra gain. The utter futility of opposing this kind of argument with logical reasoning is obvious when it is realised that a man who is capable of thinking so would be incapable of thinking anything else. However, Mr. Dodd considers it necessary to abolish the contract system for the sake of the safety of the worker. If the argument holds good, it will probably be found necessary to abolish mining altogether. Nor would one stop at that; one would abolish railway trains, trams, and motor-cars—particularly motor-cars. In fact, one would wipe the whole industrial system off the map. Then we should all be healthy, and only in danger when a healthier, but lazier neighbour had not been successful in filling the larder with the daily supply. We should not be surprised, either, if our neighbour bore a remarkable resemblance to Mr. Dodd.

At a meeting of shareholders of the Annan River Co. (Q.), held in Melbourne last week, a resolution ratifying the proposal of the directors to raise fresh capital by means of the issue of preference shares was adopted. The chairman (Mr. J. L. Wharton) explained that it was unwise to go on without making provision for treating the great mass of material in hand on a scale commensurate with its bulk. The additional capital would be devoted to the Wallaby Creek pumping scheme, involving the expenditure of about £12,000 or £14,000, tailings equipment, £3000 or £4000, and bucket dredger about £10,000. There can be no doubt that this estimate is conservative, and that the work will be carried out for a sum well within the £27,000 allowed for it.

The Cassilis G.M. Co. (V.) has decided to increase its capital to £75,000, by increasing the value of its shares from 20s. to 25s. The company having been granted £4000 by the Government, the provision of £1 for £1 entails a definite move on the part of the company to provide its portion, which will be called up in six 3d. calls. It is hoped, however, that development work will be successful in disclosing ore of value before the whole amount is called up.

The result of the crushing of 25 tons taken from 40ft. down in the open cut in Speakman's find on the Hampton Plains Estate, near Kalgoorlie (W.A.) has been communicated to the Nor'-west Syndicate, Melbourne, as being 10 oz. over the plates, which, with an average of 3½ dwt. left in the sands, shows the average value of the parcel to have been about 11 dwt. per ton. As the crushing was chiefly made to ascertain how the lode sampled in bulk, the value may be taken as fairly representative. A very important discovery has been made in connection with this property. Some samples from about the same vicinity as the above parcel was taken from were forwarded to Melbourne. Upon examination it was found that pieces of the ore were heavily mineralised. In order to determine if the mineral carried gold these pieces were selected and assayed, with the following result:—Mineral, 9.25 per cent., assaying 22.70 oz. gold per ton of concentrate. In addition, it was found that the stone carried free gold assaying 1.75 oz. per ton. It must be clearly understood that this ore was assayed only in order to determine the value of the mineral content, and the percentage of 9.25 of pyrites is only the percentage in the ore selected. The important fact is that the pyrites carry good values, and it is intended to take another parcel of 25 tons from the 50ft. level, which, when being treated, will be concentrated in order to obtain some idea of the percentage and value of the mineral. Subsequent results from this line of country will be watched with considerable interest, as it is just possible, in view of the fact just ascertained, that Speakman's is a bigger and more important find than was at first apparent.

## QUEENSLAND MINING.

### North Queensland Fields.

(From Our Correspondent.)

Mareeba, Oct. 24.

The last report from the manager of the Vulcan tin mine should provide excellent reading for shareholders. The mine is looking better now than it has done for years, and many faces of ore in the different stopes can be worked. In the 550ft. stope the development is sensational, as the face is 8ft. in width, and worth 30 per cent. for black tin. The lode shows no sign of narrowing, and as it is in virgin country, its appearance is all the more welcome. It cannot, however, be worked on a large scale until connections are made with the level above. This, however, is not a very lengthy job, as the mine is well equipped with rock drills, so in a short time good quantities of this high grade stone should be on its way to the battery. In the 360ft. level drive is now in lode material and a connection should shortly be made with the winzes sunk in good tin ore from the level above. This drive will add considerably to the ore reserves. At the 840ft. stope two machines are busily engaged breaking ore over an area of 33ft. by 23ft., worth 3 per cent. black tin. Large quantities of ore are being broken at this point. At the 965ft. stope, payable ore is being broken over an area of 20ft. by 18ft. During the month 725 tons of stone gave a gross yield of £3488, the stone averaging about 6 per cent. black tin. At the time of writing (23rd inst.) the finances of the company were in a very healthy condition, as there was over £4600 cash in hand. The aerial ropeway is nearing completion, and the balance of the material (rope) will be on the grounds this week, as it was landed in Cairns yesterday. Seventy-five per cent. of the cost of the ropeway, which will cost about £3000, has been paid, so the company is practically free from liabilities. I think it is safe to predict that at the next monthly meeting of directors, which will be held in a few days, a dividend of 3d. per share will be declared, payable in November. The market value of the stock, which, at time of writing, is 1s. 11d. per share, is not in keeping with mine values, and share should see a good rise. It is hard to explain the present market price, but the belief that the demands of the workers in these parts, which are now under consideration by the different companies, will be refused, and a strike result in consequence, has, no doubt, tended to a lack of support. However, it is fairly safe to assume that there will be no strike, although the air at present is charged with strike electricity.

The adjourned conference between the mine owners and representatives of the Australian Workers' Union will take place in a few days, when the question will be settled one way or another. The workers, on the whole, are perfectly satisfied with their conditions, and, if left alone by their political leaders, would not cause any trouble. From enquiries and observations, it is safe to assume that by far the larger percentage of the workers will vote against a strike, and they are demanding a secret ballot, which is a good sign. The various managements are taking a very firm stand, and are united as to what action will be taken. They have given the labour leaders to understand that they have no intention of granting the requests made at the recent conference. A strike at the present time would not harm the Chillagoe company, as they could close down their works for six months, and by that time the railway would be through to Mt. Mulligan, and cheaper fuel be available. The next few weeks are then fraught with much anxiety, and the married workers are casting about as to their next move, in case of trouble. Already a few of the most reliable men have moved into other districts. A strike would mean great distress, and would cripple the mining industry, which, during the past few months, has been in a more healthy condition than for a considerable time. There are, however, some wise counsels as well as firebrands among the workers, and if the political parasitical organisers could be kept under control and the dictation of the Trades Hall stopped, then there would be no talk of industrial disputes. The demands of the unionists are so outrageous that they cannot be tolerated.

Latest reports to hand from the Gilmore tin mine are most favourable. An 80 ton parcel of stone is now being crushed at the Gurrumbah battery, and this will be followed in about five weeks' time by a 100 ton parcel of good grade stone. The manager is concentrating all work in the Dolly Gray shaft, where there is a good shoot of ore in the rise from the 95ft. level. The ore is pulled by means of a horse whim for four hours daily, and from three to four tons of fines are screened each day. The stopes in the Dolly Gray are being cleaned out, in order to get at the rich stone, and the mullock being removed will more than pay for the handling. The two parties of tributers are doing very well indeed, and it is unlikely that the tribute will be renewed. It is stated that a tributer has offered the company £500 for a tribute in one of the levels, but it is not likely that his offer will be accepted. It is a strange thing that this mine was closed down through the absence of payable ore, yet when tributes were let, good bodies of stone were almost immediately located. It is not likely the directors will make the same mistake again, and there appears to be a more prosperous time in front of the Gilmores. Shares are in strong demand locally.

An attempt is being made to re-open the old Mulgrave River Mines. Mr. Fred Brown, who is well known in the North Queensland mining world, has this interesting proposition in hand, and his efforts are likely to meet with success. Mr. Brown has acquired the old Walter Hodgson G.M. Co.'s properties, which are situated in Butchers Creek, about seven miles above its junction with the Mulgrave River. Some 15 years ago the Walter Hodgson Gold Mining Co. spent from £20,000 to £25,000 of English capital on this property. The same reckless management as has wrecked many good mining ventures in North Queensland prevailed, and, in consequence, the shareholders got no returns, and the mine was closed down. During the career of the company the only returns recorded were 320 oz. of gold from 440 tons of stone. The above, however, did not include the gold in the blanketings and tailings, so it is evident that the reef must be worth about an ounce to the ton. Elaborate machinery, including a 10 head stamper battery, was erected by the company, and this has now been lying idle for 15 years. The boilers, etc., have been removed, but the mill still stands, an eloquent witness of money wasted. Thus are the North Queensland mining fields damned. Mr. Brown has infinite faith in the venture and intends at an early date to arrange for its flotation into a company. The gold-bearing reef is outcropping in the gorge nearly a thousand feet above the level of Butchers Creek. The management of the old Walter Hodgson Company built three tram lines to deliver the stone to the battery. One tram line delivered the ore from the top tunnel to a shoot 200 ft. below that level. By means of horse tramway thirty chains long the ore was then delivered to a hopper and thence by an inclined three-rail tramway, with a lay-off in the centre, for 25 chains to the 10 head battery. This costly procedure was too big a strain for the stone to stand. It is recorded that the manager cabled home to the London directors stating that the full truck would not pull the empty truck up the incline, and he received a reply to put on two full trucks. Judging by the way the work has been carried out in the past, the above is quite credible. A visit to the mine last week was an eye-opener. Considerable development work has been done in the mine, but the costly method of transport ate up available profits. It seems incredible that steam power should be availed of when water power was handy. This glaring error led to disastrous failure. The reef averages over 2ft. in width, and as Mr. Brown intends to utilise the available water power, he should meet with greater success than that which attended the efforts of the old company. During last week, Mr. S. Horsley, Inspector of Mines, Herberton, in company with Mr. Fred Brown, visited the mine. There are other mines in this locality well worthy of the attention of capital, and if Mr. Brown's venture proves successful, there is no doubt but that the Mulgrave goldfield will receive considerable attention.

At the half-yearly meeting of shareholders of the Tommy Burns Tin Mines N.L., which was held on Thursday, 23rd inst., the balance-sheet and profit and loss account were presented and discussed. For the half-year ending September 24, tin realisations amounted to £8275 14s. 10d. Two dividends were paid during the term, one of sixpence per share on May 7, and another of like amount on July 8, making in all 1s. per share on the new issue (2s. 6d.). The company is not in a good way financially, being in arrears at the Bank of Australasia to the amount of £645 15s. 2d., and £338 6s. 3d. is owing to sundry creditors. The principal items of expenditure during the term were:—Ore raising, £2757 6s. 3d.; battery wages, £1549 14s. 9d.; ore transport, £625 5s. 7d. The latter item amounts to a scandal, and it is time the shareholders made some move to remedy matters, as the amount paid to packers and carters would more than pay for the construction of a tramway or an aerial ropeway, but it is rumoured that, through a director having an interest in the carting contract, it is hardly likely that the cheaper and more efficient methods of transport will be adopted. Directors' fees—£70—is a fairly heavy item, and travelling expenses—£62 16s.—is another item chargeable to directors. The other items all appear fair and reasonable, although the crush charges might be greatly reduced. At the expiration of the half-year the company had concentrates to the value of £250 on hand. The company, prior to the close of the half-year, had the misfortune to have its battery put out of commission, but it is expected that by the end of the month the necessary repairs will be effected. The prospects of the company are not too bright, as they only have low-grade ore in sight to work on.

The fourth half-yearly meeting of shareholders in the Prince Alfred Tin Mines, N.L., was held on Wednesday night at the secretary's office. The chairman's report read as follows:—Your directors have pleasure in submitting to you for adoption the balance-sheet and profit and loss account for the half-year ended September 24, 1913, together with the mine manager's report of the work done during that period. For the seven months' work the concentrates sold realised £2980 6s. 9d., and the ore now being treated at the battery is estimated to be worth £1000. One dividend has been paid of 10s. It is with regret that we have to report that our expectations of cutting a good lode at the 150ft. level have not been realised. In the sinking of the shaft frequent intrusions of tin-bearing stone would point to the proximity of a lode, but so far driving has failed to locate it. You will notice by the manager's report that there is a good body of ore available in the eastern end of the winze in the 90ft. level, and also that an active policy of development is being carried on. The finances of the mine are in a healthy condition, and will enable development to be carried on for a considerable time, as there is no immediate prospect of heavy expenditure in any direction. The mine and plant are in good order. Owing to our expectations of the deeper levels of the mine not being realised, the question of the erection of a battery has been left in abeyance.''

The mine manager's report was as follows:—''For the half-year ended September 24, 1913, the main shaft was sunk 66ft., making a total from surface of 166ft. The country met with in sinking was very hard and carried occasional isolated patches of good grade tin stone for the whole distance. At the 155ft. mark a crosscut was put out in a north-easterly direction, which was expected to cut the lode in about 12ft. It was, however, continued to 30ft., without meeting with any payable ore except small patches similar to those in the shaft. At 17ft. from the shaft a vein of quartz a few inches thick, carrying traces of tin, was cut. Work at this level was discontinued in order to sink on the lode from the 90ft. level, where a cistern had been sunk 6ft. deep on high-grade ore of an average width of 2 to 2½ft. A winze was started from the bottom of this cistern and continued on good ore down to about 13ft., where is became much broken and too poor for shipping. An underhand stope was carried along for 35ft. west and 10ft. east, with a view to determining the best point to continue sinking. The ore along the bottom of this stope being poor and irregular, it was decided to continue the winze, which was sunk to 23ft. The water becoming troublesome for windlass work, the winze was stopped, and a crosscut is being put in from the main shaft 20ft. below the 90ft. level. About 11ft. of driving will break through to the winze. This will allow of driving along the lode being done on the lode instead of being largely on the blind, as it would be at the bottom level. It would also allow of some good ore along the floor of the 90ft. level (east end) being taken out. The north-west drive at this level has been extended 20ft. past No. 2 shaft in lode material, carrying a little tin throughout, and in places small patches of good ore. Stoping over the level has been carried on during the term on ore varying in size from a few inches to 2½ft., and of an average value of about 6 per cent. Most of the known ore suitable for shipment over this level has been worked out; what remains being small and comparatively poor, requiring a lot of picking.

55ft. level.—From a crosscut 32ft. west of the main shaft a rise was put up 13ft. with the object of locating a body of good ore left by the original owner. This holed through to the old workings, but nothing better than veins of 2 per cent. ore was met with. A crosscut is now being put in S.W. from No. 2 shaft with a view to cutting the downward extension of this ore, which is dipping rather flatly to the westward. The crosscut is out 16ft.; nothing of value has so far been met with. Owing to the old workings having collapsed, the exact position of the ore cannot be got at. The work in hand or projected includes:—(1) Driving on the lode at the 120ft. level as soon as the crosscut holes through to the winze. (2) Underhand stoping eastward along the bottom of the 90ft. level, where an apparently fair-sized body of payable ore remains to be broken. (3) Extension of the 90ft. S.E. level. This face shows 4ft. or 5ft. of ore carrying a little tin—propably under 1 per cent.—but may improve at any time. (4) Deepening of No. 2 shaft shoots of ore appear to dip to the westward, and the sinking should determine the extent of the ore in that direction. For the period under review, 244½ tons of ore have been sent to Gurrumbah battery for treatment. Of this, 177 tons—together with 40 tons which was at the mill at the end of last half-year—has been treated for the return of 22 tons 2 cwt. 3 qr. 16 lb. of black tin, equal to 10.18 per cent. The remaining 67½ tons is now at the mill awaiting treatment, and is estimated to return about 8 per cent.

The principal items of expenditure were:—Ore raising, £766 18s.; ore transport, £243 7s. 3d.; ore crushing, £217 4s.; directors' fees, £50; travelling expenses, £51 9s. The balance-sheet showed that the company had £924 19s. 3d. to its credit in the Bank of Australasia. The balance to the credit of profit and loss account, giving that account credit for estimated value of ore at mill, was £1613 3s. 1d.

At the New Minnie Moxham Gold Mine 12 men are now engaged in dam construction, and the work is progressing rapidly.

Mr. A. T. Linedale left to-day for the Ortona Copper Mine, Percyville, and from there will proceed to the Wollorgorang Copper Mine, Northern Territory.

## Anakie Field.

**(From Our Correspondent.)**

Sapphiretown, October 24.

Motor power seems to be completely displacing the horse in driving the machines for the treatment of sapphire wash. Mr. John Rose, of Sapphiretown, last week got up a 6h.p. oil engine, to be used in place of horses at his plant. There are now three engines side by side at Retreat Creek. Sapphiretown, all three being taxed to their utmost capacity.

Mr. L. Klein, the well-known sapphire and opal buyer of Sydney, spent a week on the field, leaving yesterday. Unfortunately Mr. Klein's business was in connection with the robbery of some £400 worth of rough sapphires from the office of his agent, Mr. J. Kennedy. No clue to the missing gems has so far been discovered. Mr. Klein purchases some £6000 worth of sapphires from the field annually.

The recently established gem-cutting business conducted by Mr. F. J. Placheček, late of Sydney, has proved a distinct success already. Two cutters are kept busy, and further assistance will be required to cope with the work. With the population of miners located here at present, and fresh hands arriving daily, the increased facility of treatment by improved machines and the good prices prevailing this year should effect a record for the value of output.

# VICTORIAN MINING ACTIVITIES.

## Daylesford.

(From Our Correspondent.)

The gold return (2092 oz.) from the Nuggety Ajax group for the month's milling is just about equal to that of last mouth. The Central Ajax maintains the premier position on the "Golden Mile," with a slightly decreased yield of 1304 oz., as compared with 1330 oz. for the previous month. The Ajax shows a drop to 285 oz. from its last return of 347 oz. Nuggety Ajax still keeps to small figures, returning only 48 oz., as against 68 oz. last month. North Nuggety Ajax shows gratifying improvement with an increased yield of 435 oz., as compared with 347 oz. last month.

The Central Ajax's output enables another 2s. dividend to be disbursed amongst its shareholders, leaving a substantial credit balance in reserve. Below, its prospects continue of the best. Most of the faces operated upon are capable of producing good average-quality crushing ore. West, on the bottom level, fully 80ft. will yet have to be driven before the lode is met. At the Ajax a drive is going in north at the bottom level to test the country ahead. The Ajax North are pushing on with shaft-sinking, and are down 775ft. from the surface. The stone followed north at the 700ft. level for 140ft. maintains its size and payable value. Preparations are making for the re-erection of the old Jubilee battery on the lease. There must be upwards of 1000 tons of milling stone on the surface awaiting to feed the stampers. A change has been made in the mine managership. Mr. Jas. Martin, who has done the rough and pioneer work of this mine, below and on the surface, and to whose foresight much of the credit is due, is replaced, just when, one would think, his experience of the mine would be most valuable.

Frenchman's Reef have the shaft down to 700ft., and started off to bottom another lift. The faces and stopes dealt with are giving out payable stone. The North Lord Roberts have let a contract for the erection of a winding plant, and are making progress in shaft-sinking. The drive west from the prospecting shaft is out nearly 20ft., and through crushing dirt that carries gold right through it.

## Castlemaine and District.

(From Our Correspondent.)

The McDonald's Reef Co. have purchased the whole of the plant of the Gallaway Co., at Inglewood. The manager (Mr. T. T. Dunstan) is dismantling it, and tenders have been called for carting and re-erecting it at German Gully, near Fryerstown.

Tenders are also being called for erecting a winding plant recently brought from Ballarat on the lease of the Little Nuggety mine, at Campbell's Creek.

The first half yearly meeting of the New Golden Hill Co. was held last week at the office, 413 Collins street, Melbourne. Mr. Harold Bickford presided. The balance-sheet showed that £875 4s. had been received from all sources, and £893 9s. 3d. spent. The shaft was now down 150ft. From two crushings averages of 2 oz. and 14 dwt. per ton respectively had been got. Driving is now being done in order to get under the stone, which, before flotation, yielded 6 oz. per ton. Mr. J. J. Finlay was appointed auditor, and it was resolved that 7150 unallotted shares be left in the hands of the directors for disposal as they thought fit. It is expected to crush another small parcel of stone within a few days.

An extraordinary meeting of the shareholders in McCann's Reef Co., Yapeen, was held last week to consider the question of increasing the capital of the company. It was resolved to issue another 16,000 shares at 2s. 6d. each, which will make the company one of 40,000 shares at 2s. 6d. It was agreed to allot the new issue amongst the present shareholders if they so desired.

South Wattle Gully is still breaking out good looking stone, and the manager reports the general prospects to be highly satisfactory. The reef in the main level at 300ft. is making larger in the face, and payable stone is expected in a few days at that point. The hard sandstone in the face is dipping underfoot. Level off the No. 3 rise is in 10ft. This has been put in to get the pitch of stone, and there seems to be 5ft. of payable ore over this level. Nice looking stone is also in sight at two other points.

Spring Gully has done very little reef stoping during the past fortnight. The stone showing is payable. In the south stopes below the 200ft. level the bottom spur is pitching fast, but not much stone has been broken from it. The top spur in the stope is about 18in. thick, and more regular than previously. It is showing a few stray colours of gold. For the fortnight 370 tons were crushed for 169 oz. 4 dwt. The income more than cleared expenses. An improvement has also occurred in the north intermediate stopes near the east back.

Spring Gully No. 1 have encountered a fault dipping west in the crosscut off the rise above 300ft. There is 4in. of stone on the slide, and it has shown colours of gold. Prospecting the eastern beds is in progress, with a hope of picking up the rich stone broken out in the parent mine.

# NEW ZEALAND MINING.

After an existence extending over 16 years the Hartley and Riley Beach Dredging Company, Cromwell, Otago, has been voluntarily wound up. This course was adopted in consequence of the poorness of the prospects, and in consideration of the fact that, so far as the river conditions were concerned, it was thought to be impossible to continue work for some months at least. The company held an area of 32 acres, the material worked upon being at an average depth of 35ft., and the quantity raised per hour averaged 100 yards. In 1905 two acres yielded nearly 674 oz. 14 dwt., and the total gold produced from first to last was 32,508 oz. gross, or 29,618 oz. fine, the value of which was £125,811; while altogether dividends amounting to £84,337 10s., equal to £12 19s. 6d. per share, have been paid, on a paid-up capital of £6300 (which was also the cost of the dredge employed). For the week ending March 23, 1900, the dredge washed up 1187 oz. 14 dwt. for one week's work, and for the week ending October 16, 1903, 1158 oz. 19 dwt. 11 gr. was secured. The dredge holds three records:—For the gold returns for a fortnight and for one month, and for the total dividends paid in one month. (The 1234 oz. won by the Electric G.D. Company still remains the record for a week's dredging in the Dominion.) In the days of the dredging boom the Hartley and Riley Company held pride of place for the price of its shares, on one occasion £1 shares fetching close up to £24.

Reference has been made to Electric Gold Dredging Company's record week. The last year's report is by no means so inspiriting. At the fourteenth annual meeting on the 16th October, Mr. W. T. Talboys (chairman of directors) explained that the position of the company did not warrant the directors in declaring a dividend, mainly because of the unfavourable condition of the rivers. Shareholders would see that No. 1 dredge for the first six months had secured only four weekly returns, and during the remaining half of the year 15 returns. No. 2 dredge had also to contend with the high condition of the Clutha River, which caused a good deal of the work done to be practically thrown away. A considerable amount of money had been expended during the year, but they had still a substantial deposit—£2054—at interest. The directors had always considered it advisable to keep such a deposit to meet difficulties that might arise. Their reserve had been trenched upon at one period, but was restored subsequently, so that they had a credit balance to carry forward of £1189.

In the crosscut which is being thrown out from No. 5 to No. 4 shaft at the 1300ft. level at the Waihi mine, a reef was intercepted on October 14, which it is expected will prove to be the Dreadnought reef, which is just about due, and the large flow of water coming from the face points to the existence of a strong body of quartz. At the point of interception the lode looks well, but nothing definite concerning values can be said pending the assay results. The sampling of the reef will be awaited with interest, and should the ore prove of milling grade the development will be of considerable importance, as it will serve to show that values exist 150ft. below the point at which pay ore has so far been met with in the mine—namely, the 1150ft. level.

A promising development at the Maoriland mines, Waitekauri, was reported by the mine manager on October 18, as follows:—"The low level reef is now exposed 5ft. I am not yet sure whether the hanging wall is to hand." This refers to the lode cut in the crosscut being put out to intersect the No. 4 reef, which should come to hand about 80ft. in from the present face. Owing to the intrusion of a narrow rib of country rock, after the reef had then been penetrated for 20in., it was at first thought that the hanging wall had been met with, but quartz came in again with the next round of holes fired, and the ore body now shows a width of 5ft. The average value of ore for the first 3ft. sampled was £2 16s. 6d. per ton. The assays for the remaining 2ft. referred to in the manager's telegram have not yet been completed, but the lode is reported to look well. The reef is well defined, heavily mineralised, and shows streaks of sulphides, and as the vertical height to the existing ore producing level is 150ft., with an additional 90ft. to the surface, the reef should provide a large tonnage of payable ore. Having proved that the gold lives down, the manager will proceed with the systematic development of the mine at this depth, including driving on the new ore body, the advancement of the crosscut to No. 4 lode, and driving and crosscutting on the 2ft. 6in. lode and the large body of quartz passed through in the low level crosscut.

# MINING IN NEW SOUTH WALES.

## South Coast.

(From Our Correspondent.)

Wollongong, October 30.

Bimbimbie (Moruga district) reports a little improvement in mining. Mr. H. Richards, after much hard work, has got on payable stone. At Donkey Hill Mr. J. McKeon got returns from a new lease up to 4 oz. 15 dwt. T. Quinn and S. McDonough report that they are getting fair ore. Samples from a new find at Coolagalite, in the Cobargo district, are on view, which look good; but on the strength of good samples from that part some years ago a good deal of money and labour was spent in vain.

Our Lithgow correspondent writes:—A mining expert who has returned to Lithgow from the Yerranderie silver-lead fields, states that the Government diamond drill, which for the past twelve months has been putting down a series of bores on Mr. Coffey's property, has completed the work. He states that the drill bored through several small lodes, sufficiently large, however, to warrant the owner putting down a shaft. Having finished up at Yerranderie, the diamond-drill party is removing the plant over to the Great Peaks Silver Mine. The management of this property intend putting down a number of bores from the present bottom of the shafts with a view to testing the country.

# AMALGAMATED ZINC (DE BAVAY'S).

The production, estimated expenditure, and estimated profit of the Amalgamated Zinc (De Bavay's) for the last two four-weekly periods were as follows:—

| | Four weeks ended | |
|---|---|---|
| | Sept. 20, 1913. | Oct. 18, 1913. |
| Tailings treated, tons .. .. | 39,649 | *35,906 |
| Zinc concentrates produced, tons | 11,385 | 10,341 |
| Assaying— | | |
| Zinc, per cent. .. .. .. | 49.2 | 49.0 |
| Silver, oz. .. .. .. .. .. .. | 9.1 | 9.0 |
| Lead, per cent. .. .. | 6.2 | 6.2 |
| Lead concentrates, tons .. .. | 126 | 125 |
| Assaying— | | |
| Lead, per cent. .. .. .. .. | 51.3 | 50.4 |
| Silver, oz. .. .. .. | 35.0 | 35.6 |
| Zinc, per cent. .. .. .. .. .. | 19.4 | 20.2 |
| Estimated income (spelter at £22) .. .. .. .. | £32,984 | £29,582 |
| Working expenditure (including cost of tailings) .. .. | £16,168 | £15,487 |
| Estimated profit on working account (spelter at £22), after deducting amount due to Broken Hill South Co. under agreement .. .. .. .. .. | £11,747 | £10,051 |
| Provision for royalty .. .. .. | £1,423 | £1,293 |
| Net profit on working account .. | £10,324 | £8,758 |

*Decreased tonnage due to reduced supply of crudes owing to shortage water supply, also Eight Hours holiday. No credit is taken in above figures for interest on investments or dividends on shares in other companies.

# THE "DEVASTATING DREDGE."

Mr. J. H. Gray, chairman of the Maori Queen Proprietary Gold Dredging Co., of the Ovens district, Victoria, is a member of the commission which has been investigating the supposed destruction of valuable agricultural lands by the "desolating dredge." Presiding at the company's half-yearly meeting last Friday, Mr. Gray said that, in traversing various parts of Victoria and inspecting all the dredging districts, the commission had seen some things which were not as they might have been, but, taking it all round, he did not think that dredging was the cause of so very much damage. His own opinion was that the dredges had not done very much harm, and he thought that, when the report came out, they would not find that it dealt severely with the dredges. The commission was satisfied that, in some instances, the dredges had improved the land, more particularly in the case of the Maori Queen Co. There was about 40 acres which had recently been sold, but it was not worth 1s. before the dredge touched it. It was rather peculiar that, in spite of some people saying that ground so treated was absolutely worthless, when the buyer (a wholeconfectioner in Melbourne) made application to the Lands Department, it insisted on classing the ground as first class land. Eventually, he got it as third-class. Personally, he (Mr. Gray) thought that the Government should have made the gentleman a present of the land, so that he could plant it with nut trees. Before dredging, the ground was nothing but old shafts and hillocks of tailings, but after dredging it was as level as the floor of the room, so that the devastating and desolating dredges were not doing a great amount of harm.

---

# THE COAL MINING INDUSTRY.

## New South Wales.

### Northern District.

(From Our Correspondent.)

Newcastle, November 1.

The Northern Coalminers' Wages Board has dealt with the dispute in respect to the making up of the wages of machine men in Pelaw Main colliery to 12s. 4d. per day, when they are unable to make that amount owing to the places in which they are working being "deficient." The decision of the Board is in the following terms:—"1. That every machine man working the recognised hours in this colliery on tonnage rates shall receive not less than 12s. 4d. per shift, if the failure to earn that amount has not been caused by any fault of his own. 2. The management shall not make any deduction from the said rate of 12s. 4d., unless it has reason to believe that the said machine man is at fault. In such case the management shall, before the pay, notify the same to the said machine man. Thereupon, in case of dispute, the machine men in the adjoining cavil shall be called in, together with equal representation of the management, to decide the issue, and, should these persons fail to agree, the matter shall be refered to an umpire agreed upon by the parties, or, failing this, to this Board." In announcing the award, his Honour Judge Edmunds, chairman of the Board, said it should be borne in mind that the most perfect agreement or award on this point would fail to operate satisfactorily unless, in giving effect to it, the parties were actuated by a proper spirit of compromise and a sincere desire to avoid friction. When Mr. John Brown, of the firm of J. and A. Brown, owners of Pelaw Main colliery, was asked his opinion of the award, he said: "So long as the men have to work the full time of eight hours in the pit, we do not object to paying them 12s. 4d. per shift. Any of them can earn that if they try to, and work the full time, but some of them work only from five to six hours per shift." He added that if the award assured control of the mine by the management and not by the men it would be all right.

Much more important to the miners of the Newcastle district, and to the owners of pits working the Borehole seam, has been the decision of the Wages Board on the claim of the men for payment for all small coal won by them. They asked for 1s. 6d., and the owners put in a reply asking for a review of the rates paid for the hewing of coal generally, and contending that the men were already paid for small coal in the rate which was fixed for the large coal. However, after hearing a lot of evidence, and giving careful consideration to the matter, the Board has awarded the men in certain collieries 4 1-8d. per ton for small coal. The terms of the award are:—"That in the Burwood, Co-operative, Hetton, Lambton, and Wallsend collieries, the rate paid for small coal shall be 4 1-8d. per ton, whilst the selling price of best coal is 11s. per ton, and the said rate shall rise or fall ¾d. for every 1s. per ton rise or fall in the selling price of the best coal. The award shall remain in operation for a period of three years from the date of its publication in the 'Government Gazette.'" Sea Pit and Glebe collieries are excluded, as the men in those mines are receiving, and have for many years received, payment for small coal, and the existing rates there will stand. During the hearing of the case, the position of the men who are working on what is known as a consolidated rate was mentioned. In giving the decision of the Board, his Honour Judge Edmunds said that the reasons given for the payment of 4 1-8d. per ton, at the collieries mentioned, would be found not to apply to those pits where a consolidated rate was paid, namely, a rate for filling the round and small coal together. The men in the latter collieries had entered into an agreement with their employers to work on the consolidated rate, and that settled the question, because it was a matter of contract. The Board would be prepared to review the matter; but the employees would have to show that the rate paid them was unreasonably low, and it was obvious that such a contention could not be supported. For these reasons, he had no hesitation in saying that the award should not apply to the collieries where a consolidated rate was now in operation. The award would have a currency of three years, and probably, would come into force on the first pay after its publication in the Gazette." The award does not affect the Maitland mines.

Neath colliery, in the Maitland district, was idle on Tuesday, owing the boys refusing to work. One of the clippers-on is said to have been dismissed on Monday for a breach of the rules, and the other lads then refused to turn to. The result was that two vessels, taking Neath coal, were delayed.

Bellbird colliery, the property of the Hetton Coal Company, and situated close to Cessnock, in the Maitland district, is rapidly increasing its output. The seam worked is very thick, and of fine quality. Bellbird is one of the newest mines in the Maitland field; it is worked by means of a tunnel, and promises to be one of the most important of the pits on that field.

A dispute has been in progress for the last few weeks at Whitburn colliery, to the west of Maitland, concerning payment for the working of tops. The management made an offer of 2s. 6d. per ton, and the men asked for 2s. 8d. There was a brief stoppage over the matter, and then the men went back to work, but did not go into the tops. The management complained that this caused loss to the company, and the matter was brought up at the Wages Board. As a result of suggestions made by his Honour Judge Edmunds, arrangements have been made whereby the men will work the tops, and the question of the rate of payment will be dealt with at a conference between representatives of the company and of the men.

The Minister of Mines has decided to appoint a representative of the miners on the conference regarding the prevalence of dust in coal mines and the possibility of explosions being caused thereby. It may be that a man from the Northern mines, and also one from the Southern mines, will be so appointed.

The matter of the testing of explosives for use in coal mines is being urged by the miners of this State, and the Mines Department is also active in the same regard. A reply has been sent to the Federal Government, setting out the views of the department, and it is believed that, if the Federal Government is willing to co-operate, a testing station will be established as soon as the necessary equipment can be obtained and the services of an expert in the work secured.

### Southern District.

(From Our Correspondent.)

Wollongong, November 1.

The coal trade continues good. At South Bulli, our largest colliery, they cannot get enough coal, and the prospects are that this state of things will continue. Mr. Evan Davies, the manager, has retired from active service, and is succeeded by Mr. Scobie. At the Coalcliff new colliery two Sullivan coal-cutting machines are about to be put in, making the number of coal-cutters in this mine five. At North Bulli it was expected last week that the new electrical generators will be connected in the course of a day or two with the colliery plant.

The anti-non-unionist attitude which has been manifesting itself of late in various parts is showing here, where, heretofore, there has never been a strong feeling on the subject. At the Metropolitan colliery there was a demonstration, which resulted in the two persons concerned going into the union out of the trouble. At another colliery the antagonism shown has not reached so decided a stage. The award has in it a provision of preference to unionists, but, as there has been no surplus of labour offering, discrimination has not been necessary, and there are always more than a few to whom unionism is irksome.

The Bulli Coal Company during the week have made application for an area on private land for mining purposes, the intention being to construct a tramline in connection with their extension mining. Of the prospecting propositions in the southern part of the district, the only movement for some time past to record has been the cancellation, for non-fulfilment of labour conditions, of a leasehold of 640 acres held by J. A. Fleming's party, and its being immediately reapplied for by the same party. The party's show is opened out in a much more workmanlike manner than any of the others. Re the property known as the Balgownie, which was some three or four months ago placed on the market for flotation, nothing as to the result has transpired, and there has been nothing more done on the property. Meantime, the appliances which were used for getting the coal out to the public road when the mine was being worked for household supply are tumbling down. On the Tableland the public movement in Robertson for the development of the coal seams has got on as far as the opening of a public subscription for the purpose of opening out an outcrop. There is hope that, this being done, the Government will step in and do the rest.

Coke-makers continue to get orders for all they can make, and are maintaining peaceful relations with their employees. The wreck of the new plant of the Australian Coke Company, at Corrimal, owing to the foundations giving way, has not yet been repaired, and this fine plant of ovens, one of the best in the district, continues unproductive, which must be a considerable loss. The misfortune, it is stated, will cost the company £14,000. The Illawarra Coke Company (Mr. G. W. Hyde's) are pushing on the construction of their plant at Coalcliff in a very business-like way. They have 40 to 50 men constantly at it.

### Western District.

(From Our Correspondent.)

Lithgow, Nov. 1.

The New Cullen Bullen Co., whose colliery is just a few miles outside of Lithgow, which was recently floated, has a capital of £125,000, of which £104,000 has been paid up. The management is now vested in the Howard Smith Co. Ltd., as managing agents, for ten years. It is understood that this company is the largest shareholder, and holds more than half the stock. The intention of the new management is to place the colliery in a position to be able, within twelve months, to cut 1000 tons of coal a day. Amongst improvements projected are additional sidings to accommodate from 100 to 200 trucks, and alterations to screens to give two distinct screening places. It is understood that machines will be placed in the mine with a view to opening up and driving headings; but whether or not machines will be used for regular cutting is a feature of policy not yet decided. It is stated that the company will build a number of residences for the accommodation of married men, as well as a manager's residence and administrative offices.

## Victoria.

### Powlett River District.

(From Our Wonthaggi Correspondent.)

The decision of Mr. Broome, general manager of the State mine, to reinstate the six miners who were suspended because they absented themselves from work owing, as they said, to the air being bad in their place, did not give entire satisfaction, because he would give no compensation for the time they had lost. A special meeting of the committee of the local branch of the V.C.M.A. was held, at which Mr. Broome's reply was dealt with, and it was decided to again interview him on the matter, and, if this did not prove successful, to take the men's case to the Railways Commissioners. Since then the union officials have had several interviews with Mr. Broome, but, so far, finality has not been reached. The men who were suspended have not resumed work pending a settlement of their claim for compensation. At the special meeting, held on the previous Sunday, the opinion was expressed that no settlement would be regarded as satisfactory unless the men received compensation. After further consideration, Mr. Broome consented to compensate the men, who thereupon resumed, and the trouble was ended.

Within a week two fatalities have occurred at the State mine, but the circumstances surrounding them were entirely different. In the first instance, a miner named John Bridgman was killed by a fall of stone, and in the second, Herbert Patten, foreman electrician at the mine, met his death by being dragged into the machinery. As a result of these accidents, a good deal of time has been lost, no work being done in the mine [illegible] either occasion from the time the accidents happened, on Thursday in each week, until the following Monday morning. The rule of the mine is, when a fatal accident happens, that shift shall cease work, the next shift to go on as usual, and time to be allowed off for the funeral. When the miner was killed the miners declined to go to work on the Friday morning. When the electrician was killed, the management decided to be on the safe side, and intimated that there would be no work until Monday morning. It seems to be a foolish position for the men to take up, contrary to their own rules. Their loss in wages in consequence of the two accidents amounts to about £2000, and it would have been more but for the fact that the first Saturday was the usual pay Saturday holiday.

Some of the directors of the Powlett North Woolamai Co. visited the colliery during the week, with a view, it is said, of deciding when operations shall be resumed. Up to the present eight bores have been put down, and considerably over a million tons of coal have been proved. The ninth bore has been started, and others will be put down later on, as there is nearly half the lease remaining to be tested.

## SUBSTITUTES FOR PETROL AND BENZINE.

By H. Kershaw Walker.

The ever growing demand for petrol, benzine, and other hydrocarbon liquids of the petroleum series, for use as motor spirit, accompanied, as it is, by a steady increase in the price of those commodities, is causing anxiety in many countries with regard to future supplies. At the present time the earth is being ransacked, so to speak, in order to discover new sources from which to obtain petroleum. And it is not only the lighter distillates, petrol, benzine, gasolene, and other of the more volatile portions of petroleum which are so urgently wanted, but the heavier oils, crude and residual, are now being sought after as liquid fuel, both for the navies and the mercantile marine of the more advanced nations. It is reported that attempts are to be made to meet this rapidly spreading demand for motor spirit and liquid fuel, by increasing the production of hydrocarbons of the coal tar and shale series, benzine, naphtha, paraffin, and the like, but in England, Germany and America, coal tar distillation has for many years past been carried on with great energy for an infinite variety of derivatives, not only gas works, but coke ovens and blast furnaces having been brought into requisition for their volatile and by-products, so that no great addition to the world's supply of benzine, naphtha, etc., can be reasonably hoped for from that source. Since the introduction of petroleum the treatment of shale has not been very profitable commercially. Moreover, coal tar and shale spirits have a much more disagreeable smell on combustion than petroleum spirit, which renders them less fit for use, both on locomotive and stationary engines.

In Australia, up to the present time, no discovery of petroleum springs of any importance has been made, so that the people of the Commonwealth are wholly dependent upon imported supplies of spirit and fuel oil for all purposes, and the position is not improved by the fact that there are only two channels through which their requirements can be obtained. Therefore it behoves them to think seriously if a substitute for petroleum and its outcome can be found. Now, in this article, cheap acetylene and its contingents will be proposed as able and useful competitors and rivals of motor spirit and fuel derived from petroleum. As is generally known, acetylene gas is most easily obtainable from calcium carbide (carbon of calcium), which is a mixture or combination of lime and carbon in the fairly definite proportion, 62.5 per cent. calcium and 37.5 per cent. carbon. Intense heat being necessary for the fusion of these refractory substances, the work is carried out in an electric furnace, the proper construction of which has been a subject of much and prolonged study since its first contrivance by the distinguished Frenchman Henri Moissan. A large and constant volume of electricity being required for the maintenance of the electric furnace in the production of calcium carbide, the factories engaged in this industry have been generally placed in the vicinity of the great waterfalls, such as Niagara in America, Trollhatten in Sweden, the Falls of Foyers in Scotland, several in France, Switzerland, and other mountainous countries, where water power is abundant. But, notwithstanding all that has been done throughout the world, calcium carbide as the only source, commercially speaking, of acetylene, is still an expensive article. In Australia to-day the current price is about £14 15s. per ton, so that acetylene, chiefly used because of the white and brilliant light which it gives when burning, is costly also. Cheap acetylene is our text—and it is our privilege to explain the text and to show how cheap acetylene, very cheap acetylene, can be procured. Not only for light, but for heat and power also. In the first place, calcium carbide requires for its manufacture carbon, in the form of charcoal, coke, or anthracite.

In Victoria, there are immense deposits of brown coal and lignite. It has been ascertained by careful experiment that, upon heating, or destructive distillation, as it is termed, in suitable ovens or retorts, the brown coal, after having parted with its volatile constituents, water, ammonia, sulphur, tar, etc., leaves a residue of from 50 to 60 per cent. of carbon, less metallic than the coke of bituminous coal, but denser than charcoal. It is singularly pure, that is to say, free from those ingredients which operate against the making of good calcium carbide. It contains comparatively little ash, which is a good feature.

The cost of raising brown coal at places such as Morwell, where it obtains a thickness of over 700ft., is estimated at from 1s. 6d. to 2s. per ton, or even lower. With a residue of 50 per cent. carbon, the cost of this carbon would appear to be 3s. to 4s. per ton in the ovens. But it must be remembered that the coal during the carbonising process has given up much valuable matter:—Ammonia, worth approximately 3s. 8d. for every ton treated; coal tar, 8 gallons per ton, at 3d. per gallon; gas, 9000 to 10,000 cubic feet per ton. Thus the carbon residue in the ovens may be practically regarded as a by or waste product, costing nothing, because the cost of winning the coal and placing it in the ovens is abundantly covered by the utilisation of the volatile constituents. It is this pure and inexpensive carbon which should enter into the manufacture of calcium carbide in Australia. Nothing more abundant or less costly could be even imagined. Carbon, 37.5, gratis! Lime also is very plentiful within the State, and is situated near the coal. Someone remarks: But electric power in great volume is needed for the electric arc furnace, and in Australia we have no Zambesi or Niagara, Trollhatton or Falls of Foyers, to provide power for the generation of electricity. We have not; but we have something much better and more easily harnessed than a cataract. Every ton of brown coal carbonised yields, at least, 9000 cubic feet of coal gas, and the treatment of 1000 tons of coal per day will provide 20,000h.p. daily, capable of being turned into electric energy. This enormous amount of power comes from what are frequently spoken of as waste gases. If more power were wanted, the carbon of the brown coal, treated by the ordinary methods employed for making producer, or water gas, in addition to 9000 cubic feet of coal gas, we shall have 150,000 cubic feet of producer gas to burn in internal combustion engines or under steam boilers to augment the volume of our electric supply. Thus it can be seen that there is in Australia, carbon, lime and electric power at a cost so remarkably low that, whereas imported calcium carbide costs £14 15s. per ton, we can manufacture it here for probably one-tenth of the money, and in unlimited quantity. Here it may be noted that the carbon of the brown coal, united with silica (sand), very plentiful in Australia, yields under the electric arc the valuable product known as carborundum. We now see our way to cheap carbide of calcium, and, plus water, to cheap acetylene. The use of acetylent for lighting per se, or for the enrichment of coal gas to give increased brilliancy, the use of acetylene with oxygen for welding and cutting iron, does not now concern us. The present purpose is to find substitutes for petrol, benzine, and motor spirit

Petrol and benzine vapour, when diluted with the correct admixture of atmospheric air, as is done in the gas engine, give an explosive force corresponding to coal gas similarly treated. The explosive power of acetylene gas, diluted with air in a proper degree, is three times greater than coal gas. Acetylene gas, liquefied by cold and pressure, is an explosive of such tremendous force that its use has been forbidden until the means of safety controlling it has been discovered.

But calcium-carbide is particularly safe, much safer than petrol, benzine, gasoline, or any of the hydrocarbon liquids. To generate acetylene gas, only water is needed, and the carbide can be pressed into discs, or cylinders, for compact stowage, either in the automobile car, the aeroplane, or the ocean-going vessel. Cheap calcium carbide, which, from the raw materials stored in Australia in such boundless profusion, will be one of the easiest attainments for the people of the Commonwealth, should quickly make them, for fuel purposes, quite independent of petroleum and its products. If liquid fuel should, for any unstated reason, be found preferable to solid fuel, there are but two short stages from acetylene to that most excellent of all liquid fuels, namely, alcohol. Alcohol, through acetylene from brown coal, would be a fine achievement, and it seems to be quite possible.

## QUEENSLAND'S "BIGGEST MINING PROPOSITION."

The special board appointed in September by the Queensland Government to report upon the scheme put forward by Mr. Thomas Mills, of Charters Towers, for a deep shaft to test the ground thereabouts to about 4000ft., has presented its report. The board considers that the sum named by the advocates of the proposal would be insufficient to carry it out. The report states that the board could not concur in the proposal to sink a shaft to 4000ft., when, as shown by the evidence, there was a possibility that the last 1000ft. might not be utilised. They considered that the advantage to other mines, besides the Brilliant Deeps and Mills United, were somewhat uncertain and remote, and recommendation was made relative to a modified proposal, as follows:—(a) The sinking of a circular shaft of lesser diameter, say 18ft. at most in diameter, on the site proposed, to a vertical depth of 3300ft. (b) Crosscutting and connecting with Brilliant Deeps and Mills United mines at the 3000ft. level, as finally proposed in evidence, and exploration so far as may be necessary of reefs above that level. (c) The further crosscutting to the Mills United and Brilliant Deeps formation, at a depth of 3300ft., and making connections between the two levels, with such further exploration of the reefs as may be necessary between them. This proposal would place the company in a position to prospect a very much greater area at a considerably less initial cost than that proposed by Mr. Mills, and should the prospects warrant it it would at any time be equally practicable to continue the shaft to the depth originally proposed, though the actual cost of sinking would be less. The least amount of capital which should be assured to a company undertaking the enterprise should be about the same as that previously mentioned for the 4000ft. shaft, viz., £183,000. If a company was prepared to raise that amount of capital on reasonably acceptable assurances the board was of opinion that an undertaking in accordance with the modified proposal recommended would be one worthy of assistance in the form of such subsidy as the Government may feel disposed to grant.

## NORTHERN TERRITORY MINERAL FIELDS.

### "Picking the Eyes Out."

The Department of External Affairs has received a report from Dr. H. I. Jensen, Director of Mines in the Northern Territory, giving the result of a visit he recently paid to the Mt. Bonney and Fletcher's Gulf districts. Mt. Bonney is situated some fifteen miles to the east of Brock's Creek, on the Darwin-Pine Creek railway, whilst Fletcher's Gully lies well over 100 miles to the south-west of the same station.

At Mt. Bonney, the director found that good developmental work was being carried on by the owners, Messrs. Bull and Barrows. The country immediately to the west of Mount Bonney was also traversed, and at Radcliffe's Blow stone was found to contain an appreciable percentage of copper. Dr. Jensen expresses the opinion that at deeper levels values will become richer, whilst at even lower levels a slate formation carrying good gold will be met with. At the end of July Dr. Jensen left Brock's Creek for Fletcher's Gully, and his comments on the country seen on the way indicate that he holds the opinion that the larger part of the country is very favourable from the mineralogical standpoint. Regarding the last stage from the Daly River experimental farm to Fletcher's Gully, enthusiastic reference is made as to the probability of gold and copper being there met with. Referring more particularly to the immediate vicinity of Fletcher's Gully, Dr. Jensen says that "a five-head battery would make this a payable white man's field. There are enough tin occurrences to keep a battery supplied, and it would render unnecessary the present great amount of hand-picking that has to be done." In conclusion, Dr. Jensen states that he was favourably impressed with the mining possibilities of all the country traversed. There are two likely gold belts and two likely tin areas near Mount Shoobridge, and other equally rich areas before even the rich and promising mineral country beyond the Daly River is reached.

Dr. Jensen has also paid a visit to the new tin field at Maranboy, the discovery of which is causing some mild excitement. The field is situated about 42 miles due east of the Katherine telegraph station, although actual travelling accounts for a distance of well over 50 miles. With other great natural advantages, of which an abundance of fresh water is not the least, everything seems to point to a good future for the district. The width of the tin belt varies from two to four miles, and he estimates that the tin-bearing country in the immediate vicinity approximates twenty square miles, without considerable extension into the granite country, which surrounds the field. In from five to six weeks after commencing operations, a party of five men raised and bagged 12 tons of ore, which averaged nearly 50 per cent. of concentrates, and one parcel of ore showed a return of 70 per cent. of concentrates. He is of opinion that as soon as a Government battery is definitely promised there will be a great rush to the field. Dr. Jensen makes several important recommendations regarding the new field. Firstly, it is to be a "white man's land," all Asiatics being barred from participating in the natural riches which await development. The immediate erection of a Government battery is also suggested, Dr. Jensen stating that even without any developmental work having been done there is enough battery ore in sight to warrant the erection of a plant and to keep it at work for the next two years. A magnificent specimen of the tin ore from the new field is, it is understood, on its way down for exhibition in Melbourne.

Mr. T. G. Oliver, Inspector of Mines, has reported to the Director on a tour of inspection of the mining properties to the east and south-east of Pine Creek lately carried out. Most of the mines are within forty miles of Pine Creek, the present terminus of the railway running inland from Port Darwin. Mr. Oliver concludes an interesting report by saying that a large quantity of fair-grade ore is being stowed with the waste underground, but that the usual custom of "picking the eyes out of a mine" is being pursued, and he predicts that in a short period nothing will be left but low-grade ore, collapsed shafts, and a deserted field. The only way to prevent this will be by regular and frequent visits being paid by the inspector, and departmental compulsion in the matter of putting strong and secure timbering in the workings.

## INDUSTRIAL.

### New Development in Coal-Cutting Machines.

An important development in coal-cutting machines is in evidence by the recent installation of of a bord-and-pillar type of alternating-current machine at the Mount Kembla colliery, South Coast, New South Wales. This is the first installation in Australia of an alternating-current machine for bord-and-pillar work, and an account of its performance will be interesting. The machine has now been in operation for five weeks and is giving excellent results, its average cutting being about five places per shift, the width of the places being 5-yard headings and 8-yard bords. Owing to the frequent rolls of hard stone in the floor, a system of working on canches has been established. The rolls vary in height from 18in. to 24in. above the regular level of the floor, and the canches are worked 30in. above the floor. The total thickness of the seam is about 6ft. 6in. to 7ft., and it is nearly flat. Very little disadvantage is noticed by working on the canch system. It is not so convenient for machine cutting, but good results are obtained in filling the coal. An individual miner filled as high as 20 tons in a shift. There is a good parting on both the floor and the roof. The disadvantage of having to shoot up the coal in the canches is largely offset by having the advantage of the height of the canch for filling the bulk of the coal in the bord.

To facilitate the work of loading and unloading the machine on the canches, the truck is raised to a height of 2ft. 9in. above the floor. This is done by placing two pieces of 12in. "I" beams horizontally between the wheel base frame and the truck frame. The cutting speed averages 16½in. per minute, with 6ft. 6in. undercut, and the average load taken is 40 amperes. The machine is of the gas-proof type, driven by a 30 h.p. General Electric Co. (U.S.A.) three-phase, 440-volt, 60-cycle, squirrel-cage induction motor, and a Star Delta controller is used for starting. This is the simplest type of motor that has yet been constructed. There are no commutator brushes, rheostat or auto-starter as used in other motors, and consequently none of the troubles attendant with their use. The rotor runs on ball bearings lubricated with a heavy lubricating grease, thus eliminating bearing troubles. The machine is the latest producton of the Sullivan Machinery Company of Chicago, Ill., U.S.A. Its mechanical design and method of operation are identical with their new D.C. "Ironclad" type. At Mount Kembla it is 2 miles from the tunnel mouth to the workface, and, by using alternating current, power is transmitted at a much higher efficiency than if direct current were used, and with the development of this new alternating-current machine the necessity for converting to direct-current is obviated.

The Mount Kembla colliery has two additional undercutters on order. The Bulli Colliery and Coke Works are also about to instal two of these machines.

## CONAPAIRA TIN FIELD.

A report on the newly-discovered tin field at Conapaira, some 50 miles west of Wyalong and north-west of Ardlethan, has been made by Mr. J. B. Jaquet, A.R.S.M., Chief Inspector of Mines of New South Wales. The report states:—

The prospectors' claim, near the northern end of the field, was first opened as a gold mine a few years ago. Very little of the precious metal was found, however, though the wolfram attracted attention. As far as I can learn, the tin which was associated with the wolfram was not observed. After a little prospecting had been carried out, the mine was abandoned for several years. Early this year it was re-opened, following upon the important discovery of tin at Ardlethan, and, upon a search being made, tin was found to occur in association with the wolfram. A rush of prospectors took place and a number of claims containing deposits of tin were marked off; and a vigorous prospecting campaign entered upon.

The dominant geological formations consist of a large mass of granite which has intruded ancient slates, probably of silurian age. It will be noted that the geological conditions are identical with those which obtain on the great tin fields of Cornwall, England. All the tin deposits examined by me occurred in the granite not far from the line of junction between this rock and the slates, though it is quite possible that further prospecting may show that, as in Cornwall, they extend also into the latter rocks. The most important feature to be noticed is the discovery upon the field of undoubted "fissure" lodes, which have, in some instances, been traced a considerable distance upon the surface and which are likely to prove permanent in depth. These lodes trend in a north-west and south-east direction, and underlay to the north-east at a steep angle. As far as at present proved, they vary in width from a few inches to six feet. In addition to the "fissure" lodes, there are to be found other narrow tin-bearing veins, which make and discontinue in a somewhat erratic manner.

The ore consists essentially of quartz with an admixture of cassiterite (tin oxide), wolfram, and pyrites. The latter mineral (pyrites) is only in existing workings present in insignificant quantities and frequently absent altogether. The relative percentage of wolfram and tin present vary considerably in the several claims being worked. Shehan's lode can be seen in various trenches and shallow shafts extending for a distance of several hundred feet through Ryan, Davidson, Shehan and Shehan, and Clulow's claims respectively. As seen in the shaft sunk to a depth of 50ft. in Shehan's block, the lode has an average width of about 5ft., with well defined walls. In the bottom of the shaft referred to, and elsewhere, rich bunches of tin ore are to be seen. Running parallel to Shehan's lode, other lodes of promising character have been discovered. The amount of prospecting already carried out on the field is insignificant. The work carried out so far has been mainly in the direction of locating the outcrops of the ore deposits. Consequently, it is impossible for one to give an estimate as to what the ore is likely to yield in bulk, or as to the length or depth of the chutes or pay ore which occur along the lines of lode. One can only say that good ore has been discovered in places, and that some of the lodes which are yielding this ore, being of the "fissure" type, are likely to prove permanent and thoroughly warrant the expenditure of money for their development.

In some places the country is decomposed and easy to work for a considerable distance downwards, but more often hard granite is encountered close to the surface. The majority of the mines are in consequence not well adapted for exploitation by parties of poor prospectors, and can only be proved and developed by the expenditure of considerable capital.

The development of the field has been hampered through lack of an efficient supply of water. I am informed that arrangements have now been made for the erection of a battery and concentrators at an early date, which will be available to treat the stone now being raised from the various claims.

## "PREMIER GOLDFIELD OF THE WORLD."

### The Kilo (Congo) Mines.

Early in the year the announcement was made that gold was being won in fabulous quantities at Kilo, in the Belgian Congo Territory, but the Belgian Consul at Johannesburg, Transvaal, promptly denied the accuracy of the report, stating that, on the contrary, the output from the mines was very small. Since then the "Rand Mail" has published some letters written from Fort Portal, Uganda, by Mr. C. F. Malloy, an American, well known on the Rand, who has mined in all parts of the world, to Mr. D. F. Breslin, of Johannesburg, dealing with the alleged discovery. Referring to the Consul's disclaimer, the writer says:—

"I don't doubt his integrity, but the figures given him to publish are absurdly ridiculous. During my seven months' stay in Uganda, I have met many of the Kilo employees coming from and going on their six months' holiday. Now, those who gave me any information—and many of them did—gave me the number of whites employed as fifty, and natives as thirty thousand. One man, who did not know whether or not he would return, said the yield of the Moto mine was 12 oz. per square yard. Gravel 2ft. deep from the surface. Now, anybody can understand that, with a few lines of sluices on such ground, the output per annum would be many times that of the Consul's published statement. And the above mine is only a small portion of the 150 miles of area that they are at present working."

A week later, Mr. Malloy wrote:—"During last week several parties passed through here on their way to and from the Congo. Some were traders and some were elephant hunters, who are well acquainted with affairs in Kilo, having had many years' experience in the country. I showed them the statement published by the Belgian Consul in Johannesburg, giving the amount of gold taken out of Kilo per annum. It created a great laugh. One elephant hunter declared that, from his personal knowledge, the amount stated would not be enough to pay the Kaffirs who are employed in the mines, and whose wages are from 5s. to 8s. 6d. per month. I myself think that the amount would not be enough to pay the white officials, and the miners employed in the camps. They treat the white miners very well, indeed, pay £40 per month, with board, wines and liquors, and even champagne, all free—an Australian told me, more than he could use. The Belgians in Kilo and Katanga are great wine drinkers. Some of the officers in Elizabethville, who were far gone in their "cups," let it be known that the money spent in Katanga, which was considerably over one million pounds, was Kilo gold. A German trader who passed through here two weeks ago told me that over one year ago they had discovered five reefs giving over 60 per cent. gold; that is, more gold than rock. . . . From a reliable party, who is on his way to Mombasa, from the Lake district, where the Belgians are making a road from Kilo to connect with the English road from Ginga, on the Great Nyanza, they struck an enormously rich reef, giving 70 per cent. gold. There is no doubt the Rand will have to take a back seat, for Kilo is the premier goldfield of the world. Until the Ginga-Kilo road is completed it would be impossible to get a mortar-box into the country."

## ORE DEPOSITION AT MT. LYELL (T.).

By Hartwell Conder, M.A., A.R.S.M.

In the Records of the Proceedings of the United States National Museum, No. 2005 constitutes a brief paper of 26 pages by Messrs. Chester G. Gilbert and Joseph E. Pogue, on "The Mt. Lyell Copper District of Tasmania."

The paper is of especial interest in that it embodies some careful metallographic work on the ores of the Mt. Lyell and North Mt. Lyell mines. This method of exmination has been widely used in the examination of metals and alloys in metallurgical work, and is now being applied to the problems of ore deposition as well. In the words of the writers, "the microscopic work was done on polished sections with a metallographic microscope, using vertical illumination from an acetylene light at magnifications ranging from 30 to 200 diameters. The minerals were identified by noting their characteristics, such as colour, hardness, structure, tarnish and etching effects, upon areas sufficiently large to furnish fragments for blow-pipe tests: by which means criteria were obtained for the identification of these minerals, even when microscopically developed." It will be realised that this opens a new field of research which may yield fresh means of tracing out the intricate problems involved in the occurrence of our valuable minerals.

The verdict of the writers is consonant with that of Twelvetrees and Gregory, that the ores in both mines arose through replacement of the minerals in the schist. Further, they consider that priority of deposition may be assigned to the pyrites, and that, broadly, "the order of deposition, as evolved, runs from cupriferous pyrite through chalcopyrite, bornite, and chalcocite, to the tetrahedrite-enargite group. They can find little evidence of secondary enrichment from above, but they point out the difficulty of distinguishing between this form of enrichment and local selective action in the primary deposition. They dissent from Gregory's view that the ore is "due to tectonic and not to igneous action," and regard the ore-bearing solutions as a "deep-seated development from a differentiating mass of igneous rock."

The paper is accompanied by three plates, giving photomicrographs of the ore sections. It is a useful and valuable contribution to our knowledge of the occurrence of the ores at Mt. Lyell.

The writers refer to a selected bibliography on the Mt. Lyell field, and speak of Prof. Gregory's work on the Mt. Lyell mining field as giving the results of a "thorough geological investigation." It may, however, be observed that, so far, it cannot be said that any thorough investigation of the geology of this field has been made. Prof. Gregory's work was the outcome of two brief visits to this field, and shows clearly a lack of familiarity with the main features of the geology of the West Coast.

The policy of the geological department has been to investigate the outlying parts before turning attention to the main centre of interest. This policy is undoubtedly a wise one, since it should be possible to correlate the information collected at other points in arriving at conclusions here; but it is satisfactory to know that the examination of the Mt. Lyell district will not now be long deferred, and that we may expect a thorough and detailed survey of one of the most complete and difficult geological problems that can be encountered in Australia.

# ENGINEERING AND ELECTRICAL SECTION

THE FAMOUS
"Brimsdown"
"Wirum"
BRITISH MADE Lamps.
The most popular, reliable and economic lamp on the market.

Sole Agents - THE
LAWRENCE & HANSON
Electrical Co. Ltd.
466 LONSDALE ST., MELBOURNE.
33 YORK ST., SYDNEY.
and at WELLINGTON, N.Z.

## BRITISH ASSOCIATION.

### Manchester Meeting.

(From Our London Correspondent.)

A committee on certain of the more complex stress distributions in engineering materials (chairman, Professor J. Perry) submitted to the engineering section a lengthy report, and arrived at the following conclusion:—

Most experimental work has been done on ductile steel, but more tests are required under three-dimensional stress, and particularly under compressive stresses.

One point appears to have escaped notice. A material might appear to have different shearing strengths under different systems of stress, as in the case of cast iron in shear and under compression. The shearing stress has been shown to be approximately constant at the elastic failure of steel under conditions of the same general type of stress distribution. Are these maximum shearing stresses the same under all conditions of loading?

They have frequently been compared with the tensile strength, and the differences do not seem to be great, but it would be of interest, and necessary for further refinement, to test exactly the same material under very different combinations of principal stresses.

Few experiments have been made with the materials now classed as brittle, and those already made should mostly be repeated. Here we can assume that there is a clear field. The same applies to non-elastic ductile metals, and to those intermediate between ductile and brittle.

The methods of experiment will require further consideration. Simple tension and compression are the most direct tests available. Longitudinal tension and internal fluid pressure applied to a thin hollow cylinder appears to be the readiest means of securing two tensions. Longitudinal compression and external fluid pressure have been used for obtaining two compressions, but it is hardly satisfactory for all cases, and might be replaced by external fluid pressure on a solid specimen with free ends, as in Bridgman's pinching off test, but this requires extremely high pressures. A complete treatment of the problem in three dimensions appears possible only by the use of high fluid pressures.

Cases of combined stresses in engineering practice should be the subjects for separate tests, and cannot entirely replace those which are intended to determine the laws of failure. Combined alternating stresses are mainly of practical interest, and here again the experiments should be modelled to suit the engineering examples. Cases are not uncommon in which compound stresses are applied under shock conditions, but a further consideration of this matter might well be the subject for a later report.

## MELBOURNE CITY COUNCIL'S ELECTRIC SUPPLY UNDERTAKING.

In connection with the discussion which arose some time ago in the Melbourne City Council relative to the supply of electric energy to Footscray, the statements made by Mr. Harper (City Electrical Engineer) have led to the belief gaining ground that the outlying municipalities are being charged too much for the supply of current. It will be remembered that Mr. Harper submitted tables showing the cost of production and the charge for the bulk supply of electric energy to the Footscray Council. These particulars were submitted to refute the contention of certain members of the Melbourne City Council that city consumers were charged a price which imposed upon them the burden of paying off capital cost, while the outlying consumers went scot free. Mr. Harper was able to show that, so far as the Footscray council is concerned, the Melbourne City Council is making a profit of about ½d. per unit, equivalent to nearly 40 per cent. over cost of production. That this was a very unsavoury pill for the purchasing councils is evidenced by a resolution adopted last week by the Port Melbourne Council on the motion of Cr. Howe, that "the Councils of Footscray and Brunswick be invited to join the Port Melbourne Council in waiting on the Melbourne City Council to ask for a reduction in the rate of supply of electric energy in order to allow them to cater for large consumers of power, the present rate being prohibitive." It was pointed out during the proceedings that large consumers had applied for current at a lower rate than that fixed, while a reduction would mean a loss to the Council unless the Melbourne City Council reduced its charge proportionately. The Williamstown Council is waiting for some finality in connection with its application, made to the M.C.C. about eight months ago, for the supply of current, which it was expected would be reached when the position relative to the supply of energy to Footscray was ascertained. The M.C.C. have now side-tracked into the question of seeking legal advice, and until this is received all the purchasing councils will probably be hung up on the same peg.

---

## LOCAL GOVERNMENT ENGINEERS (V.).

### First Annual Conference.

At the first annual conference of the Victorian section of the Institute of Local Government Engineers of Australasia, held at the Melbourne Town Hall last Friday, the general secretary, Captain G. A. Taylor, presented the following report:—

"I had recently before me a statement showing areas, revenues from rates, and salaries paid in many of the Victorian shires. That return showed a bad state of affairs. It showed that there were some shires with a little conscience, and others with none at all. The latter set are paying an officer to undertake the duties of engineer, secretary, and collector, as little as £144, £181, and the like, with the right, however, of 'private practice.'

"This private practice bugbear and fallacy had to be squelched in New South Wales. I would fairly ask the Victorian councils which participate in this trickery what 'private practice' is open for an engineer hedged in with the responsibilities they are certain to impose 'in the interests of the shire.' Upper Yarra, for instance, not only imposed duties out of all reason, but expected the engineer to act as clerk of works as well. The institute would again point out the necessity for the introduction of a reform to provide that engineers must serve no more than one shire, except where their areas adjoin. In the present circumstances many councils might be without engineering service altogether for all the good they are benefiting. The practice is to employ the cheapest man, without a care for his capacity to undertake the work. He might be engaged by numerous other councils in the various capacities of engineer, clerk, valuer, and rate collector, as was, or is now, the notorious 'Pooh Bah.' Those are facts that do not weigh with the council seeking the cheap man, but the trouble is that they invariably get cheap service in return, and the ratepayers, together with the system of local government, suffer.

"The underpaid man is a disheartened and nonchalant worker from the outset. If he is of the 'Poo-Bah' type, his indifference is induced by the fact that each of the councils he serves is regarded by him as one of the many that go to provide his salary. Not being permanently employed in one, there is no reason why he should, in his opinion, efficiently serve any; and the act is farther to the surmise. He serves none as he should, and cannot possibly serve all.

"The engineer who is content to concentrate his professional brains and skill on the development of one shire is the better officer, because his permanency keeps him in touch with local requirements, which 'the jackal' type, in their periodical raids, cannot discern. The obstacle to an engineer confining his operations to one shire is that shires are not prepared to pay him a commensurate salary when they can secure professional jackals for the scraps they like to offer. Local Government in Victoria cannot hope to develop as it should while the devastations of the jackals are permitted, and the power lies with the Minister in the manner indicated. Then shires bereft of their right to engage the officer who is prepared to accept a little from this and a little from the other will require to offer reasonable salaries to secure the permanent services of qualified engineers."

Later in the meeting, on the motion of Mr. W. J. Muntz, seconded by Mr. W. Gay, it was agreed:—"That this conference is of opinion that the local Government engineer should receive consideration in any proposed establishment of a board of control for the Federal Territory."

---

## SYDNEY TRAMWORKS ELECTRIC POWER STATION.

Such portion of the new power station for the Sydney tramways at White Bay, Balmain, as is necessary for immediate requirements is rapidly nearing completion. The dimensions of the station when complete will be 465ft. by 242ft. overall, and it will provide accommodation for a plant which will be capable of developing 100,000 horse-power at a nominal rating, or 120,000 horse-power for short periods, when the demand is high. The plant will consist of three 7000 kilowatt turbo-alternators, each with an overload capacity of 50 per cent. for two hours; turbines, of the impulse and reaction type, manufactured by Messrs. Willans and Robinson, of England, coupled to alternators by Messrs. Dick, Kerr and Co. of England, running at 750 revolutions per minute; a fourth unit of 7500 kilowatt capacity, an impulse type turbine by the General Electric Co., U.S.A., with an alternator running at 1500 revolutions per minute. The machines are arranged in pairs, with the auxiliary equipments in the basement between the foundations. Condensing plants for the three 7000k.w. turbines are being supplied by the turbine manufacturers, but in the case of the fourth unit, the condensing plant complete, together with the circulating pumps for the other three units, is being supplied by Messrs. Allen and Son, England. The circulating pumps are of gunmetal, each being capable of delivering 13,000 gallons of water per minute against a head of 23ft.; and they will be operated by 125h.p. electric motors, running at 375 revolutions a minute. Each condenser has a cooling surface of 14,300 square feet.

The steam plant will consist of Babcock and Wilcox water-tube boilers, four of which are being provided to each turbine unit. The boilers are probably the largest at present installed in Australia, each having a heating surface of 8283 square feet, with a grate area of 196 square feet, and a guaranteed normal evaporation of 27,000 lb. of water per hour, or 37,000 lb. at forced rating. The steam working pressure of each boiler will be 180 lb. per square inch, and the superheat 200 deg. Fahr. Each pair of boilers will be connected to a chimney of special design, the required draft being obtained by means of an induced air blast on the ejector principle. Sixteen chimneys will be required for the completed station.

Two concrete conduits, each 6ft. square, are being provided to bring the water from White Bay to the power-house, and return it thence to Rozelle Bay. A suitable arrangement of the valves will make it a simple matter to reverse the direction of the flow and discharge of water. Special motor-driven revolving screens of wire-netting will catch any rubbish and bring it to the ground surface, where it will be cleaned off by a revolving brush, and ultimately burned.

Meantime, only about half the building space and portion of the plant will be required, but when complete the residents of Sydney and suburbs will have one of the largest and best equipped power-stations in the world.

## ENGINE-DRIVERS' AWARD.

Mr. Justice Higgins, President of the Commonwealth Conciliation and Arbitration Court, last week delivered his award on the plaints of the Federated Engine-drivers' and Firemen's Association against respondents in all the States except Western Australia, the award applying to a variety of industries in numerous industrial centres. The minutes of the award will be discussed by the parties next Wednesday. The following are the details of the award:—

Wages.—The minimum rate of wages to be paid by any respondent to employees of the following classes, if members of the claimant organisation, shall be as follows (with the exceptions hereinafter mentioned).—Locomotive drivers, 12s. a day, but if the railway gauge be not less than 3ft., 11s. per day; winding engine drivers, 12s. per day; crane engine drivers: (a) if the crane exceeds five tons, 12s. per day; (b) if not, 11s.; traction engine drivers, 11s. 6d.; winch drivers (a), if on bucket dredge, 11s. 6d.; (b) if not, 11s.

Other Engine Drivers.—(a) If the engine or engines have steam as motive power, and have a single cylinder, with a bore exceeding 12in. in diameter or have singly or together two or more cylinders the sum of the areas of whose bores exceeds the area of a circle 12in. in diameter (that is to say exceeds 113.0976 square inches with condenser 11s. 6d.; without condenser 11s.; (b) but if as stated in (a) 10s. But if the engine driver also attend an electric generator or dynamo (other than a dynamo for merely lighting the works) he shall have an additional payment, (a) if cylinder over 24in., 1s. day; (b) if not, 6d. per day; or if the engine driver be also in charge of the plant, an additional payment of 1s. per day.

Motor Attendants.—(a) Where the motor or motors to which the employee attends exceed 50 h.p. in all, 9s. per day; (b) 16 years of age and under 18, 5s. per day; 18 and under 19, 6s.; 19 and under 20, 7s.; 20, but under 21, 8s.; 21 or over, 9s. But in the case of traction or locomotive drivers in Victoria, if the attendant be 21 or over, 10s.; if under 21, employed underground, 7s.

Firemen.—(a) If attending one boiler or gas generator, 9s.; (b) attending two boilers, 9s. 8d.; (c) three or more boilers, 10s.; (d) if attending boilers developing in the aggregate 1000-h.p., 11s.

Trimmers, Greasers, or Engine Cleaners.—Adults, 9s.; under 16, 4s.; 16 and under 18, 5s.; 18 and under 19, 6s.; 19 and under 20, 7s.; 20 and under 21, 8s.; but if they sometimes or always stop or start engines, 1s. more.

Boiler Cleaners. (a) If and while at "dirty work", 1s. 6d. per hour; (b) if not, 1s. 1½d.

Hours, Overtime, Sundays, etc.—In the case of employees other than locomotive drivers and locomotive firemen, (a) eight hours shall constitute a day's work (except in case of continuous process), 48 hours per week. The provision that eight hours shall constitute a day's work shall be deemed to be satisfied if the time of duty be 8¾ hours on five week days and 4¼ hours on one day in each week. In case of the continuous process all time on duty in excess of 96 hours in every fortnight shall be deemed overtime, except when the excess is owing to arrangement between the employees themselves, or is necessary for effecting periodical rotation of shifts, or is owing to the relieving man not coming on duty at the appointed time. (b) For all time of duty beyond the eight hours payment shall be made at the rate of time and a quarter for the additional time for the first two hours, and at the rate of double time for the additional time thereafter. (c) For all time on duty on Sundays or holidays (except in the case of a continuous process) payment shall be made at the rate of time and a half, with this exception, that whenever in a mining undertaking (other than metalliferous mines in Victoria) pumping or baling is necessary, or repairs to or renewals of engines or other machinery, payment shall be made at the rate of time and a quarter. In the case of locomotive drivers and firemen (a) 48 hours shall constitute the week's work; (b) for all time of duty beyond 48 hours in any one week payment shall be made at the rate of time and a quarter for the first two hours and time and a half thereafter; (c) for all time of duty beyond eight hours in any one day payment shall be made at the ordinary rate per hour for the first two hours, and at the rate of time and a half thereafter. In all cases the time on duty necessarily occupied in raising steam, in starting up, closing down engines, or in banking fires, shall be included.

Preference.—On respondents undertaking to this court not to discriminate against members or officers of the claimant organisation in giving or continuing employment, or in any other way, and not to obstruct or injure the organisation in the legitimate proceedings, the court declines to make any order for preference to members of the organisation against the said respondents. But the court reserves the question of making an order for preference against the other respondents.

Miscellaneous.—Except in the cases hereinafter mentioned, winding engine-drivers shall not be required to do any work other than attending to their engines if they are liable to be called upon to raise or lower human beings up or down a shaft or incline. The excepted cases are—(a) The cases of the following respondents, so long as they adhere to their present system of working:—Golden Reef, Golden Pyke, United Devonshire, Central Red, White and Blue, Catherine Reef United, Bruun's Frederick the Great, New Prince of Wales, South Cornish, Murchison, Virginia, Specimen Hill, Golden Reefs, Catherine Reef, Diamond Creek, New Normanby mining companies. (b) In the cases of such engine-drivers as do the other work with the written consent of the claimant organisation or its authorised agent, or with the consent of the board of reference constituted by agreement between the claimant and the respondent who employs the engine-driver. Where the employment or work involves functions of a mixed character the minimum wage to be paid to the employee shall be calculated as if he performed such only of the said functions as involved the highest rate of wages under this award. The provisions of this award apply except where the contrary intention appears to persons engaged in the several occupations referred to, whether the motive power be steam, electricity, coal gas, suction gas, pressure gas, air, oil, or any other motive power other than hand or animal power.

Definitions.—An engine-driver is "in charge of plant" (a) where two or more drivers of the same class are employed at the plant at the same time, and he is the driver invested with the superintendence and responsibility; (b) where the driver being the only person of his class employed on the plant does the general repair work of the plant in addition to the work of engine-driving.

"Holidays" means Christmas Day, Boxing Day, New Year's Day, Good Friday, Easter Monday, Eight Hours Day (or Labour Day), or such other days not less than six as the employer may prescribe for the employees, or any of them, with the consent of the claimant.

"Dirty work" means all work done in person inside a boiler, including scraping and cleaning any internal part of the boiler, flues, or tubes.

"Continuous process" means a process in which men are employed seven days every week for not less than eight hours per day for an unbroken period of not less than one calendar month.

"Motor attendant" means a person who attends to an electric motor or motors of 10 horse power or more in the aggregate, and performs any duties of oiling or cleaning or attending to commutators, brushes, fuses, or switches.

Term of Award.—This award is to continue in force for a period of five years from this date.

The award is practically the same in each claim, except with regard to wages. The rules quoted are those applying to Sydney, which is made the basic point of calculation. The rates for Melbourne and Launceston are to be 6d. less; Ballarat, Bendigo, and Eastern Tasmania, 1s. a day less; Omeo (V.), Stanthorpe (Q.), and Emmaville (N.S.W.), 6d. a day more. The northern and southern collieries and other parts of New South Wales, South Australia, and the West Coast of Tasmania are on the same rates as Sydney. The date at which the determination will come into force remains to be fixed.

## HYDRO-ELECTRIC SCHEME (T.).

### Assembly's Resolution Rejected.

Just before the appearance of our last issue, the Tasmanian Legislative Council rejected the resolution sent up by the House of Assembly favouring the purchase by the Government of the hydro-electric portion of the undertakings of the Hydro-Electric and Metallurgical Company. The terms of that resolution, which was substituted for the alternative schemes set forth by the company when asking for financial relief from the Government, were given in our columns on October 9. This was formally brought before the Upper House on October 21 by the Acting Chief Secretary, Mr. C. Russen, who delivered a long and lucid speech, strongly in its favour, and the Council devoted four sittings to its consideration. The tone of the speeches was anything but inimical to general principle of Government purchase of the works; members showed that they were open-minded on the subject, prepared to hear both sides, and to do justice to both the company and the public. But, as the debate proceeded, it became increasingly clear that there was a general desire that an independent expert report should be secured before the Government committed itself to such a large outlay, the only estimate of the value of the scheme and of the work done so far supplied being that of the vendors or their agents. That was the gist of the amendment to the resolution proposed by Mr. Ellis Dean after Mr. Russen had concluded his speech, and Mr. Dean's speech, in which he declared himself as strongly in favour of Government purchase if it could be done without loss to the State, undoubtedly carried weight with the House. While the Legislative Council was considering the question, others outside of Parliament were doing so also, and the Chamber of Commerce passed a resolution requesting the Government to obtain an independent report and valuation before giving a reply to the company. It is not surprising, therefore, that at the end of the discussion the Council rejected, by 14 votes to 2, the resolution passed by the other House. But this does not close the matter altogether, for leave was given on the 29th to table a new motion inviting the House of Assembly to submit fresh proposals, after an expert report and valuation have been received.

Meantime, Mr. Ogden, in the House of Assembly, was keeping interest alive. He asked the Premier whether he was aware of the truth or otherwise of the rumour to the effect that a number of those persons who were actively opposing the purchase by the State of the Hydro-Electric Company's assets, and had assisted in carrying resolutions against it, were at the present time negotiating with the London debenture holders on behalf of the Hobart Gas Company for the purchase thereof? To this, Mr. Solomon replied that he had no information on the subject, but Mr. Ogden gave no particular reason for believing the rumour, nor any clue as to its origin or distribution.

## ULIVI'S "F" RAYS.

### Reported Admiralty Trial.

It was announced by cablegram from London last week that a trial had been made by the British Admiralty, in the Solent, off the Isle of Wight, of Signor Ulivi's method of applying the principles of wireless telegraphy to the explosion of submarine mines. It is true that next day brought another cablegram, saying that, according to the "Daily Mail," the trial was of new explosives and not of a new method of those already in use, and apparently an official declaration will be required before it is known exactly what was done, and how. At any rate, the occasion created a fresh interest in Signor Ulivi's device, and some particulars of it may be given here. Signor Ulivi, who is an Italian engineer, does not claim that he is an inventor, nor even a discoverer. All he claims is that he has applied well-known laws to this special purpose; that by utilising the infra-red rays of the spectrum any known explosive can be fired, no matter how carefully it be stored or how vigilantly guarded. Ammunition in a ship's magazine is no longer safe; torpedoes can be made to sink their own ships. The light rays employed, which Ulivi designates F rays, are in some respects similar to the more widely-known X rays, not only penetrating the stoutest and finest metals, but showing a special partiality for metals as the medium through which they can best exert themselves. A few weeks ago "The World's News" gave a general account of some experiments which had been made at Havre, and from that journal the following passages are quoted. After speaking of the arrival of the yacht "Marie Henriette" at Deauville, with Ulivi on board, of the embarkation of General Castelnau, of the Headquarters Staff; Major Ferrie, head of the wireless company of the Eiffel Tower; and Captain Cloitre, from the Admiralty; of the yacht's departure under the guidance of a pilot, and her speedy return, the writer proceeds:—

"For the next two days extraordinary rumors were flying about that the Italian engineer Ulivi had successfully demonstrated a method of exploding, at distances varying from 600 yards to 12 miles, various charges hermetically sealed in metal receptacles and sunk at random. A series of these receptacles was laid down at 600 yards apart for a distance of about 6000 yards, and a final test was made before Villers at a distance of over 12 miles. It had been proved that charges could be exploded if fitted with a 'Branly coherer,' which was useful for submarine mines, and, in fact, any charge that the exploder wished to ignite. But Ulivi's method is of infinitely greater possibilities, aiming at the enemy's explosives wherever they may be stored. Should trials at longer distances succeed, it would almost seem as if an end were approaching to all naval warfare and to navies themselves. Torpedoes will be exploded on board their own ships, and charges inside the guns. Airships with metal envelopes, like the Zeppelin, will be foredomed, and it is impossible to see how far the whole art of war may not be revoluntionised, if war itself be not rendered almost absurd by an invention which renders the possession of explosives more dangerous to their owners than to their adversaries.

"Broadly speaking, Signor Ulivi's method consists in seeking with a projector the metallic masses situated within range, towards which he is to shoot his infra-red rays, and by the range-finding process of the 'return waves' he can calculate the exact distance of each and its radio-magnetic capacity. A fixed calculation then allows of despatching the exactly necessary wave towards this object of known capacity at a known distance. The cardinal point is accuracy and precision in determining the locality and capacity of the target, and this was the principal object of the experiments outside Havre, since the rest of the operation is admittedly and scientifically one of comparative ease. The attuned wave, in traversing the metal it meets, diminishes the frequency of its vibrations, and the task of the operator consists in bringing the frequency to the critical point at which a spark is emitted, and emitted on the other side of the metal plate of resistance. If rumour is to be believed, Signor Ulivi has succeeded in evolving a method of certainty in effecting the production of this spark, and proved it triumphantly on the sunken charges outside Havre."

---

## IMPORTANT ADVANCE IN GAS ENGINE DESIGN.

London, August 1st.

The Institution of Mechanical Engineers has been holding its meetings at Cambridge this week under the presidency of Sir H. F. Donaldson. The morning meetings have been occupied with the reading of seven papers, the titles of some of which have already been stated. In addition to two days at Cambridge, one has been devoted to a visit to Ipswich, and the proceedings conclude to-day at Bedford. From our point of view by far the most interesting subject advanced has been that covered by Professor Bertram Hopkinson in his paper on "A New Method of Cooling Gas Engines." The author described a method of internal injection, the cold water being injected through a hollow casting projecting into the combustion-chamber, and provided with a number of holes or small nozzles about 1-32 inch in diameter. The jets so formed are comparatively coarse, so that even when projected into the flame the water reaches the part of the wall against which it is directed with but little evaporation on the way. The jets are directed to all parts of the surface of the combustion chamber and against the face of the piston. Prof. Hopkinson said that when he first began to consider the use of internal injection as a means of cooling, the difficulties of corrosion and lubrication seemed to be an insuperable bar, until it occurred to him that they could probably be overcome by the simple device of regulating the amount of water injected in such a way that the temperature of the whole engine is kept well above 100deg. C. Under such conditions (which of course are only rendered possible by the absence of all external water cooling) every drop of injected water is boiled when it reaches the walls, and no liquid can accumulate. The large drops of water projected from the nozzles can dissolve but little gas on their way to the walls, for their surface is relatively small, and they are only in contact with the gas for a fraction of a second. What little they do absorb is at once driven off when they strike the hot metal, because the water is almost instantly converted into steam. Prof. Hopkinson gave particulars of trials which had proved that corrosion may be completely prevented in this way. The practical application of this system of cooling, he said, had been much facilitated by a discovery made by himself soon after he began experimenting with it. He later described an experimental engine which had been worked for some thousands of hours, and is now working with a very hard water, containing about 0.35 gramme of salts to the litre (25½ grains to the gallon), so that the surface of the combustion chamber and the face of the piston have become thickly encrusted with salts. Yet no trouble whatever has arisen, because no water has been allowed to fall on the sliding surfaces. The absence of pre-ignition under such conditions is also noteworthy, and shows the efficiency of this method of cooling. In order to put his ideas to a practical test, Prof. Hopkinson had a Crossley engine 11½in. dia. x 21in. stroke, rated at 40 b.h.p. (with coal gas) at 180 revolutions per minute, fitted with a new cylinder consisting of a plain barrel without any water jacket. The valve motions were retained, and the valves and the shape of the combustion chamber were the same, the only change being the removal of all external water-cooling. It was therefore possible to make an accurate comparison between the performance of the engine with the new system of cooling, and the results of the measurements of fuel economy and the temperatures of the piston and other parts of the engine which had been made by the author on the same engine when jacketed. The compression ratio in the engine is 6.37, giving a compression pressure of about 175lb. per square inch. This, says Prof. Hopkinson, is higher than usual, and proved when the engine was jacketed to be too high for ordinary practical working. The successful working of the new cylinder therefore constitutes a satisfactory proof of the freedom from pre-ignition, which is characteristic of cooling water-injection.

Prof. Hopkinson gave a sectional diagram of the new cylinder with water injection rose (see figure). The injection rose is a hollow casting, projecting into the combustion chamber. There are about 25 holes in the rose, each 1-40 inch in diameter, and the jets proceeding from these are directed as shown against all parts of the combustion chamber and piston head. There is no jet on to the exhaust valve, as it has been found that the drip from the rose is sufficient to keep this cool. The water is injected by a simple plunger pump similar to that used for the injection of fuel in Hornsby's oil engines. It is driven by a cam on the valve shaft, whereby a charge of water is injected once in a cycle. The pump stroke commences about 30deg. before and finishes about 30deg. after the point of ignition, so that water only goes in at a time when practically the whole of the sliding surface of the barrel is covered by the piston.

Immediately after erection with the new cylinder, the engine was run continuously for 120 hours on an electrical load with coal-gas. Continuous observation was kept of the gas consumption and of the load. The engine developed during this period 43 b.h.p. on the average, and ran very smoothly and steadily. The average mean effective pressure was 101 lb. per square inch. When jacketed, the engine would not develop more than 40 b.h.p. continuously without overheating, and mixtures giving a mean pressure of more than 100 lb. per square inch produced excessive maximum pressures (over 500 lb.) with violent thumping explosions. The reduction in maximum pressure, under these circumstances, by water-injection is over 100 lb. per square inch, and the effect is very marked, the explosion becoming almost inaudible. This effect of the presence of steam in the explosive charge is of course well known, but the quantity of steam formed in an engine cooled in this manner is so large that it constitutes a substantial advantage of the method. It will be noticed that the formation of the steam does not involve any thermodynamic loss, such as occurs when water is sprayed into the cylinder in an atomised condition, and evaporated before reaching the walls, since the heat used is that which would otherwise be wasted in the jacket-water.

The quantity of water used on this trial was on the average 102 lb. per hour, equivalent to 2.4 lb. per b.h.p.-hour. The temperature of the engine varied from 150deg. to 180deg. C. No water was visible on the piston or the spindles of the valves, and when the engine was stopped at the end of the trial the inside of the combustion chamber was found to be perfectly dry. When the engine was jacketed and giving the same power for short periods the jacket water removed about 67,000 B.Th.U. per hour, which would be sufficient to evaporate 108 lb. of water at a temperature of 20deg. C. under atmospheric pressure..

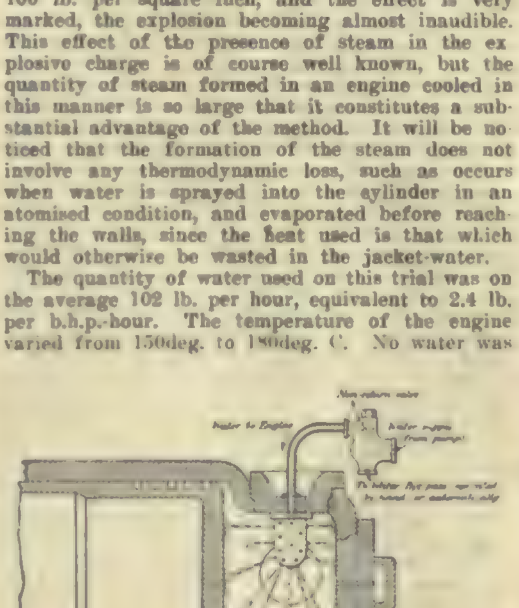


Fig. 1.—Section of Cylinder with Water-Injection Rose.

The engine was subsequently put to drive a dynamo in a factory engine rooom. Its speed was increased from 180 to 195 revs. per minute. It was left in the hands of the ordinary engine room staff for several weeks, and was worked continuously for long periods of time at excessive loads. During this time it developed at times 50 b.h.p. with coal gas for several hours together—an increase of 25 per cent. on the maximum continuous load which it could safely carry when jacketed. The engine is now at Cambridge engaged in regular service with a suction-producer driving the workshops and producing electric current for the engineering laboratory at the University. "It is left to itself like an ordinary gas engine, giving no trouble at all, and has now been in regular work for two years, the total time of running being 5000 hours."

A later section of the paper deals with the application of the method to large engines—one an engine of 18½ inches bore, giving 105 b.h.p., and the other a 1000 b.h.p. Oechelhauser engine of 36in. bore, trials being quoted which proved beyond all question that the largest cylinders now built can be cooled entirely by water injection if applied in accordance with the principles enunciated by the author. An entirely new engine designed *ab initio* with a view to the use of water-injection has been made by Messrs. Davey, Paxman and Co. It is now completed and undergoing trials. It embodies all the experience gained in the course of the experiments. It is a 2-cycle single-acting engine, 18 inches in diameter by 24 inches stroke, with separate gas and air pumps, and is cooled entirely by water-injection.

---

## MOTOR TRACTION.

One is struck, in observing the extent to which motor traction is availed of in Melbourne, by the vast possibilities bound up in that means of transport. And Melbourne is not by any means the leader of fashion in this respect; on the contrary, it lags far behind in a lot of things with which modern progressiveness is associated. Still, the general aspect of Melbourne as a hive of industry is vastly different from what it was five years ago, and that it will at length arrive in the forefront with all the latest and best facilities goes without question. Indeed, taking Australia as a whole, its industrial conditions are such that its one hope in the race of nations lies in the adoption of the most approved and improved of time and labour-saving appliances. Associated with these must be method and system, and that personal element which is the fuel or motive power of the machinery of commerce. With efficiency, made up of the best equipment and business system, and the personal, intelligent force of brains, the trader, the manufacturer, and the contractor may laugh at high wages. In this connection, the "Engineering Magazine" for September contains an article on motor trucks in engineering work, in which the author says "Modern contracting and engineering construction has been reduced almost to a science in the utilisation of labour-saving machinery, save in an important—in fact, one of the most important—of the factors which in the main determine the success or the failure of the engineering contractor. Transportation is still being done by the majority of builders and contractors in the same fashion employed since the engineering industries began to assume their enormous industrial importance." And this complaint comes from the land of acumen and hustle. Concurrently with this, the writer of that complaint gives an account of the use of motor traction in construction work in the United States, which, after all, is very extensive, and the complaint is clearly directed at the army of contractors which trails behind the vanguard. Still, there must always be the leaders and the ruck in the onward march, a condition found in all countries at all times.

The writer of the article referred to quotes the probable reason for the comparative indifference of the contractor, until the last couple of years, in regard to motor transportation as being that motor truck manufacturers had not made a very serious study of the peculiar requirements of the engineering contractor. In other words, there is, or has been, no co-operation between the two factions. Progressiveness is made up of many details, every one of which should be a factor in the sum total. Every detail should count, and it cannot be denied that transport is an item which figures prominently in the costs sheet of every contractor—engineering and building alike. A very telling argument used by the writer of the article is that, in the face of keen competition in these industries, the contractor who does not provide himself with every kind of efficiency tool that modern science has placed at his command can never hope to compete in the race for profitable business. In the construction of engineering works requiring a vast amount of haulage, the time lost in slow transportation sometimes costs the contractor all the profit which his contract carries with it. This is perfectly true, and here in Melbourne we see daily evidences, on the one hand, of the tenacity with which the slow system of transport by horse vehicle retains its hold; on the other hand, the thin edge of the wedge of enterprise whereby motor traction is rapidly finding popularity for common carrying and delivery purposes. To give some idea of the value of motor trucks, apart from their ordinary functions of carrying and transporting loads, the "Engineering Magazine" illustrates a variety of purposes to which they are put. In one case, two motor waggons are coupled to a huge steam shovel to move it to new ground. In another, a motor truck carries a huge pipe on its own floor and drags another mounted on a trailer, representing in all a load of 12½ tons, and, in addition, is shown how the pipe is unloaded by power supplied from the motor engine. In yet another, a 48-inch pipe, many times longer than the waggon, is loaded by means of a derrick, one end made fast to the floor of the waggon and the other end resting on a trailer. In other instances the trucks shown are invariably constructed for self-dumping, either from the back or sides, a variety of methods being used; but all directed to the same purpose, to save time and labour. Because of its wonderful versatility it seems inevitable that the motor truck will ultimately finally supersede the horse. And yet the motor truck is acknowledged to be far from perfect, but it has come to stay because it has shown itself to be superior in many ways to the horse, and it is only a question of time when motor construction will reach a stage of perfection which will ensure absolute reliability in all its uses.

## WIND POWER.

### Application for Generation of Electrical Energy.

By W. H. Myers.*

Lord Kelvin is credited with having been the first to suggest the combination of wind-mill driven electrical plants and storage batteries as a means of utilising the power of the wind, and Professor Blyth, in 1887, the first to put the suggestion into practical shape, by erecting a plant in Marykirk, Kincardineshire. The mill first employed by Professor Blyth was of the usual four-arm type, the length of arms being 14ft., and the sail dimensions 8ft. by 3ft. Bevel gearing was used at the top and bottom of the vertical connecting shaft, so that the driving-wheel connected to the ground shaft revolved round in a fixed direction, without regard to the position of the wind-wheel up aloft. I might here interpose that one of the latest types of electro windmill plants (to coin a new technical term), recently developed in Germany, utilises just this method of bevel-gear drive, with various added refinements, and a view of this gear will be shown later. In the mill employed by Professor Blyth, no automatic speed regulating apparatus was employed, and although it was found (as might have been anticipated) that the wheel had to be stopped when the wind velocity was high, i.e., when it should have been usefully employed, the trials made were sufficient to indicate that the batteries could be easily charged, in spite of the irregular speed of the mill. In the light of our later knowledge, it will, of course, be known that the batteries (unless of the latest Edison, or, possibly, Fuller, type) would also be easily destroyed with such irregular running. Storage batteries, too, in those days had only quite recently developed from the laboratory stage. Professor Blyth then experimented on the American type of mill with metal blades, as the speed irregularities with the former type rapidly destroyed the canvas coverings of the vanes. He also, and this is a fact of special interest, arranged for the generator to be rope-driven from a large wheel keyed upon the mill shaft, the generator being fixed upon the mill platform and revolving with the mill-head. The irregular speed of the mill still caused trouble, however, and he finally adopted a type of mill constructed upon the principle of the Robinson anemometer, with sets of cup-shaped vanes moving at the ends of horizontal radii, and turning a vertical shaft to which the generator was attached. The theory of the Robinson anemometer indicates that the peripheral speed of the cups can only "asymptotically" approach a limiting terminal value, whatever velocity the wind may attain, and therefore all danger from racing is avoided. Professor Blyth found this action to be satisfactory, and he devised an automatic governor "cut-in cut-out" to serve the usual purpose, to which he added an additional governor for cell regulation. The inefficiency and expense of this apparatus was, and is, a bar to its commercial adoption, but there is still, I think, one important outlet for the utilisation of the idea, viz., in the lighting of light-houses, beacon lamps, etc., to which the particular form of this prime-mover should be specially suited. I am not aware of any suggestions having yet been made to utilise wind-power for this purpose or in this manner, but there do not appear to be any serious difficulties in the way of thus providing a cheap and reliable light compared with that of existing apparatus and without requiring more than a very infrequent inspection. The Commonwealth authorities are now taking extensive and expensive steps in providing more adequate coastal lights, and a few experiments in this direction might be well worth the making on the part of officers concerned.

Another form of regulation, which periodically windmill inventors reinvent, lies in the automatic adjustment of the individual sails, or portions of sails, on each radial arm, so that the total projected sail area exposed to the action of the wind lessens in accordance with an increase in wind velocity. Some comparatively large (and superlatively expensive) wind-wheels have been made in this manner. A number of these have been used in combination with electrical generators and storage batteries for the lighting of private mansions and for miscellaneous services, but with lack of commercial success. The installation of electro-windmill plants has been carried out on an extensive scale in Denmark with great success, in spite of the rather cumbersome equipments employed. Scores of such plants are in daily operation throughout the country, in which, I may add, the wind conditions are not more favourable than in the more thickly-inhabited parts of Australasia. These machines are used for supplying power for all kinds of farming operations, for lighting villages and large buildings, and it speaks volumes for the commercial value of the equipments that, in a comparatively poor country, their use should have become so general.

Another form of electro windmill apparatus is that operating on the Child's patent. This apparatus will be of special interest to members, as the first successful plant in Australia is operated, and is still operating, on the Child's principle. Some partially successful experiments were made at the Steel Wings Co.'s works, at Bay-road, North Sydney, some years ago, but for several reasons were not taken further, except in England. So that complete information on the plant at Adelaide might be furnished to members, I visited that city recently in order to personally inspect it, and by the courtesy of Mr. Peter Waite, who purchased the plant and who had it installed at his home near Adelaide, I am enabled to supply the following particulars:—

I may say that the plant has now been in continuous operation for over two years, and has been in every way successful. Mr. Waite speaks enthusiastically about it. I am afraid, however, that the first cost of this type of plant will be a considerable barrier to its general addition. The speed regulation is effected by means of the three-tail vanes shown, two of the vanes (one centre and one side vane) being hinged along their horizontal edges to the supporting rods, the third being a fixture. The two hinged vanes are connected through toothed sectors, and are controlled by a weight which acts upon both simultaneously. The modus operandi is as follows:—With a low wind velocity, the main wheel revolves at right angles to the wind's direction, as usual, and the pressure on the two side vanes is balanced. With increasing velocities, the hinged side and centre vanes, which are normally kept in a vertical plane by means of the weight, turn on their hinges so as to expose less and less surface to the wind. The wind-wheel will obviously then tend to turn out of the wind until a balance is re-established, thus limiting the speed of the wheel. The main wheel is connected by enclosed bevel gearing to a vertical shaft, which has a pulley at the lower end, at the base of the tower; this is roofed over to also cover the electrical generator, the latter being driven by belt from the pulley on the vertical shaft. The generator runs also on a vertical shaft, and the belt tension is maintained by means of a weight, rope, and pulley.

The voltage regulation in this instance is only partially obtained by the speed control, a neat system of relays on the main switchboard varying the shunt field resistance so as to further regulate the voltage. Provision is made on the switchboard for the battery to be automatically connected to the generator at full normal voltage (110 volts), and for either half of the battery at half voltage, so that further advantage may be obtained from the lower wind and wheel velocities. End cell regulation is also provided and the system of supply is three-wire. The wind-wheel is 18ft. diameter, on a tower 60ft. high. The generator is of 2.5kw. capacity, with a maximum speed of 1600r.p.m., and is shunt-wound. The battery consists of 54 cells of the Tudor type, 324 amp. hours capacity at the three-hour rate. The total number of lamps connected is over 100, of varying candle-powers, and the actual average output (which is metered) amounts to about 3kw. hours per night. The plant is also used to operate three flat irons, one radiator, one one-horse-power motor driving a cream separator, some fans, and for occasionally charging the battery of an electric motor car; this latter supply, however, is not all derived from the windmill. I was informed that the wind-power was amply sufficient for requirements, and that, with one exception recently, no mechanical troubles whatever had been experienced. This defect was due to a broken ball in the ball races of the main bearing, and therefore in no way belittles the very excellent mechanical design and construction of the plant.

As a matter of interest, it was noted from the log-book which has been kept that the maximum energy generated in any one day amounted to 16 kilowatt-hours, although figures of 13 and 14kw. hours were commonly obtained. The area of each of the tail vanes is 16 square feet (4ft. by 4ft.). About 30 gallons of distilled water are used in 12 months for topping up the battery, and the only other item involving attendance is the adjustment of the Stauffer grease cups, about once per month. I saw no sign whatever of wear and tear on the plant, and the battery, as mentioned later, is in excellent condition.

The equipments now working on the Turnbull patents are, as far as I am aware, the only successful plants in which the voltage regulation is effected directly by maintaining a constant speed of the wind-wheel and generator, when in parallel with the battery, and is, therefore, entirely free from the extra expense, complications and internal losses of energy inherent in other equipments.

### Amount of Power Available.

This question is, of course, of paramount interest, as, even on the assumption that it is possible to utilise the energy due to air-movements, there has always been, in the minds of practical men, grave doubts as to the reliability of this source of energy, i.e., as regards the frequency with which we may safely expect to obtain "useful" winds. Now, recognising quite clearly from the first that this was the bed-rock foundation upon which any commercial wind-electrical scheme would need to rest, Mr. Turnbull and I have made, during the last two or three years, as complete a study of this question as our spare moments would allow, and have obtained data from reliable sources from several parts of the world.

Let us look into the matter a little closely. You are all aware that, speaking generally, the pressure upon surfaces of obstacles exposed to the wind is roughly proportional to the square of the velocity; in fact, speaking roughly, the pressure (in lbs. per square ft.) $= (\text{velocity})^2 \times .003$, where the velocity is taken in miles per hour. Smeaton's formula, viz., $P = \frac{V^2}{200}$ is not now considered to be as accurate as that given.

The energy imparted to the obstacles is therefore approximately proportional to the cube of the velocity of the wind, and in the case of a wind-wheel the theoretical horse-power developed when in operation should be proportional to the cube of the wind velocity. It is evident that conditions exist which will make winds of low velocity useless for practical purposes, and that quite large amounts of energy may be developed at the higher velocities. The main point of these remarks, as far as this paper is concerned, is that, with wind-wheels of ordinary manufacture, there is a certain wind velocity, below which it may be said that the energy imparted is commercially "useless." The experience of experimenters in many countries is that this value is in the neighbourhood of eight to ten miles per hour, and it is upon this velocity that the ratings of electro-wind-mill apparatus are based; it will be readily apparent, however, that any increase in the efficiency of the wind-wheel design, or any specially favourable wind conditions, will allow of this figure being decreased.

If a means were found which would make use of the energy developed by winds, having velocities of eight miles per hour and upwards, the commercial utilisation of wind-movements would doubtless have been proved many years ago. With all the apparatus which has so far been put into practical operation, however, it has been found necessary to limit the amount of electrical energy generated, or, in other words, since these plants are in almost all cases connected in parallel with a storage battery, to limit the charging current of the battery by limiting the speed of the wheel, or otherwise.

Now, I wish to draw particular attention to one point in connection with this phase of the question which has, until now, not been sufficiently considered; and I might again point out that, in this point, as in many others, the design of a wind-wheel for electrical generation will, in future, differ materially from that for ordinary mechanical purposes.

The wind, as you are doubtless aware, does not "blow" steadily; it works in gusts, either rising to a peak and dying away to nothing, or forming a succession of peaks above a fixed average, according to the intensity of the breeze or storm. The direction of the wind is constantly and suddenly changing, especially in the case where ground obstacles, trees, houses, etc., are in the vicinity. Even quite small obstructions on the ground have a much greater effect on the output of a wind-wheel than is commonly supposed.

It will readily be apparent that the obvious duty of the electro-wind-mill designer is to utilise the peaks of wind velocity and fill in the hollows, by making use of the regenerative action of the fly-wheel to the greatest possible extent. A wind-wheel presents an ideal condition for utilising this principle, and with a properly designed wind-wheel, not only will the regulation of the wheel, apart from any automatic provision made otherwise, be greatly improved (by increasing the cross section of the outer rim, for instance), but the utmost use will, ipso facto, be made of the available energy of the wind.

It may be objected that the inertia of such wheels will not allow of full use being made of the lighter breezes (i.e., those under eight miles an hour velocity), but such light breezes are of little use for power or storage purposes, except under special conditions, and do not affect the above conclusions. The design of the wind-wheel tails is also of considerable importance and very little thought appears to have been given to this in the past.

Assuming, now, that the wind conditions in a specific case are satisfactory (and it must be apparent that this will be generally the case), let us look into the direct action of a fair average wind upon a wind-wheel. We know, as above mentioned, that the pressure upon an obstacle due to air movement at a certain velocity may be approximately determined from formulae. We also know the projected area and the angle of inclination of the wheel-blades, and the general dimensions, weights, etc., of the wind-wheel; and we can therefore calculate the approximate output which should be derivable from the wind-wheel. When we come to look into the actual records, however, we find that the figures obtained will only amount to from 15-25 per cent. of those calculated. Where, then, is our theory lacking? This is not altogether an easy question to answer, although it must be apparent that the reduction of wind-pressure on the vanes due to the vortex movements of the air in the vicinity of the wheel must have a great bearing on the reduction of the "air-mechanical" efficiency of the wheel. In my opinion although I have not yet had an opportunity to test the point, an altogether unnecessary amount of power is wasted owing to air friction at the periphery of the wheel, and it should be possible for considerable waste in this direction to be obviated by suitably designing the blades; but questions of this nature may well form the basis for many future papers. Professor La Cour has conducted a vast amount of research work in this direction and experiments have also been carried out in America upon wind-wheels of various types, with different sail angles, etc. Nevertheless, from the point of view of the electro-wind-mill designer, the data are very meagre indeed.

---

*A paper read before the Electrical Association of New South Wales.

Actual tests carried out by local plants, measuring wind velocity by a specially accurate anemometer, and the output by the ordinary electrical means give results which have so far confirmed the figures in the following table; these figures being the result of the mean of a number of tests carried out by Mr. J. W. Titt, the well-known manufacturer of wind-mills in Warminster, England.

| Dia. of wheel (ft.) | Horse-Power (at velocities per hour of) 10 miles. | 12 miles. | 16 miles. | 20 miles. | 25 miles. |
|---|---|---|---|---|---|
| 14 | ¼ | ½ | 1 | 1¾ | 2½ |
| 16 | ½ | ¾ | 1½ | 2½ | 3½ |
| 18 | ¾ | 1¼ | 2 | 3 | 4 |
| 20 | 1¼ | 2 | 3 | 4 | 5½ |
| 25 | 1¾ | 3 | 4½ | 6 | 8 |
| 30 | 3 | 4 | 5½ | 7 | 9 |
| 35 | 4 | 5½ | 6¾ | 8½ | 10 |
| 40 | 5 | 6½ | 8 | 10 | 12 |

I may add here that the actual cost of a wind-wheel is a small proportion of the total cost of an electro-windmill plant, and, therefore, in cases of doubtful wind conditions, the extra cost of ensuring a full supply of power is small.

Having thus described the reasons which have led me to believe that the practical utilisation of wind power does not present insuperable difficulties, let us turn to another matter, viz.,

Practical Equipments.

One may say at once, with regard to practical equipments, that the attempts hitherto made to commercially develop the electro-wind-mill devices have started on too ambitious a scale. It was early realised by Mr. Turnbull and appears also to have been lately realised by the A.E.G. Co., of Berlin, that by far the largest field in which a demand existed for apparatus of this nature lay in the lighting of private residences, railway stations, hotels, hospitals, etc., rather than the wholesale provision of lighting or power for towns and villages. The arrival of the metal-filament lamp also put a very different complexion upon the problem which had spoilt previous efforts, and it was soon realised that there were three essentials of design necessary, apart from other considerations, such as first cost, mechanical details, etc., to be kept in mind in developing such apparatus:—

(1) The storage battery used should be amply large enough, under given conditions, to cover the maximum duration of "useless" wind, as above mentioned.

(2) The generator should be small, i.e., large enough merely to carry the average load when the wind reached the necessary velocity, and, in addition, to simultaneously furnish a small charging current to the battery if required. And

(3) The wind-wheel should be amply large enough to enable the apparatus to work in this manner at the same maximum speed.

It was also recognised that such apparatus should be designed upon the best modern mechanical and electrical principles, and that no attendance whatever, save an occasional inspection, should be necessary, even though the equipment may be working at all times, day and night, wet or fine. It was also quite obvious that to ensure commercial success, all these objects must be attained without excessive cost.

I think that I may now safely say that this has been done, even though one's views may vary as to what constitutes the term "excessive cost"; and the data so far obtained with actual equipments under working conditions are sufficiently convincing to allow me to place such views on paper, and therefore to accept whatever responsibility the expression of such views may ultimately entail.

(To be continued.)

---

## BRITISH AND EUROPEAN DEVELOPMENTS.

(From Our Correspondent.)

London, Oct. 3rd.

The annual statement of the directors of the Auckland (N.Z.) Electric Tramways Company, Ltd., which has just been circulated here, gives results which may be summarised as follows.—

| Year ending June, | 1912. | 1913. |
|---|---|---|
| Route miles | 23.31 | 25.42 |
| Passengers carried | 36,053,050 | 40,331,316 |
| Average receipts per passenger | 1.53d. | 1.53d. |
| Average expenses per passenger | .92d. | .93d. |
| Proportion of expenses to receipts | 60% | 60% |
| Number of cars working | 126 | 156 |

| | |
|---|---|
| Total revenue for 1913 | £261,713 |
| Traffic Receipts for 1913 | £257,591 |
| Increase | £28,449 |

After meeting all charges against revenue, including £19,974 for debenture and other interest, the rental and percentage of profits payable to the Auckland City Council, £5670, and setting aside £25,000 to renewals and depreciation as compared with £20,000 for 1912, there is a total surplus of £54,177 plus £8267 brought forward. The preference dividend, and a final dividend on the ordinary shares (making a total of 1s. 7d. per share for the year), having been paid, and a further £17,500 transferred to reserve, there is £8782 to be carried forward. Including issues of debenture stock and preference shares made during the year, the issued capital was at June last:—£150,000 preference (six per cent.), £300,000 ordinary, and £388,557 first mortgage debentures. It is now proposed to issue £100,000 in ordinary shares, and the matter will be up for approval at the meeting next week. The Remuera and Morningside extensions (2.11 miles) have been opened, and the new central repair works now building will be finished by the end of this year. Of the year's capital expenditure of £115,304, a large portion was for the additional cars, 30 in number, and ten more are approaching completion. Other matters upon which capital was expended were:—Power house extensions, track duplications, extensions to distributing system, etc. Since June last property adjoining the power station has been acquired so that generating plant additions may be made as required. A further 1000 k.w. set is to be installed at once. In place of Mr. S. E. Garcke, who has retired from the board, Mr. L. M. Myers has been elected a director.

Everybody has been mystified and shocked during the last few days by the strange disappearance of Dr. Rudolph Diesel, inventor of the Diesel oil engine, from the vessel on which he was journeying from Antwerp to Harwich. He was on his way to England for the purpose of visiting the new works which are in course of erection at Ipswich for the Consolidated Diesel Engine Manufacturers Ltd., and afterwards attending the meeting of the company in London. He was in company with M. Georges Carels, of the well-known continental firm of Carels Freres, in which the consolidated company has a very large holding. Dr. Diesel had left M. Carels and other friends with whom he dined on board and had retired to his cabin to rest. All else seems to be conjecture save that he was a sufferer from insomnia, that he was not to be found at breakfast next morning, and that his cabin had not been slept in. Naturally the papers are full of the matter, and while there are those who say that he was not on board at all, the directors of the Consolidated announced to the meeting that they feared he would never be seen again. The loss of so distinguished an engineer, especially at a time when the engine which bears his name is finding its way into all kinds of service and to all parts of the world, is a matter for profound regret. To the company named above, the loss is not stated to be so serious as might be at first expected, as he was chiefly related to the concern in an advisory capacity. The chairman of the Consolidated, in addition to his reference to the above calamity, had also to refer to other adverse influences that had been at work. They had been delayed in completing the Ipswich works, and difficulties had been experienced in obtaining orders during the past few months owing to the high price of fuel oil. Experiments had been conducted at the works with other fuels, and though these experiments were not complete they were partially successful. M. Carels, who replied to shareholders later at the meeting, mentioned that the business of Carels Freres had been adversely affected owing to the monetary crisis consequent upon the Balkan war. The high price of oil had also hampered them in their efforts to obtain orders. A lengthy series of experiments had been made with a special Mexican oil. The strike in Belgium had also prevented the company securing orders, as they could not give prompt delivery at the time. The meeting was adjourned to December 31st.

Mr. J. B. Hamilton, tramway manager at Leeds, in his paper on "Urban Passenger Transport," read last Friday at the Municipal Tramway Conference, said that he looked upon low fares as being essential in fully satisfying and developing the travelling requirements of our great cities and towns. Unquestionably a very large proportion of the success which had attended the introduction of electric traction was due to the fact that its economy of operation had enabled the undertakers to reduce fares from time to time lower and lower, and it was marvellous to note the response in increased travel which each reduction of fare had produced. At Glasgow under the last fare change granting about a mile for a half-penny, instead of half-a-mile, as formerly, the number of passengers within a year had increased by nearly 20 per cent., whilst the gross revenue had increased by 2 per cent., or £20,373. In Leeds, since 1902, the same phenomena had been noted. There must be economy in operation so as to enable the lowest possible fares to be granted, but there was an economic limit beyond which fare reductions could not be carried. Whilst wages were increasing and must continue to do so for some time to come, in other directions great economies were being carried out. Large steam turbine plants had lowered the cost of producing energy, as compared with ten years ago, by practically one-half. Improvements in section and composition of rails, and in the methods of track construction, would undoubtedly lessen in the future the item of expense under this head, whilst the developments in other directions might still further increase the economies of operation. Mr. Hamilton devoted a large part of his paper to a consideration of the question of motor 'bus competition. He referred to the impossibility of getting reliable figures of the cost of operation of motor 'buses from companies. In the accounts of the London General Omnibus Co. for 1912, a figure of 9.76d. per mile had been given, but it was probable that the figure could not be taken as correct, as the company did not seem to desire to state, for public information, the exact costs. The Keighley and Eastbourne municipalities had been working fleets of motor 'buses for years past; at the former the cost was 16d., and at the latter 14.39d. per mile, while at Halifax a figure of 12.7d. was reported. The first two of these figures related to vehicles not of the most modern type. Mr. Hamilton says that, after a great deal of consideration and examination of private figures, he has come to the conclusion that 10d. per mile, to include all costs of operation, interest upon the outlay, and sinking fund as applied by Parliament in a like manner as with tramways, was a fair and reasonable figure, looking at the cost of petrol at the present time. Brief reference was made by Mr. Hamilton to the question of railless electric traction. While suffering from the same limitation in size, which applied to the motor 'bus, it had the advantage that it was free from smell, and was almost entirely free from the tendency to skid, this latter point being due, no doubt, in a large degree to the fact that the motors and weight were not placed upon one end of the chassis, but were slung below the level of the chassis and near its centre. In total costs of operation, under ordinary conditions, it was at least from 20 to 25 per cent. less per car mile than motor 'buses. It was equal in flexibility in an ordinary width of roadway, viz., 30ft. to 35ft., to a motor 'bus. It had never been claimed for it that, except under special conditions, it should be substituted for tramways in cases where very large volumes of traffic were required to be dealt with, nor where a very close and frequent service was necessary. In streets or highways which were too narrow to permit of the passing of vehicles confined to rail traction, in conjunction with other vehicular traffic for districts where the traffic was too infrequent to justify the higher capital outlay necessitated by tramway construction, and generally as an auxiliary to and as feeder for tramways, this form of traction had a very great future. Its lessened costs, as compared with that of motor 'buses, and its greater reliability in operation, made it preferable as a feeder to an electrically operated undertaking to that form of traction. Each case must be judged on the local conditions and in relation to the cost of installation and operation. Routes could certainly be more readily dropped, and new ones opened with the migratory motor 'bus. Mr. Hamilton expresses the conviction "that the era of rail transit . . . . shows not the slightest sign of being superseded by any other form." His closing words may be quoted:—"'To epitomise briefly the position, the motor 'bus has seven times the number of fatal accidents per vehicle per annum, and twice as many injuries per million passengers as compared with tramways. Its obstructive street condition in fine weather is as two 'buses are to one tramcar, and in inclement weather as four 'buses to one tramcar, whilst the cost to a municipality of providing transit by motor 'buses is double the amount per seat provided by electric tramways."

## POSTAL ELECTRIC SUPPLIES.

When Mr. C. Frazer was Postmaster-General, in the Fisher Ministry, he induced the Cabinet to agree to disqualify the Western Electric Company, of London, for tendering for supplies connected with the Postal Department. Last Friday, in the House of Representatives, Mr. Josiah Thomas, who had preceded Mr. Frazer in that position, asked the present Postmaster-General (Mr. Wynne) if it was true that he had removed the embargo. On an affirmative reply being given, Mr. Frazer arose in his wrath and declared that the Western Electric Company had "deliberately swindled the Commonwealth out of £5900," and that the money had been recovered when action was taken. He had told the Fisher Ministry that the department should not deal with a set of swindlers, and had secured Cabinet approval of a recommendation debarring the company from tendering for any Commonwealth necessities during the Fisher Ministry's term of office. Mr. Wynne admitted that in removing the disqualification from the company he had not consulted the Cabinet nor the Prime Minister. The position referred to by Mr. Frazer had been brought about by a provision in the tender form that, in supplying certain materials to the Postal Department prior to the passing of the Customs Act, any increase of duties would be paid by the purchaser, while, if the duty were reduced, an amount would be refunded to the purchaser. Owing to an oversight in the Postal department, no claim for the refund was made upon the Western Electric Company. It was sharp practice on the part of the company to retain the money, but technically and legally it was entitled to hold it until the claim had been made. The fact that the Commonwealth was entitled to the money was not known until an ex-employee, for the sake of reward, disclosed the circumstances. Since the embargo had been removed, and the Western Electric Company allowed to tender for supplies, prices had gone down to such an extent that the department would save more than the amount of money involved in the first case.

## MISCELLANEOUS.

According to the report made by the Chief Electrical Engineer on the subject, the utilisation of the waters of the Shoalhaven River (N.S.W.) for a hydro-electric scheme is quite practicable. The proposal would involve a dam immediately below the Warri Bridge, whence a fall of 35 chains to the power station would give a head of 1010ft., which would be adequate to generate continuously 10,000 horse power, or, if necessary, a plant capable of generating 30,000 horse power could be devised. For the purpose of an estimate a plant capacity of 14,000 electrical horse-power is assessed capable of carrying an overload of 20 per cent. for 10 hours. A transmission main to connect with the proposed State power scheme at Kiama is also allowed for. The capital cost is set down at £526,000, the annual expenditure at £45,820, and the annual receipts at £52,180. It is understood that capital is available for establishing industries in the vicinity, once an adequate supply of cheap power can be relied on.

* * *

The Postmaster-General of New Zealand (Mr. Rhodes) announced last Friday that wireless charges on ships worked by the Marconi Telefunken system between Australia and New Zealand will be reduced from 10d. to 5d. a word at the beginning of January.

* * *

The Prahran-Malvern (V.) Tramways Trust reports the acceptance of the tender of the Steel Company of Australia (£917) for contract No. 45, points and crossing for tramway loop near Caulfield railway station.

* * *

In connection with a statement made by him in a recent speech, to the effect that as the result of certain defects in engine axles he had ordered a certain firm to be struck off the list of the State's suppliers, Mr. Cann, the Treasurer of New South Wales, last week made the following statement:—"I am reported to have said that, as the result of inquiries and reports, I had cabled to London cancelling an order for axles placed with certain English firms. That is not correct. What I said was that I had cabled the Agent-General to strike off the firm that had supplied the defective axles, but I never said it was an English firm. As a matter of fact, it was a German firm, and all the defective axles have been traced to that one firm."

* * *

Replying to Mr. McWilliams (T.) in the House of Representatives last Friday, Mr. Kelly, the Acting Minister of Home Affairs, said that the expenditure to date on the Port Augusta-Kalgoorlie railway was £831,000, that 60 miles of track had been formed at the West Australian end, and 40 miles on the South Australian division: that 33 miles of the main line had been laid in South Australia, and 5 miles 7 chains in Western Australia, and that, exclusive of quantities already laid, there were 31,214 tons of rails, and 334,205 sleepers on hand.

* * *

Our Lithgow (N.S.W.) correspondent writes that with the opening of the new deviation on the Great Western line between Emu Plains and Valley Heights, on top of the Blue Mountains, the necessity for the use of "banker" engines,or "push-ups," as they are more commonly known, has disappeared. This new route was primarily decided on to eliminate the 1 in 33 grades, which were the prominent feature right from the beginning of the mountain rises to Mount Victoria. Having partially got rid of this cause of expensive running, it followed that the "banker" engines would have to be removed from their present quarters, at Penrith, and taken to where the old grade of 1 in 33 commenced. It was, accordingly, decided to station the engines at Valley Heights, and for some months past a large gang of men has been engaged making earthworks for the necessary new roads, erecting inter-locking gear, and building sheds for the accommodation of the "push-ups." Accommodation has, therefore, been made for the "stabling" of ten engines of this type. In addition to the sheds, lines have been put in for coaling purposes, the necessary fuel being fed into the tenders by gravitation. Ashpits and a special line to run the ashes away into an adjoining gully are included in the work, and before Christmas the new sheds, tracks, etc., will be in use, and another big reduction of the present expensive cost of running will have been effected.

* * *

The Marconi Wireless Telegraph Co. is engaged in completing its "girdle round the earth"; new high-power stations are to be erected at San Francisco, Hawaii, Japan, and later on in the Philippines, Brazil, and the Argentine.

* * *

The switching on electric light at Shepparton (V.) last Friday night was a red-letter event in the history of the town. The Order-in-Council was granted to the Provincial Electrical Development Co., but the plant was supplied and will be operated for 12 months by the Silvertown Electric Company. The plant is stated to be the most complete of its kind in Victoria, and is designed for the requirements of a progressive town for many years. Thirty miles of cables have been erected, and provision has been made for eighty-three street lamps of the latest type, and the light is being supplied to many of the larger business places and a number of private residences.

* * *

A contract has been let to Messrs. Stuart and Co. for the erection of large premises at the corner of Goulburn-street and Wentworth-avenue, Sydney, which will be occupied by the Australian General Electric Co. The structure will probably be five stories high, and will be fitted with an automatic heavy load electric elevator. The whole of the decorative electric light fixtures will be installed by the Australian General Electric Co.

* * *

The Premier of Victoria and the Minister of Education have been asked to receive a deputation on the 19th inst., and to hear arguments in support of a resolution passed last week at a conference of representatives of technical schools, convened by the Ballarat School of Mines, and held at the Working Men's College for the purpose of considering the question of the control of technical schools. The resolution referred to was as follows:—"That in the opinion of this conference the progress of technical education will be best promoted by preserving the individuality of the present existing institutions under the present form of government and local control, assisted by adequate grants from the consolidated revenue."

* * *

The fact that the New South Wales Parliament rejected the Border Railways Bill, which would have given effect to the agreement come to between the Governments of the State and of Victoria, does not imply that the agreement is dead. Mr. Holman, Premier of New South Wales, has assured the Victorian Premier, Mr. Watt, that, if returned again to office, he will re-introduce the Bill next session; therefore, says Mr. Watt, the agreement may be regarded as still alive.

* * *

An Order-in-Council was passed by the Victorian Executive last week, under the Electric Light and Power Act, to enable the Mildura Shire Council to supply the town and the shire with electricity. The charge fixed was £1 for any amount up to 20 units, and 1s. per unit after for light; but

* * *

In addition to accepting the tender of the Commonwealth Art Pottery and Insulator Company for the supply of a large number of telegraph insulators, as mentioned in our issue of October 16, the Postmaster-General's department has now accepted a further tender of the same company for the supply of 1,768,800 insulators of the "B" type for the sum of £20,003 9s. 4d., while the Fire Brick, Insulator and Pottery Company of Victoria will supply 426,000 of the "A" type for £12,282 10s. In addition, the following contracts have been let for insulators to be imported:—513,000, "A" type, through Dalgety and Co. Ltd., for £12,508 19s. 7d., and 78,000, "A" type, through Webster and Co., for £1969 10s. The batch of insulators will cost, therefore, over £46,764, and with those previously arranged for, the outlay will be close upon £50,000.

* * *

The mission of Mr. S. Swinburne, the English wireless expert who was nominated by the Imperial Government, at the request of the Federal Government, to report upon the wireless stations of the Commonwealth, did not occupy him long ashore. What was the nature of his business has not yet been made public, but it may be presumed that the brief visit was actually necessary. Mr. Swinburne reached Melbourne on October 19, and left again on the 29th, so that he was here only ten days after a five weeks' journey.

* * *

Our Wollongong (N.S.W.) correspondent writes: —"A sub-committee of the municipal council of North Illawarra, appointed to make inquiry and report as to a scheme of lighting, have an offer from the Bellambi Coal Company to extend their supply of current to the Bulli shire to this municipality, and the offer will come before the council next week. The colliery is on the borders of the shire and the municipality, and the station through which the current is supplied to the shire is on the main road, right at the municipal boundary."

* * *

The House of Representatives last Thursday agreed to a motion by Mr. H. Gregory (W.A.), for the appointment of a select committee to inquire into all matters pertaining to any contracts and agreements proposed or entered into for the use of powellised and other timbers, with power to inquire and report as to the merits of powellising, and all matters incidental to the proposed use of powellised sleepers and other timber in connection with the construction of the railway from Port Augusta to Kalgoorlie. The motion having been seconded by Mr. Poynton (S.A.), Mr. Fowler (W.A.) supported it, saying that when jarrah timber was suitable and supplies were at hand, it was incomprehensible that karri should be used, and more paid for it in order to have it powellised. The motion was amended by including the names of Messrs. Bennett, Bamford, McWilliams, M'Malley, Fenton, Sinclair, and Gregory as the members of the committee.

* * *

Finality has been reached at last with respect to the site of the head power-station for the electrified suburban railways of Melbourne. After several conferences between the Railways Commissioners and the Harbour Trust, it has been found that interference with the Trust's port improvement scheme can only be avoided by the power-house being erected some distance further back from the river than was proposed when it was first found necessary to abandon the Yarraville site. A site near the intersection of North-road and Douglas-parade, Newport, has therefore been selected. The Harbour Trust has agreed to the Railway department retaining the right to a small river-frontage on which to erect a wharf and conveyors in the event of the necessity arising for the purchase of sea-borne coal. The Railways Commissioners state that, though reduced from 58 acres to about 45 acres, the area was greater than that available at Yarraville, and sufficient for the requirements of the department. There had been no intention of erecting the power-station buildings on the river frontage, and, therefore, questions concerning the intake and outflow were not affected by the curtailment of the area. The new site has now to be tested by boring to ascertain the character of the foundation which it will afford, and if this is satisfactory a start will at once be made with the excavations.

* * *

The varying extent to which residents in various parts of New Zealand practically show their appreciation of university and technical education was mentioned to a Wellington audience recently by Mr. R. McCallum, with the idea of stimulating a healthier feeling that appears now to exist with respect to Victoria College. "I am going to pay a very high tribute to Otago University," said Mr. McCallum, "in order to point out to the people of Auckland, Canterbury, and the middle district of Wellington that they do not support their university colleges in the same way as Otago does. This year's Education Report shows that last year no less a sum than £6408 was contributed to Otago University by the general public, apart altogether from endowments, etc. Now what did the others do? Auckland contributed only £650; the middle district, including Wellington, Taranaki, Nelson, Marlborough, and Westland, contributed a paltry £165 5s., and Canterbury contributed nothing at all. Not only that; we have it on the best authority that during the last 10 years no less a sum than £56,000 has been contributed to the Otago University. That university is certainly the best equipped and the best managed university college in New Zealand."

# Invited and Accepted Tenders

It is particularly requested that the information regarding contracts open, and the successful tenderers, be forwarded to The Editor not later than Monday of each week.

The following contractions are used throughout:—S—supply; D—delivery; M—manufacture; C—construction; E—erection; P—purchase; I—installation; R—removal. Where no contractions appear, supply and delivery is understood. The date at the beginning of each paragraph refers to the closing of tenders.

## INVITED.

### Commonwealth.

**Specifications, tender-forms, etc., for tenders invited for the Postmaster-General's Department of the various States under this heading may be had as follows:—Victoria—Various State G.P.O.'s. New South Wales—Departmental Stores, Sydney, and various G.P.O.'s in other States. South Australia—Adelaide, Melbourne, Sydney and Brisbane G.P.O.'s. Western Australia—Departmental Stores, Perth, and various G.P.O.'s in other States. Queensland—Various State G.P.O.'s. All States—Various G.P.O.'s. If the specifications, etc., may be had elsewhere, in addition, the places will be given in parentheses.**

POSTMASTER-GENERAL'S DEPARTMENT, Melbourne.—11th November (extended from 4th November).—D. and E. of eight automatic telephone switchboards at the Ascot, Canterbury, Malvern, Cheltenham, Footscray, Oakleigh, Sandringham, and Williamstown Telephone Exchanges, as per schedule No. 953.

11th November.—S. and D. of motor tubes, covers and solid tyres, as per schedule No. 987.

**11th November.—S. and D. of relays, jacks,** lamps, etc., as per schedule No. 982.

12th November.—S. and D. of general stores for **2 years, as per schedule No. 913.**

9th December.—S. and D. of 1000 reinforced concrete poles, as per schedule No. 959.

16th December.—S. and D. of one common battery multiple switchboard at the Telephone Exchange, Wills-street, Melbourne, as per schedule **No. 968.**

30th December.—S. and D. of telephone ma**terial, as per schedule No. 976.**

27th January, 1914.—S. and D. of switchboards, telephones, etc., as per schedule No. 990. (See **advertising columns.)**

POSTMASTER-GENERAL'S DEPARTMENT, Sydney.—12th November.—S. and D. of motor accessories, as per schedule No. 341.

**12th November (extended from 8th October). — S. and D. at the Telephone Exchange, Watson's Bay, Sydney, of 1 automatic switchboard with all associated equipment as per schedule No. 234.**

12th November (extended from 22nd October).—S. and D. of 5000 caps for supervisory lamp, schedule No. 338.

12th November (extended from 22nd October).—4500 cords 3 steel conductors, schedule No. 328.

12th November (extended from 22nd October).—500 fuses, 3 ampere, schedule No. 338.

12th November (extended from 22nd October).—250 telephonometers, schedule No. 338.

12th November.—S. and D. of 350 cable boxes, as per schedule No. 342.

12th November (extended from 22nd October).—S. and D. of 7 miles copper clad steel wire, as per schedule No. 335.

12th November.—S. and D. of 363 wooden ladders.

**19th November.—S. and D. of 450 bells, magneto, as per schedule No. 333.**

19th November.—S. and E. of 618 wooden poles and erection 20 miles wire.

19th November.—S. and E. 100 wooden poles and erection 26½ miles wire.

3rd December.—S. and E. of about 104 wooden poles and erection 4 miles wires.

3rd December.—S. and E. of 324 wooden poles and 14¼ miles wires.

18th March, 1914.—S., D. and E. at the Telephone Exchanges, Epping, Ryde, Hunter's Hill, Drummoyne, Wahroonga, Paddington and Waverley, Sydney, of seven (7) automatic switchboards, with associated equipment, as per schedule No. 179.

POSTMASTER-GENERAL'S DEPARTMENT, **Brisbane.—13th November.—S. and D. of all ma**terial necessary to repair 28¾ miles telegraph line, as per stores schedule No. 456.

**19th November.—Bronze wire, as per schedule** No. 273.

26th November.—S. of all material specified and labour for erection about 170 miles H.D. copper wire from Inglewood to Mungindi.

1st December.—S. of all material specified, and erection about 107½ miles H.D. copper wire to Roma and Pickanjinnie.

17th December.—S. and D. of insulators, as per stores schedule No. 280.

31st December.—S. and D. of insulators, as per stores schedule No. 282.

7th January, 1914.—S. and D. of switchboards, as per schedule No. 271.

7th January, 1914.—S. and D. of telephone instruments, as per stores schedules Nos. 275, 276 and 277.

7th January, 1914.—S. and D. of protectors, parts, etc., as per schedule No. 278.

POSTMASTER-GENERAL'S DEPARTMENT, Perth.—19th November.—S. and D. of rectangular dry cells.

3rd December.—S. and D. of H.D. copper wire.

10th December.—S. and D. of 60 tons galvanised iron wire.

21st January, 1914.—S. and D. of switches, telegraph line with plugs.

POSTMASTER-GENERAL'S DEPARTMENT, **Adelaide.—12th November.—One lamp signalling trunk line switchboard, of five sections, one cable turning section, and one cable storing section, one two-position recording desk, and one chief operator's desk, as specified in specification No. 431, etc., delivered at the Telephone Exchange, Adelaide, as per schedule No. 296.**

26th November.—S., fitting and erection of 229 wooden poles.

**POSTMASTER-GENERAL'S DEPARTMENT, Hobart.—1st December.—S. and D. of dry cells, as per schedule No. T. 84.**

DEPARTMENT OF HOME AFFAIRS.—Kalgoorlie-Port Augusta Railway.—28th November (extended from 5th November).—M., S., D. and E. of 4 locomotive engines and tenders (N.S.W. "P" type); tender capacity, 4500 gallons of water, and approx. 7½ tons of coal.

**18th November.—M., S. and D. of six-wheel brake vans, complete.**

**2nd December.—600 pairs of wheels and axles** (9in. x 4½in. journals).

2nd December.—S. and D. of 15 bogie cattle waggons and 30 bogie sheep waggons. (See advertising columns.)

FEDERAL TERRITORY.—26th November.—S. of pumping plant for Canberra.

DEPARTMENT OF HOME AFFAIRS.—Quarantine Station, Sydney.—10th November.—S of laundry equipment.

24th November.—S. of boiler plant for Quarantine Station.

**DEPARTMENT OF DEFENCE—Small Arms Factory, Lithgow, N.S.W.—29th December.—P. of scrap steel, brass, jute bags, whale oil, etc.**

**12th January.—S. of iron and steel for manufacture of rifles.**

### States Invited.

### Victoria.

RAILWAY DEPARTMENT.—6th November.—S. of steel channel bars.

7th November.—S. of fireproof safe.

7th November.—Horizontal frame saw webs.

**12th November.—Steel channel bars.**

**12th November.—20 tons steel ingots.**

**12th November.—Steel blooms, for crank pins.**

**12th November.—Locomotive boiler tubes.**

**12th November.—High-speed tool steel.**

**12th November.—Flame arc lamps.**

**12th November.—Insulated copper cable.**

**13th November.—M. and D. of one 60h.p. elec**tric motor and accessories.

**12th November.—M., S. and D. of mild steel girders for bridge over Boggy Creek.**

**12th November.—M., S. and D. of mild steel girders for Nicholson River.**

12th November.—M., S. and D. of steel ceilings **and wall panels.**

12th November.—M., S. and D. of cutters for wood-working machines.

**12th November.—C. and riveting mild steel girders for Toorak Station.**

12th November.—S. and D. of 100 tons unchilled cast iron scrap.

19th November.—M., S. and D. of metal gates.

19th November.—S. and D. of galvanised plain and barbed wire.

19th November.—M., S. and D. of 18 railway tricycles.

19th November.—M., S. and D. of 25 tons 7-8in. steel fishbolts and nuts for 60 lb. rails.

19th November.—Autometer speed recorders.

**19th November.—M., S. and D. or cast steel wheel centres for A2 engines and new truck stock.**

**19th November.—Brass locomotive tubes.**

19th November.—150 tons pig iron.

19th November.—10 tons sulphate of copper, **best quality, for electrical purposes, battery material.**

26th November.—S. and D. of 1000 cast steel blooms for axles for electric motor bogies.

3rd December.—Steel blooms, for piston rods.

3rd December.—S. and D. of vulcanised rubber electric light wire.

10th December.—M., S. and D. of one 15-ton crane for Ballarat.

7th January (1914).—S. and D. 10,000 porous pots for batteries.

7th January.—S. and D. of best steel boiler plates.

7th January.—S. and D. copper rod.

7th January.—S. and D. copper plates.

7th January.—S. and D. of cast steel wheel centres.

7th January.—S. and D. of steel blooms for crank pins.

7th Jan.—S. and D. of locomotive brass boiler tubes.

7th January.—S. and D. of best Yorkshire iron angles.

7th January.—S. and D. of locomotive seamless copper tubes.

7th January.—S. and D. of steel channel bars.

14th January.—S. and D. of 5 Detroit lubricators.

14th January.—S. and D. of 100,000 lineal yards tarpaulin canvas.

14th January.—S. and D. of high speed twist drills.

14th January.—S. and D. of one concrete mixer.

21st January.—S. and D. of one high speed lathe.

21st January.—S. of hydraulic jacks.

28th January.—S. and D. of 200 forges and rolled steel disc wheels.

28th January.—M., S., D. and E. of one three-phase alternator, complete, at Newport.

VICTORIAN RAILWAY COMMISSIONERS—STATE COAL MINE.—12th November (extended from 1st October).—S. of rope haulage engine and electrical equipment for McBride Tunnel.

17th December.—S. of one motor-driven ventilating fan.

STATE RIVERS AND WATER SUPPLY COMMISSION.—6th December.—M. and S. of one centrifugal pump and quick revolution steam engine about 800h.p.

P & O COMPANY'S ROYAL MAIL STEAMERS
FOR MARSEILLES, PLYMOUTH AND LONDON.

Leave Sydney on the subjoined dates, calling at usual ports.

FIRST AND SECOND SALOON ONLY.

| Steamer, | Tons. | Commander. | Noon. | Melb., 3 p.m. |
|---|---|---|---|---|
| MEDINA | 12,500 | Notley | Nov. 15 | Nov. 18 |
| MONGOLIA | 10,000 | Lewellin | Nov. 29 | Dec. 2 |
| MACEDONIA | 10,500 | Bennett | Dec. 13 | Dec. 16 |

PASSAGE MONEY TO LONDON—
Single, £41 16s. to £82 10s.
Return, £69 6s. and £123 4s.

Return Tickets between Inter-State Ports are available for return by Orient, Messageries Maritimes, and N.D.L. steamers having room.

SPECIAL HOLIDAY RETURN TICKETS to COLOMBO are now issued, available for two months. Fares from Sydney, £45 2s. first saloon, and £31 18s. second saloon.

A. GORDON WESCHE, Superintendent IN AUSTRALIA, 63 Pitt-street, Sydney.

The COLONIAL MUTUAL FIRE Insurance Company Limited.

Principal Office: 60 MARKET-ST., MELBOURNE.

Branches in all the States.
Transacts Fire, Guarantee, Employers' Liability, Marine, Burglary, and Plate Glass, Accident, Workers' Compensation and Live Stock Insurances.
Send for Prospectus.
W. TUCKER, General Manager.

Harringtons Ltd.

ANALYTICAL & METALLURGICAL DEPT.

Highest prices given for all gold, silver or platinum residues, etc.
Lowest fees for all kinds of Assay, Analytical, and Metallurgical work.
Expert Advice on Ore Treatment, Bullion Refining, Smelting, etc., etc., Directed by a qualified Analyst from Messrs. Johnson and Sons, London: Assayers and Refiners to Bank of England, H.M. Mint, The Council of India, etc.

HARRINGTONS LTD.
386 George Street, Sydney.

**A.U.S.N. Co. Ltd.**

*Fast, Regular, and Comfortable Passenger Steamers*
(also carrying cargo) from and to
MELBOURNE, SYDNEY, ADELAIDE, FREMANTLE, BRISBANE, and all QUEENSLAND PORTS.

Passage Tickets interchangeable, with other Inter State Companies, on certain conditions.

Full Particulars at
**COMPANY'S OFFICES**
**at all principal Australian Ports.**

**The Mount Lyell Mining & Railway**
**CO. LIMITED.**

Purchasers of **Ores containing Copper, Gold and Silver.** Rates obtainable on application to the Secretary

Manufacturers of **Coke for Smelting and Foundry Purposes, Acids, Etc.**

**HEAD OFFICE—**
**39 QUEEN-STREET, MELBOURNE.**
**D. G. LUMSDEN,**
Secretary.

**The "Atlas" Diesel is the right Engine for Mining Work!**

Proof of its efficiency is its popularity. Many managers have adopted the "Atlas" Diesel Oil Engine after experimenting with every other make. Let their experience be your profit and prompt you to get particulars.

We can tell you here that the "Atlas" Engine is unique as regards

**POWER — RELIABILITY — LOW COST OF RUNNING.**

Being a true internal combustion engine, it requires no ignition device, It runs on the very crudest fuel, such as Petroleum residue, etc.—starts easily and surely, and requires but little looking after—in fact, it runs itself.

It will pay you handsomely to get particulars of this famous engine. Call and see it running if you can—to-day.

**We are Mining Machinery Specialists.**

**STAWN LIMITED,**
**Engineers, 343 Kent Street, Sydney.**

## New South Wales.

PUBLIC WORKS DEPARTMENT.—8th December.—M., S. and D. of steel bridges for Cooperbung and Piper's Creeks, on fifth section, North Coast Railway, viz., Wauchope to Kempsey.

RAILWAY DEPARTMENT.—12th November.—S. of three 30-kilowatt motor generator. (See advertising columns.)

26th November.—S. of one 2000 lb. storage battery freight truck. (See advertising columns.)

15th December.—M. and D. of one turbine centrifugal pumping plant for Crown-street Pumping Station.

14th January, 1914.—S. of 2 electrically driven turbine pumps, 50 gallons per minute. (See advertising columns.)

WATER CONSERVATION AND IRRIGATION COMMISSION, 29 Elizabeth-street, Sydney.—10th November.—S. of storage battery for Yanco Power House.

## Queensland.

TREASURY DEPARTMENT.—(Babinda Central Sugar Mill)—24th November.—S. D. and E. of small electric generating plant, motive power, and all accessories. Shafting, brackets, and travelling crane for 30 cwt. Tools for fitting shop. Bar iron and piping. One locomotive, about 12 tons loaded, 2ft. gauge.

6th January, 1914.—S. and D. of 23 miles of steel rails, 28 lb. per lineal yard, with all fastenings, to be delivered at Cairns Wharf in July, 1914.

PUBLIC WORKS DEPARTMENT.—7th November.—S. and D. of electric light material for hospital for insane, Goodna.

HOME SECRETARY'S DEPARTMENT.—25th November.—S. and D. of drugs and chemicals.

## Western Australia.

GOVERNMENT TENDER BOARD.—13th November.—S. of 16,000 gallons of oil.

20th November.—S. of copper firebox, tube plates for Railway Department.

20th November.—1000 yards roofing canvas.

20th November.—200,000 yards tarpaulin canvas.

20th November.—S. of sewerage fittings.

## South Australia.

SUPPLY AND TENDER BOARD.—11th November.—S. and D. of 8 indiarubber hosepipes for Pintsch gas, 50ft. long x 5/8 dia.

11th November.—S. and D. of 130 tons of moulders' blacking.

11th November.—S. and D. of 20 cwt. zinc alloy, which must analyse 83.0 per cent. pure aluminium, 14.25 per cent. pure zinc., and 2.75 per cent. copper.

18th November.—S. and D. 210 tons' calcium carbide.

25th November.—S., D. and stacking 200 miles galv. wire netting (100 miles 42 x 1½ x 18g. and 100 miles 36 x 1½ x 18g.).

6th January, 1914.—S. and D. of 1500 bars chain iron, various sizes.

RAILWAY DEPARTMENT.—4th November.—S. and D. 368 tons coloured or white cotton waste.

18th November.—S. and D. of 1137 bars of copper.

18th November.—C. of bridge for Millswood subway.

13th January.—C. of 12 bogie goods break vans, with passenger compartments, 3ft. 6in. gauge.

PUBLIC WORKS DEPARTMENT.—16th December.—S. and E. at Renmark of complete pumping plant.

MINES DEPARTMENT.—29th November.—P. of Parramatta and Yelta mines plant and machinery. (See advertising columns.)

## New Zealand.

PUBLIC WORKS DEPARTMENT.—17th November (extended from 31st October).—S. of telephone instruments and accessories for Lake Coleridge power scheme.

PUBLIC SERVICE TENDER BOARD.—17th November.—1000 bolts, double "J."

17th November.—1 mile cable, D.C.L.C., armoured, 104 pairs.

17th November.—2 miles cable, D.C.L.C., armoured, 78 pairs.

17th November.—1 mile cable, D.C.L.C., armoured, 52 pairs.

17th November.—1 mile cable, D.C.L.C., armoured, 26 pairs.

17th November.—¼ mile cable, lead-covered, silk and cotton insulated, 312 pairs.

17th November.—¼ mile cable, lead-covered, silk and cotton insulated, 624 pairs.

17th November.—4000 castings, 53 lbs., 6 hole.

17th November.—4000 castings, 40 lb., 6 hole.

17th November.—3000 clamps, Messenger, with coach screws and bolts.

17th November.—2400 covers, bicycle (more or less).

17th November.—2400 tubes, bicycle (more or less).

17th November.—600 covers, motor-cycle (more or less).

17th November.—600 tubes, motor-cycle (more or less).

17th November.—Motor-cycles and bicycles, spare parts for—1 gross chains, Renold's, ½in. by 3/16in., 114 links; 150ft. chain, Renold's, 5/8in. by ¼in.; 1 gross pairs mudguards, steel, with screw in stays; 1½ gross outfits, Woodgate's Patchquick; 72 pairs pedals, rubber, 4in., genuine B.S.A.; 2 gross plugs, sparking, Bosch, single point; 72 saddles, Brook's B10; 3 dozen stays, spare, for mud-guards.

17th November.—100,000 insulator bolts, Sinclair.

17th November.—100,000 insulator cups, Sinclair.

17th November.—2 tons metal, jointers'.

17th November.—200 reams paper, brown.

17th November.—2500 plugs, single current.

17th November.—5000 porous pots, Leclanche No. 1.

17th November.—1000 telephones, table.

17th November.—5 tons wire, copper, annealed, binding, 60 lb. per mile.

17th November.—100 tons wire, copper, hard-drawn, 200 lb. per mile.

17th November.—100 tons wire, iron, galvanised, 200 lb. per mile.

17th November.—100 tons wire, iron, galvanised, 150 lb. per mile.

17th November.—7000 zincs, Leclanche No. 1.

## General.

KORUMBURRA MUNICIPAL POWER HOUSE (Jas. D. Batty, engineer-in-charge).—17th November.—P. of 130 Hart Accumulator Cells.

BALLARAT WATER COMMISSIONERS (V.) (Alex. Fraser, Secretary).—11th December.—C. of reservoir embankment, on the Moorabool River. (See advertising columns.)

SHIRE OF SWAN HILL.—2nd December.—S. and D. on site of all machinery and labour for duplication of electric power plant at Swan Hill.

BRISBANE—THE METROPOLITAN WATER AND SEWERAGE BOARD (Albert-street).—11th November.—S. and D. of electric blue printing machine.

13th January, 1914.—M. and D. of material for aerial ropeway.

ELDERSLIE STATION, Winton, W. Q'land.—19th November.—Sinking and completion of an artesian bore, maximum depth 4500 feet.

CITY OF LAUNCESTON (T.) (C. W. Rocher, Town Clerk).—24th November (extended from 13th October).—Section i., S. and D. of transformers, etc.; section ii., S. and D. of feeder cable, etc.; section iii., S., D. and E. of high tension switchboard, etc.

CHRISTCHURCH CITY COUNCIL (H. R. Smith, town clerk).—5th January, 1914.—S. and D. of series street lighting plant and accessories. Specifications may be seen Town Clerk's office, Melbourne.

HAMILTON ELECTRIC SUPPLY CO.—13th November.—P. as going concern, plant, land and rights of business.

CITY OF MELBOURNE.—7th November.—S. and D. of one cast-iron spiral stairway

G. Ahern, Zeehan (T.).—For sale, machinery. (See advertising columns.)

MUNICIPAL COUNCIL OF SYDNEY.—10th November.—S. and D. of a radial drilling machine. (See advertising columns.)

10th November.—Provision of switchboard for motors in connection with the refrigerating apparatus at the fruit markets; also high-pressure feed water piping for water meter, at the Power House. (See advertising columns.)

10th November.—Iron-clad switches. (See advertising columns.)

ELECTROLYTIC REFINING AND SMELTING CO. LTD., Port Kembla (N.S.W.).—22nd November.—Engineering, electrical, chemical and general stores, for years 1914 and 1915.

## ACCEPTED.

### Commonwealth.

POSTMASTER-GENERAL'S DEPARTMENT, Victoria.—250 ironclad indicators, £48 15s.; 750 ironclad indicators, £148 2s. 6d.; 5000 jacks, three-part, £109 7s. 6d.; 3000 jacks, five-part, £75; 30 plugs, £7 17s. 6d.; 1000 plugs, three-part, £116 13s. 4d.; 800 cord weights and pulley, £15; 24 induction coils, £12 12s.; 4500 fuses, £168 15s.; 500 ironclad indicators, £375; 100 indicators, £17 10s.; 100 plugs, £62 10s.; 900 plugs, three-part,

Dunlop Mining Goods
Are now used with satisfaction in most of the Leading Mines of Australasia—Their QUALITY & WEAR are UNSURPASSED
Tenders & Samples submitted
Correspondence Invited
Send for Illustrated Catalogue

The DUNLOP RUBBER Co. of AUS. Ltd.
108 Flinders St. MELBOURNE.
& ALL STATES

Dunlop Rubber Belting
Is more efficient than Leather belting for Outdoor & Wet Work.
Sample & Price on application.

**"FIBRO-CEMENT" Fireproofing**

Everyone about to build should obtain full particulars of this cool, acid-proof, ant-proof and fire-resisting material. The slates for roofs and the sheets for walls and ceilings are specially suited for the Australian climate. Used by the Federal and State Governments and by all the leading Architects and Builders.

**ECONOMICAL AND EVERLASTING.**

Full particulars, etc., from Sole Agents and Importers—
**JAMES HARDIE & CO. Melbourne & Sydney**

£123 15s.; 100 resistances, £4 3s. 4d.; 50 resistances, £2 1s. 8d.; 25 pilot lamp sockets, £2 3s. 9d.—Western Electric Co. (Aust.) Ltd.

POSTMASTER-GENERAL'S DEPARTMENT, N.S. Wales.—S., D. and E. of 2 sections of common battery switchboard, £2824 10s.—British General Electric Co.

30,000 lineal feet conduit, glazed earthenware, 6 ducts, £3312 10s.; 24,000 lineal feet conduit, glazed earthenware, 9 ducts, £4950—The Hoffman Brick and Potteries Ltd.

9200 cells, dry, rectangular, £958 6s. 8d.—W. G. Watson and Co. Ltd.

POSTMASTER-GENERAL'S DEPARTMENT, Tasmania.—1900 jacks, three part, in strips of 20, numbered, at 17s. 6d. per strip; 360 jacks, local, in strips of 10 jacks per strip, complete with 360 number plates, at 16s. 6d. per strip; 100 jacks, local, in strips of 10 jacks per strip (without number plates), at 15s. per strip; 460 sockets, lamp, mounted in strips of 10, to Commonwealth Sealed Pattern No. 101, numbered, at 12s. 6d. per strip; 300 lamps, line, 24 volts, for use with C.S.P. No. 101, to Commonwealth Sealed Pattern No. 141, at 8d. each; 600 caps, opal, for line lamps, to Commonwealth Sealed Pattern No. 259, at 12s. per 100; 50 caps, opal, for line lamps, to Commonwealth Sealed Pattern No. 259, the lamp caps to be marked in accordance with No. 8 of Drawing C.46, at 12s. per 100; 385 coils, retardation, to Commonwealth Sealed Pattern No. 82, but wound to 100 ohms, at 1s. 7d. each; 400 coils, heat (green), at 3½d. each; 30 condensers, two microfarad, in tin case, 7⅛in. x 4⅝in. x ⅞in., with connecting lugs, to Commonwealth Sealed Pattern No. 208, at 2s. 10d. each; 15 strips, terminal, to M.D.F., two-way, numbered, at 4s. 6d. per strip; 20 strips, terminal, for intermediate distributing frame, three-way, at 5s. per strip; 28 strips, terminal, for intermediate distributing frame, four way, numbered, at 5s. 3d. per strip; 100 guards, for caps of supervisory lamp, for use with Commonwealth Sealed Pattern No. 259 to Commonwealth Sealed Pattern No. 178, at 6s. 11d. per 100; 175 plugs, three way, to Commonwealth Sealed Pattern No. 357, at 1s. 4d. each; 370 relays, line, 5000 ohms, at 8s. 6d. each; 15 relays, line, 100 ohms, at 8s. 6d. each; 370 relays, cut off, 150 ohms, 5s. 6d. each; 15 relays, cut off, 500 ohms, at 8s. each; 15 relays, magneto, line locking resistances line coil, 2000 ohms, locking coil 400 ohms, at 8s. 6d. each; 30 relays, supervisory, 100 ohms, with 600 ohms non-inductive resistance, at 7s. 6d. each; 3 strips, protector, for use on main distributing frame, Hobart C.B. Exchange (the capacity for each strip to be 200 lines fully equipped), at £41 10s. per strip; 550 yards cable, switchboard, 21 conductors, at 7d. per yard; 220 yards cable, switchboard, 42 conductors, at 1s. 2½d. per yard; 220 yards cable, switchboard, 63 conductors, 1s. 8d. per yard; 110 yards cable, switchboard, 84 conductors, at 1s. 11½d. per yard; 22 yards cable, switchboard, 154 conductors, at 4s. 3d. per yard; 20 sockets for pilot lamp, to Commonwealth Sealed Pattern No. 284, at 1s. 9d. each; 20 caps, opal, for pilot lamps, to Commonwealth Sealed Pattern No. 260, at 5½d. each; 20 guards for caps of pilot lamps, for use with Sealed Pattern No. 260, to Commonwealth Sealed Pattern No. 261, at 3d. each; 25 caps, opal, for meter circuit (marked M), to Commonwealth Sealed Pattern No. 258, at 4½d. each; 25 caps, red, for pilot lamps, for use with Sealed Patterns Nos. 136 and 284, to Commonwealth Sealed Pattern No. 139, at 4d. each.—Western Electric Co. Ltd.

500 registers, electrical, recording up to 9999, with two connecting lugs, resistance 400 ohms and 400 ohms, at 7s. 9d. each.—J. Bartram and Son Pty. Ltd.

2000 jacks, in strips of 20, to Commonwealth Sealed Pattern No. 426, at 21s. 6d. per strip; 500 sockets, lamp, mounted in strips of 20, at 16s. per strip; 300 lamps, line, 24 volts, at 8d. each; 500 caps, opal, for line lamp, at 12s. per 100; 25 strips, mounted, for number plates, at 4s. 6d. per strip; 300 plates, number, numbered from 900 to 1251, at 4d. each; 300 relays, line, 1000 ohms, at 5s. 6d. each; 300 relays, cut off, 30 ohms, at 6s. 3d. each; 20 strips, terminal, for intermediate distributing frame, numbered, at 2s. 9d. each; 40 strips, terminal, for intermediate distributing frame, at 6s. each; 100 registers, electrical, recording up to 9999, with two connecting lugs, resistance 500 ohms and 40 ohms, at 6s. 6d. each; 220 yards, cable, switchboard, 42 conductor, at 1s. 3d. per yard; 990 yards cable, switchboard, 63 conductor, at 1s. 8d. per yard; 66 yards cable, switchboard, 84 conductor, at 1s. 3d. per yard; 2 strips, protector, for use on main distributing frame, Launceston C.B. Exchange (the capacity of each strip to be 200 lines, fully equipped), at £41 10s. per strip.—Western Electric Co. (Australia) Ltd.

4 tons sealing wax, 3 tons in 1 lb. sticks, and 1 ton in ½ lb. sticks, in packages of 7 lb. each, at 76s. 3d. per cwt.—John H. Wall.

1500 lb. twine, roping, in well-wound balls of ½ lb. net, at 11¼d. per lb.; 1000 lb. twine, medium, in well-wound balls of ½ lb. net, at 10¾d. per lb.—James Miller and Co. Pty. Ltd.

800 tins obliterating ink, in tins ½ lb. net, at 5½d. per tin—Joplin Manufacturing Co. Ltd.

DEPARTMENT OF HOME AFFAIRS.—S. of copper pipes, valves, etc., for power generating station, Federal Territory, £611—Morts' Dock and Engineering Co. Ltd.

S. and D. of line materials, Canberra, £225—E. Campbell and Sons Pty. Ltd.

S. and D. of line materials—H. Joyner.

## Victoria.

VICTORIAN RAILWAYS.—M. (from steel which will be sold to the contractor by the Corporation), S. and D. of ⅞in. steel heel bolts, 8⅞in. long, with steel nuts, to Litho. No. 539/13, as specified, for 60 lb. rails, at £22 19s. per ton, delivered at Warrnambool Railway Station; M. (from steel which will be sold to the contractor by the Corporation), S. and D. of ⅞in. steel chair bolts, 5⅝in. long, with steel nuts, to Litho. No. 540/13, as specified, for 60 lb. rails, at £24 5s. per ton, delivered at Warrnambool Railway Station; M. (from steel which will be sold to the contractor by the Corporation), S. and D. of 1in. steel heel bolts, 9½ in. long, with steel nuts, to Litho. No. 538/13, as specified, from 80 to 100 lb. rails, at £22 17s. per ton, delivered at Warrnambool Railway Station—C. C. Wiggs.

S. and D. of 10 type-high plungerless six-wheel numbering machines—8 number (set in frames containing 4 machines each), for £90; 2 number, at £10 each—Middows Bros. (Australia) Ltd.

S. and D. of liquid fuel for oil furnaces, at £5 per ton, delivered pumped into Departmental tanks on trucks at Williamstown Railway Siding—British Imperial Oil Co. Ltd.

P. of 10 Lux railway cylinder lamps, £117 10s.—Lux Light Co. of Victoria.

P. of a quantity of Westinghouse brake material, £1047 4s. 4d.—Westinghouse Brake Co. of Australasia Ltd.

P. of 25,000 gallons of oil for gas making, £833 6s. 8d.—Commonwealth Oil Corporation Ltd.

STATE FORESTS.—P. of all rights under Patent No. 17801 for the artificial seasoning of timber in so far as such rights apply to the State of Tasmania, £750—J. House.

STATE RIVERS AND WATER SUPPLY COMMISSION.—Putting down to water 5 boreholes in the Walpeup West Waterworks District (Contract No. 1203), £1125—G. P. Conlon.

## Western Australia.

GOVERNMENT TENDER BOARD.—S. of brass discs, items 1 to 6, £8 12s. 6d.—R. S. Cumpston.

PUBLIC WORKS.—S. of three road rollers, £72 10s. each—J. and E. Ledger.

---

## DIVIDENDS.

The following dividends and bonuses of mining companies in Australia have been declared, and are payable on the dates noted.

November.

3rd.—Bullfinch Proprietary (W.A.), 1s., £23,800.

6th.—New Chum Goldfields G.M. Co., Bendigo (V.), 6d., £800.

6th.—North Bendigo G.M. Co., Bendigo (V.), 6d., £600.

11th.—Bourke's Hill T.S. Co., Emmaville (N.S.W.), 6d., £1125.

14th.—Porepunkah Dredging Co., Bright (V.), 1s., £250.

14th.—Tongkah Compound Co., Siam, 1s., and bonus, 1s., £5000.

19th.—Broken Hill Proprietary S.M. Co., 1s., £75,000.

20th.—Ajax Central G.M. Co., Daylesford (V.), 2s., £3000.

December.

1st.—Silverton Tramway Co., Broken Hill, (N.S.W.), 1s., and bonus, 2s., £37,500.

12th.—Amalgamated Zinc (De Bavay's) Ltd., Broken Hill (N.S.W.), 1s., £25,000.

29th.—Zinc Corporation, Broken Hill (N.S.W.), 1s. 6d., less English income tax, all shares, £67.400.

---

The Mammoth Copper Mines smelters (N.Q.) blew in recently, and are now working very satisfactorily. On Monday last 50 tons of copper matte was railed to the Chillagoe converters, and about 20 more tons were awaiting shipment from Mungana. Four traction engines are at work hauling the matte and coke between Mungana and Cardross. Two more engines are being put into commission at an early date. Mr. Rutledge, manager, speaks in high terms of the properties under his control, and predicts a very prosperous future for them.

# WESTERN AUSTRALIAN MINING.

(From Our Correspondent.)

Kalgoorlie, Oct. 27.

Developments at No. 5 level of the Victorious indicate that the ore-shoot is pitching east and also lengthening in that direction. For instance, at No. 4 level, the first 190ft. driven east was worth 182s. 7d. per ton, and the next 65ft. to 255ft. only 12s. 7d. per ton. At 5, the first 27ft. only averaged 9s.; then, from 27ft. to 138ft., assays showed 59s. 6d.; from 138ft. to 220ft., 19s.; and from 220ft. to 265ft. — the present face — 107s. 3d. per ton. During the last week free gold and telluride have been showing, and some very high assays have been taken. The plat at No. 6 level is being cut, and, if developments at No. 6 warrant it, an Edward's roaster and Krupp's ball mills will be ordered.

Developments in the Lake View Mine have come very opportunely to refute to some extent Dr. Malcolm MacLaren's assertion "that it is unsound mining to sink deeper in search of ore bodies that both indications present, and a wide experience of similar conditions combine in asserting to be non-existent." The sinking of the main shaft on the Lake View was suspended in February, 1905, at a depth of 1945ft., because below 1700ft. the lodes were practically barren in the calc schist. In April, 1912, Mr. H. E. Vail, the present manager, resumed sinking, and reached 2149ft. before the end of the year. He now announces that, at the 2100ft. level, the face of the north drive at 158ft. is in ore averaging 77s. per ton over a width of 54in., with ore still in the east wall. The ore carries free gold and telluride. The further opening up of this lode will be watched with extreme interest, as hitherto, when the lodes passed from the quartz diabase, or dolerite, into the underlying calc schist, they invariably became unpayable or barren, with the solitary exception of the wonderful Brown Hill-Oroya shoot, which was in calc schist just below its junction with the diabase or dolerite.

It is rumoured that the Golden Ridge Co. will exercise its option on the Yerilla King at £6000, but it hardly seems likely. Since the option was taken in July two returns have been published of 236 tons for £660, and 114 tons for £250, which is a very long way below the previous average of the mine of £14,800 from 3300 tons, besides the quantity is far too small for a company with a nominal capital of £50,000, in 10s. shares. Up to April, 1911, the company was making a revenue of £6500 a month for a profit of £3000. From April, 1911, to February, 1913, the monthly revenue was £5200 and the profit £1700. From February, 1913, to October, 1913, the revenue was £4600 and the profit £1000. In future the revenue will be £4000 and the profit £500. It does not appear as if the Yerilla King will ever be able to approach these figures, as in eight years the mine has only returned £15,700 from 3700 tons. Yerilla is 25 miles east of Kookynie, which is 118 miles north of Kalgoorlie by rail. It is on the Mulga country, where timber and fuel are very scarce and dear. On March 31 the Golden Ridge Co. had liquid assets of £12,000, and, up to the end of October, would have added another £7000, as no dividends have been paid. The company may yet secure a suitable property at a reasonable figure and again join the dividend list. Since 1904 the company has paid £140,209 in dividends, or nearly ten times the amount the Yerilla King has produced in the time.

Mr. Charles Martin, at one time manager of the Moribund Westralia Mt. Morgans, then of the defunct Chaffinch, and till quite recently manager of the Kyarra, an off-shoot of the Bullrush Gold Estates, since being appointed manager of the Ruby Well Option Syndicate, has been letting himself go on the vast possibilities of Whitaker's, Holden's and portion of Davey's leases now held by the syndicate. No work has been done, or can be done, till the leases are surveyed and granted by the Warden, which will certainly not be before the annual holidays, as Holden's Find is 55 miles north of Meekatharra, the nearest town where the Warden's Court is held. The find has been visited by Mr. Hope Nicolson, Mr. Campbell Shaw and other well-known mine managers, who were not enamoured of the prospect, as nothing could be seen for scrub. If people in Melbourne and Adelaide gamble recklessly in lease applications, as they seem bent on doing at Holden's, as they did three years ago at Bullfinch, and since at Kurnalpi, Binti Binti, and, to a less extent, at Ora Banda, they have only themselves to blame. Not a score of leases outside the Bullfinch Propy. were ever granted at Bullfinch, not half a dozen at Kurnalpi, and only two at Binti Binti, yet wild gambling took place in the shares of companies which never held a lease far less a gold mine. Apparently Adelaide speculators are living in hopes of striking another Brookman's "Sheep Farm," but, without British capital to prove it, even the "Sheep Farm" might have lain as dormant as the Bullfinch, Kurnalpi and Biuti Biuti Districts are to-day.

As the oxidised ore in the Mountain Queen is practically exhausted, Bewick, Moreing and Co. have taken a sampling option on the Great Victoria, 12 miles distant, which was last year under option to the Great Boulder Co. They are satisfied with the results of the samplings shown by Mr. Hamilton, who is far too cautious over selecting a possible new property. The chances are in favour of the Mountain Queen Co. taking the Great Victoria, unless the price asked is too stiff. The mine, if properly tackled, will probably prove the biggest low-grade property in Australia.

## NEWS AND NOTES.

The 15th dividend of the Bourke's Hill Tin Sluicing Co., Emmaville (N.S.W.), of 6d. per share, payable on the 11th inst., will amount to £1125, and will make the amount paid to members of the company £16,875, equal to 7s. 6d. per share, the shares being paid up to 8s. 6d. only, and only liable for a further 1s. 6d. each.

Referring to the company's new steel works at Newcastle (N.S.W.), the last monthly report of the Broken Hill Proprietary states that the construction of foundations is making good headway. Dredging and reclamation work has been carried on continuously. The loading jetty is finished. The first consignment of machinery, consisting of a 60-ton crane, has arrived, and was landed at this jetty. This crane will be put together immediately, and be ready for the unloading of the heavier portions of the plant that are expected to arrive towards the end of November. The complete ironwork for the blast furnace, together with the blowing and hoisting engines, was shipped by the s.s. Anglo-Egyptian, which left New York on October 5. The first shipment of boilers for the power plant will be made from England early in November, and the gas-producers are in course of shipment from America.

The following representatives of the Universities of Berlin and Halle (Germany) will visit Australia next year in connection with the congress of the British Association for the Advancement of Science:—Professor Albrecht Penck, professor of geology at the Berlin University; Professor Johannes Walther, professor of geology at the Halle University; Professor Felix Luschan, professor of anthropology and director of the Anthropological Institute, Berlin University.

The operations which are being conducted on the Gympie (Q.) goldfield, under the supervision and direction of Mr. Dunstan, Govt. Geologist, give every promise of being successful. It was generally believed that the geological characteristics were against the possibility of the reef forming again. Mr. Dunstan, however, held a different view, and contended that the three beds of slate in the high ground would be found continuous in depth and did not converge into one bed. The work that has been carried out has proved the existence of three beds, and the reef and the correctness of Mr. Dunstan's predictions. It is Mr. Dunstan's opinion that gold will be found at the junction of the slate and the reef, and he thinks that exploratory operations should be continued with that view. Already a crosscourse has been encountered, which was not anticipated, and was not recorded in connection with the workings of adjoining mines. The slate bed, therefore, may not be continuous. It may drop or rise abruptly in some places, so that whether or not the operations will be crowned with success is very problematical at present.

The vacancies on the board of the Bank of Australasia caused by the deaths of Mr. W. R. Arbuthnot and the Rt. Hon. A. Lyttleton, have been filled by Mr. F. Livingstone-Learmonth and Mr. Michael Hugh Hicks-Beach.

The revenue of the Melbourne Tramway and Omnibus Co. for October amounted to £64,974, showing an increase of £2030 as compared with October, 1912: the passengers carried numbered 7,786,549, an increase of 244,691, and the mileage run was 1,033,110, an increase of 30,062.

The gold received by the Melbourne branch of the Royal Mint during the week ended on November 1 amounted to 8374.71 oz.

The October receipts of the Prahran-Malvern (V.) Tramways Trust from the lines controlled by it amounted to £7657 7s. 6d., as against £3749 11s. 7d. for October, 1912. The number of passenger fares was 1,144,431, against 586,507, and car mileage was 128,825, against 64,082. The comparisons, as supplied, do not really convey much information, however, as new lines have been opened during the year. All they show is the increased responsibility of the Trust.

The first battle-ship to fill her tanks with oil for fuel at Port of Spain, Trinidad, is the "New Zealand," which arrived there on October 28, and was expected to remain for about a week.

The Zinc Corporation (N.S.W.) has declared an interim dividend of 1s. 6d. per share, less English income tax on all shares, payable on December 29. The total distribution amounts to £67,400.

At the half-yearly meeting of shareholders of the Langi Logan South Co., Ararat (V.), held last week some hopeful news was communicated to them. The wash which had just been cut by the intermediate drive showed gold in every dish tried. The principal object was to extend the main level towards the deep channel in which the higher grade wash was believed to exist. About a million gallons of water daily was being raised, which would have the effect of keeping the deep ground drained. Also, developments in the surrounding leases continued to be favourable. The retiring directors, Messrs. Murray, Rain, Staughton, and Armytage, were re-elected.

The novel experiment of employing strike-breakers is being tried by the Quincy Mining Co., Mich. (U.S.A.). The men will be housed and fed on the property; and by this means it is hoped to restore the production of copper to the normal in a very short time. Only about 20 per cent. of the strikers have returned to work in the Quincy Co., while about 60 per cent. have gone back to the Calumet and 75 per cent. to the Trimountain mines.

The sixth half-yearly meeting of shareholders of the Hansel Mundy G.M. Co., Bendigo (V.), was held in Adelaide on the 28th ult. In the course of his address the chairman, Mr. G. A. Wallman, stated that the developments in the mine had reached a very interesting stage, in connection with which the company would receive the sum of £1900 from the Victorian Government, besides half the cost of installing the pumping plant.

Speaking from the chair at the meeting of the Royal Bank of Australia on the 29th ult., Mr. R. J. Alcock referred hopefully to the promise of the coming season. The general outlook, he said, was bright, but there were two considerable drawbacks—labour unrest and a stringent money market. "For the former (he said) there appears to be no panacea; our legislators have tried one scheme after another, but, while we may credit them with a sincere desire to so regulate the relations between capital and labour as to do away with friction, the most optimistic can scarcely regard their efforts as completely successful. In Victoria a fresh attempt is to be made, and we wish it all success, but experience does not lead us to be hopeful. It does not lie in my province to suggest remedies; I would merely point out that the loss resulting from the dislocation of trade caused by labour troubles is very great, and if it could be expressed in figures I think it would 'stagger humanity.' The other trouble, the monetary stringency, is fortunately of a more transitory character, and it will doubtless pass away before very long, although I cannot say the end is yet in sight."

The hearing of the appeal to the Judicial Committee of the Privy Council by the Ore Concentration (Elmore process) against the decision of the Supreme Court of New South Wales in the action brought by the appellant company against the Sulphide Corporation (N.S.W.) for infringement of patent rights, has been concluded, but judgment is reserved.

Professor Haber, of Carlsruhe, Germany, has for some time, at the suggestion of the Kaiser, been investigating the causes of mine explosions and how best to prevent them. One outcome of his general knowledge of gases has been the invention of a whistle, which is sounded by the air of the mine, and in which an alteration in tone is produced when the air contains ·1 per cent. of dangerous gas.

The report and balance-sheet of the Bank of Australasia, which appeared in our issue of last week, show a net profit for the half-year ended on April 14th of £206,644, which, with a balance of £28,548 brought forward, makes a total of £235,192 to be allocated. The directors have declared a dividend for the half-year at the rate of 14 per cent. per annum and a bonus at the rate of 3 per cent. per annum, together equal to £3 8s. per share, free of income tax, and making a total distribution of £136,000. The reserve has been increased by £50,000 to £2,060,000, and £20,000 has been applied to reduction of cost of bank premises, leaving a balance of £29,192 to carry forward. The directors announce that the £400,000 of new capital issued was fully subscribed. Deposits amount to £18,515,035, as against £17,906,493 in October, 1912, and £18,196,527 in April last year, while advances are given at £17,192,686, as against £17,225,792 in October, 1912, and £17,065,355 in April, 1912, the increase of deposits for the full year being £318,508, and that of advances £127,311.

It was announced last week that an important step had been decided upon by the directors of the Mt. Lyell (T.) Mining and Railway Co. and the Wallaroo (S. Aus.) Phosphate Co., with a view to economy in the manufacture, but especially in the distribution of superphosphate for agricultural use. For the past few years, since the Mt. Lyell company set up its chemical works at Port Adelaide, the two companies have been working as rivals, though there was little difference in the composition of their products, and both have felt severely the increasing cost of production, without being able to "pass it on" sufficiently to recoup the manufacturers, on account of competition from abroad, there being no duty in the Commonwealth tariff on chemical manures. It has been decided, therefore, to amalgamate the two concerns, without closing the works of either. The geographical positions of Wallaroo and Port Adelaide are very favourable to wide distribution over two very large but different wheat areas, Wallaroo having command over the land on both sides of Spencer's Gulf, including the immense area of Eyre's Peninsula, as well as northwards beyond Lake Torrens, while Port Adelaide commands the whole eastern area up to and beyond the borders of New South Wales and Victoria. By this new arrangement it is considered that the farmers will be benefited through the avoidance of further increases in the cost of superphosate, while the manufacturing industry will be preserved to the State. The proposal is to form a new company with a capital of £400,000, under the name of the Wallaroo Mount Lyell Chemical Works Ltd., shareholders in the Wallaroo Company receiving share for share in the new company, while the Mt. Lyell company will hold a share interest on account of its own shareholders. Meetings of members of both companies will be held shortly, at which they will be asked to approve of the scheme of the directors, and at which fuller particulars will be given.

The proposal of the Allgemeine Elektrizitaets-Gesellschaft, of Berlin, to connect the Gesundbrunnen quarter of the capital with the city of Neukoelln by means of an electric railway for rapid transit, has been approved of by the competent authorities. The railway, the cost of which is estimated at £4,500,000, will have to carry about 60,000,000 passengers annually. It will have only one class, and will carry its passengers, by means of a service of three and six minutes respectively, for 1d. as far as the fourth stopping place, and for 1½d. as far as the eighth stopping place. A ticket for the whole line is to cost 2½d., while, during the early hours of the day, a return ticket for the same distance is to cost only 1½d.

In regard to the limits of weight and the rates of postage for ordinary letters there exist, in the various countries belonging to the Universal Postal Union, certain differences which frequently cause disagreements and disadvantages in connection with international communications. The German Post Office, which has always enjoyed the reputation of being particularly progressive, has admitted that these difficulties exist, and, therefore, considers it highly desirable that uniformity in regard to the limits of weight and the rates of postage is once more established. German papers state that, at the next meeting of the Postal Union, to be held in 1914, at Madrid, the German Post Office authorities will consequently move for the adoption of a rule to this effect.

The action of oxidisers in cyaniding is not thoroughly understood. Morris Green, of Johannesburg, suggests that the addition of potassium permanganate, not in excess, is useful not so much in oxidising reducing matter as in yielding a solution which dissolves the gold content of the charge more readily. Experiments proved this idea to be quite fallacious. Potassium ferricyanide is a well known oxidiser, but its reaction with potassium cyanide and other substances involved in cyaniding appears to be quite unknown. A pure solution of ferricyanide in water is found to have no action on gold. The addition of the salt to a cyanide solution always accelerated the rate of solution of gold in the latter, but eventually destroys potassium cyanide, and introduces reducing matter into the solution; but notwithstanding this, its presence causes gold to dissolve more rapidly. The assistance given by oxidisers in he dissolution of gold is of a secondary nature. Unlike free oxygen, oxidisers do not retard dissolution. Potassium nitrate, bichromate, and chlorate were found to be without influence upon the solubility of gold in cyanide solutions.

## PUBLICATIONS RECEIVED.

Victorian Year Book, 1912-13. By A. M. Laughton, F.S.S., Government Statist. Part VI., Law, Crime, etc.; Part VII., Vital Statistics (Government Printer, Melbourne, 1913.)

* * *

Annual Report of Government Geologist of South Australia, with Appendix on the Artesian Water Resources of the State, and plans. (Government Printer, Adelaide, 1913.)

* * *

Mt. Grainger Goldfield, South Australia. Special report by R. Lockhart Jack, B.E., F.G.S., Assistant Government Geologist. (Government Printer, Adelaide, 1913.) An extended abstract of this report was given in our issue of May 15 last, and its late appearance in pamphlet form is possibly due, as in the case of the Half-Yearly Review, to pressure of work in the Government Printing Office.

## Commonwealth of Australia.

Postmaster-General's Department,
Melbourne, October 31, 1913.

TENDERS will be received at the office of the Deputy Postmaster-General, Melbourne, until 3 p.m., on January 27, 1914, for the Supply and Delivery of Switchboards, Telephone, etc. (Sch. 990). See "Commonwealth Gazette," November 1.

AGAR WYNNE,
(266) Postmaster-General.

---

Department of External Affairs,
Melbourne, October 29, 1913.

APPLICATIONS will be received by the Secretary, Department of External Affairs, Melbourne, until Novmber 17, from Surveyors and Assistant Surveyors, to undertake Contour and Survey Work in the Oil Field, Vailala District, Papua. Period of engagement, twelve months certain. Applicant to state age, and furnish copies of testimonials.

Fares from Australia to Papua will be paid. Salaries, £425 and £200, respectively.

**Appointee should supply his own instruments.**

(Sgd.) ATLEE HUNT,
**Secretary.**

---

Department of Home Affairs,
Melbourne, October 22, 1913.

### KALGOORLIE TO PORT AUGUSTA RAILWAY.

### ANALYTICAL AND BIOLOGICAL CHEMIST.

Applications are invited from persons competent to fill the position of Analytical and Biological Chemist in connection with the Western Australian Powellised Sleeper Contract. The position will be under the Kalgoorlie to Port Augusta Railway of 1911, which provides that the appointment will be during the pleasure of the Minister, and may be for any period not extending six months beyond the date on which the line shall be declared open for traffic.

Salary, £500 per annum.

Applicants must be thoroughly capable of conducting analyses of all classes of materials, and must have a knowledge of timber and its diseases.

The successful applicant will have to reside in Western Australia, and will be immediately responsible to the Engineer-in-Chief for Commonwealth Railways.

Applications, accompanied by copies of diplomas and testimonials, and addressed to the Secretary, Department of Home Affairs, Melbourne, will be received until noon on Tuesday, 25th November, 1913.

The age of the applicant must be stated.

W. H. KELLY,
For Minister of State for Home Affairs.

---

Department of Home Affairs,
Melbourne, October 30, 1913.

### KALGOORLIE TO PORT AUGUSTA RAILWAY.

### TENDERS FOR BOGIE CATTLE AND BOGIE SHEEP WAGGONS (4ft. 8½in. GAUGE).

TENDERS, addressed to the Secretary, Department of Home Affairs, Melbourne, will be received **up to 11 a.m., on Tuesday, December 2, 1913,** for the Manufacture in Australia, Supply and Delivery of—

15 Bogie Cattle Waggons, and
30 Bogie Sheep Waggons.

Plans, specifications, etc., will be on view on and after November 5, 1913, at the following offices:—Commonwealth Railways, 84 William-st., Melbourne; Commonwealth Works Director, Customs House, Sydney, and Commonwealth Works Registrars, Brisbane, Adelaide, Perth and Hobart. The charge for each copy of the specification will be £1/1/-, and for each plan 5/-, which must be paid before the documents can be issued.

Tenders are to be endorsed "Tender for Bogie Cattle and Bogie Sheep Waggons," and are to be accompanied by the deposit mentioned in the form of tender.

JOSEPH COOK,
Minister of State for Home Affairs.

---

## THE ZINC CORPORATION LIMITED.

Notice is hereby given that an Interim Participating Dividend of One Shilling and Sixpence per Share, less income tax at the rate of 1/2 in the £, has been declared, payable on December 29, to preference and ordinary shareholders registered on November 14. Transfer books close on Thursday, November 13, at 5 p.m., and re-open on Saturday, November 15.

J. M. STOKES, Local Secretary.

---

## Government Notices (N.S.W.).

New South Wales Government Railways,
Office of the Chief Commissioner,
Sydney, November 1, 1913.

TENDERS will be received at this Office until 12 o'clock noon on the dates specified for the undermentioned works, etc., viz.:—

WEDNESDAY, NOVEMBER 12, 1913.

The Supply of Three Thirty-kilowatt Motor Generators, to Specification No. 427 (price 2/6).

WEDNESDAY, NOVEMBER 26, 1913.

The Supply of One 2000 lb. Storage Freight Truck, Specification No. 426 (price 2/6).

WEDNESDAY, JANUARY 14, 1914.

The Supply of Two Electrically Driven Turbine Pumps, 50 gallons per minute. Specification No. 432 (price 2/6).

All specifications are obtainable at the Electrical Engineer's Office, 61 Hunter-street, Sydney.

Tenders are to be endorsed, "Tender for Motor Generators," or, as the case may be.

The Chief Commissioner does not bind himself to accept the lowest or any tender.

By order,
J. S. SPURWAY,
Secretary.

---

## MILL FOREMAN WANTED.

FIRST-CLASS MAN.

Salary — £500 per annum.

Apply, with References and Fullest Personal Information,

MOUNT MORGAN GOLD MINE,
QUEENSLAND.

---

## ONE HUNDRED MACHINE MINERS WANTED.

PERMANENT JOB.

Contract Miners last year averaged 17/4 per Shift.

Wages Miners, 11/- per Shift.

Apply on Job—

MOUNT MORGAN GOLD MINE,
QUEENSLAND.

---

## TO MINE-OWNERS, SAWMILLERS AND Others.

FOR SALE.

Two Robey Boilers, loco. type, carrying 120 lb. steam; 64 tubes, 10ft. long; 500ft. heating surface; in first-class condition. Price, £200 each, at Adelaide Mine, or £215 in the truck at Zeehan Railway Station.

Also

Boiler, similar type, but smaller, carrying 80 lb. steam, 54 tubes. Price, £130 at Mine, £145 in Zeehan Station.

Also

A Tandem Loose Eccentric Jet Condensing Engine, 4ft. 9in. stroke, 13ft. flywheel geared one in four, and 16in. Cornish lift 300ft. of columns.

Also

A Quantity of Magnificent Specimens of Crocoisite (chromate of lead), suitable for Museums or School of Mines.

For further particulars apply—

G. AHERN, Zeehan.

---

## AMERICAN LINEN COMPANY'S.

Australian Letters Patent No. 10416, dated 9th December, 1907, for "Flax Machines."

Notice is hereby given that the above patentee is prepared to license the manufacture of the above patented invention, or to sell or otherwise dispose of the patent on reasonable terms, or offers, proposals, or suggestions from any person, firm or corporation desirous of using, exercising, and/or vending the patented invention in Australia, or of otherwise supplying the requirements of the public in respect to said invention, will be favourably considered. The specification and drawings of the patent may be inspected at the Custom Houses of the capital cities of the States, and at the address below. For the proprietor, FRED WALSH, Patent Attorney, George and Wynyard streets, Sydney.

---

## BOURKE'S HILL TIN SLUICING COMPANY No Liability, Emmaville, N.S.W.

A Dividend (15th) of Sixpence per Share has been declared in the above Company, payable at the registered office, 125 Queen-street, Melbourne, on Tuesday, 11th November, 1913. Share register will be closed from November 6 to 11.

JAMES MACKAY, Manager.

---

## MUNICIPAL COUNCIL OF SYDNEY.

NOTICE TO ELECTRICAL CONTRACTORS.

In future, in Installations for Connection to the City Council's Electric Supply Mains, any wire intended to connect a length of conduit to "earth" must be connected to the conduit by means of a proper clip. Installations inspected by the Council with a view to connection after the 10th November, 1913, will not be connected to the supply mains unless this requirement is complied with.

THOMAS H. NESBITT,
Town Hall, Sydney, Town Clerk.
30th October, 1913.

---

## MUNICIPAL COUNCIL OF SYDNEY.

TO CONTRACTORS.

Sealed and endorsed tenders will be received by the undersigned until 3 o'clock p.m. on Monday, the 10th November, 1913, for the following:—

- (a) Provision of Switchboards for Motors in connection with the Refrigerating Apparatus at the Fruit Markets.
- (b) High Pressure Feed Water Piping, for Water Meter at the Power House.
- (c) Supply and Delivery of a Radial Drilling Machine.
- (d) Iron Clad Switch Fuses.

Copies of specifications, etc., may be seen or obtained upon application at the office of the City Electrical Engineer, upon payment of the sum of 10/6 in each case.

The lowest or any tender not necessarily accepted.

Tenderers, please note that they must pay their cash deposits direct into the City Treasury, and not enclose same with their tenders, otherwise their tenders will be rejected as informal.

THOMAS H. NESBITT,
Town Hall, Sydney, Town Clerk.
29th October, 1913.

---

## BALLARAT WATER COMMISSIONERS.

TENDERS are invited for the CONSTRUCTION of a RESERVOIR EMBANKMENT (together with Bye-wash, Tower, and Outlet Works) on the Moorabool River, about 4 miles north-east of the Township of Wallace.

The embankment is to contain about 157,870 cubic yards of materials, including selected earth, clay, stone and concrete.

Copies of the contract drawings and printed copies of the specification, conditions of contract, and schedule of quantities, etc. (price, £1/10/- per set), may be obtained at the Water Commissioners' Office, Ballarat.

Each tender is to be accompanied by a preliminary deposit of £100. The final deposit will be 5 per cent. of the contract sum.

The Commissioners will not necessarily accept the lowest or any tender.

Tenders, addressed to the Chairman, Ballarat Water Commissioners, endorsed "Tender for the Construction of Reservoir Embankment," are to be deposited in the tender box at the Water Office, Ballarat, before 12 noon Thursday, December 11, 1913.

FREDERICK BRAWN,
Ballarat, Oct. 31, 1913. Chairman.

---

## BABYLONIAN G.M. CO. NO LIABILITY.

Notice is hereby given that a Call (3rd) of Threepence per Share (making 4/8 in all paid thereon) has been made on the Contributing Shares in this Company, and is payable at the Registered Office of the Company, 43-6 Royal Exchange, Adelaide, on Wednesday, November 12, 1913.

By order of the Board,
(303,16) J. L. ANDREWS, Secretary.

---

## WANDILIGONG GOLD DREDGING COMPANY No Liability.

A Dividend (59th) of One Shilling per share has been declared, payable at the registered office of the Company, Gavan-street, Bright, on Wednesday, November 26, 1913. Transfer books close Wednesday, November 19, 1913.

P. J. BREEN, Manager.

---

TENDERS are invited for the Purchase or Working on Royalty of Ransome International Conduit Co.'s "Improvements in the Construction of Concrete," covered by Commonwealth Letters Patent No. 13681, of February 4, 1909. The proprietors will dispose of the whole or part interest in the patent, or will grant licenses to work the same to fulfil the full requirements of the public. Address: C/o Phillips, Ormonde & Co., Patent Attorneys and Consulting Engineers, 17 Queen st., Melbourne.

---

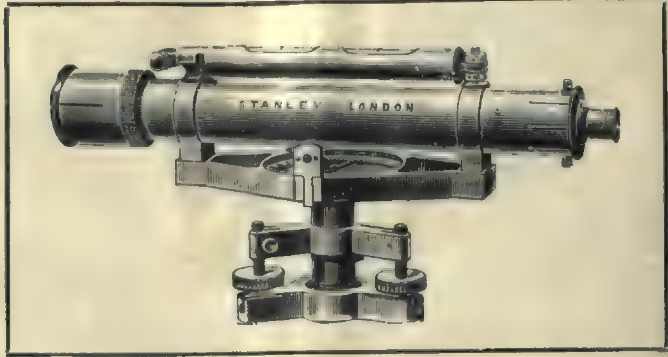
## ARTHUR H. HASELL,

GYPSUM, PHOSPHATE, GUANOS, MAGNESIA, WHITING, DOLOMITE, INFUSORIAL EARTH, TIMBER, HEMP, SULPHUR, Etc
ANALYSES MADE FREE.
HEAD OFFICE: Lombard Buildings, 17 Queen-street Melbourne.
Branches: 2 Bridge-street, Sydney. 1 Lipson-street, Port Adelaide. Factories: Pt. Adelaide, S.A.; Newport, Vic.; Newcastle, N.S.W. Mines: Kapunda and Marion Bay, **Daly Head, S.A.; Boort, Vic.; Cooma, N.S.W.**

TRADE **STANLEY** MARK

Largest Manufacturers of Surveying and Drawing Instruments in the World.

Please send for our K.28 Catalogue. Postage Free, and Compare our Prices with those of other "first-class" makers.



**W. F. STANLEY & Co. Ltd.**
286 HIGH HOLBORN, LONDON, ENGLAND.

AGENTS: FAIRFAX & ROBERTS, SYDNEY. WM. WATSON & SONS, MELBOURNE. SAWTELLS, ADELAIDE.

**CARL WERNER & CO.,** OPHTHALMIC —OPTICIANS—

The Finest Illustrated Catalogue of Scientific Instruments in Australia mailed on request—comprising

THEODOLITES, LEVELS, LEVELLING STAVES, BRUNTON'S AND VERSCHOYLE TRANSITS, ETC., ETC.

All the Requirements for the Drawing Office in Stock.

**336 COLLINS STREET - - MELBOURNE.**

A pneumatic tube installation connects the chief telegraph office in Leipzig with the post office at the new Central railway station and the Exchange post office. The distance between the chief telegraph office, and the two branch offices is rather more than half a mile in each case, and the new installation serves mainly for transmitting telegrams, of which a very large number has to be dealt with daily. By means of this pneumatic tube installation, telegrams reach the head office in from 3 to 4 minutes, while the service generally has been much improved.

## ALPHABETICAL LIST OF ADVERTISERS.

(—) Indicates Fortnightly or Monthly Advertisement.

| | Page. |
|---|---|
| Acton Lamp Co., The | — |
| Adams, Wm., and Co. Ltd. | IV., Cover II. |
| Ahern, Gerald | XIII. |
| Ainsworth, W., and Sons | — |
| Allen, Edgar, and Co. Ltd. | XIV. |
| Allen, W. H., and Co. Ltd. | — |
| Allgemeine Electric Co. | — |
| Allis-Chalmers Co. | X. |
| A.U.S.N. Co. | 394 |
| Austral Otis Engineering Co. | — |
| Australian Gas Retort and F.B. Co. | — |
| Australian General Electric Co. | VII. |
| Australian Metal Co. Ltd. (Elec. Dept.) | — |
| Australian Wood Pipe Co. Ltd. | VIII. |
| Babcock and Wilcox Ltd. | Front Cover |
| Bannister, L. | — |
| Bessemer, Henry, and Co. Ltd. | — |
| Blakemore, G. H. | XIII. |
| Bondholders' Register | XIII. |
| British General Electric Co. Ltd. | XII. |
| British Imperial Oil Co. Ltd. | XVI. |
| British Aluminium Co. Ltd. | — |
| Broken Hill Pty. Ltd. | Cover III. |
| Brown, Bayleys Steel Works Ltd. | — |
| Bruce, Peebles and Co. Ltd. | — |
| Bullivants' Wire Ropes | Front Cover |
| Coates, Matthew C. | XIII. |
| Cole, E. W. | XIII. |
| Colonial Mutual Fire Insurance Co. | 393 |
| Commonwealth Bank of Australia | XVI. |
| Commonwealth Oxygen Co. | IX. |
| Crowley, Valentine J. | XIII. |
| Curtis's and Harvey Ltd. | XII. |
| Darley Firebrick Co. Pty. Ltd. | — |
| Davidson and Co. Ltd. | XV. |
| Denny Bros. Ltd. | — |
| Diercks and Co. Pty. Ltd. | — |
| Draeger (R. Jacobson) Rescue Apparatus | — |
| A. L. Campbell and Co. Pty. Ltd. | — |
| Dunlop Rubber Co. of Aust. Ltd. | 394 |
| Dudbridge Gas Plant | XI. |
| Dyason, Edward and Co. | — |
| E. and A. Copper Co. Ltd. | IV. |
| Edwards Pyrites and Ore Reduction Co. | I. |
| Edison and Swan | — |
| Elder's Metal and Mercantile Pty. Ltd. | XII. |
| Elliott Bros. Ltd. | XI. |
| Engineering Supply Co. | — |
| Falkiner Boll Co. | XI. |
| Ferguson, Mephan, Pty. Ltd. | Front Cover |
| Ferrier and Dickinson | XV. |
| Ferranti Ltd. | IV. |
| Firth, Thomas, and Sons Ltd. | IV. |
| Fraser, Alex., Pty. Ltd. | XVI. |
| Fyvie and Stewart | IX. |
| Gardner, Waern and Co. | XV. |
| Gen. Elec. Mfg. Co. of Sweden | XV. |
| General Electric Co. Ltd. | VII. |
| Goldfields D.D. Co. | II. |
| Goodall, T. M., and Co. Ltd. | IX. |
| Gorler, Max | — |
| Govt. Tourist Bureau, N.S.W. | — |
| Goyder and Hallet | XIII. |
| Great Cobar Ltd. | XIV. |
| Green, E., and Son | — |
| Greenway, T. J. | XIII. |
| Guthridge, N., Ltd. | XV. |
| Hadfield's Steel Foundry | XVII. |
| Hales Ltd. | — |
| Hardie, James, and Co. Ltd. | 394 |
| Hart Accumulator Co. Ltd. | — |
| Harringtons Ltd. | 393 |
| Hargraves and Daggar | XIII. |
| Hassell, A. H. | 397 |
| Henley's Telegraph Works Co. Ltd. | 377 |
| Hirsch and Sohn, Aaron | XVI. |
| Hornsby and Sons Ltd., R. | — |
| Hordern, Anthony, and Sons Ltd. | Cover III. |
| Horrocks, Roxburgh Pty. Ltd. | XVII. |
| Hopkins Bros. and Odlum | 377 |
| Ingersoll Rand Co. | VIII. |
| I.R., G.P., and Telegraph Co. Ltd. | VI. |
| Kay, McNicol and Co. | XIII. |
| Klinger, Richard and Co. | — |
| Knox, Schlapp and Co. | — |
| Krupp, Fried | X. |
| Kynoch Ltd. | XVII. |
| Laidley, Wm., and Co. | — |
| Lawrence and Hanson Elec. Co. Ltd. | 387 |
| Lempriere, W. and J. | Cover IV. |
| Lincona Belting | Cover II. |
| Lohmann and Co. | Cover IV. |
| Ludowici, J. C., and Sons, Ltd. | — |
| Lufft, E., and Co. | — |
| Mackensen, A. W. | — |
| Malleable Fitting and Agency Co. | Cover II. |
| Mannesmann Tubes | — |
| Martin, Jas., and Co. | — |
| Melville and Mullen | — |
| Miller and Co. | — |
| Mines Department, Queensland | Cover III. |
| Mines Department, Victoria | — |
| Mines Department, Western Australia | — |
| Mines Department, South Australia | — |
| Minerals Separation and De Bavay's Ltd. | XVIII. |
| Morton, B. K. | Cover II. |
| Mount Lyell M. and R. Co. Ltd. | 394 |
| Mt. Morgan G.M. Co. Ltd. | — |
| McArthur Engineering Co. Ltd. | IV. |
| McCarty, Underwood and Co. | XIII. |
| McDonald, A. H., and Co. | — |
| McMicking and Co. | XII. |
| Nobel's Explosive Co. Ltd. | Front Cover |
| Noyes Bros. (Sydney) Ltd. | — |
| Noyes Bros. (Melb.) Pty. Ltd. | X. |
| P. and O. Company | 393 |
| Pacific Cable Board | — |
| Parrington, Lascelles | — |
| Pearn, Frank, and Co. | — |
| Peerless Rubber Co. | — |
| Pels, Siegfried | XVI. |
| Perrot, Frank R. | X. |
| Price, Martyn, and Co. | — |
| Robertson, Geo., and Co. Pty. Ltd. | — |
| Roeblings, J. A., Sons and Co. | XVI. |
| S.A. School of Mines and Industries | — |
| School of Mines, Ballarat | XIII. |
| School of Mines, Kalgoorlie | — |
| School of Mines, Charters Towers | Cover III. |
| Shaw, John, Ltd. | — |
| Siskol Drills | — |
| Siemens Bros. Dynamo Works Ltd. | V. |
| Silberberg, H. B., and Co. | XVI. |
| Sirocco Fan | XV. |
| Short and Mason | — |
| Smith, T. and W. | — |
| Smith, Walter F. | XIII. |
| Smith, J. D. Audley | XIII. |
| Snow, Francis H. | XVI. |
| Stanley, W. F., and Co. Ltd. | 398 |
| Stawn, Ltd. | 394 |
| Steel Co. of Australia | — |
| Steanes, T. K. | Front Cover |
| Sterling Telephones | — |
| Sulphide Corporation Co. Ltd. | XVI. |
| Sullivan Machinery Co. | II. |
| Summerhayes, A. A. | — |
| Taylor, P. T., Ltd. | XIV. |
| Thompson and Co. (Castlemaine) Pty. Ltd. | II. |
| University of Sydney | — |
| Union Electric Co. of Aus. Ltd. | Front Cover |
| Walkers Ltd., Queensland | XII. |
| Watson, W. G., and Co. Ltd. | — |
| Weinberg, E. A. | XIII. |
| Werner, Carl and Co. | 398 |
| Western Elec. (Aust.) Ltd. | — |
| Westinghouse Brake Co. of A'sia Ltd. | Cover II. |
| Weymouth, George, Pty. Ltd. | — |
| White, Franklin | XIII. |
| Willans and Robinson Ltd. | XVIII. |
| Worthington Pumps | Front Cover |

Printed and Published by **Harold Smith**, for the Proprietors, at the "Australian Mining Standard" Office, 376 Flinders-lane, Melbourne, Victoria.

## PROFESSIONAL CARDS.

### GERALD AHERN, A.O.S.M.,

MANAGER COMET MINE,
DUNDAS, TASMANIA.
Mines Sampled and Reported On.

Tele. Address—Gerald Ahern, Zeehan, Tasmania.

### G. H. BLAKEMORE,

CONSULTING METALLURGIST
For Copper and Lead,
MINING ENGINEER,
CASTLEREAGH CHAMBERS, 10 CASTLEREAGH ST
Telegraph Codes: Bedford McNeill 1908 Edition.
Moreing & Neal.
A.B.C. 5th Edition.
Cable Address. Radgarn. Telephone 7124 City

### MATTHEW C. COATES, A.M.I.E.E.

CONSULTING MECHANICAL and ELECTRICAL ENGINEER. Expert Reports given for Power Generating Plants, Factory Installations, Steam, Gas and Electric.
99 QUEEN-STREET, MELBOURNE.

### VALENTINE J. CROWLEY,

CONSULTING ELECTRICAL ENGINEER.

Hydro-Electric Plants and Transmission Lines Designed and Supervised.

Austral Chambers, Telephone 7736
97-99 QUEEN STREET, MELBOURNE.

### GOYDER & HALLETT,

ASSAYERS AND ANALYSTS.
118 Gawler Place, Adelaide.
Telephone 169.
Metallurgical and Chemical Processes Investigated.
Ores Sampled and Assayed.

### T. J. GREENWAY, M.I.M.M., F.I.C.

MINING AND METALLURGICAL ENGINEER.

60 QUEEN STREET, MELBOURNE.

### HARGRAVES & DAGGAR,

CONSULTING ENGINEERS & METALLURGISTS.
Broken Hill Chambers, 31 Queen Street, Melbourne, and at Bendigo, Vic., and Sydney, N.S.W.
Consultations, Examinations,
Reports for Investors, Machinery Erection and Supervision.
Tel Central 6864. Process Devisors, &c.

### KAY, MACNICOL & CO.,

Mechanical, Mining & Electrical Engineers.

BROKEN HILL CHAMBERS.
31 QUEEN STREET, MELBOURNE.
Cable Address. "Engineer," Melbourne.
Telephone, No. 4885.

### McCARTY, UNDERWOOD & CO.,

CONSULTING ELECTRICAL AND MECHANICAL ENGINEERS.

31 QUEEN STREET, MELBOURNE.

Telephone, 7296

### J. D. AUDLEY SMITH,

MINING ENGINEER,
9 Bridge-street, Sydney

Telephone No.— City 2677.
Telegraphic Address— Audley Smith, Mining Engineer, Sydney

### WALTER F. SMITH,

MANAGER FLOATER G.M.
Ravensthorpe, W.A.
Mines Sampled, Valued, and Reported on.
ASSAYS MADE.

Code: Bedford McNeil.
Reliable Information Furnished on the Phillips River Gold and Copper Field.

### E. A. WEINBERG,

MINING AND METALLURGICAL ENGINEER,
19 QUEEN STREET, MELBOURNE.

## PUBLISHERS' ANNOUNCEMENTS.

### Cole's Book Arcade

Melbourne
Sydney
Adelaide

—BOOKS Advertised—
—by Everybody are—
—SOLD AT COLE'S—

Send for **COLE'S BOOK BUYERS' GUIDE** or Catalogues on your Special Subject.

**MINE MANAGER'S** Book-keeping Manual and Office Companion, by Edwin R. Field. 3/6, postage 1d.

**ROUTLEDGE'S EVERYMAN'S CYCLOPAEDIA,** 50,000 items of literary, historical and useful knowledge. Cole's Price: 2/6, postage 4d.

**HEALTH, STRENGTH and HAPPINESS,** a Book of Practical Advice for Men and Women, by Dr. Saleeby. Cloth 3/6, paper 2/-, postage 3d.

**LIFE AND EVOLUTION,** by F. W. Headley, with 100 illustrations. Now 5/-, postage 4d.

**THE MAN FARTHEST DOWN,** a record of Observation and Study in Europe, by Booker Washington. Cole's Price: 3/6, postage 3d.

**BACKBLOCK BALLADS** and Other Verses, by Den (C. J. Dennis) from the "Bulletin" and other live papers. Paper 1/6, cloth 2/6.

**E. W. COLE, Book Arcade, Melbourne, Etc.**

### BALLARAT School of Mines

DEPARTMENTS:
CHEMISTRY and METALLURGY,
ENGINEERING and SURVEYING
ELECTRICAL ENGINEERING,
GEOLOGY and MINING
MATHEMATICS and PHYSICS.

Prospectus on Application.
F. J. MARTELL, Director.

### SIAM OFFERS

A splendid new field for Australian Business Enterprise.

### SIAM WANTS

Mining and Agricultural Machinery, Seeds, Hides, Tallow, Meats, Jams, Butter, Cheese, Potatoes, General Manufactures, also Horses, Cattle and Sheep.

**The Siam Observer (Daily),**
**The Siam Maitri**
**The Siam Weekly Mail** **(Weeklies.)**

Siam's Leading Newspapers, which, with

**The Siam Directory**

are published at the Siam Observer Offices, Bangkok, will put you in touch with this market.
Rates and Particulars from
***GORDON & GOTCH.***

### FRANKLIN WHITE,

MINING ENGINEER,
CITY MUTUAL CHAMBERS,
62 HUNTER ST., SYDNEY
G.P.O., Box 1498.
Code: Broomhall Imperial Combination

### Critchley Parker Publications

**Past and Present Metal Markets.** W. E. Figgis. Book and 2 Charts, 15/-. Posted, 16/3; foreign, 16/5.

**Coalfields and Collieries of Australia.** F. Danvers Power. 440 pages, 229 illustrations, demy octavo. 25/- nett. Posted, 25/3; foreign, 26/8. (Size, 9 x 6.)

**High Explosives.** W. R. Quinan. 224 pages, royal octavo, 21/-. Posted, 21/3; foreign, 22/4. (Size, 10 x 7.)

**Power.**
(*Issued under authority Sydney Municipal Council.*)
2/6 nett; post free.

**Australian Mining and Metallurgy.** Donald Clark. 600 pages, royal octavo. 21/- nett. Posted, 21/4; foreign, 22/9. (Size 10 x 7.)

**Gold Refining.** Donald Clark. 134 pages (plates), demy octavo. 12/6 nett. Posted, 12/7; foreign, 13/1. (Size, 9 x 6.)

**West Australian Mining Industry.**
(*By authority W.A. Government.*)
250 pages, crown folio. 10/- nett. Posted, 10/2: foreign, 10/8. (Size, 14½ x 10.)

**New South Wales Mines and Minerals.** 250 pages, crown quarto. 5/- nett. Posted, 5/1; foreign, 5/7. (Size, 10 x 7½.)

**Victoria, and its Mining Resources.**
(*By authority Victorian Government.*)
84 pages, crown quarto. 3/- nett; post free.

**Mining and Railway Map of Australia.** (In preparation.) Cloth, 21/-.

**Ventilation of Mines.** Johann Sarvaas. 60 pages. 2/7 post free.

**Australasian Joint Stock Coy's Year Book.** R. L. Nash (Financial Editor, "Daily Telegraph," Sydney). 500 pages, demy octavo, 10/6 nett. Posted, 10/8; foreign, 11/9. (Size, 9 x 6.)

**Australian Mining Standard.** Issued every Thursday 26/- per annum. British possessions, 32/6; foreign, 34/8; post free.

Size stated in inches.

Order through your Bookseller, or

***AUSTRALIAN MINING STANDARD,***
**Sydney: 12-14 O'Connell-street.**
**Melbourne: 376 Flinders Lane.**
**London:** Hill Publishing Co., 6 Bouverie St., Fleet St.

*Also published by us, but now out of print.*

**Tasmania and its Mineral Wealth.**
(*By authority Tasmanian Government.*)

**Metallurgy of Tin.** P. J. Thibault. Demy octavo. 12/6.

**Resourceful Queensland.**
(*By authority Queensland Government.*)

**Electrical Progress of Australasia.**

ESTABLISHED 1860.

### BONDHOLDERS' REGISTER

Publishes the Actual Numbers of all Drawn Bonds Throughout the World.

PUBLISHED FORTNIGHTLY.

**10s. PER ANNUM.**

73 FARRINGTON ST., LONDON, E.C.

Australian Offices,
376 FLINDERS LANE, MELBOURNE.

**"Allen's"**

**IMPERIAL**

**Manganese Steel**

FOR

Dredging Pins and Bushes, and all Wearing Parts of
Rock-Crushing Machinery, Points, Crossings, Etc.

SOLE MAKERS OF

**THE "STAG" TUBE MILL**

For Grinding Grit, or Tailings, and Granular Materials,
to any degree of Fineness.

THE "STAG" BRAND OCTAGON MINING DRILL STEEL

**EDGAR ALLEN & CO., LTD.,**
Imperial Steel Works, SHEFFIELD.

Stocks on Hand
of
Mining and High Class Tool Steels.

AUSTRALIAN REPRESENTATIVES:
**P. T. Taylor Ltd., 141 York Street, Sydney.**

## MIXED MEMS.

The White Island Sulphur Co., which, for the past 18 months or so, has been carrying on operations on the enormous deposits of sulphur discharged from the vapour of sulphur springs on White Island, in the Bay of Plenty (N.Z.), in order to provide further capital for its enterprise has floated a new company called the New Zealand Sulphur Co., with a working capital of £25,000, and with reserves to provide a further £20,000. That sum will be spent in putting up works on the island equipped with retorts, refining plant, trucks, rails, prospecting plant, and shipping and landing facilities, including moorings and wharf, in accordance with a scheme settled upon six months ago. The retorts and other heavy plant, which had been lying at Tauranga pending the putting into operation of this scheme, have now been landed at White Island. The company has secured improved communication with the island by chartering the 57-ton auxiliary schooner Waiapu. The first shipment of sulphur was landed lately in good condition. The quality of the product may be judged from the fact that although this cargo was in the crude state, it was nevertheless 75 per cent. to 80 per cent. pure. The company considers its prospects bright, and is confident of being able to turn out in the next three or four months pure sulphur to the extent of 500 tons per month. It is expected that in the near future there will be no difficulty in at least doubling that output, while ultimately the output will be even larger.

* * *

The Leuschner Flotation Process.—This is an acid-oil flotation process (Gliickauf, March 9, 1912), which has been used very successfully at several places in Germany for separating sulphides from gangue matter. It can be applied to the treatment of either previously untreated ore or to low-grade concentrates. The gas required for floating the minerals is obtained from carbonates, which, if there are none in the ore, are mixed with it before entering the bath. A very low grade of oil is used, and no attempt is made to recover it. The consumption depends solely upon the percentage of sulphides present in the ore. A 60 deg. Glover acid is used and from 40 to 60 kgms. are consumed per ton ore. The temperature of the bath varies between 60 and 80 deg. C., and its specific gravity from 1 to 2 degrees Baume. There is no vacuum used, and the design of the plant is consequently very simple. A plant to treat about 50 tons of ore per day would cost between £250 and £312 10s., and the cost of treatment would vary between 4s. 2d. and 6s. 3d. per ton. From 2 to 3 horse-power is required to operate with. The process is now being applied to zinc and lead ores with a considerable degree of success, and an extraction in excess of 95 per cent. is being obtained with a high degree of concentration.—"Mexican Mining Journal," July, 1913.

* * *

The use of mine telephones has greatly increased on the Rand, for which, of course, the size of the mines and the completeness of their equipment renders them peculiarly suitable. Telephones enable quicker communication between the surface and the different levels underground, and in the case of disaster, such as fire, enable the men to be got out from the workings with rapidity and without confusion. Ordinary messages are more quickly distributed, and closer supervision over the personnel is established. It has been found, too, that time is often saved by the engine-driver in case of many minor accidents, which are of not infrequent occurrence in a large mine, suitable relief can be quickly obtained.

**GREAT COBAR LIMITED,**

COBAR, N.S.W.

MINE OWNERS, SMELTERS, COLLIERY PROPRIETORS, PURCHASERS
OF COPPER ORES AND MATTES.

VACANCIES FOR COMPETENT MACHINE MINERS.

SYDNEY: Australasia Chambers, Martin Place, And at Lithgow and Singleton. LONDON: 65 New Broad Street, E.C.

TRADE 'SIROCCO' MARK

Centrifugal Fans

for

Auxiliary Underground Ventilation.

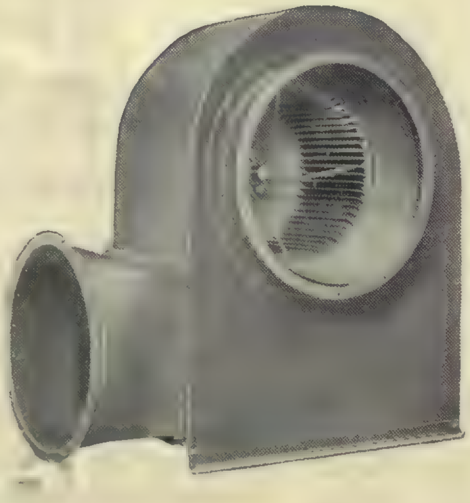
All Industrial Purposes.

Blowing or Exhausting.

Fitted for BELT DRIVE

or for

Direct Coupling to Motor.



DAVIDSON & Co., Ltd., Belfast, IRELAND.

Our AGENTS keep Fans in Stock.

SYDNEY: Ferrier and Dickinson, 12 Spring-street.
PERTH: Saunders and Stuart.
NEW ZEALAND: John Chambers and Sons Ltd., Wellington.
MELBOURNE: Fyvie & Stewart, 362 Collins-street.
BRISBANE: Engineering Supply Co. of Australia Ltd.
ADELAIDE: Unbehaun & Johnstone, 100 Currie-st.

---

Everything for Mining

SUPPLIED BY US.

CANDLES,
EXPLOSIVES,
CHERSEN ROCK DRILLS,
WINDING ENGINES,
STONE CRUSHERS,
ROAD MAKING PLANT.

CARD CONCENTRATOR, Sole Manufacturers.
DORR THICKENER,
DORR CLASSIFIER,
B and M TANKS,
TILGHMAN'S AIR COMPRESSORS.

QUARRY BARS.
WELL BORING PLANTS. BLOW OFF VALVES, ETC.

Agents in all CAPITAL CITIES of Commonwealth and NEW ZEALAND

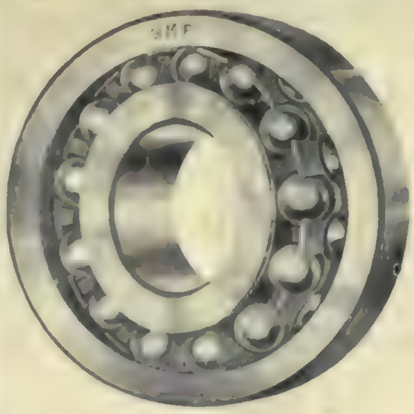
N. GUTHRIDGE LTD.

Offices and Stores—SYDNEY and MELBOURNE.

---

S. K. F. BALL BEARINGS.

A new system being adopted by many factories and engineers for shafting, machines, fans, pumps, etc.



Saves up to 70 per cent. power, and use practically no lubricant.

Radial, Thrust, Double Thrust.

S. K. F. are self-aligning, thus overcoming the worst features of other bearings.

Swedish Diesel "Polar" Motors—the coming power.

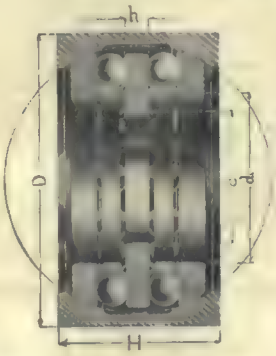
General Electric Mfg. Co. of Sweden: Power Plants.

Motors, Dynamos, Transformers, Etc.

Dissolved Compressed Acetylene for Welding, Light, etc.

Rewinding and all Electrical Repairs a speciality.

Jungner Indestructable Accumulators.



GARDNER, WAERN and CO.,
57 Queen St., Melbourne; 334 Kent St., Sydney.
*Stores and Showroom, 369 Flinders Street, Melbourne.*

COCKLE CREEK
SMELTING WORKS, N.S.W.
THE SULPHIDE CORPORATION LIMITED,

**Purchasers of:**

Ores, Concentrates, and Slags, carrying Gold, Silver or Lead, on specially favourable terms for net cash.

**THE WORKS** are situated only 9 miles from the Port of Newcastle, where the Corporation has every facility for taking delivery of consignments on behalf of shippers.

**Manufacturers of:**

Superphosphates, Sulphate of Ammonia, and other fertilisers, also Tar and Sulphuric Acid.

Tariff and full particulars can be obtained on application to—

THE MANAGER, Cockle Creek, N.S.W. GIBBS, BRIGHT & CO., Agents.

Commonwealth Bank of Australia
HEAD OFFICE SYDNEY

**Branches** are open for the transaction of **GENERAL BANKING BUSINESS** at **New South Wales**—Sydney. **Federal Capital**—Canberra. **Victoria**—Melbourne. **Queensland**—Brisbane, Rockhampton, and Townsville. **South Australia**—Adelaide. **Western Australia**—Perth **Tasmania**—Hobart. And at 36-38 NEW BROAD STREET, **London.**
Cable remittances made to, and drafts drawn on foreign places direct. Foreign bills negotiated and collected. Letters of credit and circular notes issued to any part of the world. Bills negotiated or forwarded for collection. Banking and Exchange Business of every description transacted within the Commonwealth, United Kingdom and abroad. Interest paid on fixed deposits.

SAVINGS BANK DEPARTMENT

**Branches** are open at 3 Moore Street, **Sydney**; 317 Collins Street, **Melbourne**; Queen Street, **Brisbane**; Royal Exchange, 96 King William Street, **Adelaide**; St. George's Terrace, **Perth**; Elizabeth Street, **Hobart**; and **Canberra** (Federal Capital); and **1900 Agencies** at **Post Offices** which issue Money Orders in the **Australian Commonwealth and Papua,** from 9 a.m. to 5 p.m. daily, and noon Saturday
All Branch Offices are open for **deposits** and **withdrawals** on Friday 7 to 9 p.m
**Withdrawals on demand** may be effected at any office within the Commonwealth.
**1/- Minimum Deposit. 3% Rate of Interest on all Deposits up to £300**
JAMES KELL, Deputy Governor. August, 1913 DENISON MILLER, Governor

On the Witwatersrand 227 air compressors are in use with a total of 103,791h.p. Of dynamos, both direct and alternating current, there are on the Rand 232, with a total of 72,016kw., and in all South African mines, 656 dynamos of 113,767 kw. The number of rock drills in use on the Rand shows more rapid development than is generally recognised. In four years the number in use has been more than doubled. In 1908 the total was 2425, and in 1912 5530. This increase is due largely to the introduction of small drills, which has so considerably assisted in the solution of labour scarcity. Much attention is also being paid to detachable bits. The number of tube mills also is increasing, the total last June having been 286 as against 263 in 1912.

Siegfried Pels,
26-28 Neuerwall,
Hamburg - - Germany.

Argentiferous and Non-Argentiferous.
**Copper Ore & Matte.**

Leady Copper Ore and Matte.
Wolfram
Scheelite

A MARKET for all ORES and MATTES

Lead Ore
Lead Bullion
Tin
Vanadium
Tantalite
Bismuth

*Treatment of Complex Ores.*

*Cable Address: — Siegpels.*
CODES:
A.B.C. 4th and 5th Ed., A1, Liebers, Western-Union, Bedford McNeill.

All Australians visiting London should read the "British Australasian," 6d. weekly—an illustrated paper containing mail and cable news from Australia, and news of Australians in Europe and at home.

Australians are cordially invited to visit the "British Australasian" Reading Room at the offices, 115 High Holborn, London, W.C., where they can see the home papers, meet their friends, use the telephone, and obtain information without charge.

H. B. Silberberg & Co.,
*443 Bourke St.,*
Cor. Bourke and Queen Sts.,
*MELBOURNE.*
Tel. 1377.
8 O'CONNELL STREET, SYDNEY.

Large Stocks of—
Ainsworth's Balances, Morgan's Crucibles.
Braun's Laboratory Ore Crushers. Gasolene Furnaces.
Fluxes. Assayers' Requisites.
Jena Chemical Glassware, Etc., Etc.

FRANCIS H. SNOW,
Buyer of
ORES, MATTES, METALS, CONCENTRATES, & MINERALS
——of every description——

Australasian Representative of:
ELECTROLYTIC R. & SMELT'G Coy. of A'LIA Ltd., Pt. KEMBLA, N.S.W.
ARON HIRSCH & SOHN, HALBERSTADT, GERMANY.
L. VOGELSTEIN & Co., NEW YORK.

Head Office—KING WILLIAM-ST., ADELAIDE.
Sydney Office:—8 BRIDGE STREET.
Perth Office:—ST. GEORGE'S TERRACE.
Broken Hill:—F. G. WHITE, P.O. Box 78.
Zeehan:—A. J. SPOTSWOOD.

JOHN A. ROEBLING'S SONS CO.
New York,
ELECTRICAL COPPER WIRE AND CABLES.
HIGH QUALITY FLEXIBLE
WIRE ROPES
FOR MINES, HAULAGE, ELEVATORS, ETC.
STOCKS ON HAND.
ANY LENGTH CUT.
Representative:
ALEX. FRASER PTY. LTD.
Cobden Buildings,
368 Flinders-street,
Melbourne.

HIGH EXPLOSIVES.
Obtainable from All Booksellers. 224 Pages. Price, £1/1/-.

*LIQUID FUEL for Diesel & all Crude Oil Engines.*
"SHELL" SPIRIT, "SHELL" BENZINE, LUBRICATING OILS AND GREASES.
Prices and particulars on application to
THE BRITISH IMPERIAL OIL CO. LTD. Adelaide, Brisbane, Fremantle, Melbourne, Sydney and New Zealand

## CONTENTS

### THURSDAY, NOVEMBER 13.

EDITORIAL—

Australian Mineral Output . . . . . . 399
Leaderettes . . . . . . . . . . . . 400
News and Notes . . . . . . . . . . 401
Brief Comment . . . . . . . . . . 401
Investor's Column—
J. Kitchen and Sons Ltd. . . . . . . . 402
Hampdens (Q.) . . . . . . . . . . 402
Personal . . . . . . . . . . . . 403
Metal Quotations . . . . . . . . . 403
Sydney Stocks . . . . . . . . . . 403
Our Big Mines . . . . . . . . . . 404
The Coal Mining Industry . . . . . 404
Victorian Mining Industry . . . . . 404
Mining in New South Wales . . . . . 406
Tasmanian Mining . . . . . . . . 406
Queensland Mining . . . . . . . . 407
Western Australian Mining . . . . . 408
Mineral Returns . . . . . . . . . 408
Royal Mint Returns . . . . . . . . 408
New Zealand Mining . . . . . . . 408
Scheelite Mining in N.Z. . . . . . . 409
Metal Prices . . . . . . . . . . 410
Briquetting Powlett Coal . . . . . . 410
Industrial . . . . . . . . . . . . 410
Reports of Companies, etc. . . . . . 410
Wind Power . . . . . . . . . . . 448
Technical Education . . . . . . . . 449
Port Phillip Heads . . . . . . . . 449
To Prevent Collisions . . . . . . . 450
First-Aid in Electrical Accidents . . . . 450
Federal Railways . . . . . . . . . 450
Melbourne Tramways . . . . . . . 451
Brisbane Tramways . . . . . . . . 451
Municipal Council of Sydney . . . . . 451
Two Large Contracts . . . . . . . 451
North Illawarra Lighting . . . . . . 451
British and European Developments . 452
Miscellaneous . . . . . . . . . . 452
Steel Works at Newcastle . . . . . . 452
Invited and Accepted Tenders . . . . 453

BACK NUMBERS OF THE "MINING STANDARD."

[illegible]

A [illegible] will be sent if the number required is [illegible]

[illegible] three months old, [illegible] and beyond that period, one penny per [illegible]

[illegible]

Postage, British 1d., Foreign 1½d.; Australasia [illegible]

[illegible] Publishing Department [illegible]

FIRE. . BRICK

Our Products have proved their superiority.

FIRE CLAY GOODS For Every Purpose.

Darley Fire Bricks will withstand the most intense heat, and will not shrink. Our bricks are made near Bacchus Marsh, Victoria, and we supply all the States.

Specialities

High-Grade Firebricks & Retorts.

*Prompt Delivery. For Prices, etc., write to—*

DARLEY F. B. Co.,
Oliver's Lane, Flinders St. Melbourne

MINING STANDARD.
PUBLISHED EVERY THURSDAY.
• Forwarded Post Free to any Address.

| | Per annum. |
|---|---|
| Australasia | 26/- |
| British Possessions | 32/6 |
| Foreign | 34/8 |

Payable half-yearly or yearly, in advance.
All amounts should be made payable to order of "CRITCHLEY PARKER, Bank of Australasia."

12 O'Connell-street,
Sydney.
Tel. City 8103
P.O. Box 331.

376 Flinders-lane,
Melbourne.
Central 7931 & 1838
P.O. Box 253.

CASUAL ADVERTISEMENTS.

The rate for this class of advertisement is governed by the position it occupies.

If it appears on leader page or amongst or next to reading matter, the rate is 15s. per inch (nonpareil) per insertion.

Towards end of reading section—
Brevier, 16 ems width, 6s. per inch per insertion.
Nonpareil, 8s. per inch per insertion.

For the convenience of advertisers, we might state that Brevier has approximately 7 words to a line, and 8 lines to the inch—6s. Nonpareil has approximately 8 words to the line, and 11 lines to the inch—8s.

ALTERATION TO ADVERTISEMENTS.

As our publishing arrangements necessitate the "Mining Standard" being issued simultaneously in Sydney, Melbourne and Adelaide on the same day each week, advertisers wishing to change their advertising matter must supply same ten days in advance of publication.

ADVERTISEMENT PROOFS.

Proofs are submitted to advertisers in order to give them an opportunity of going over the advertisements before printing.

Advertising Copy must be typed and so arranged as to clearly indicate the display required for the more important features of the advertisement.

Any departure from the original copy will be charged for. Advertisers are specially requested to instruct their publicity departments to give us clear and definite instructions respecting changes of matter or new copy in order to avoid incurring unnecessary charges.

AUSTRALIAN
MINING STANDARD.
PUBLISHED EVERY THURSDAY.
ESTABLISHED 1888

It is requested that all business communications be Addressed to Critchley Parker

THURSDAY, NOVEMBER 13, 1913.

## AUSTRALIAN MINERAL OUTPUT.

In our issue of September 18th we gave the value of the mineral output of the various divisions of the Australian Commonwealth in the year 1912, an identical basis being taken in the several cases. Now we wish to show on a similar basis how the figures stand for all time. First of all, let us give the total output values for the various divisions. These are as follows:—

| | |
|---|---|
| New South Wales | £233,531,027 |
| Victoria | 295,691,692 |
| Queensland | 103,619,541 |
| W. Australia | 113,326,510 |
| S. Australia | 30,112,514 |
| Tasmania | 36,586,404 |
| N. Territory | 2,808,193 |
| Total | £815,675,881 |

One hardly knows whether to include Papua or not. It is a Dependency of the Commonwealth, but does not form portion of it, and there is an added difficulty in that the figures for the dependency are not made up, as are those of the Commonwealth, for the calendar year, but for the financial year ending June 30. The latest official figures for Papua are for the year 1911-12. If the Papuan administration would even give an estimate of the value of the output of its various minerals for each six months, the compiler of statistics could add together any two six-monthly estimates; but unfortunately this is not done. We are, then, reduced to allowing for the dependency for the latter six months of the year 1912, half the amount of the value of its output for the twelve months ended June. This gives us a total for Papua of £1,286,182, and a grand total for Papua and the Commonwealth of £816,962,063.

As regards the figures for the Northern Territory, we have to repeat the complaint we made last year that these are mainly a matter of guesswork. One may (a) take the figures as given in Knibbs' Commonwealth Year Book, which we are glad to say is no longer open to the objection we took 12 months ago when its figures in one section were contradicted by those in another; or (b) take the figures supplied in the "Record of Mining in the Northern Territory" (which gives statistics up to the end of 1898) and add for the subsequent years the figures given in the Commonwealth Year Book; or (c) prefer the figures given in the memorandum prepared in connection with the Bill for the Acceptance of the Northern Territory by the Commonwealth and add thereto, from Knibbs, the totals for the past four years; or (d) rely entirely upon the annual reports of the Government Residents up to the time of the taking over of the Territory, supplementing these figures by the ones for later years from the Year Book. As regards the Government Residents' figures as shown in the various annual reports, these invariably, or almost invariably, differ in the statistics at the end of each report from the figures given in the body of the report. To show how these various means of estimating the output of the Territory vary, we append a table in which we do not include "d" because we have not at hand the complete reports of the Government Residents:—

| | A | B | C |
|---|---|---|---|
| Gold | £2,145,993 | £2,062,902 | £2,128,862 |
| Silver | | | 69,993 |
| Silver & Lead | 74,819 | 57,262 | |
| Copper | 329,406 | 199,302 | 152,328 |
| Tin | 328,898 | 326,010 | 331,218 |
| Wolfram | 43,293 | 43,937 | |
| Mica | Nil | 8,312 | |
| Other minerals | 669 | 669 | 125,792 |
| Total | £2,923,078 | £2,698,394 | £2,808,193 |

In "B" we have included in the copper £79,079 of "smelter product with copper base." The figures which we adopt are those of "C," with this difference, that we cannot accept the figures for either copper or miscellaneous minerals. The total of £125,792 for these latter is, even after deducting £43,937 for wolfram and £8312 for mica, ludicrously high, and the copper figures are, apparently, altogether too low. We have, therefore, taken away the whole of the former total with the exception of £669, added a trifle to the silver figures to bring them up to the Commonwealth Statist's total for silver-lead, and given the whole of the balance (£68,717) to copper.

It may also be mentioned here, incidentally, that we were, apparently, wrong in our statistics for last year and the year before in omitting from the South Australian returns the figures for bluestone, sulphuric acid, and pyrites, which we took to be not of South Australian origin—a view which was in accord with that taken by the Commonwealth Statist. We understand, however, that the bluestone came from Moonta, and the sulphuric acid from Wallaroo, while the great bulk of pyrites came from the Weald Ellen mine. We have, therefore, included in the South Australian totals the sum of £36,495 which Mr. Knibbs omits as not being rightly credited to South Australia in the last three annual returns.

Turning now to the main object of our research, we find that the proportions in which the values of the output for various sections of the Commonwealth are made up, taking nothing that amounts to less than .5 per cent. of the total, are as follows:—

| | N.S.W. | Vic. | Q'land. | W.A. | S.A. | Tas. | N.T. | Papua. | Total. |
|---|---|---|---|---|---|---|---|---|---|
| Gold | 25.4 | 98.7 | 72.6 | 96.5 | 4.6 | 20.2 | 76.0 | 97.8 | 67.1 |
| Silver | 19.1 | — | 1.7 | — | 1.1 | 17.1 | 2.7 | — | 9.6 |
| Lead | 10.2 | — | 0.5 | — | | | | | |
| Zinc | 3.2 | — | — | — | — | — | - | — | 0.9 |
| Copper | 5.0 | — | 10.5 | 1.0 | 92.5 | 28.0 | 7.9 | 2.2 | 7.6 |
| Tin | 4.0 | — | 7.8 | 0.9 | - | 32.0 | 11.8 | — | 3.8 |
| Iron | — | — | - - | — | 1.1 | — | — | — | - |
| Tungsten | — | - | 0.7 | — | — | — | 1.6 | — | — |
| Opal | 0.6 | — | — | — | — | — | — | — | — |
| Coal | 30.5 | 0.9 | 5.1 | 0.9 | — | 1.6 | — | — | 9.9 |
| Shale | 1.0 | — | - | — | — | — | — | — | — |

Let us now proceed to take the various leading minerals separately. The value of the gold output amounts to 67.1 per cent. of the total. In the various divisions of the Commonwealth these values and their percentage of the total values are as follows:—

| | | |
|---|---|---|
| Victoria.. .. .. | £291,703,453 | 53.2 |
| W. Australia .. | 109,298,872 | 19.9 |
| Queensland .. .. | 75,217,830 | 13.7 |
| N.S.W. .. .. .. | 59,462,975 | 10.9 |
| Tasmania .. .. | 7,407,282 | 1.4 |
| N. Territory .. | 2,128,862 | .4 |
| S. Australia .. | 1,390,525 | .3 |
| Papua .. .. .. | 1,257,889 | .2 |
| Total .. .. | £547,867,688 | |

(In the case of Papua we have allowed £30,314 as the value of the gold won in the latter half of 1912.)

The value of the silver and lead output amounts to 9.6 per cent. of the whole. The combined figures are as follows:—

| | | |
|---|---|---|
| N.S.W. .. .. .. | £68,380,792 | 87.4 |
| Tasmania .. .. | 6,258,748 | 8.0 |
| Queensland .. .. | 2,245,556 | 2.9 |
| W. Australia .. | 708,981 | .9 |
| S. Australia .. .. | 345,728 | .4 |
| Victoria .. .. .. | 212,119 | .3 |
| N. Territory .. | 74,819 | .1 |
| Total.. .. .. | £78,226,743 | |

New South Wales has been by far the biggest producer of both silver and lead, the value of its output of the former amounting to £44,619,611, and of the latter to £23,761,181. Of Queensland's total, £1,711,152 constituted the silver value; and almost the whole of Victoria's production under this heading was silver.

In copper, the value of which is 7.6 per cent. of the total, the figures are as follows:—

| | | |
|---|---|---|
| S. Australia .. .. | £27,865,032 | 44.6 |
| N.S.W. .. .. .. | 11,784,102 | 18.9 |
| Queensland .. .. | 10,948,399 | 17.5 |
| Tasmania .. .. .. | 10,256,981 | 16.4 |
| W. Australia.. .. | 1,113,062 | 1.8 |
| N. Territory.. .. | 220,376 | .4 |
| Victoria .. .. .. | 215,761 | .3 |
| Papua .. .. .. .. | 28,293 | — |
| Total .. .. | £62,432,006 | |

(We have allowed £4840 as the value of Papua's output of copper during the latter half of 1912.)

The figures for tin (which accounts for 3.9 per cent. of the total value) are:—

| | | |
|---|---|---|
| Tasmania .. .. | £11,869,943 | 37.7 |
| N.S.W. .. .. .. | 9,327,609 | 29.6 |
| Queensland .. .. | 8,110,704 | 25.8 |
| W. Australia.. .. | 1,051,155 | 3.3 |
| Victoria .. .. .. | 782,680 | 2.5 |
| N. Territory .. .. . | 331,218 | 1.1 |
| Total .. .. | £31,473,309 | |

The value of the coal output has been 9.9 per cent. of the whole. Treating this mineral similarly to those already dealt with, we get the following result:—

| | | |
|---|---|---|
| N.S.W. .. .. .. | £71,226,355 | 88.3 |
| Queensland .. .. | 5,377,235 | 6.7 |
| Victoria .. .. .. | 2,462,391 | 3.1 |
| W. Australia .. | 1,069,435 | 1.3 |
| Tasmania.. .. .. | 572,963 | .7 |
| Total .. .. | £80,708,379 | |

The value of the zinc yield has been .9 per cent. of the whole. Treating this mineral output; and, of this, New South Wales' proportion is practically 100 per cent., amounting to £7,539,913 out of £7,545,170, the outputs of Western Australia and Tasmania, the only other contributors, being negligible. In conclusion, the percentages of the various sections may be set down thus:—New South Wales, 28.6; Victoria, 36.2; Queensland, 12.7; Western Australia, 13.9; South Australia, 3.7; Tasmania, 4.5; Northern Territory, .3; Papua, .2. The nett result of the year's operations has been a considerable improvement of New South Wales' position at the expense of Victoria, and a very slight improvement in the proportions of Queensland, Western Australia, and Tasmania.

The fact, as stated elsewhere, that the Melbourne City Council had refused the application of a motor 'bus company for the right to traverse the streets for hire, on the penny section principle, came as a surprise to most people when the announcement was first made, for if there is one hope of improved travelling facilities which the average citizen cherishes more ardently than another, it is the introduction of penny sections. Has not a war been waged for months, and even years, against the Tramway Company because it refused to recognise the clamour for penny sections? It is not too much to say that almost every other of the many drawbacks of the service would have been overlooked if the directors had introduced penny sections. Yet here was a new comer, a formidable rival to the obdurate Tramway Company, offering not only to take away a good deal of the company's business and convert it to dividends on behalf of a fresh set of shareholders, but at the same time to institute penny sections, and depend upon them for its profits, and permission to do so has been refused. Suspicions, and even whispers, of outside influence and vested interests were provoked, and it was not until several days after the first announcement that light was thrown on the matter. At last Monday's meeting of the City Council, Alderman Jeffries pricked the bubble. He asked whether it was a fact that the hackney carriage committee had refused an application by the Melbourne Motor-Omnibus Company for such a permit; if so, he said, it was quite against the principle for which the council had long contended with respect to the tramways. The chairman of the hackney carriage committee, Councillor Morell, admitted that the company's application had been received, and refused; but the reason was, not that they objected to penny sections, but that the route mentioned was along Flinders-street and Spencer-street, to connect the two railway stations, that is to say, the very same route as is now covered by the only penny section on the tramway service, which was stipulated for in the company's lease of the lines. That was not the way in which Councillor Morell stated it; what he said was that it was felt that, to encourage such traffic, would be highly dangerous at certain portions of the day, when there was congestion. It was mentioned also that one company had had granted two or three dozen routes, some of which had been used for a week or two and then given up. Citizens, therefore, have the comfort of a renewal of the assurance that the City Fathers are still pledged to penny sections.

* * *

As was mentioned in our last issue, Mr. J. H. Gray, a member of the Dredging Inquiry (River Pollution) Board, was betrayed by his position as chairman of the Maori Queen Proprietary Gold Dredging Co., of Bright (V.), into disclosing what he believed would be the general tendency of the Board's report, which, by the way, is only now in process of being prepared. When this indiscreet forecast was followed next day by the expression of a contrary view by another member of the Board (Mr. F. W. Fair, chairman of the Shepparton Urban Waterworks Trust), those interested began to wonder whether the Board's labours would, after all, terminate in a majority and a minority report. "Mr. Gray would find himself deceived," said Mr. Fair. "There was a strong majority of the members against dredging being allowed. As to the ground where dredging had been done being 'as level as the floor of the room,'" Mr. Fair remarked, "we should like to know where it is. We have travelled over many districts, and are of a different opinion. We have seen nothing like the level ground Mr. Gray speaks of." This adoption of the plural pronoun raised another question and added mystery to the divulgences. Had Mr. Fair been appointed to speak for the members of the Board as a body? If so, where was the Board's chairman? Then a metropolitan journal published what it called "the probable final recommendations of the Board, as shown by the actual determinations so far arrived at," although, as mentioned above, the report had not then been completed. The next surprise created the fear that instead of two reports, or even one, there might be no report at all; for, annoyed by the disclosures and predictions of two of his colleagues, the chairman, Mr. W. Davidson (who, it may be stated, was an ideal man for that office), forwarded his resignation, and the whole work of the Board narrowly escaped total wreck. As Inspector-General of the Public Works Department for many years, Mr. Davidson had been accustomed to work with officers trained to keep their own counsel and departmental secrets, and to leave disclosures to their chief; but in this matter his collaborateurs had broken away and given their personal opinions as findings of the Board. It is not difficult to understand Mr. Davidson being piqued by what he properly considered a breach of faith, an undertaking having been made at the outset that no disclosures should be made. Fortunately, the Premier and the Chief Secretary prevailed upon the chairman to withdraw his resignation, so that there is yet a hope that a report (if not two, or even three) may yet be arrived at. Having resumed his chairmanship, Mr. Davidson called a meeting of the Board for last Monday, at which the work was taken up where it had been left off.

* * *

It may be remembered that recently in our Leader columns we commented upon the elevation of Sir Rufus Isaacs to the Lord Chief Justiceship of the United Kingdom after his unfortunate excursion into speculation in American Marconis. Since then, we are informed by cable, the committee of the London Stock Exchange has suspended several of its members for five years for the part they have played in the very same matter. This may be held to show either that, as Shakespeare says, "That in the captain's but a choleric word, Which in the soldier is flat blasphemy," or that the London Stock Exchange has a much keener sense of honesty and propriety than that possessed by the legislative body which whitewashed Sir Rufus Isaacs and Mr. Lloyd George, and so made clear the way for the former to be translated into the highest permanent judicial position in the gift of a Ministry that has shown itself to be actuated by no very delicate instinct of what is right and honourable. An earlier cable stated that Ministerial influence was being exerted to prevent the Stock Exchange taking action that would so severely reflect upon the action of Parliament, and the still more discreditable action of the Government; and to this rumour no denial has been forthcoming. The Stock Exchange is to be congratulated on its action; but what a reflection it constitutes upon the ideals of those taking an active part in British politics!

**Whatever else it lacks, the New South** Wales civil service has a large number of **officers and members who have a weakness for** statistics concerning the departments they be**long to. At a social gathering recently, Colonel Holmes furnished his listeners with some figures showing the expansion, since 1888, of the services controlled by the Board of Water Supply and Sewerage. In that year the capital cost of services was £3,183,000, the revenue £125,486, and the working cost £24,000. In 1913 the figures under the same heads were, respectively, £10,990,388, £629,479, and £217,889, the net profit over the working expenses being £411,590, or equal to 3.75 per cent. on the capital outlay. On the figures for that year** the percentage on capital outlay in 1888 was **4.65. During the 25 years under review the** gross receipts paid into the Treasury by the **Board totalled £9,163,517. The fact that the total working expenses for that period are not given involves the acceptance of Colonel Holmes' statement that the net average annual profit is 3.75 on capital cost. The** worst feature of the reviews which these **statisticians make with some pride is that they actually reveal, from a business standpoint, decidedly poor results. It is no use mincing matters. The affairs of a State constitute a business involving capital outlay,** working expenditure and revenue, and it should be made to pay. Unfortunately, huge sums must be spent on so-called unreproductive works, the benefits accruing from which it is impossible to show on a balance-sheet. How, then, should our reproductive works fare, and how do they fare? The earning capacity of the State railways is on a par with this, and if the reproductive works of the State are incapable of making an adequate profit to repay interest on the capital sunk into each of them, it is obvious that the entire business of the State must fare very badly indeed.

## NEWS AND NOTES.

With this issue the "Australian Mining Standard" presents its readers with a special engineering supplement of 48 pages. This supplement will be found to contain a very interesting article by Mr. J. J. C. Bradfield, Chief Engineer of Metropolitan Railway Construction, New South Wales, on the "Linking of Sydney and North Sydney," and also an article on "Power Gas Producers" by Mr. Matthew G. Coates, a very highly reputed Melbourne engineer.

A valuable discovery has been made at the Ajax gold mine, Wadnaminga (S.A.), which after being worked for some [illegible] several years by Mr. E. [illegible], of Kapunda, was recently placed by him under option to the [illegible] company. The lode of a width of about 11ft., is of an ironstone formation, and is enclosed in a casing resembling the [illegible] about 4 to 5ft. apart. The dumps and tailings, about 15,000 tons of which from previous work has been dumped on the surface, have now been found on assay to average 7 to 8 dwt. throughout. The [illegible] company are exercising their option.

Operations at the Mount [illegible] mine (S.A.) have resulted in profitable [illegible] of the several parcels of ore marketed for testing purposes, returning a profit of £3 5s. per ton from the underlay shaft, £4 from the [illegible] shaft, and £6 for a parcel of ore from lode No. 2. The assay of the dump ore [illegible] as to three-quarters of its contents 60 per cent. lead, 40 oz. silver and 1 oz. gold, and as to the remaining quarter 22 per cent. lead, 2 oz. silver and 8 dwt. gold. The lode is 25 to 30ft. wide, and a tunnel driven 250ft. at the base of the hill has [illegible] the No. 2 lode somewhere below the intersection with No. 1, which is expected to be encountered within a few feet. Work on the tunnel has been temporarily suspended owing to the heat, and all hands are now [illegible] on the underlay shaft to afford the necessary ventilation.

The works of the British Australian Oil Company at Hamilton, a suburb of Newcastle (N.S.W.), [illegible] near Newcastle [illegible], have been closed down for several months owing to the reconstruction of the company. From the first it was confidently anticipated that the works would re-open, for the company has a fine seam of shale at Murrurundi, at the head of the Hunter Valley. Now it is stated that the preliminary work towards the opening of the refinery at Hamilton has been commenced, and in a short time it is expected that a number of men will be employed. The intention **is to enlarge the works, and greatly increase the output above what it was prior to their closing** down. The reopening of the refinery will mean the employment of a large number of men at the shale mine at Murrurundi.

**A find of gold near Cobargo (N.S.W.) is reported to be promising. Some big yields were ob**tained in the locality some years ago. The find is **said to be situated in settled granite country. It would appear to be on private property, as a number of applications for permits to enter same have** recently been granted by the warden.

An agreement dated 28th October, providing for the sale of the undertaking and assets of the Etheridge Gold Mines Ltd. (Q.) to a new com**pany of the same name, has been executed. The** liquidator of the old company has circularised **shareholders to the above effect, asking them to avail themselves of their right to apply for their** proportion of shares in the new company, that being share for share paid to 6s. The capital of the new company is in 120,000 shares of 10s. each, **issued as paid up to 6s., the unpaid balance of** 4s. per share being payable, 1s. on application, 1s. on allotment, and in calls of 1s. per share at intervals of not less than three months.

In our advertising columns the Australian Mutual Provident Society announces that the next yearly investigation into the affairs of the society, and the consequent distribution of the cash surplus, will be made as at 31st December next, **when all participating policies issued in the** ordinary department before that date, as well as those already on the books, will share in the cash bonus to be allotted for the current year. This feature of the society's operations is at all times pleasing to the members, as it is quickly followed by an intimation of the most gratifying kind in the shape of a bonus certificate showing each member's share in the huge profits earned **by the society during the year. What this may mean to each individual policy holder may be** best conveyed by the fact that no less a sum than £936,971 was distributed in cash bonuses for the **year 1912, which amount represented reversionary** additions to the face value of policies of more than a million and a half sterling. Since its establishment the society has distributed the enormous sum of £17,750,073 by way of cash bonuses among the members.

The clean up at the [illegible] (V.) Tin Mining Co. for October gave the low return of 6½ tons. New ground, which is producing rich dirt, is being operated on. A supply of water equal to several months' requirements has been stored, and the prospects at the mines are reported to be encouraging.

The gold received at the Melbourne branch of the Royal Mint during the week ended on November 8 amounted to 14,972.51 oz.

Apropos of the report, on another page, by Mr. [illegible] regarding the poor water supply on the route of the east-west railway, it appears that Port Augusta (S.A.) itself is in danger of a water famine, through the Government's agreement to supply the locomotives. Notices have been served on all persons having water agreements that they would be discontinued from October 31, and 5s. per thousand charged for all water used, and public meetings are protesting against the "exorbitant price," which represents an increase of over 200 per cent. The Government is charged with "using the people's needs as a means of extorting revenue instead of regulating or increasing the supply." One speaker said the regulation was "about as sensible as if a baker who to supply 1000 loaves found his clients suddenly doubled, and instead of supplying two thousand loaves, doubled the price." The water was in the hills, **and only required to be stored and reticulated.** He added that the Government had made no provision to replace the consumption by the Commonwealth railways, who paid 3s. per 1000 gallons. The Commonwealth could afford to pay **that price, but the producers could not. The present fruit crop depends upon a water supply this month. These things were said at meeting pre**sided over by the Mayor, Mr. J. Roberts, on October 28, at which a committee was appointed to watch the interests of residents. On the following Tuesday the Commissioner of Public Works, Sir Richard Butler, informed the House of As**sembly that the extra charge would not be en**forced at present.

**The Talisman Consolidated Ltd., New Zealand,** has declared a quarterly dividend of 1s. 9d. per share, free of taxes, payable on December 4 to shareholders on the register on November 18.

Five miners were arrested lately as a result of investigations which have been quietly made by Superintendent Davidson, of Benalla (V.), during recent weeks respecting allegations of gold **stealing from mines in the Jamieson district. On the 2nd inst., Michael Miller and Alexander Giles** were arrested at Mansfield while on their way to the Melbourne Cup meeting, and a quantity of retorted gold was found in their possession which is believed to have come from Gaffney's Creek. Next day the police visited Gaffney's Creek, interviewed John Hampton, Joseph Murphy and William Beaver, and found large quantities of gold **bearing quartz in Hampton's possession, and in various places over a radius of eight miles. They** also were arrested. The gold is believed to have **been stolen.** The accused were taken to Jamie**son later in the week, and will come before the court in due course.**

**A dividend of 1s. 3d. per share, absorbing** £80,424, has been declared by the Mt. Lyell M. and R. Co. (T.), payable on the 15th December. Accounts for the half year ending 30th **September, which will be issued on the 13th inst., show a net profit from all sources of** £41,943. This is after writing off £10,865 for mine prospecting and development and £11,390 for **depreciation of mine plant, etc. The balance of North Mount Lyell mine fire expenses account, amounting to £20,858, has been provided out of the reserve fund.**

From a crushing of 22 tons of stone from the **Devonshire reef, Stuart Mill (V.), Messrs. Mat**thews, Lloyd and McKenzie lately obtained 20 oz. 14½ dwt. of gold.

During October the battery of the Mararoa **G.M. Co., Norseman (W.A.), crushed 2730 short** tons of stone for a return of 1009 oz. 4 dwt. of **bullion, worth £3 4s. 10d. per oz., amounting, therefore, to £3271. Also 1985 tons were cyanided, yielding £1175, while 8 tons of concen**trates gave £47, and 737 tons slimes, £509, making a total revenue of £5002.

The value of bullion won by the Commodore **G.M. Co., Meekatharra (W.A.), during October** was £1760, of which £400 was from 420 tons **cyanided. In addition the slimes produced, 410 tons, are estimated at an assay value of 23s. per ton, or £471 10s. Expenditure for the month was £797, viz., mining £542, milling £163, cyanid**ing £61, realisation £31. On development £272 **was spent and £4 on capital account, making a** total expenditure of £1073, and leaving a profit **of £963.**

**The October output of bullion from the Bull**finch Proprietary mine (W.A.) was worth £15,394, representing 3624 oz. fine, from 6175 tons **of stone. Working expenses amounted to £5554,** leaving a profit on working account of £9840, **from which £755 was deducted for development. The September figures were: value of bullion £14,417, representing 3394 oz. fine, from 5545** tons; working costs £5003, working profit £9414. **Had the October stone been of the same grade as the September the yield of gold from the October crushing would have been 3779 oz. fine, so that** the value of the stone was a good ½ dwt. per ton less.

## BRIEF COMMENT.

**It is noteworthy that the development reported** as having occurred recently on the Carpathia tin **mines, Ardlethan (N.S.W.), is on the surface, and** so far as can be judged at present does not **materially enhance the prospects of that property in depth. The find is situate 190ft. from No. 1** shaft, and, upon being exposed, was found to be of **high grade, assaying over 15 per cent. metallic tin. It is evident that the Carpathia will maintain a reputation for being patchy; but if the layers of ore are big and frequent enough shareholders will have no cause to grumble. It is also evident that the management is bent on upholding the reputation of the mine as a producer, as shipments of ore are being regularly despatched for treatment, and will doubtless realise sufficient cash to pay the dividend estimated.**

A very extraordinary report is that of Mr. E. A. **de Lautour, manager of the Etheridge Gold Mines** Ltd. (Q.), on the Queenslander mine. He is able **to dwell optimistically on the prospects of the property in the same breath as he quotes figures to show the reef to be diminishing in size as depth is attained. To quote him: "Just below the No. 3 level the reef is 90 inches wide, and assays 17 dwt. per ton. On sinking a further 35ft. the reef was found to be 20 inches wide, but showed gold freely, and, with specimens rejected,** assayed 5 oz. per ton. At a further depth of 15ft. **the reef widened to 36 inches, a bulk sample of 2½ tons from which assayed 17.6 dwt. per ton." Discarding the circumstance of the reef narrowing down to 20in. and making richer at 35ft. below the No. 3 level, in a sink of 50ft. the reef lost two-thirds of its width and maintained its value. Still later the manager wires that at a depth of 115ft. below No. 3 level there is 10in. of quartz assaying 25 dwt. per ton. This he describes as "just making." If this be a new make, what has happened to the reef he was following? The manager reports commencing a level at 360ft., 100ft. below the No. 3 level, and he expects to have to drive 90ft. to intersect the 35 dwt. ore existing 480ft. in from the shaft at No. 3 level. The reef is certainly most erratic, with a tendency to pinch, and the manager will be lucky if he find any reef at all at the point at which he anticipates meeting it.**

The Amalgamated Hill End Ltd. (N.S.W.) is apparently in for a rather good time. According to report, the Star of Peace workings have been drained, and a number of veins disclosed, the value of which yet remains to be determined. The mica vein in this vicinity has been followed without it showing signs of a break, and the value of this is said to vary from 5 oz. to 50 oz. per ton. It is admitted that, on account of the smallness of the vein considerable time is lost in working it; and, unless some wholesale averaging be done, mining costs are likely to be expensive, providing this run of material is found to persist. The information available, in spite of everything, is meagre, and it is apparently as difficult for the management as for the outsider to forecast the value of the new ground opened up until more development work is done. This is evidently progressing with all possible expedition. The chief factor is that excellent values have been determined. Their extent alone remains to be proved, and only time will permit that.

At a general meeting of shareholders of the Lancefield G.M. Co. Ltd. (W.A.) held in London on the 24th September, it was decided to abandon the property to its creditors. In the course of his address, the chairman (Mr. R. J. Hoffmann) stated that, since the installation of the dry treatment process in 1906, a total of £900,000 of gold had been won from 600,000 tons of ore. No statement of costs was given, this being obviously unnecessary seeing that the company closed down £40,000 in debt. It is lamentable that a property which has yielded so much wealth, with a potential store approximating £350,000 still untapped, should end on the rocks in this fashion. No doubt what remains will always form a tempting bait for speculators, and will cause an effort to be made to recover it. It must not be forgotten, however, that Bewick, Moreing and Co. have had six years, and ample money in addition to the £900,000 which the mine has produced in that period, in which to overcome the difficulties attached to making the treatment of Lancefield ore pay, and this should act as a deterrent to any further effort being made to reopen the mine until the problem of its ore treatment has been completely solved.

Now that lateral development work is proceeding from the bottom of the much-discussed winze in the Oxide Creek property at Mt. Oxide (Q.) shareholders will not be demanding too much information if they insist upon being enlightened as to the actual dimensions and average value of the ore-body so far as is ascertainable at that point. The extraordinary tendency of many managers to disclose only values (the bigger the better) and give haphazard information as to measurements, is no doubt the outcome of the "boom" policy which is so injurious to the industry. The winze referred to has wrung from the manager some wild statements in regard to value. It is not advisable to stake a reputation on the sides and ends of a winze. The manager is paying a visit to Sydney to confer with the directors on matters of policy, which it is to be hoped will include provision for a sound method of reporting developments.

Anent the foreign venture craze, the Malayan Tin Syndicate of Sydney has appointed Mr. W. Crompton, who is reputed to have had 17 years' experience in the Straits, to proceed there and secure certain tin-bearing areas personally known to him. Australian investors need not run away with the idea that all the good things in the Settlement are awaiting them with open arms. As a matter of fact, there is an abundance of capital there ready and available for the first likely proposition that presents itself. Ultimately Australian investors will find that, with perhaps an exception or two, they had been saddled with "rejects." As to the areas personally known to individuals with long experience, we fancy we have heard of something similar before. Like everything else that wears the glamour of remoteness, Malayan tin will not pay a return call.

At the fourteenth general meeting of shareholders of the Harden G.M. Ltd. (N.S.W.), the directors will resign their stewardship by virtue of necessity. There is nothing left of which to render account. For the nominal figure of £6500 the property was secured and equipped, and thereafter yielded £195,000 for 70,000 tons treated. Unfortunately only £38,000 of this amount has been returned to shareholders for their enterprise, and it is to be hoped that they will not resent the niggardly treatment they have been subjected to when the directors cry "vale."

Developments at Bushy Hill, Cooma (N.S.W.), would indicate that miracles in mining never cease. It is reported that on Blake's lease the lode has been proved for a distance of 400ft. east and west of the workings, and that assays show over 4 oz. of gold and 20 per cent. copper per ton. If it be intended to convey the impression that this is the average value of the lode over length and width the information is hardly explicit enough. Other statements regarding the same property are just as vague in that a "large quantity" of stone from the open cut shows 2 oz. gold per ton, while there are "thousands" of tons of tailings which assay over an ounce. Generalities like this are not convincing, and are more harmful than otherwise to the prospects of a property.

# THE INVESTOR'S COLUMN.

## Some Companies Attracting Attention To-day.

(By Our Exchange Reporter.)

### J. Kitchen and Sons Ltd.

The announcement of a proposal to distribute among the shareholders a bonus of one share in five has naturally had a good effect on the market for this stock, and the quotations, which a month or six weeks ago were stationary in the vicinity of 85s., the best buying offer being at 83s., and the seller at 87s. have since improved to 97s. buyer, which is a sharp and substantial rise for the shares in an investment company. As the balance-sheet is about to be published in a few days it would be inadvisable to attempt any definite or detailed forecast of the results of the year's operations—it will be sufficient to assume with some confidence that they have been of a very profitable character. If so, they should be found to be better than for the previous similar term, when they were considered as fairly good, the net profit, after making necessary provision for depreciation on buildings, land, machinery, rolling stock, etc., and also for bad and doubtful debts, being £12,596 13s. 6d. The dividends declared were at the rate of 7 per cent. for the year, but as these disbursements absorbed £11,722 there was not much left to come and go on. The amount carried forward to the credit of profit and loss was, however, £19,550, and as the general reserve stood at £40,000, the company was in a strong position at the beginning of the financial year. As a large proportion of these undivided profits are to be utilised in order to provide the necessary capital for the proposed issue of bonus shares, the company must have been doing good business, and as the subsidiary undertakings in which it is interested include one for the purpose of growing copra, the plantation of which is a year nearer the producing stage, it is probable that those who have an inner knowledge of the position of affairs have been trying to quietly pick up any shares offering below 90s.; there have not been many.

The policy of the company is a progressive one, the directors being determined to maintain its trade position, evidence of this fact being found in the number of undertakings in which an interest is held. These include the Sydney Soap and Candle Company, in which £36,320 is invested; the Brisbane Soap Company, £3750; and J. Kitchen and Sons and Marsh Ltd., £8694. The main new enterprise, and one which will have the most important effect on the future prospects of the company, is the Copra Growing Company, in which the amount of capital invested amounted at the beginning of the year to £24,500. The value of this tropical fruit as a commercial product appears to be steadily increasing, and especially in connection with such businesses as that in which this company is engaged. There is also a matter in connection with the growing of cocoanuts, which contains very large trade possibilities, and it is the fact that although the Mahommedan people of the world are forbidden by their religion to use animal fat as an article of food such a prohibition would not apply to the vegetable fat contained in the cocoanut. Great difficulty would no doubt be experienced in India, for instance, in getting a conservative and caste observing people like the Hindoos to change their customs and modes of living, but this would not apply to the Mahommedans to nearly so great an extent, and once margarine or some other fatty form of food made from the cocoanut were introduced it would probably meet with a large and increasing consumption. Such possibilities are, however, largely a matter for future realisation, as the company will for some years probably require all its cocoanut fat in connection with its own manufactures. It may be of service to point out that the dividend on the shares, which are fully paid up to £4, has been at the rate of seven per cent. As a bonus of one share for every five in the company is to be given to the existing holders, it may be assumed the dividend on them will be at the same rate. That is to say that an additional sum of £5 12s., making £33 12s. per annum altogether, will be receivable by any person who purchases a hundred shares prior to the distribution of the bonus. Such a dividend would be equal to a little under six and three-quarters per cent. on a purchase now at £5, and as a considerable expansion of the company's business during the next three or four years is well within the range of probability, it seems certain that the shares will go to £5—perhaps higher.

### Hampdens (Q.).

The fluctuations in the price of shares in this company may be regarded as a very fair indication of the condition of the mining market, inasmuch as they show that neither good developments nor satisfactory returns are sufficient to maintain a stock at an advance in value. Probably "bear operations" are very largely responsible for this state of affairs, for some of the dealers have no doubt recognised that the public has not been investing lately except to a very moderate extent, even in the best of the market stocks, and they have therefore regarded an improvement in price, no matter what the cause may be, as a favourable opportunity to "sell forward." The racing campaign is generally a period of slackening interest in Stock Exchange movements, and this year has not been an exception; in fact, it has been rather quieter than usual. Under such conditions there is not only a falling off in the volume of transactions, but also a general tendency towards lower ranges of quotations.

Hampdens, however, looked decidedly firm about a fortnight ago, and were bought so freely that the prices rose from 37s. to 40s., a substantial rise when it is remembered that there are 350,000 shares in the company issued. The improved enquiry was owing to important mine developments both at the Hampden and the Duchess, the ore body being opened up from the winze at the 550ft. level of the latter property, and which is now at a depth of about 700ft. from the surface, being both of substantial size and very high grade. This downward continuation of very payable ore, private advices being to the effect that the official statements of the value are of a conservative character, is a matter not only of great importance for the Hampden, but for other companies on the Cloncurry field. At the Hampden mine itself the developments recently reported as having taken place at the 350ft. level, which is being driven from the No. 2 shaft towards the No. 1 (which is the centre shaft) are of a very satisfactory character. The distance between these two shafts is about 1400ft., and the level had been continued in ore worth about 6 per cent. for a length of 300ft. A blank was then encountered up to a point approximately 800ft. from the shaft. Good payable ore was then struck, the value being from ten to twelve per cent., and this chute has now been driven on for 120ft. The width can hardly yet be said to be determined, as the ore bodies in the mine vary in size, contracting in places and then widening out again, but about 9ft. wide is not an unreasonable estimate. This discovery is all the more welcome from the fact that, although the lodes in the mine are substantial, the payable bodies or chutes of ore which they contain are not generally large, nor are the values particularly high, certainly not equal in either of these respects to those of the Duchess. It may be as well to mention here that one of the causes for the relapses in the price of Hampden shares, which occur from time to time, is a suspicion among some of the market operators that rather more than a fair proportion of rich ore from the Duchess is being sent to the smelters in order to keep up the monthly returns, but, judging from a recent managerial statement upon this point, and also from the official estimates in the periodical reports as to the quantity and general average value of the ore, there does not appear to be any justification for such a belief. Following on the favourable developments thus referred to, the smelting returns for the last month, although of a slightly lower average value per ton of crude ore, bulked much larger than for some time previously, and were of a very reassuring character. Under these circumstances it seems strange that there should have been a market set-back, for even if the average value of the ore treated was slightly lower it is well known to every investor that a tendency towards such depreciation in value is a characteristic of every big mining company, and is owing to a great extent to a natural desire of the manager to put through the mill or the smelter as much of the lower grade material as is compatible with payable results. In forming an opinion upon the merits of mining property it is as a rule much better to go by the amount of the net profit obtained from the yield rather than by the value of the ore, and, judging the last return from the Hampden on these lines, it seems good enough to justify better market prices than are now ruling. Anticipation of the result of the return no doubt accounted for the heavy buying which caused the rise to 40s., and the real cause of the subsequent reaction was probably the decline in the price of copper. This has been fairly pronounced, amounting as it does to nearly £5 per ton during the last few weeks, and it is not only the drop in price which is disconcerting, but the evidence also of a downward tendency in the metal market. There are other contingencies to be remembered as well, such as scarcity of water and possible labour troubles in the future. The company has taken steps to provide against the former, and must take its chance with regard to the latter. It is probably in no worse position in this respect than most mining enterprises—perhaps better—as the rate of wages and the earnings under the contract system are high at Cloncurry. With copper at its present quotation, Hampdens seem worth buying.

## SYDNEY STOCKS.

The market for investment stocks during the week has continued the even tenor of its way. In fact, slow but sure has been its motto for some considerable time past. The market certainly has not lacked confidence; on the contrary, investments have attracted more buyers than sellers. There has not been so much money sunk in new flotations of late, but then the policy of increasing their capital pursued by so many of our old established dividend paying companies has necessarily been a strain upon the purse of investors, and has curtailed the money available for new ventures. An increased dividend in the hand is worth two prospective dividends in the future, after all, is a wise policy for shareholders to adopt. The dividend payments recorded on the official list of the Sydney Stock Exchange have continued to expand. The disbursements made in October amounted to £726,876, while for the four months from July 1 last the dividend payments have aggregated £2,801,872, as compared with £2,693,384 for the corresponding months last year. Bank shares in particular have been in request, and the good season ahead has been reflected in appreciation of values of those shares. The restricted turnover has been due simply to the disinclination of holders to part with their shares. The fact that exports are increasing and the balance of trade is again swinging in our favour, means additional wealth, and consequently there will be more money available for investment, which should enlarge the scope of business and create firmer prices in the Sydney share market. The poverty-stricken position of the Government's finances have and will continue to prove a drain upon the money market, which looks like keeping very tight, but that circumstance precludes the chance of the rate of interest falling, which benefits the individual with money to lend. Usually towards the close of the year a good deal of sorting out business is transacted in the share market. Investors like to weed out those ventures which have not come up to expectations, and start off with a clean sheet for the new year. Therefore business in the near future may show more activity, and prices a certain amount of irregularity as far as outside investments are concerned.

If the market for investments has been quiet, then business in the mining section in comparison has been lifeless. From the transactions recorded sharebrokers have barely earned their rent many days. For some reason or another "Cup week" usually demoralises all business, and its effect on the Sydney Stock Exchange has been most palpable. The very fact of there being a holiday in Melbourne on Tuesday rendered the market on the Sydney Exchange inoperative. The week has been a disastrous one for holders of Gt. Cobar shares, quotations having fallen down to close upon £1. There were rumours floating about the vestibule and passages of the Exchange that the company was finding a difficulty in meeting their debenture liabilities. Then, too, the production of the mine has been hampered by labour troubles. The situation is evidently one of anxiety. A glance at the returns for the past four months disclose nothing of a satisfactory character, as the following comparison shows:—

| | Copper. | Gold. | Silver. |
|---|---|---|---|
| | Tons. | Oz. | Oz. |
| July | 681 | 3,377 | 11,653 |
| August | 546 | 2,746 | 10,143 |
| September | 532 | 2,411 | 10,819 |
| October | 503 | 1,628 | 8,841 |

The estimated contents of the concentrates, according to the manager's report, have varied but slightly during the four months. The copper and silver concentrates treated during October, however, showed a distinctly lower percentage. The company is over capitalised, and we should imagine that the present shareholders will have gone prospecting in another sphere before Gt. Cobar, as it stands to-day, pays a dividend out of profits. Practically all the copper companies have had a bad week. Mount Elliott have been handled pretty severely by the "bears," both on the London side and in Sydney. In fact Mount Morgan scrip has been about the only one which has stood firm in the face of a pronounced "bear" market. And yet Mount Morgan shares, on present prices and recent dividend payments, are an expensive stock. Hampden-Cloncurry shares suffered with the rest, although the mine production during October showed a distinct improvement all along the line. Mount Lyell has appeared once again on the dividend paying list, having declared a payment of 1s 3d per share—the first since June, 1912. The money required for the dividend amounted to £80,424. Moving in sympathy with London quotations, the market for Broken Hill shares has been weak and irregular. The actual result of the movements, as far as the Sydney list is concerned, displays little variation in prices as compared with this time last week, although Broken Hill Junction, Junction Norths are lower. In the tin section it has been Carpathia shares which have provided the broker with most employment. Early in the week the "bulls" got going on the contributing shares. The talk of a new strike in the mine stimulated the market. Also there was some covering to be executed.

At any rate from about 16s. 6d. at the close of last week the contribs. sold up to 20s. on Thursday. It stands self-evident that the rise in the contributing shares was not solely due to the new find, otherwise the paid up shares would have participated to an even larger extent, carrying, as they do, no liability. Curiously enough the paids have received little or no attention, and have moved forward but slightly. As for the new development, it has occurred about 189ft. from No. 1 shaft. The mine manager reported being down some 6½ft., and exposing milling ore 2½ft. wide by 4ft. long, with ore continuing in both ends. At 4ft. it assayed 15.8 per cent. tin, and was increasing in value as it went down. The Carpathia mine will doubtless turn out a good proposition, but the stumbling block to its success is its capital of £150,000. A few weeks ago the Sydney Stock Exchange issued to its members a new book of rules and regulations, the outcome of the inter-State conference in Melbourne. But the ink has hardly had time to dry before the new rules in some cases have been set aside. Report has it that the members of the Adelaide and Melbourne Stock Exchanges would not countenance the amendments and additions agreed upon by their representatives at the conference, and have been conducting their operations as formerly. Not so the members of the Sydney Stock Exchange, who have embodied them in their new book of regulations; therefore until they have been officially rescinded should abide by them.

---

## PERSONAL.

News was received in Melbourne last week, by cablegram, of the death, in his 80th year, of Sir W. H. Preece, the eminent electrical and civil engineer, who died on the 6th inst. Sir William Preece was born at Carnarvon, South Wales, in 1834, and after being educated at King's College, London, and serving a year under Mr. Edwin Clark, civil engineer, he joined the International Telegraph Company, and in three years was promoted to the charge of the company's southern district. Two years later he changed to the Channel Island Telegraph Company, and again in two years he became superintendent to the London and South Western Railway Company. In 1870 he took a post under the Postmaster-General, became chief electrician in 1877, and from 1892 to 1899 he was engineer-in-chief to that department. In his time Sir William did much by inventions of his own, but especially by means of his pen, to advance electrical science, and his professional genius was widely recognised, not in England only, but in America and in Europe. Probably few large electrical undertakings were put in hand for many years past without previous consultation with him.

Mr. James Nangle, who has for some time been Acting-Superintendent of Technical Education in New South Wales, has been appointed Superintendent in succession to the late Mr. J. W. Turner. Mr. Nangle is 44 years of age, and is in himself a witness to the immense boon of popular technical education, and the still grater boon of industry and perseverance. Leaving school at eleven years of age, he began life in a small engineering shop, and was afterwards apprenticed as carpenter and joiner. When only 15 he attached himself to the Technical College, Sydney, and having been connected with it as pupil, teacher, lecturer and acting-superintendent ever since he now finds himself at its head. Mr. Nangle has not devoted the whole of his energies to the college, however. Having worked his way as a youth, he began practising as an architect in 1891, that is, at the age of 22, and much of his work now adorns the Sydney streets and suburbs, notably the premises of Marcus Clark and Co., opposite the Central railway station. He is a fellow of the Institute of Architects, as well as its hon. secretary, a member of the Board of Examiners and hon. testing architect to the Institute, a member of the International Society for the Testing of Materials, a fellow of the Royal Astronomical Society of Great Britain, and for two years was president of the New South Wales branch of the British Astronomical Association. Mr. Nangle's views on Technical Education will be found in another part of this issue.

Mr. A. C. Reid has been appointed assistant at the Queensland Geological Survey Office.

Mr. A. B. Brady, Under-Secretary for Public Works, Queensland, who left Brisbane on March 2 for a tour of the world, returned on October 30. He finds nothing to blush for in the progress and present position of his State; is convinced that Australia is the finest country in the world, and Queensland the best part of Australia.

Mr. W. Long, of the Adelaide Meteorological Bureau, has been appointed meteorological observer on Macquarie Island for 1914, in succession to Mr. G. F. Ainsworth, who has been in charge of the party there during the past two years. Mr. Long will journey to his new sphere on board the Aurora, when she leaves Hobart for the Antarctic to bring back Dr. Mawson and his colleagues.

Mr. C. Evans, the Queensland Commissioner of Railways, is to retain his position there, his term having been extended for a further term of two years from November, 1914.

Mr. Fred. Thonemann, having returned from his tour in England, has rejoined the Board of the Australian Paper Mills.

Mr. James White, a resident of the Barrier for 39 years and a pioneer prospector of Broken Hill (N.S.W.), died on October 31.

Mr. Robert Hyndman, who had been connected with the Bank of Victoria as manager of the Kyneton branch from 1872 until he retired in 1911, and joined the bank as far back as 1856, died at Kyneton on the 7th inst., at the age of 80 years.

On Friday the death was announced of Mr. J. N. Bendell, a well-known member of the Sydney Stock Exchange. As a token of esteem in which their late confrere was held the Exchange was closed after the noon call on that day.

---

## METAL QUOTATIONS.

(From Our Correspondent.)

### By Cable.

London, Tuesday.

Copper suffered a further decline in values, and the set-back was sufficiently severe to cause some alarm. It has to be recognised that last week's lowest rate showed a wide margin above the average monthly rates ruling in the early part of the year, which, after January, did not rise to £69 per ton for several months. It may be added that until last year the November average has only twice in ten years exceeded £65. If copper went down, tin was on the up-grade, with a slight weakening towards the end of the week. Lead rose and fell again, but the tendency was upwards at the close.

COPPER.—Monday saw a drop in the price for spot delivery of 35s. per ton, the quotation being £71 12s. 6d.; Wednesday brought £71 17s. 6d., followed by £70 2s. 6d. and £69 15s.

The quotations for three months' delivery were £70 10s., £70 12s. 6d., £69 10s. and £69.

Electrolytic brought £77 5s. (a fall of 5s.), £76 10s., £75 5s. and £75. Yesterday's quotation was £73 10s.

The total supplies for October were 38,999 tons. Total deliveries (including Chilian and North American for all Europe), 40,991 tons. Stocks in England and France and afloat (including quantity advised from Chili and Australia), 21,350 tons. Quantity advised from Australia by mail and cable, 3750 tons. The European visible supply is 25,827 tons. American stocks of refined copper at the end of October were 32,566,000 lb., or 14,538 tons.

TIN.—Opening with £181 15s. for spot, the market rose to £183 and £183 15s. before a backward move resulted first in £182 12s. 6d., and then £182 10s.

For three months' lots the rates were £183, £184 5s., £184 15s., £183 15s. (two days).

Total stocks (including stocks in America and quantity afloat) amount to 13,049 tons. The quantity of Straits and Australian on spot and landing is 1975 tons, and the quantity afloat 4240 tons. Deliveries in London and Holland during the past month were 3114 tons.

LEAD.—The market started at the previous week's closing rate of £20 12s. 6d., and rose to £20 13s. 9d.; then came a drop to £20 5s., recovering to £20 10s.

SPELTER was unchanged at £20 15s.

SILVER.—The daily prices were:—27 7-16d., 27½d., 27 11-16d., 28⅜d. and 27 9-16d.

ANTIMONY.—"Star" brand has had a fall of 10s. per ton since a fortnight ago, the price now being £29, but 50 per cent. ore still brings £6 5s. per ton.

WOLFRAM (70 per cent. ore) improved from 33s. 6d. to 34s. per unit, equal to a rise from £117 5s. to £119 per ton.

MOLYBDENITE rose from 2s. 8d. to 2s. 9d. per lb., or from £298 14s. to £308 per ton.

MANGANESE (50 per cent. ore) had a slight rise from 9⅜d. to 9½d. per unit, or from 39s. 1d. to 39s. 7d. per ton.

---

Elder's Metal and Mercantile Propty. Ltd. (Melbourne) have supplied the following cabled average metal prices for October:—Spelter, ordinary brands, £20 13s. 9d. per ton; foreign soft lead, £19 9s. 5¼d. per ton; silver, fine, 2s. 6¼d. per oz.; standard, 2s. 4d. per oz.; copper, standard, spot, £73 9s. 5½d. per ton; best selected, £78 18s. 4d. per ton.

The secretary of the British Chamber of Commerce, Paris, has supplied the following metal prices for September:—Copper, per ton (Havre), £77; tin, per ton (Havre), £204 12s.; lead, per ton (Havre or Rouen) £23 12s., (Paris) £23 16s.; zinc, per ton (Paris), £23 16s.; nickel, per ton (Paris), £165-£175.

# OUR BIG MINES.

## Examinations of Their Yearly and Half-Yearly Reports.

(By a Mining Accountant.)

### Broken Hill Proprietary Block 14.

### Half-Year to September 30, 1913.

This old company is quietly pursuing its way in search for the ever-scarce carbonate ore, and in the exploitation of the limited amount of sulphide ore known to exist in the mine. The slow process of extinction is uneventful. There are no happy discoveries to report, nor does there appear to be much prospect. The net profit for the half-year was £8844, this sum being exceeded by the dividend of £10,000.

The output of carbonates was much the same as previously, both in tonnage and metal contents. The stopes continue to yield fairly well, and there is no reason to fear any sudden drop in production, but the cost of mining the ore is gradually rising as the orebodies are being depleted. A summary of the results is as follows:—

| | Half-year ending | | |
|---|---|---|---|
| | Sept., 1912. | March, 1913. | Sept. 1913. |
| Carbonate ore despatched tons | 12,484 | 6,992 | 6,957 |
| Lead .. .. .. per cent. | 28.63 | 25.4 | 24.6 |
| Silver .. .. .. .. oz. | 15.99 | 14.9 | 14.9 |
| Working cost of mining per ton .. .. .. .. | 26/10.6 | 35/6 | 39/5 |

The table has not a cheerful significance. The output, no doubt, would have been greater were it not for the Silverton Tramway strike in the early portion of the half-year. In the above table the cost is the total cost per ton in railway trucks ready for despatch.

The sulphide ore is being attacked fairly vigorously. During the term 16,899 tons of this class of ore was forwarded to the Junction North, as against 9503 tons the previous half-year. The ore was drawn from the 200 to 600ft. levels, practically all the previously worked stopes having been utilised in providing the output. Also new stopes have been opened in ground that has remained untouched for many years. Steady progress has been made toward more systematic working. The mullocking system has been reorganised. An extra emergency escape away for the lower levels has been completed by connecting the 400ft. level south with the Broken Hill Proprietary Co.'s workings. A summary of results may be shown as follows:—

| | Half-year ended | | |
|---|---|---|---|
| | Sept., 1912. | March, 1913. | Sept., 1913. |
| Sulphide ore despatched tons | 2,173 | 9,503 | 16,899 |
| Average assay value— | | | |
| Lead .. .. per cent. | 15.1 | 15.47 | 15.3 |
| Silver .. .. .. oz. | 11.9 | 12.05 | 10.9 |
| Zinc .. .. per cent. | 11.0 | 12.01 | 11.0 |
| Cost of mining and delivery .. .. per ton | — | 16/9.4 | 18/10.2 |

The average grade of the ore shown above is considerably higher than the grade credited to the ore reserves. This latter is 12 per cent. lead, 8.5 oz. silver, and 9 per cent. zinc. The reserves are estimated at over 200,000 tons. The stopes are yielding well, and notwithstanding that about 17,000 tons of sulphide ore was raised during the period at least as much ore was developed.

The total quantity of oregon timber used underground was 260,000 super feet. It is interesting to note that South Australian hardwood is making headway for use underground, 70,000 super feet being used. The use of hardwood is gradually extending in replacement of the more expensive oregon. Block 14's timber cost was 2s. 4.5d. per ton on all ore despatched.

There is nothing remarkable about the accounts. Working account is credited by "ore account £45,204," and sundry sales £320. Profit on the working account is £11,295, as against £6578 for the previous term. The net profit, after adding £1294 for interest and deducting £3745 for interest to preference shareholders, for depreciation, income tax, royalty, expenses incurred on account of properties inspected amounts to £8844, as against £5805 at March last. The excellent price of £19.1008 ruled as the average for lead during the half-year, and silver was also favourable, being 29.6406d. per ounce. It is plain that low metal prices would knock the company very severely. The leading financial features for the half-year are shown as under:—

| | |
|---|---|
| Revenue .. .. .. .. .. .. .. .. .. | £46.808 |
| Expenditure .. .. .. .. .. .. .. .. | 36,140 |
| Written off for depreciation .. .. | 1,824 |
| Net profit .. .. .. .. .. .. .. .. | 8,844 |
| Dividend .. .. .. .. .. .. .. .. | 10,000 |
| Carry forward .. .. .. .. .. .. .. | 71,413 |
| Paid capital .. .. .. .. .. .. | 155,000 |
| Liquid assets .. .. .. .. .. .. .. | 87,157 |
| Liabilities .. .. .. .. .. .. .. .. | 4,891 |
| Surplus of liquid assets .. .. .. .. | 82,266 |

# THE COAL MINING INDUSTRY.

## New South Wales.

### Northern District.

(From Our Correspondent.)
Newcastle, November 8.

The dispute which arose concerning the working of top coal in the Whitburn colliery a few weeks ago has not been settled. The matter has been mentioned at the Wages Board by counsel for the Colliery Proprietors' Association, who pointed out that the owners of the mine were losing through the men not working in the tops. His Honour Judge Edmunds, chairman of the board, when the matter was again brought forward last Wednesday announced that the board would finish the Stockton-Borehole case, and would then give one week to consideration of the dispute at the Lambton B pit. After that, the Whitburn dispute would be taken up, and would be considered alternately, week by week, with the Lambton B matter.

South Greta colliery (Maitland) was idle on Tuesday. The men met at the pit mouth in the morning, and it was alleged that the manager had not carried out a number of promises that were made some time ago; in consequence the men decided not to go to work that morning. Mr. W. Brennan, general secretary of the Colliery Employees' Federation, went up to the mine during the day, and as the result of his advice, the men decided by a small majority to go back on Wednesday morning. A deputation met the manager, Mr. A. J. Miller, during Wednesday, and the result of the interview was reported to the men in the evening and accepted as satisfactory.

The Wages Board is at present considering the matters in dispute between the men and the management at the Stockton-Borehole colliery. The mine was idle for some months, owing to failure of the parties to agree concerning the rates and conditions in the pit. The taking of evidence has been fairly well advanced, and the matter should not now take long to decide.

The Coal-dust Committee, consisting of Messrs. D. A. Robertson, Metropolitan colliery (chairman); A. A. Atkinson, Chief Inspector of Coal-mines; R. A. Harle, manager of Hebburn colliery (Maitland); and W. Rees, miners' check inspector in the Maitland district, commenced its sittings this week, to consider the question of coal-dust in mines, and the possibility of explosions being caused thereby. On Thursday the greater portion of the sitting was devoted to the discussion of the paper by Dr. W. E. Garforth, president of the Federated Institute of Mining Engineers, of which an abstract appeared in our issue for October 9. The committee will inspect two collieries on the South Coast during the coming week, and two in the Newcastle and Maitland districts during the following week.

The Pelaw Main miners are pleased with the award given in respect of the working and paying of the machine men so far as it relates to the fixing of a minimum rate of 12s. 4d. per day for a fair day's work, and to the provision of cutting for machine men in their own section; but they think that the proposal to pool the earnings of the men is unworkable. A meeting of the lodge is to be held, at which the whole matter will be considered.

Amongst the collieries in the Hunter Valley which have been opened out during the last two or three years is that at Muswellbrook, about 80 miles north-west of Newcastle. Until a few years ago it was not thought probable that coal would be found there, but a good seam has been discovered and Professor David has spoken highly of it. It is a bright, bituminous coal, burns freely, and is an excellent steam coal; and it is anticipated that when the main northern line is duplicated, and the line out to Denman from Muswellbrook completed, there will be a big demand for the mineral for locomotives and for other purposes from towns within a certain radius.

Speaking at the Eight-hour function in Newcastle on Saturday night last, Mr. Cann, State Treasurer, referred to the work which the Government is carrying out in the harbour of Newcastle in order to provide additional and up-to-date facilities for the loading of coal. He said the Government had actually commenced this work, which, when completed, would enable them to ship 10,000,000 tons of coal per annum. The Government had under order six electric cranes for the new wharf in the basin. A new hydraulic crane is to be erected, and the erection of another Myler Hoist is contemplated. He added that they recognised the importance of the coal trade, and that it was growing rapidly, so they wished to make full provision for the handling of the mineral when it reached the waterside, so that nothing might occur to hamper the industry.

Mr. Cann, the State Treasurer of New South Wales, has referred the matter of the congestion in the coal traffic at Newcastle and the need for more locomotives for the handling of the coal to the Chief Railway Commissioner. Mr. Cann says he expects that the matter will be remedied during the next few weeks.

On behalf of the men working on what is known as the Victoria seam in the Newcastle district—New Lambton, Shortland, South Waratah and Burwood Extended collieries—a claim has been lodged with the Wages Board for the fixing of rates for pick and machine-won coal. The pick rate asked for is 3s. 4 1-5d. per ton, with yardage and other payments added; and for machine cut coal, 2s. for shooting and filling, with one-half of the yardage rates asked for on behalf of the pick miners. These rates are considerably in excess of those ruling at present in the pits named.

### Southern District.

(From Our Correspondent.)
Wollongong, November 8.

The reported bad results from southern coal in a trial by vessels of the fleet notwithstanding, consignments from various collieries of the district continue to go there. Mt. Keira had for long supplied 2000 tons per fortnight to the vessels of the Imperial Navy.

The foundations of the engine house at the Corrimal coke ovens, which in common with those of the ovens gave way to the heat when the ovens were fairly in operation, have now been renovated, and the machinery is at work. The engines, which are actuated by the waste gases from the ovens, were generating the electric current for the colliery plant, and when put out of action by the collapse there was some inconvenience. The ovens are not yet ready for use again, but the boilers are designed for the use either of the gases aforesaid or of the usual fires.

The output of the North Bulli colliery for the last fortnight is a record, exceeding all previous similar periods by over 600 tons. A drive through stone has been started, which may open up a new district.

The Illawarra Coke Co., Coal Cliff, the latest addition to the coking industry, has got the work of preparing the ground for its plant of ovens finished, and is ready to begin oven building. The company, which was formed less than a year ago, has, since it got to work, made businesslike progress.

The Mines Department staff are preparing for publication an account of the mines of this district, historical and descriptive.

The electrical plant to be installed at the Mt. Pleasant colliery is to be more than the equal of all but one or two such plants in the Commonwealth.

# VICTORIAN MINING ACTIVITIES.

## Bendigo and District.

(From Our Correspondent.)

The gold production for the fortnight ending November 8, 1913, amounted to 6133 oz. 13 dwt. The principal producers were Central R., W. and Blue, 541 oz. 10 dwt.; Virginia, 276 oz. 10 dwt.; Williams United, 264 oz. 7 dwt.; Bendigo Dredge, 261 oz. 12 dwt.; North Bendigo, 252 oz. 5 dwt.; South New Moon, 241 oz. 12 dwt.; Great Northern, 237 oz. 2 dwt.; Carlisle, 217 oz. 12 dwt.; Johnson's Reef, 208 oz. 10 dwt.; Catherine Reef, 198 oz. 10 dwt.; Koch's Pioneer, 159 oz.; Golden Pyke, 154 oz. Four dividends, aggregating £3025, were announced, viz.:—Williams United, 6d., £875—total to date, £1312 10s.; New Chum Goldfields, 6d., £800—total to date, £21,600; Great Northern, 6d., £750—total to date, £170,950; North Bendigo, 6d., £600—total to date, £600.

Golden Pyke, while erecting a new surface gearing at the main shaft, will suspend underground operations for about ten days. This delay, combined with the additional expenditure in new plant, led to the deferring of the usual 1s. dividend this fortnight. The 447ft. level has reached the Constellation boundary, where there is 18in. of good quality stone adhering to the hanging wall. With the footwall quartz the crushing material in the end has a width of 4ft. and is all of profitable quality. The north stopes at this depth are without any change of note, and in stoping south a few colours of gold are still visible in 3ft. of stone. At 543ft. very fair gold is showing in the stopes north of the Nos. 1 and 3 rises. South of the shaft the other stope has been squared to the Golden Age boundary, where the reef is small and of low value. Another stope is now being started from the No. 2 rise in the same direction, and is expected to disclose better prospects at the outset. The additional stope off the first rise from 643ft., opposite the shaft, is not as promising as anticipated. The stone has contracted, and is not revealing as much gold as seen in the latter stages of this rise. The explanation probably is that the stope is just a few feet short of the richer shoot. Better prospects are being disclosed south of the No. 2 rise at this depth, fair gold showing in the footwall portion of the reef at 100ft. from the end of the lease. At 730ft. the east crosscut should reach the downward continuation of the reef in another 8ft. On the outer reef at 447ft. there is 18in. of payable stone in stoping south from the Constellation boundary.

Unity shares gained in favour with the entering of auriferous spurs in the 920ft. east crosscut. This crosscut started from the west leg of the Pandora formation, which overlies the Victory reef. The west back of the latter was passed through some time ago, and the crosscut recently left the lava dyke behind. The end, at 110ft. from the plat, is close to centre. A few feet from the face is a small west leg, connected with a saddle reef worked in the mines further south. The gold bearing spurs will be found between this and the corresponding east leg, which will be uncovered in a few days. The main objective of the crosscut is the system of productive spurs, now profitably worked by the Carlisle Co. in the adjoining mine northward, and which should be located some distance further east. The crosscut will reach the Victory back within the next 70ft. A rise will then be put through to some old workings, that extend to 25ft. below the 940ft. crosscut and where a higher system of spurs formerly yielded payable average. A connection will also be made with a rise on the same back from 1018ft. This rise is up 75ft. on the underlay. There is a strong fault and a good width of crushing material in the rise, which is undoubtedly a portion of the stone being opened up by the Carlisle in this direction. The company has driven 85ft. north on the fault and Victory east back, off the rise; but though a fair sample of gold has been seen, the stone is of very low grade. From the end of the level there is less than 50ft. of ground to spend before reaching the Carlisle boundary. Southward, however, the company's holding is more extensive and the whole of this portion of the lease intact. On the Paddy's Gully line of reefs a winze has been sunk to 188ft. below the 937ft. crosscut. The winze started close to the west side of the anticline and passed through 7ft. of quartz at a depth of 120ft. At 148ft. a strong easterly-dipping fault was encountered; but beyond a few spurs nothing of importance was found in sinking. At the bottom of the winze, and 1146ft. from the surface, the syncline gold is exposed. In crosscutting 46ft. west a strong east back of the Garden Gully line was reached. This back recurs as a double west back of the Paddy's Gully anticline at 74ft. in the east crosscut, where it carries several inches of bedded quartz. The latter crosscut reached the centre at about 160ft. from the shaft, exposing a spur or two underfoot. Continuing the crosscut to 225ft. only country rock was traversed; but had the crosscut been extended another 15ft. the matching east leg of the west back, at 70ft. from the plat, would have been uncovered. The cap of this formation is probably 130ft. overhead, and is to prospected by a crosscut off the winze at 1025ft. There is a strong probability of this reef being identical with one from which the Sea Co. obtained over £16,000 in dividends several years since, at about ½ mile south. The spurs referred to in the bottom crosscut were formed below the cap, exposed a well-defined top small saddle reef. The cap was of no value and the resources of the backs have yet to be tested.

Bendigo Dredge, a venture on the Bendigo Creek, near White Hills, had the remunerative yield of 369 oz. from the last clean up from two plants. Of this the No. 2 plant produced 150 oz. from what is known as Caroline's Paddock, a property of 40 acres reclaimed from the old puddlers' workings for cultivation purposes. The ground, however, does not appear to have been suitable for the purpose originally acquired, and the Bendigo Dredge Co. secured it by purchase. From the first ½ acre 207 oz. of gold have been extracted, and the transaction will apparently prove a very profitable one. The No. 1 plant yielded 219 oz. from the acre paddock just completed on the other side of the creek. A third dredging plant is to be erected to work the Ironbark and Long Gullies.

Specimen Hill are sinking a centre winze from 2035ft. in search of the 2280ft. reef of the Clarence United. There is a crosscut at 2235ft., exposing two east backs and a west back. The cap connected with the first east back may be reef sought for, and should be reached in the winze from 2035ft. during the next few weeks. The reefs were known to exist several years ago, but no attempt was made to ascertain their value beyond crosscutting at 2235ft. At 1445ft. the stone in the north stopes is of low grade, but will be further tested in the vicinity of the lava before being abandoned. The spurs in the 280ft. rise have shown gold, but are of no value as yet.

South New Moon second milling from the crushing material allied to the faulting of centre and the lava in the 1140ft. south level was again satisfactory, averaging nearly 8 dwt. per ton. A rise is now going through to connect with a winze from 1060ft., when the output will be increased. Stoping is in progress off the rise, but comparatively little gold is visible. There is a good extent of ground available southward. At 1060ft. fair gold is disclosed in the north-east stopes. Having driven the south intermediate level 87ft., a rise has been started in the end to prospect through to 980ft. The 980ft. north stopes reveal a little gold, the prospects of the south eastern stopes being still the more favourable. A little gold is also showing in the outer stopes at 250ft. south of the 980ft. crosscut, but the main spurs at 460ft. south have not been so productive of late. The 820ft. south level has been discontinued till the mullock broken is required in the stope. This level is expected to disclose the continuation of the 980ft. spurs before reaching the Clarence United boundary. At 500ft. a full width of low-grade quartz is being traversed in the rise on the fault, over the crosscut on the north boundary. The outlook here may improve as operations approach one of the east backs. There is over £900 to credit, and another dividend is a possibility of the near future.

Catherine Reef, according to the official estimate, have extracted nearly the whole of the payable stone north of the 2300ft. plat, leaving the future to depend largely on the results south of the shaft at this depth and above 2200ft. At 2300ft. the south level is advanced 535ft. without revealing a colour of gold, though quartz of a favourable character has been traversed throughout. There is 4ft. of stone allied to the hanging wall and a few spurs to eastward in the end. The lava is less consolidated at present. At 460ft. in a prospecting crosscut is going east, but has not exposed more than very low-grade spurs. Stoping is in progress over the 2200ft. south level, and the company are also opening up the spurs to the east of the old stopes in anticipation of meeting with better results. A weekly gold production of 50 oz. is stated to be sufficient to cover working costs, now that a portion of the new mill is otherwise revenue-producing.

Williams United, after a lapse of over 30 years, the last disbursement of profits being made in August, 1883, re-appeared on the dividend list during the week. This is entirely due to the more productive character of the eastern spurs in the 2100ft. south stopes. A great extent of crushing material is showing in these workings, emanating from the faulting of the eastern backs and footwall beds. The whole carries some gold, with the spurs some distance from the hanging wall of the fault of good quality. The level is in nearly 700ft., and spurs containing gold are still showing. The principal difficulty, which, however, is gradually being overcome, has been in filling up the stopes, the 2000ft. level being not half as far advanced. At the latter depth driving is through quartz showing a few colours of gold. Overhead a search is being made for the extension of another system of spurs that were formerly worked with success nearer the shaft.

Golden Age are restricting operations above 853ft. to the five lowest stopes, the reef being small and of little value in the two uppermost stopes. Payable returns are still maintained, and a fair sum is showing on the right side of the ledger. An average width of 12in. of reef is available in stoping. At the north shaft the 655ft. north level is in 102ft., with a few colours of gold in 9in. of quartz on the Golden Pyke back. About 50ft. of solid ground remains before reaching the Golden Pyke lease. The reef is only 3in. and of low-grade in the first stope, enlarging and improving in quality in the second. In advancing the south level to 107ft. more stone is making toward the hanging wall, but the quality continues of low-grade. Prospects are likely to brighten after passing through a fault seen in the higher levels of the north shaft. At the east shaft a depth of 1615 ft. is attained. The deepening of the shaft is being followed with interest, as operations are shortly expected to reveal an east leg of a new reef on the Paddy's Gully line.

## Castlemaine and District.

(From Our Correspondent.)

Spring Gully crushed 200 tons last week, and it just touched the payable margin, running out at about 5 dwt. per ton, the result being 49 oz. 5 dwt. The outlook of the mine is unchanged. A continuance of payable crushings is forecasted by the management.

South Wattle Gully is opening up splendidly, and considerable interest will be felt in the revelations of the battery when the latter is erected and in working order. Down to the 300ft. level stone that assays up to good payable average has been broken. At the 300ft. level itself the drive off No. 3 rise displays a reef 18in. wide, and of nice appearance. The stone is being saved for crushing. The drive from the No. 1 rise on the west leg is in 97ft., and a reef of fair quality is in sight. The main level has been extended 351ft., and there a reef 3ft. thick, highly charged with minerals, is being broken. The 350ft. level is in 42ft., and a new make of stone has been cut. It is rising west 3ft. thick, and good gold has been found in prospects.

New Golden Hill is doing developmental work. A small parcel of 8 tons was sent to the Spring Gully battery, and it returned just over 4 oz.

Little Nuggety, at Campbell's Creek, has not yet got machinery erected. In the meantime the old main shaft is being enlarged.

Campbell's Creek bucket dredge did well with a single plant last week. The No. 2 plant was hung up through a break in the machinery, and the No. 1 plant lifted 58 oz. 12 dwt. in 136 hours. This is more than enough to pay for the ordinary working of both dredges.

## Maldon.

(From Our Correspondent.)

For the month of October Oswald's gold mine yielded 847 oz. 8 dwt. This includes the return from the chlorination plant of over 300 oz., a return of 219 oz. from the battery, and a general clean up—400 tons for 198 oz. (battery); cyanide, 88 oz. 10 dwt. from 720 tons; slimes, 170 tons, 36 oz. 5 dwt. At the 400ft. level rising is being done on flat leaders, going away to the east and showing traces of gold. Stoping on stone 4ft. wide above the floor, and worth 1 oz. per ton, is the chief development at 500ft. At Tabletop the rise is up 10ft., and a few leaders were passed through, but they are not payable. In the 600ft. stopes the reef is 3ft. wide, worth 12 to 15 dwt. Under the stope the reef is 6ft. wide and worth half an ounce. The 800ft. level has a crosscut south at a distance of 400ft., and it is out 44ft., and 15ft. of quartz has been passed through, while the last 20ft. has been soft mullocky country with a few leaders. The 1100ft. level has been extended south to 613ft., and a good wall formation carries a little stone, being highly mineralised flue.

South German Co., in the intermediate drive north off the bottom of winze below 1750ft., has advanced to 113ft., and the stone is more than the full width of the drive, with 18in. laminated stone on the east wall. The 2000ft. level has been extended to 1092ft., and the stone is worth 5 dwt. per ton. Work has been suspended for the present, and the hands are putting up a rise over the back of the level 845ft. north of shaft in stone carrying gold. Baxter and party are stoping north and south of winze below 1750ft. level on the east reef on payable stone, and Grigg and party are breaking out stone of fair quality at No. 7 level. The company crushed 17 tons from the 2000ft. level north for 5 oz. 16 dwt. and mineral 3 oz.; cyanide, 720 tons, 69 oz. 8 dwt. The tributers had a clean up all round, as follows:—Baxter and party, 143 tons, 75 oz. 4 dwt.; Grigg and Jubber, 83 tons, 19 oz. 15 dwt.; Merlo and party, 26 tons, 3 oz. 13 dwt.; H. Morris, 14 oz. 1 dwt.

Derby United Co. reports values of half an ounce at the 825ft. level, the channel being 3ft. wide. At the 680ft. level the reef is 4ft. wide and worth 4 dwt. per ton. From 200 tons treated by cyanide 26 oz. 12 dwt. gold was taken.

F. Tollit and A. Stacey, who have been working on the Derby lease near the New Chum mine, cleaned up 16 tons at the South German battery for 7 oz. 14 dwt. smelted gold.

T. Hansen and C. Buzza, who are working on Fenteman's Reef, cleaned up 50 tons at the same battery for 8 oz. 2 dwt. This material is very easy to get.

Jas. Manson, who has a tribute at Maloney's Red, White and Blue mine at Gowar, from the surface down to 84ft., crushed 15 tons for 6 oz. 12½ dwt.

## Ararat.

(From Our Correspondent.)

The realisation of developments in a number of the local mines has been longer deferred than was generally anticipated by the general public. Consequently the market values of some of the most important properties has suffered. To those who have had previous experience in sinking large and wet shafts, opening up and draining extensive leads, the present progress is quite satisfactory, for there are always a number of unforeseen difficulties that crop up that cannot fairly be included in a first estimate. Then there are the breakdowns that are unavoidable in machinery when driven at high speed. The New Langi Logan mines, to which the above refers chiefly, has been no exception to the general rule. They have had, during their history, many unexpected difficulties. Heavy grounds and later on extremely hard ground retarded progress in the main reef drive; later they have had the breaking of the H piece on their 20in. pump, which reduced their pumping capacity to about half for a period of about six weeks. As well as the new parts being replaced, additions have been made, and the pumping arrangements are now very much improved—indeed, it is confidently anticipated that the improvements will more than compensate in the next three months for the expense and time lost in effecting the repairs.

At the No. 2 shaft work was suspended a few months ago pending the building in of the high pressure boilers; this has now been completed, and a start will be made at once to resume the sinking of the shaft, which is now down over 200ft. When the required depth is reached no time will be lost in extending the two drives intended—one to go north to meet the Cathcart lead, and the other to go east to intersect the main Langi Logan lead.

At the Cathcart Central the leading drives continue to open up rich wash as the work proceeds down the lead, and judging from the regularity of the returns from paddling operations, a long and prosperous future is assured. Mr. D. H. Browne, who has lately taken charge, has had a long and extensive connection with alluvial mining, and with his high reputation shareholders can rest assured that their mine will be worked to the very best advantage.

At the Cathcart Proprietary nothing new has occurred, and work consists principally of cutting up and panelling the ground between their old workings and the Cathcart Central boundary. There is a feeling among some shareholders that further prospecting would disclose valuable tributaries; this, however, is problematic.

At the Langi Logan South work has been advanced much faster lately than was anticipated. A rise has been put up from the intermediate level and a drive is now being extended in wash of a very encouraging character. Of course, it is on a much higher level than the main channel, and although gold can be obtained in every dish tried it is not yet payable, but is improving as the drive advances towards the deep grounds. The main bottom level, which was for a time in very hard reef, is now in porphyry dyke formation, in which better progress is being made. The erection of two puddling machines is nearing completion, and a better estimate of the value of the wash will be obtained when a few machines can be put through.

Cathcart Victory has suspended operations at their new shaft after reaching a depth of 115ft. on account of the increase in water. They will now put in a 12in. draw-lift, and will fix up their puddling engine from the old shaft to serve as a pumping engine. A higher set of poppet legs will also be erected while the other alterations are being made.

The Great Langi Logan and North Langi Logan are both sinking in basaltic rock. The latter has a well equipped plant, consisting of three boilers, winding engine and compound pumping engine.

The Upper Langi Logan and Langi Logan Central are both boring; the former is the most northerly company at work on the field. At the Langi Logan Central a large number of bores have been put down, and an extensive and valuable find of wash has been proved. It is likely that a shaft will be started here soon. The Government drill, which was operating on the East Langi property, has been removed to the N.E. portion of the field. A well defined gutter was proved to traverse the East Langi lease, and a nice prospect of gold was obtained from three of the bores.

## MINING IN NEW SOUTH WALES.

### Broken Hill.

(From Our Correspondent.)

Broken Hill, November 7.

The Broken Hill mining field has gained publicity once more—through developments at depth. Mining lately in Broken Hill has been dull, even though the market has been crowded with fluctuations of prices, but values until the other day were all ''paper'' and prospective values.

Then the North mine struck the expected ore body at the 1400ft. level, and so interested were all concerned that the directors agreed not to delay, but to test width and values by means of a diamond drill. The drill simply ate through the lode, proved the body 112ft. wide at that point, and then found schist and rock.

Next the Central mine (Sulphide Corporation) met its ore body at 1300ft.; directly afterwards the British crosscut, at the 1100ft. level, passed from low-grade ore through fair-grade ore into good grade ore. Meantime, the Junction, in the progress of opening up from the 1000ft. level, also met with something better than was expected.

A comparison of the ore values of these developments is worth more than a moment's consideration. They run thus:—

| | Level. | Lead per cent. | Silver oz. | Zinc per cent. |
|---|---|---|---|---|
| North .. | 1400ft. | 17.5 | 10.0 | 15.0 |
| Central | 1300ft. | 14.0 | 12.0 | 17.0 |
| British | 1100ft. | 19.6 | 13.0 | 13.3 |
| Junction | 1000ft. | 20.0 | — | — |

The North ore body, as stated, has been proved 112ft. wide, a splendid body, wider than on the level above. The Central has just entered its body with a 9ft. by 7ft. crosscut, and has no idea of width, but judging from the level above and the position of the hanging wall (the lode was cut on the footwall) the width should be greater than in the workings above. In the British the crosscut, according to the latest report, was in 188ft., the last 66ft. in ore, and the final 7ft. in the high-grade sulphides quoted above. An unofficial later report quotes the ore as of even higher value. Nothing official has yet been issued concerning the Junction's 1000ft. level, but rough assays of the ore met with certainly go high—more than likely they exceed 20 per cent. for lead and are also good for zinc.

There can be added to these occurrences the good luck of Block 10 on the 615ft. level. Unfortunately the crosscut here has got into low-grade ore, latest assays going 7.7 per cent. lead, 2.5 oz. silver, and 7.5 per cent. zinc; but the greater portion of the lode has shown good ore. This seemingly, though not yet fully proved, is the body that came in from the Central at an upper level, gave great hopes, and then petered out.

In mining one cannot with accuracy see ahead. One may theorise and sum up, but finality is not always to measure. Still, to an ordinary optimist it appears as if the happenings of the past couple of weeks have added many years of life to Broken Hill. A lode 112ft. wide, still going down, is not worked out in a limit of time, neither is one 66ft. (and more). The Central development, too, will make good for the South mine, and the South Blocks must have later benefit. Regarded calmly, Broken Hill in the past, say, fortnight has put on a new garment of life. Certainly it is a pity that Black 10 failed so badly at depth. I do not think that the present Central occurrence is likely to help Block 10 at all, but the proving of ore at great depth, at both the south and north ends of lode, surely gives a prospect to the intermediate. The Broken Hill ore bodies do not run in a straight line, but angular from the camel's hump. Where the meat stopped in this hump has not yet been proved.

What has occurred and is occurring supports what I have written for many months past. The northern end of line of lode has always been able to look after itself (except perhaps in the case of the Junction North, and that is far from done with), but I have always insisted that the great future of the field rested with the southern end of the field. What the Central and South are showing will, it is now more than certain, be shown later on in some of the neglected properties below the Zinc Corporation's territory.

### South Coast.

(From Our Correspondent.)

Wollongong, November 8.

Black Range, near Bega, the place of the recent molybdenite finds, has been prospected several times. As long ago as 1888 there was a find of silver, which a company was formed to develop. The silver pinched out and copper ore of low-grade came in. Molybdenite was found, but as the ore contained copper and zinc it was judged valueless for molybdenite, and the company, having exhausted its capital, gave up. At present the prospecting claim has a shaft on it, about 30ft. down, with a drive from it of over 12ft. Molybdenite is reported showing more in the ore as depth is increased.

Scott and party have a show which also has improved as the shaft got deeper. On a number of the claims pegged nothing has as yet been done.

## TASMANIAN MINING.

### Mount Lyell District.

(From Our Correspondent.)

Queenstown, November 7.

A very satisfactory condition of affairs continues to prevail at the Mount Lyell company's mines, and operations generally are proceeding without interruption of any kind.

At the North Lyell ore breaking is in active progress at the 400, 700, 850, 1000, 1050 and 1100ft. levels, and these sources of production have been added to by the opening up of another level at 925ft., midway between the 850ft. and 1000ft. levels. This level is being worked from the rise which goes from No. 26 stope at the 1000ft. level to the No. 20 stope at the 850ft. level. This rise was put up a considerable time back and traversed good ore for the full distance, thus establishing beyond doubt the identity of No. 26 stope at the 1000ft. level with portion of the big ore body which has been exploited for years past in No. 20 stope at the 850ft. level. A fair start has now been made with stoping at this (925ft.) level, and the work of ore extraction will be extended as fast as circumstances will permit. There is no doubt that there is an immense quantity of good ore awaiting extraction between these two levels in this part of the workings, and when fairly opened up the 925ft. level will become an important contributor to the general output of the mine. At the 850ft. level a development, which although expected is none the less interesting, has recently occurred. This is the proved extension of the very fine ore body which has been exploited for years past in No. 22 stope, into the Lyell Comstock ground. When the Comstock leases were acquired by the Mount Lyell Company it was of course known by the management of the latter that it was Lombard-street to a China orange on the No. 22 stope ore body at the 850ft. level of the North Lyell mine going into the southern section of the Comstock lease. As to how much the Comstock people knew—well, "they didn't know much about it then, but they know all about it now." The ore body in question, which has been worked on its northerly trend towards the Comstock boundary, is now well inside it, and although the body has apparently "split" into two sections there is an aggregate width of from 50 to 60ft. of excellent grade ore showing as far as it has gone into the Comstock ground. This division in the ore body need not, however, be regarded as likely to interfere with the continuity of the ore on its present course, as it is going strong onough to warrant the belief that its limit will not be reached for a long time to come. As to the downward extension of this ore body from the 850ft. level in the Comstock ground, this has been proved by exploratory work in No. 40 stope at the 1000ft. level, where the ore has also been proved to extend into the Comstock lease, and it may be accepted as certain that the portion of No. 40 stope ore body which at the 1000ft. level goes into the Comstock ground is identical with that of No. 22 stope ore body at the 850ft., where, as mentioned, the ore is going strong into the Comstock property. At the 1100ft. level, while the continuity of the ore into the Comstock has not yet been established, it is pretty certain that it will not be long before this is done. No. 41 stope, which lies north of the east or main crosscut, and has for a long time past been an appreciable producer of excellent grade ore, is being worked on the ground floor on its northerly course in the direction of the Comstock boundary, and as the ore body is keeping good there is very little doubt that it will in the near future be found to make its way into the Comstock ground in conformity with the behaviour of No. 40 and No. 22 stope ore bodies at the 1000ft. and 850ft. levels respectively. The output is now about 425 tons daily.

Operations at the Mount Lyell mine are being continued on similar vigorous lines to those in vogue at the North Lyell mine. The extraction of pyrites is in active progress at three levels underground, with a limited tonnage coming from the open cut. A small quantity is also being won in the course of cutting the main galleries through the ore body in the South Lyell mine. The aggregate output of pyrites is now 800 tons a day, which is excellent work, and as the supply of labour is now fairly well up to requirements, and is likely to continue so, there is every likelihood of this tonnage being maintained. In addition to the pyrites required for the smelters the Mount Lyell mine has now, in consequence of the closing down of the Chester mine, to supply the material required for the company's fertiliser works on the mainland, and this of course means extra activity at the Mount Lyell mine and a corresponding increase in the amount of labour employed.

At the reduction works three furnaces are in constant operation, with every prospect of keeping so for some weeks to come. Any way it is certain that they will be able to keep three going for the full four weeks of the present monthly term. The output of copper for the four weeks' run ending on October 29, although not quite as good as that for the previous period, was very satisfactory, being about 540 tons, as against 589 tons for the September run. The decrease is due to the fact that during the period one of the furnaces was down for several days at the beginning, so that the three furnaces were in blast for only about three weeks out of the four. During the current month, however, it is practically certain that three furnaces will be in commission without any interruption, and it is therefore reasonable to forecast that the output of copper for the month under review will reach at least 600 tons. And it may fairly be said that present indications are encouraging enough to warrant the prediction that this gratifying condition of affairs has come to stay.

Regarding the outlook generally a strong illustration of the wonderful manner in which the company has regained its normal activity since the serious setback caused by the North Lyell disaster is afforded by the number of men now employed. The total at present (exclusive of the staff) is very close to 2000. These are made up as follows:—Mines, 1063; reduction works, which includes those employed on the Lake Margaret power scheme, 729; railways, 160. These figures may be taken as an approximate average, subject of course to slight variations through men coming and going. Out of the 729 under the heading of reduction works quite 200 are employed on and in connection with the Lake Margaret works. This is being vigorously pushed ahead, and it is hoped to have it practically completed by the end of the present summer.

---

Mr. Valentine J. Crowley, consulting electrical engineer of 97-99 Queen-street, Melbourne, has been appointed by the Lilydale Shire (V.) to report on an electric light scheme for Ringwood and Croydon. So far as can be ascertained, the scheme involves the purchase of energy, but from what source has not yet been decided.

# QUEENSLAND MINING.

## North Queensland Fields.

(From Our Correspondent.)

Mareeba, Oct. 31.

A syndicate has been formed at Chillagoe to work a molybdenite mine, situated about 9 miles from Almaden—the junction town of the Chillagoe and Etheridge railway lines. The mine is situated only one mile from the latter line, and is on the Tate River. The prospector of the property is Mr. Alex. Riddell, senr., who has had a great deal of experience at Wolfram, where he experimented with a flotation process for the recovery of the final particles of molybdenite. On the ground above mentioned there is a clearly defined reef 2ft. in thickness, which shows molybdenite very clearly. The present owner has sunk a shaft 35ft. deep, which he has securely timbered. This shaft has touched the sulphide level, and the ore showing fully justifies the formation of a syndicate. The ore will be sent to Wolfram for treatment, and it will be grist to either the Irvinebank Mining Co.'s or the French Rare Metal Co.'s mill.

At Galala, which is situated a few miles from Fossilbrook, and on the same river as the above mentioned molybdenite mine, a party of prospectors from Bamford have located a good wolfram bearing stone, which they have called the "Senate." A shaft has been sunk 30ft., and has opened up sufficient ore to justify the erection of machinery, and this the owners intend to install at an early date. Messrs. Wallace and Teague are the lucky owners of this property, and as they are both working miners, their luck is deserved. There are some other good mines in this district, but the wolfram bearing lodes appear to be very flat.

Mr. W. Davis' mine, the "Senior," has been a very consistent producer. A fair amount of alluvial tin is being won in and around Fossilbrook, which township is but little known to the outside world, or even to those resident in and around Cairns. It is a most promising district, and should be well worthy of the attention of capital in view of the prices of wolfram and molybdenite.

A new discovery, which is attracting some attention in Herberton at present, is the "Becker" tin mine. It is situated right in the township of Herberton, opposite Mr. John Newell's house, and at the back of the hospital. When first discovered the old residents derided the mine, but recent developments are full of promise, and the "Becker" may yet be one of the big mines of Herberton. The lode, which has been prospected right on top of the hill, runs in an easterly and westerly direction. Trenches have been cut in various places over a width of about 200ft., and samples from these trenches gave very fair results (up to 3 per cent.). A shaft has been sunk, all in lode material, the bottom at present showing ore worth about 2½ per cent. From the bottom of the shaft a crosscut has been put out a distance of 24ft., in lode, carrying tin values. A sample of stone from the dump of ore raised from this crosscut was tried, and gave very fair results. Judging from the work done so far on top of the hill, there appears to be an immense quantity of low grade ore already proved and easily mined. On the southern slope of the hill there is an outcrop of a micaceous rock, which is carrying a lot of tourmaline and a little tin. On the south-east slope of the hill, immediately above the hospital, workings have disclosed a spar lode about 4ft. wide, carrying rich patches of tin. The lode has been proved for a length of 30ft. This lode has, however, not been sunk on beyond a few feet, but it appears to be going down very strongly. It may, perhaps, be only another of Herberton's many stringers, but present appearances justify the shareholders' optimistic spirit regarding the future of the mine. The Great Northern battery is only about 600 yards distant, and as there is a good fall from the mine to the mill, an aerial ropeway could easily be installed. The owners are hopeful that the mine will justify the erection of a milling plant of its own, but more development work will have to be done before such a move is contemplated. The present crushing charge at the Great Northern battery, 22s. 6d. per ton, precludes low grade ore from being treated profitably.

A scheme is on foot to erect a modern tin stone milling plant at Mareeba, which is the most central and convenient position, and it is anticipated that ore can be crushed for, at the most, 15s. per ton. If this scheme eventuates, it will be a boon to the miners, and will considerably help along the mining industry. The time is coming when the many large low grade tin propositions will have to be worked.

The "Froghole" is another Herberton mine which is looking very well at the present time. The lease is situated on the south side of the Great Northern Freehold, and the shaft is within 2ft. of the boundary of this freehold. Fifty feet of straight sinking was done before the large spar lode was met with. This lode formation is 10ft. to 50ft. wide, carrying tin-bearing shoots about 5ft. wide by 30ft. in length (they have not been proved further). The present depth of the shaft is about 220ft. on the underlie, and all the stone taken out in the sinking of the shaft was sent to the battery. At about the 120ft. mark in the shaft on the east side, a chloride lode was struck. The point of contact between the chloride and spar lodes was just to the east of the shaft, and it was from this point that two sensational crushings of stone were raised. The crushings were respectively 40 and 42 tons for returns of 40 per cent. and 46 per cent. black tin, worth over 70 per cent. for metal. Outside of the shaft very little ore has been stoped, the longest drive being about 20ft. At the 200ft. mark in the shaft the shoot of tin was practically lost, so a drive was put in about 25ft. westerly on poor grade stone. A winze was then sunk 35ft. on the underlie on stone of about the same quality as in the drive. At the bottom of the winze there is now a good face of high grade stone. The stone at this point appears to be about 4ft. wide, but its full width is not yet proved, as good tin is showing on the hanging wall side, and when this is shot out, the shoot may be proved to be of greater width. In the bottom of the main shaft there is only about 1ft. of tin-bearing stone, so it is apparent that the rich shoot of tin is bearing away in a westerly direction, and from present indications it will soon be necessary to sink a straight shaft to enable the ore to be mined economically. There is a good quantity of lower grade ore in the mine, but the absence of cheap crushing power will not allow the stone to be mined profitably. About 50ft. away from the Froghole shaft a well timbered three-chambered shaft has been sunk, on the Northern Freehold, to a depth of over 100ft. This shaft is all ready for machinery, but as the lode is outside the Freehold, it is practically of no use to the Great Northern Company. It could, however, be used to great advantage by the Froghole leaseholders, and it would result in the lease being worked on a much larger scale if the owners were to get permission from the company to use the shaft.

The Handicap Tin Mine is not looking so well as last reported. The sensational "Rainbow" mine is suffering from an eclipse at present. The last crushing, representing four months' work, gave the two owners over £7000. Since then the shoot of ore has been lost, and the work done to date has failed to locate it. The owners now intend to go back to the open cut and stope out the ore, of which there is about 500 tons in sight. At the same time, the new manager, Mr. A. Wishart, who has had long experience in the Herberton district, will continue the search for the lost shoot of tin.

The Anniversary Copper Mine, Herberton, which failed to return dividends to its shareholders, was subsequently let on tribute, and the tributers are now sending large quantities of good grade ore to the Chillagoe smelters.

The "Uncle Sam," another copper mine in the same vicinity as the Anniversary, is making a splendid showing. The owners, Messrs. Sam Carse and Reg. Arthur, have developed a lode of grey ore worth 30 per cent. The lode has not been opened up for any distance, but in a few weeks some idea of its value will be known. It certainly looks very promising at present.

The "Lovely Nancy" is another Herberton mine which is causing its backers to pat themselves on the back. Developments during the past week have been most favourable and will be reported in a week or two.

Retimbering operations are in progress at the Great Northern Tin Mine, Herberton's oldest and most famous mine. However, sad to relate, the company does not intend to resume mining operations. The mine is situated on 60 acres of freehold, right in the heart of Herberton, and this country is locked up from the prospector, and were it not so it is fairly safe to state that on several parts of the freehold mining operations would be in progress.

There is nothing further to report regarding the Prince Alfred and Tommy Burns mines at Sunnymount. Neither are looking very bright. The Tommy Burns Co. is over £1300 behind, and if the battery does not get a go on shortly, the company will be forced into reconstructing.

The latest flotation scheme in these parts is the Mareeba Goldfields. For some time past the Mareeba Goldfields Amalgamated Leases Syndicate has been operating on several properties on the old Mareeba goldfield, distant about five miles from Mareeba. One of these leases, it will be remembered, was the subject of sensational litigation some time ago. The Syndicate has now proved the ground to a depth of about 80ft. and have developed several reefs which are estimated to return from 1 to 2 oz. to the ton, and, in addition, there is a fair area of alluvial country which can be treated by hydraulic sluicing. The prospectus of the company has not yet been issued, but at a meeting last week it was decided to give the managing director a four months' option over the properties, so as to enable him to proceed South and place them on the market. It was decided that a company with a capital of £25,000 be formed, in 100,000 shares of 5s. each, of which 40,000 are to be issued as fully-paid up to the vendors. The vendors evidently place a very high value on their properties.

The Chillagoe smelters closed down temporarily on Wednesday last, the reason being a shortage of fuel supplies, principally coke. It is expected that the furnaces will be again in operation next week. There is a great shortage of labour in these parts, and the company is trying to get 50 or more men from the South. The same shortage prevails at Cardross and Mt. Mulligan.

The adjourned conference between the mine managers and representatives of the A.W.U. has been postponed indefinitely, and there appears to be a firmer tone in the industrial market. The consensus of opinion among the men is that things had better be left as they are, for the present.

Trouble has broken out at the solid tin mining township of Koorboora. The manager had occasion to discharge two men from the Tennyson mine owing to there being no face of ore available for them to work. One of these men happened to be related to the president of the local branch of the A.W.U. (which is almighty in these parts), and a cry of victimisation was raised. The unionists were quietly given the word to take a holiday, or they would be marked men. It is not a strike, as the men have no grievance with the management. Still, the fear of the A.W.U. is so great that they ceased work. The manager intimated to the men that when they were tired of their holiday their billets were open to them. The majority of the men describe the situation as ridiculous and scandalous, and yet they dare not go back to work. It is by actions of this kind that the wheels of progress are blocked.

Mr. John Newell last week visited the "Wairuna Copper Mines." These mines, which were favourably reported on by the Warden and Inspector of Mines some time ago, are by latest reports developing into valuable properties, and no doubt more will be heard of them in the near future.

Mr. F. G. Brown, who for the past 20 years has conducted mining operations on the Mulgrave and Russell Rivers, and whose Walter Hodgson mine was reported in my last notes, has made a request to the Mines Department for a loan to enable him to recommence operations. The Russell River alluvial mines have not been worked for the past seven or eight years, and the eight miles of races constructed by Mr. Brown have fallen into disrepair. It is in order to effect the necessary repairs that he is seeking the aid of the Mines Department. Accordingly, on Monday last, that Department instructed Mr. Syd. Horsley, Inspector of Mines, Herberton, to visit the field and report on its possibilities. Mr. Horsley returned to Herberton yesterday, and we understand from Mr. Brown, who passed through to Cairns to-day, that Mr. Horsley is favourably impressed. During the term the property has been in Mr. Brown's hands he has recovered about £25,000 worth of gold.

Operations at the New Minnie Moxham Gold Mine at the present time are mainly confined to the construction of the dam, the said work progressing very satisfactorily, and the dam will be constructed in ample time to catch the coming wet season's rains. The mine continues to look well, and the reserves amply warrant the erection of a battery.

The returns of crushing from the Herberton mineral field for the month of September were made available to-day. A total of 7307 tons 7 cwt. 1 qr. 27 lb. of stone were crushed at the various batteries for a return of 240 tons 5 cwt. 2 qrs. 18 lb. of tin, valued at £23,414. Under the heading of purchased ores are the following:—Stream tin, 33 tons 15 cwt. 2 qrs. 6 lb., value £2954. Wolfram, 18 tons 4 cwt. 1 qr. 4 lb., value £1824. Copper, 4 tons 1 cwt. 1 qr., value £286. Lead, 7 tons 14 cwt. 1 qr., value £153. Silver, 1907 oz., £220. The Herberton district, as will be seen, is richest in tin. The wolfram returned is mainly from the Mt. Carbine district, which should, geographically, be in the Chillagoe district. The Rainbow was the principal tin producer for September, 506 tons 14 cwt. 3 qrs., giving 61 tons 5 cwt. 2 qrs. 23 lb., valued at £7230. The Vulcan Tin Mine crushed 555 tons 15 cwt. of stone, for 26 tons 12 cwt. 14 lb. of tin, valued at £2483. The Governor Norman Mine crushed 2139 tons 15 cwt. 2 qrs. of stone for 30 tons 2 cwt. 2 qrs. 6 lb., valued at £1303. The Pompeii, another of the Irvinebank Mining Co.'s properties, crushed 336 tons of stone for 18 tons 6 cwt. 15 lb. of tin, value £1244. The Stella Mine crushed 241 tons for 18¾ tons of tin, value £933. Some rich crushings were put through by individual mine owners, and the following are worthy of mention:—Smith and party at the Gurrumbah mill crushed 10¾ tons of stone tin, worth £183. Robinson Bros., Irvinebank, put through 13 tons at the London mill for a return of 4 tons 3 cwt. 1 qr. 21 lb., value £498. Alexander Bros., 12 tons of stone gave them £142. Syd. Sheppard sent in 17 tons to the same mill and got 3 tons 16 cwt. 1 qr. of tin, value £448. Peter Tranby crushed 29 tons 16 cwt. for 3 tons 12 cwt. 2 qrs. 14 lb. tin, value £405. At the Perseverance mill, Silver Valley, 45 tons 12 cwt. from the Sailor Boy mine were crushed for 6 tons 6 cwt.

2 qrs. 1 lb., value £778. From the Hadleigh Castle Mine, W. C. Walworth Pearce owner, 7 tons 17 cwt. of stone crushed for 2 tons 1 cwt. 27 lb. of tin, value £240. The Stannary Hills Mining Co. crushed 359 tons 9 cwt. of stone at the Rocky Bluffs mill for a return of 3 tons 10 cwt. of tin, value £416. At Emuford, Messrs. Green and Marvell have a number of low-grade propositions, and they are teaching the miners a valuable lesson in the treatment of these ores. They have erected an up-to-date crushing plant driven by suction gas, and with ore worth about £1 per ton are making excellent profits. From their "Marvel Loch" mine they crushed in April 234 tons of stone for a value of £220. In May, 193 tons for £235; June, 221 tons for £244; July, 199 tons for £220; August, 154 tons for £182. In addition to the above, crushings were put through from their other mines giving about equal returns. Taking things all round, the tin mining industry is in a most flourishing condition.

### Anakie Field.

(From Our Correspondent.)

Sapphiretown, October 30.

A 6 h.p. Victoria oil engine recently erected here by Mr. Rose to drive his washing machine has given great satisfaction. Five loads of wash dirt were treated in an hour; and on the tailings being tested it was found that there was practically no loss by gem stones escaping. In the old days here and by the old system nearly a day was occupied in treating a single load.

## WESTERN AUSTRALIAN MINING.

(From Our Correspondent.)

Kalgoorlie, Nov. 3.

Developments in the north drive at 2100ft. in the Lake View mine are still satisfactory. The drive from 158ft. to 165ft. has averaged 80s. per ton over a width of 69in. This is the official statement, and is very conservative. A rich pipe of ore was followed by a winze from the 1900ft. level, and the new development is supposed to be a continuation of this. Until further prospecting is done, the real extent of the development cannot be gauged. The Star portion of the mine is opening well, and will keep the mill supplied for years, as the Morrison lode is practically virgin, being up to 50ft. wide in places. The lode has been exposed at seven levels down to 1100ft., and very little ore has been stoped below 300ft. Then the rich development at the 1600ft. level in the Chaffers is now 60ft. from the Star boundary.

The south drive on the west branch of No. 3 lode at No. 16 level in Chaffers has now been extended a total distance of 160ft. The average value for the full width of the drive is 117s. 7d. per ton, the last 5ft. averaging 112s. 6d. The main west crosscut at No. 15 level is now out 339ft., and is expected to cut No. 3 lode at 410ft. Crosscutting at No. 4 and No. 17 levels is also proceeding. It is extraordinary that the Great Boulder lode (known also as Horseshoe No. 4, from which the bulk of the Boulder ore has been won) as well as the Horseshoe Nos. 2 and 3 lodes, which have produced over 90 per cent. of Horseshoe's output, are all valueless so far as tested in the deeper levels of Chaffers.

At No. 18 level in the Great Fingall, No. 7 winze has been started, and for the first 9ft. sunk was in ore 27in. wide, assaying 158s. 9d. per ton. This is the best development recorded for a long time, and is below the deepest level so far opened up. The No. 18 level is out 608ft. north and 398ft. south, but of the total distance only 400ft. is payable, and worth 46s. 6d. per ton. The values in the remaining 600ft. are very erratic. However, as the lode in places is known to be much wider than the drive, pay ore may be disclosed in stoping. Ore from the new lines between No. 15 and No. 18 levels should be available for the mill very soon, as the equipment of the internal shaft at No. 13 level is practically complete. For some time, the mill has been operating on ore from old pillars and ore rejected in the early days, and this source of supply is practically exhausted.

The Nil Desperandum at Burtville, which has been giving returns since 1897, has just yielded 846 oz. from 160 tons, from the 50ft. level, and may yet give an impetus to that long neglected district. This mine, in 16 years, has produced £40,700 from 4200 tons, and has frequently changed ownership. The present owners, Messrs. Gaston and King, after sinking a shaft to a depth of 50ft. have crosscut across the formation a distance of 80ft., and have intersected four narrow leaders from which the crushing just announced, including formation, has been taken. Several buyers have been after the property, but no deal has eventuated.

## MINERAL RETURNS.

The Victorian yield of gold for October was 34,110 oz. gross, or 31,548 oz. fine, valued at £134,008. Compared with the yield for October of last year there has been an increase of 420 oz. fine. The yield for the last ten months was 385,374 oz. gross, or 358,268 oz. fine, valued at £1,521,863. This shows a decrease of 28,623 oz. fine compared with the quantity won during the corresponding period of last year.

Queensland output of gold for October was 19,635 oz. fine, valued at £83,404, as against 30,000 oz., valued at £127,449 in October last year, a decrease of 10,360 oz., valued at £44,045. The yield for the ten months amounted to 220,053 oz., valued at £934,725, a falling-off of 74,628 oz., valued at £300,009, as compared with the same period in 1912.

The gold output of Western Australia for October was 111,508 fine oz., valued at £473,658. Compared with the previous month this shows a decrease of 3,660 oz., and an increase of 5342 oz. on the yield for October last year.

The mineral exports from Broken Hill during October were valued at £410,901. The silver-lead concentrates produced totalled 29,404 tons, valued at £309,206; while zinc concentrates aggregated 38,803 tons, valued at £97,093; and the output of silver-lead crudes was 1210 tons, valued at £3598. The silver-lead slimes exported were 1174 tons, valued at £712; while 177 tons zinc slimes were valued at £292.

The statement prepared by the Queensland Mines Department of minerals other than gold, coal, or precious stones, obtained from the mining fields throughout the State during the quarter ended September 30 last, shows that minerals were obtained to the total value of £577,338—£163,423 less than the corresponding quarter of 1912. This decrease is attributable chiefly to the industrial trouble at Cloncurry. The totals for the nine months ended September, 1913, are higher than those for the similar period of 1912. The total quantities of the various ores obtained were as follow, the figures for the corresponding period of 1912 being given in parentheses:—Copper, 6032¾ tons, value £417.636 (7652½ tons, value £598.447); silver, 156.954 oz., value £17.781 (164,039 oz., value £19,265); lode tin, 637 tons, £59.427 (529 tons, £57,382); alluvial tin, 315¼ tons, £36.687 (261 7-20 tons, £33,957); lead, 923 tons, £18,482 (824¾ tons, £15,470); wolfram, 93 tons, £9390 (124½ tons, £11.528); bismuth, ½ ton, £43 (3-20th ton, £60); molybdenite, 11½ tons, £3059 (15½ tons, £2723); manganese, 25 tons, £130 (79 tons, £277); ironstone, 1061 tons, £676 (2283 tons, £1345); limestone, 41,979 tons, £9755 (26,596 tons, £7052); bismuth wolfram, 45¾ tons, £4272 (24¾ tons, £2055); chrome, nil (200 tons, £200).

## ROYAL MINT RETURNS.

### Sydney Branch.

| | October. Fine oz. | Since Jan. 1 Fine oz. |
|---|---|---|
| Gold received for Coinage— | | |
| New South Wales .. .. | 12,169.67 | 85,958.02 |
| Queensland .. .. .. .. | 4,532.93 | 192,009.42 |
| New Zealand .. .. .. | 17,531.54 | 165,590.88 |
| Victoria .. .. .. .. .. | — | 166.12 |
| Northern Territory .. | 189.37 | 393.27 |
| Tasmania .. .. .. .. | 40.77 | 178,97 |
| Western Australia .. .. | 4.05 | 267.95 |
| Papua .. .. .. .. .. .. | 1,268.19 | 12,632.85 |
| Other Countries.. .. .. | — | 181.01 |
| Coin .. .. .. .. .. .. | 22.42 | 351.52 |
| Total .. .. .. .. | 35,758.94 | 457,730.01 |
| Gross value of above .. .. | £151,894 | £1,944,312 |

### Melbourne Branch.

| | October. Fine oz. | Since Jan. 1 Fine oz. |
|---|---|---|
| Gold received for Coinage— | | |
| Victoria .. .. .. .. .. | 39,972.96 | 384,111.66 |
| New South Wales .. .. | 531.22 | 4,422.73 |
| New Zealand .. .. .. | 8,856.65 | 55,689.27 |
| Queensland .. .. .. .. | 293.63 | 2,136.32 |
| South Aust. (inc. N.T.) | 163.16 | 7.012.28 |
| Tasmania .. .. .. .. | 1,762,25 | 18,349.79 |
| Western Australia .. .. | 1,977.89 | 5,591.28 |
| Other Countries .. .. .. | — | 7.34 |
| Light Gold Coin .. .. | — | 1,141.55 |
| Unknown .. .. .. .. .. | 198.03 | 2,803.83 |
| Total .. .. .. .. | 53,755.79 | 481.266.05 |
| Gross value of the above.. | £228,340 | £2,044,287 |

### Perth Branch.

| | October. Gross oz. | Since Jan. 1. Gross oz. |
|---|---|---|
| Gold received for Coinage— | | |
| Western Australia .. .. | 121,200.11 | 1,223,593.17 |
| Other Australian States | — | 14.75 |
| Unknown Origin .. .. | 95.20 | 584.86 |
| Total .. .. .. .. | 121.295.51 | 1,223,992.76 |
| Value of above (calculated at £3/10/- per gross oz. of material received) .. | £424,534 | £4,293,092 |

## NEW ZEALAND MINING.

The latest news to hand from the Waihi Gold Mining Co. indicates a very favourable development in the reef mentioned last week as having been struck between the No. 5 and the No. 4 shafts at the 1300ft. level, and which is fully believed to be the Dreadnought. Up to the end of October about 9ft. of quartz had been exposed with only one wall to hand. At the corresponding point in the level overhead the reef was small and poor, and it is thus evident that it is gaining rapidly in strength going down. Moreover the ore is of better appearance. On October 23 the management stopped the pump to the 1300ft. level, and the fact suggested that the purpose was to conserve coke supplies as much as possible, there being both a coal strike and a strike of the waterside workers in progress. Within a week, however, although there was no improvement in the industrial outlook, pumping was resumed, so that probably the stoppage was due to some other cause. At any rate, the management has expressed the hope that no further stoppage will be necessary.

The last four-weekly report on the operations at the Waihi mine states that the west drive of the Royal lode was worth £3 15s. 9d. per ton at 372ft., other values on that lode, however, varied from 37s. 3d. to 10s. 11d. (in the latter case the lode was 5ft. wide). In the Dreadnought lode the values are as follows.—At 387ft., 44in. wide, £2 11s. 8d. per ton; 395ft., 24in. wide, £2 5s. 1d.; at 402ft. 42in. wide, £1 7s. 5d. East of Bath south-east crosscut, the following are the widths and values:—At 43ft., 45in. wide, £4 2s. 4d. per ton; at 51ft., 60in. wide (exposed), £6 9s. 11d. (no walls seen); at 58ft., 60in. wide (exposed), £1 3s. 6d. (no walls seen); at 64ft., 60in. wide (exposed), £2 8s. 10d. (no walls seen); at 74ft., 60in. wide (exposed), £10 18s. 2d. (no walls seen); at 84ft., 12in. wide (exposed), £5 0s. 5d.; at 94ft., 48in. wide, £1 6s. 6d.; at 104ft., 48in. wide, £1 15s. 8d.; at 111ft., 42in. wide, £1 7s. 4d.; at 118ft., 48in. wide, £4 0s. 2d.; at 127ft., 60in. wide, £4 3s. (south wall seen). At 76ft. there was quartz about 18in. wide, branching off into the south wall. It was worth £10 13s. 1d. per ton. This will be further explored. At 664ft. the Empire lode was worth £3 3s. 10d. per ton. A considerable amount of work was being carried out on the upper levels, with the object of attacking the arches on the Martha and Welcome lodes.

For the four-weekly period ended October 18, the Waihi-Paeroa Gold Extraction Company Ltd. treated 11,000 tons of tailings for a return of about 819¼ oz. fine, valued at £3480. The total amount won by the company now amounts to 16,176 oz. fine, valued at £68,711, from the treatment of 209,500 tons, and dividends paid have amounted to £12,500.

The New Big River company, Reefton, had the satisfactory return of 526 oz. 12 dwt. gross from 460 tons crushed, and 101 oz. 8 dwt. gross recovered by cyanidation, the whole representing a little over 555½ oz. fine, valued at £2360.

The "Mataura Ensign" contains an account of the starting of dredging operations last week by the Vulcan dredge on the Mataura River. Some time ago the Orcadian Dredging Co. worked its dredge on the Mataura River, near the Lower Knapdale-road, but the dredge and its rights were purchased by Messrs. Excell and Cook, of Waikaka Valley. These gentlemen had the river prospected, and, being satisfied with the prospects, set to work to make additions to the working parts of the dredge, with the result that it now contains two engines, two boilers, and two pumps, and in addition a string of buckets—one on every tread of the tumbler. By this means double the quantity of wash can be lifted and dealt with. The tables were also enlarged, and the whole design of the dredge improved. The repairs and improvements and additions to the dredge cost over £2000, and the dredge is now capable of lifting over 5000 cubic yards of wash per hour, which means that a very large quantity of deposit will be dealt with every week. In response to the invitation of the proprietors, a large gathering assembled to witness the starting of the dredge. Mr. R. L. Christie, speaking on behalf of the proprietors, said it was probably 20 years since the first dredge had started on the Mataura River opposite Knapdale, and, like many others since then, it had ceased operations after a short career. Gold was known to exist in the Mataura River, and with such a dredge as they stood on there was every prospect of a successful career before the enterprising proprietors, who had previously succeeded where others had failed.

There is as yet no apparent change in the condition of affairs with regard to the flow of water and gas in the crosscut at the 1000ft. level. The manager, Mr. Warne, paid a visit of inspection to the crosscut on October 24, and proceeded as far as the face, where he found the water flowing out of the bottom of the face as strong as ever. A test was also made of the pressure at the valve on the casing of the bore-hole, and this was also found to be about the same as when the last test was made a week previously, so that all work at the 1000ft. level continues at a standstill.

# SCHEELITE MINING IN NEW ZEALAND.

By Cyril W. Gudgeon.

The scheelite fields of Nekw Zealand occur payable in only three known localities—Macrae's Flat, and Glenorchy district, Otago, and in the Nelson province. The Macrae's Flat field is the oldest and best known producer of this ore, and as the Golden Point mine has been constantly producing for 25 years, a description of this mine and its methods will best describe the New Zealand practice for recovery of this rare ore.

Macrae's Flat is situated in Otago province, about 50 miles north of Dunedin. The country is a high plateau elevation, 2000ft., described by Professor Park as a "block mountain"; rock, mica schist, lying horizontal, classified by Hector as silurian. A mineralised belt or zone runs more or less continuously from the Stoneburn mine to Highlay mine, a distance of 16 miles, right across the plateau. This zone is ½ to 2 miles across, with occasional cross belts, is highly mineralised, and carries isolated shoots of ore, though in places the outcropping is visible for stretches of 3 miles.

The Golden Point reef systems, which are worked by adit levels, are three parallel lodes, running conformable with the altered strata, striking N. 40 deg. W., and dipping 10-25 deg. N.E., separated 15ft. and 25ft. respectively. The top lode, No. 1, is 3ft. to 4ft. in thickness, and carries very low values in gold and scheelite (with occasional small pockets of rich ore). No. 2 (centre) is 5ft. to 6ft. in thickness, and carries ½ to 2 oz. gold to ton, and is highly impregnated with scheelite, and also holds many pockets of almost pure scheelite. No. 3 lode is small and of no importance.

The lodes are very much faulted, step and reverse faults predominate, and in consequence somewhat hard to follow, requiring careful timbering. Being almost flat causes at times a considerable amount of shovelling. In the old days the lode was opened out by drives along reef, but this system, while having the advantage of prospecting the ore body being developed, has been replaced by drifts under the lodes, crosscutting and vertical rises, which has enabled the ore body to be kept under better control, and also cut down the cost of ore getting. Owing to soft nature of the schist, levels 6ft. by 4ft. are driven on day wages (10s.) as low as 6s. 6d. a foot, single hand hammer being the system of drilling in vogue. Stopes are timbered with ordinary "king posts," "lap," and struddles, with four laths to each set, kept where convenient to size of lode being extracted.

The occurrences of scheelite in lode (Fig. 1) is very patchy, pockets of ore being the exception rather than the rule, and are now only worked out in the ordinary course of stoping operations. It is seldom, however, there is no scheelite present, as when not visible to eye assays often indicate as low as .2 per cent. present.

The most favourable indication of a pocket of rich ore is a footwall of hard, black, slickensided schist, very highly polished and mineralised; of the late day good pockets obtained this indicator has been always present.

The treatment at mines is to bag all firsts and send to surface, seconds being sent out with ordinary ore to mill. The firsts are then hand knapped up to 60-65 per cent. $WO_3$ and bagged for shipment, rejects being passed to mill for treatment.

The costs on this mine are moderately low; during last quarter on 1998 tons treated were:—

Costs.

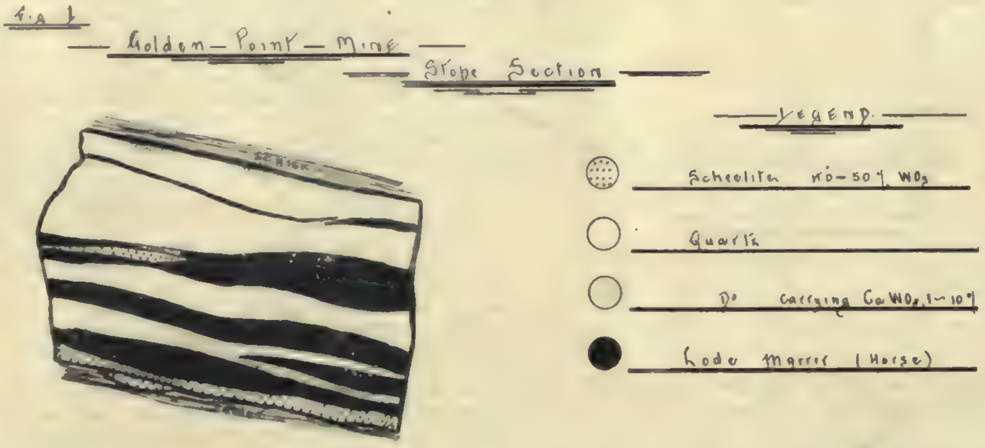
| | Per ton crushed. | | | |
|---|---|---|---|---|
| Mine— | s. | d. | s. | d. |
| Supervision . . . | 0 | 5.6 | | |
| Stoping . . . . . | 2 | 7.5 | | |
| Development .. .. .. | 2 | 0.7 | | |
| Tramming .. .. .. .. | 2 | 2.1 | | |
| Repairs . .. .. .. .. | 0 | 4.9 | | |
| Mine total .. .. .. .. | 7 | 8.8 | 7 | 8.8 |
| Mill— | | | | |
| Breaker and jigs .. | 0 | 1.9 | | |
| Milling .. .. .. .. .. | 2 | 3.9 | | |
| Concentrating .. . | 0 | 4.0 | | |
| General .. .. .. .. | 0 | 3.8 | | |
| KCy plant . . .. .. .. | 1 | 1.3 | | |
| Magnetic plant . | 1 | 6.0 | | |
| Mill total . .. .. . | 5 | 8.9 | 5 | 8.9 |
| Administration and general expenses — . — .. .. .. | | | 1 | 2.8 |
| Gross total . . . | | | 14 | 8.5 |

1000 tons tails cyanided at 2s. 2.5d. per ton treated.

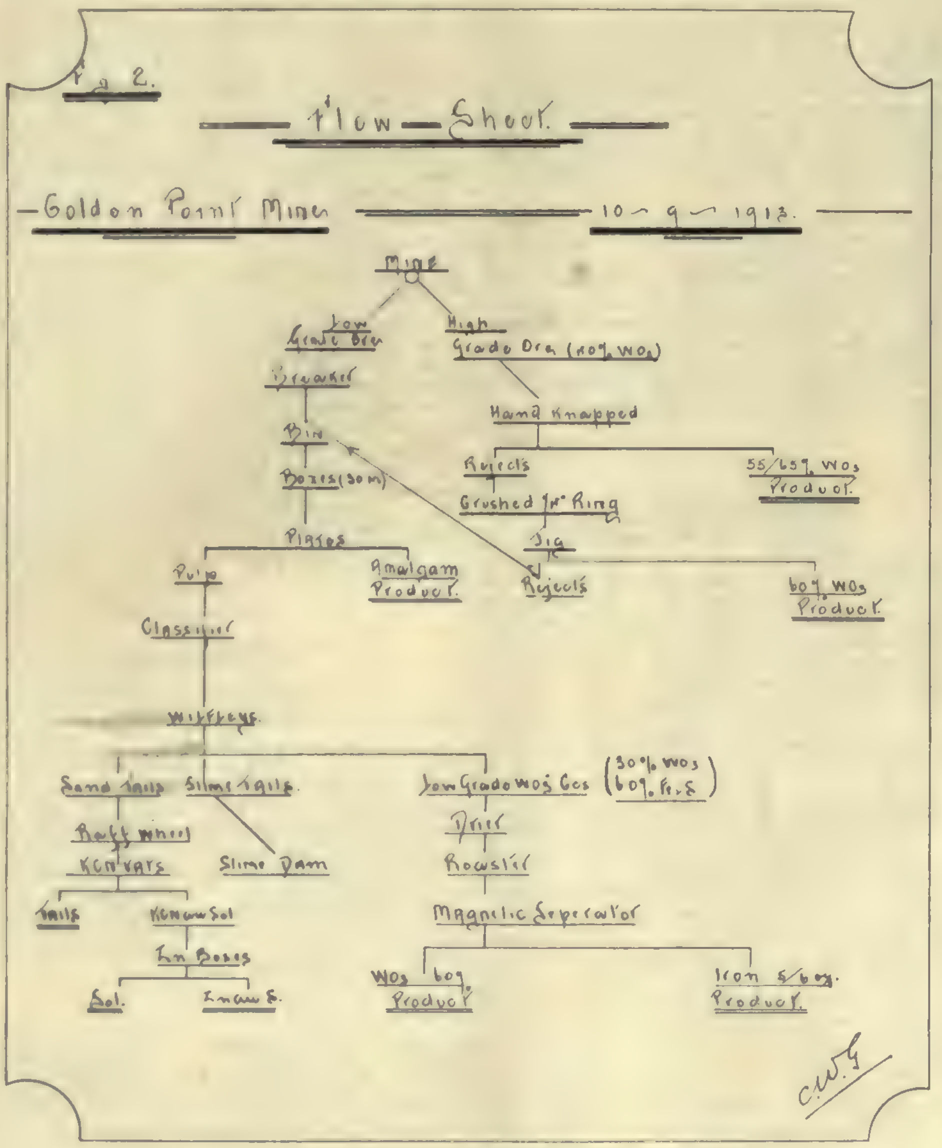
22 tons pyritic scheelite treated at £4 16s. per ton.

Mill.—The milling operations for clean stones are simply crushing to 30 mesh; amalgamation, then concentrating out of the scheelite, which, owing to its heavy sp.g., presents no concentrating difficulty in separating from its gangue. Of late years, however, with the increasing depth of workings (500ft.), the lodes have passed into the sulphide zone,, and in consequence of which the scheelite is associated with the pyrites, and saved together as a low-grade concentrate. The present treatment is illustrated by flow sheet (Fig. 2).

The plant consists briefly of a 55 b.h.p. Camlings suction gas plant, 10-head mill (900 lb.) feeders, Wilfley tables, baff wheel, and 250-ton KCy plant, power jig cylindrical drying furnace, 6ft., and cylindrical roasting furnace, 9ft. Weatherill double roll magnetic separator, W.S., two type. The dynamo that generates the current for separator also lights the mill. This plant has the advantage of being suitable for ore treatment from either oxide or sulphide zones.



The mill has a capacity of 30 tons per day, crushed to 30 mesh, of the gold, which averages usually 15s. per ton, 6s. 4.5d. is caught on the "plates," 5s. 4d. in "KCn. plant," tails reject to creek, 10d., and slimes to slime dam account for the balance. The average low-grade concentrates containing Ca $WO_4$ 30-40 per cent., pyrites 50-55 per cent., and $SiO_2$ 10 per cent., with a gold content of 2½ oz., runs from ½ to 1 per cent. of tons milled, and firsts hand knapped usually total 1-2 tons per month, making the average recovered value of ore to £1 2s. 6d. per ton crushed.



Complete analysis of a sample of the low-grade pyritic scheelite concentrates is as follows:—

| | | |
|---|---|---|
| $WO_3$ .. .. .. .. .. .. | 36.1 | p.c. |
| $SiO_2$ .. .. .. .. .. .. | 10.8 | „ |
| As .. .. .. .. .. .. | 9.5 | „ |
| S .. .. .. .. .. .. .. | 4.4 | „ |
| Fe .. .. .. .. .. .. | 7.7 | „ |
| CaO .. .. .. .. .. .. | 9.3 | „ |
| $Fe_2O_3$ .. .. .. .. .. .. | 22.2 | „ |

which, for purposes of magnetic separation, are grouped into three heads—

| | |
|---|---|
| $CaWO_4$ .. .. .. .. .. | 45.4 = $WO_3$ 34.4 |
| $SiO_2$ .. .. .. .. .. .. | 10.8 |
| Iron .. .. .. .. .. .. | 43.8 |

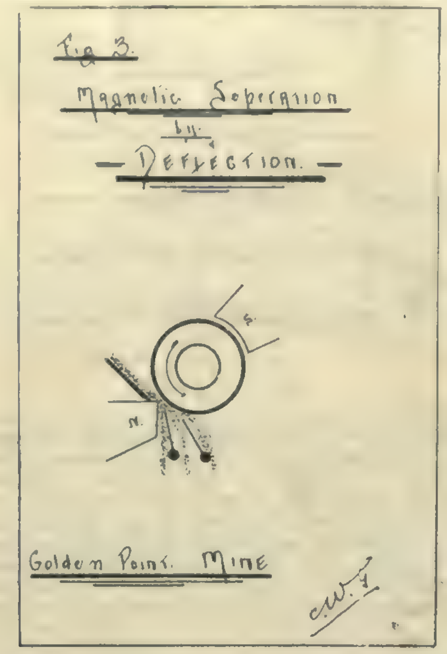
The magnetic separation, as carried out, consists in thoroughly drying the concentrates, then roasting the pyrites to the magnetic sulphide stage, screening and separation; in operation, 15 per cent. of the $CaWO_4$ and 21 per cent. of the $SiO_2$ (present in treatment) is deflected over with the magnetic iron, while running on high amperage (Fig. 3). This iron product is submitted to a re-treatment and roast, resulting in a clean iron product, 5-6 oz. to the ton; and the scheelite product is brought up to—

| | |
|---|---|
| $CaWo_4$ .. .. .. .. .. | 73.4 = to 61.2 $WO_3$ |
| $SiO_2$ .. .. .. .. .. .. | 14.3 |
| Fe, etc. .. .. .. .. .. | 12.3 |

In treatment of concentrates that may be high in $SiO_2$, before going to separation plant, they are jigged (Dutch product) to bring $SiO_2$ contents down to 10 per cent. or under, which is the pre-magnetic standard adopted.

The scheelite product is bagged in double bags of 140 lb. each (16 to ton), and sold usually to London and Hamburg buyers or their Australian agents. The realisation costs on shipping to London are:—N.Z. agents' charges, freight to port, insurance, etc., £4 per ton; and Home charges, freight, assays, etc., £4 4s. 6d. per ton—total, £8 4s. 6d. The scheelite being sold on its $WO_3$ value at 27s. 6d. to 35s per unit—depending on market fluctuations.

The pre-eminence of this mine in its palmy days as a scheelite producer may be gauged by its production, 1905-10 inclusive: 429 tons, of a value of £38,620, an average of 71.5 tons produced per annum, and in year 1910, 97 tons out of the N.Z. total of 143 were sent forward by this mine. This, in the world's production of 6000 tons, represents 16 per cent. The complete figures for gold and scheelite are, to 1905:—Gold, to value of £20,000, and scheelite, £24,000; 1905-10, 21,670 tons treated yielded, gold, £18,581, and scheelite, £38,620, roughly in the proportion of 1 to 2.



For use in the industries, the tungstic acid is separated from the lime (CaO), and used as an alloy with steel for making of high speed heat resisting tools of an extraordinary hardness, high-grade cutlery, armour plating, etc., etc.; its most familiar use, however, is in the filaments of electric light, where it cuts the cost of the light about one-third, and gives a steadier, brighter light. The CaO bye produce, due to separation of the $CaWO_4$, is used for making a high-grade porcelain.

## METAL PRICES.

For the benefit of those of our readers using the Figgis metal charts accompanying the work "Past and Present Metal Markets," published by Critchley Parker, the following list of monthly average prices for copper, tin, silver, lead and zinc is given in order that the charts may be brought right up to date:—

| | | Copper. | | | Tin. | | | Lead. | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | £ | s. | d. | £ | s. | d. | £ | s. | d. |
| 1912 | Oct. | 76 | 10 | 5 | 228 | 7 | 0 | 20 | 7 | 9 |
| „ | Nov. | 76 | 17 | 6 | 227 | 12 | 6 | 18 | 2 | 6 |
| „ | Dec. | 75 | 10 | 6 | 226 | 17 | 4 | 18 | 1 | 4 |
| 1913 | Jan. | 71 | 18 | 6 | 228 | 5 | 0 | 17 | 1 | 11 |
| „ | Feb. | 65 | 12 | 6 | 220 | 6 | 3 | 16 | 8 | 5 |
| „ | Mar. | 65 | 8 | 9 | 213 | 11 | 10 | 15 | 19 | 8 |
| „ | Apr. | 68 | 4 | 10 | 224 | 14 | 2 | 17 | 8 | 10 |
| „ | May | 68 | 18 | 9 | 224 | 14 | 3 | 18 | 14 | 3 |
| „ | June | 65 | 4 | 6 | 204 | 9 | 1 | 19 | 10 | 8 |
| „ | July | 64 | 5 | 10 | 183 | 16 | 11 | 19 | 7 | 10 |
| „ | Aug. | 69 | 4 | 0 | 188 | 14 | 6 | 20 | 8 | 0 |
| „ | Sept. | 73 | 5 | 3 | 193 | 7 | 7 | 19 | 14 | 10 |
| „ | Oct. | 73 | 9 | 5 | 184 | 19 | 10 | 19 | 9 | 5 |

| | | Zinc. | | | Silver. |
|---|---|---|---|---|---|
| | | £ | s. | d. | d. |
| 1912 | Oct. | 27 | 5 | 8 | 29.32 |
| „ | Nov | 26 | 16 | 0 | 29.01 |
| „ | Dec. | 26 | 9 | 6 | 29.32 |
| 1913 | Jan. | 25 | 19 | 1 | 28.98 |
| „ | Feb. | 25 | 4 | 3 | 28.35 |
| „ | Mar. | 24 | 11 | 4 | 26.67 |
| „ | Apr. | 25 | 2 | 4 | 27.41 |
| „ | May | 24 | 10 | 4 | 27.82 |
| „ | June | 21 | 19 | 10 | 27.19 |
| „ | July | 20 | 11 | 2 | 27.07 |
| „ | Aug. | 20 | 14 | 0 | 27.33 |
| „ | Sept. | 21 | 3 | 10 | 28.08 |
| „ | Oct. | 20 | 13 | 9 | 28.09 |

## BRIQUETTING POWLETT COAL.

### Better Than Screened Coal.

For a long time tests have been in progress at the laboratory of the Victorian Mines Department to ascertain the suitability of coal, especially small coal and slack, from the State colliery at Wonthaggi for the manufacture of briquettes, and whether this can be done at such a cost as would make their manufacture a commercially sound proposition. A report has recently been issued by Mr. P. G. W. Bayly, chemist and assayer to the Department, in which the following conclusions are reached. It is to be understood that the coal used in these experiments came indifferently from all parts of the mine, something like uniformity in size being secured by crushing.

"The total cost of manufacture of the briquettes in Melbourne, including a coal charge of 7s. per ton, and freight charge of 3s. 7½d. per ton, should not exceed 15s. 3d. per ton. Certain modifications which I have in mind would probably reduce this figure. The cost price of good household coal (Newcastle) is about 18s. 6d. in Melbourne, and the usual selling price about 25s. A satisfactory process of briquetting will enable this slack to be used in competition with the best screened coal, either for household use, factory boilers, locomotives, or marine boilers. For household use, the briquettes have the advantage of clean handling, no dust, no waste by continued breaking up, and convenience of size for using. For factory use the large series of boiler tests show a clear gain for the briquette over the lump coal of similar nature. The average results are:—

| | Evaporation from and at 212 deg. F. | Percentage Evaporative Value. |
|---|---|---|
| | Lb. | P.c. |
| Powlett briquettes, X type | 8.07 | 100.0 |
| Powlett screened .. .. .. | 7.77 | 96.3 |
| Powlett briquettes, A type | 7.51 | 93.1 |
| Powlett slack .. .. .. .. | 7.18 | 89.0 |

"By briquetting, the heating power of the slack coal (regarded as 87 per cent. of that of good New South Wales coal) has been raised above that of good screened coal.

"Tests were made on railway locomotives, and they showed that under forced draughts, the briquettes held together, and did all the work required of them. The evaporation results were lower for briquettes, thus:—Maitland screened, 9.92 lb.; Powlett screened, 9.02 lb.; Powlett briquettes, 8.48 lb. The analyses of the coals showed that the Maitland coal used was of particularly good quality, and very clean, while the Powlett sample was unusually dirty, and the briquettes also were high in ash:—Maitland, 3.80 per cent. ash; Powlett screened, 8.72 per cent. ash; Powlett briquettes, 9.37 per cent. ash. The process of briquetting added a little to the ash percentage.

"The result showed that a dirty slack, with a low calorific value, which could not have been used at all in its fine state of division, had been made into a fuel which satisfactorily stood the severe strain of a locomotive express run. By altering the shape and size of briquettes a higher evaporation result would have been attained. In fact, all the results of the series of tests should be improved upon with more experience of the type of fuel required to be manufactured for different purposes. Briquettes should be a very useful fuel for marine work, owing to easy bunkering and quick ignition."

## INDUSTRIAL.

An order, for what is probably the largest number of steam pumps to be ordered in one lot, was recently placed with Mr. Frank R. Perrot, of 204 Clarence-street, Sydney, the Australian representative of the Gardner Co., by the Surrey Boiler Works of Victoria. This company was so well pleased with the Gardner pumps that it decided to equip all its boiler plants with them, and an initial order for sixty was at once placed. Mr. Perrot informs us that about 1000 Gardner steam pumps have been sold in Western Australia alone, but, judging from indications during the brief time he has been in the eastern States, he expects soon to exceed the western record.

Ipswich (Q.) is badly wanting a tramway or trolley service, and at its monthly meeting, at the end of October, the Chamber of Commerce agreed to support the request of the Booval Progress Association that, for the purpose of allowing them to arrive at a decision as to the advisableness, or otherwise, of instituting a tramway service for Ipswich district, the following steps be taken:—(a) To define a probable tramway area for Ipswich and district; (b) to collect and submit estimates of construction and equipment of an overhead electric tramway service; (c) to collect and submit estimates of construction and equipment of the Edison storage battery car system.

## REPORTS OF COMPANIES AND CORPORATIONS.

### Mt. Lyell M. and R. Co. (T.).

The following were the smelter and converter returns of the Mt. Lyell Mining and Railway Co. for the last two four-weekly periods:—

| | Four Weeks Ended Oct. 1. | Oct. 29. |
|---|---|---|
| Mt. Lyell ore treated .. .. tons | 18,199 | 16,122 |
| N. Mt. Lyell ore treated ..tons | 10,025 | 9,401 |
| Lyell Comstock ore.. .. ..tons | 497 | 70 |
| Total ore .. .. .. .. tons | 28,721 | 25,593 |
| Fluxes and purchased ores .. | 89 | — |
| Blister copper produced ..tons | 596 | 527 |
| Contents— | | |
| Copper .. .. .. .. .. .. tons | 589 | 520 |
| Silver .. .. .. .. .. .. .. oz. | 41,343 | 37,957 |
| Gold .. .. .. .. .. .. .. .. oz. | 742 | 697 |

### Broken Hill South (N.S.W.).

The assay values of ore and concentrates treated by the Broken Hill South Silver Mining Co. for the last two four-weekly periods were:—

| | Four weeks ended Oct. 4 | *Nov. 1. |
|---|---|---|
| Crude ore treated, tons .. .. | 26,810 | 24,458 |
| Assay value— | | |
| Lead, per cent. .. .. .. .. | 13.9 | 14.0 |
| Silver, oz. .. .. .. .. .. | 6.6 | 7.0 |
| Zinc, per cent. .. .. .. .. | 13.4 | 14.1 |
| Concentrates produced, tons .. | 4,188 | 3,779 |
| Assay value— | | |
| Lead, per cent. .. .. .. .. | 67.6 | 67.3 |
| Silver, oz. .. .. .. .. .. | 23.3 | 25.2 |
| Zinc, per cent. .. .. .. .. | 6.6 | 6.6 |

*Failure of water supply caused stoppage of 72 hours.

### Great Cobar Ltd. (N.S.W.).

The output of the Great Cobar Ltd. for the last two months was as under:—

| | Sept. | Oct. |
|---|---|---|
| Blister copper, tons .. .. .. .. | 532 | 503 |
| Contents, estimated— | | |
| Gold, oz. .. .. .. .. .. .. | 2,411 | 1,628 |
| Silver, oz. .. .. .. .. .. .. | 10,819 | 8,841 |
| Concentrates on hand, estimated— | | |
| Copper, tons .. .. .. .. .. | 80 | 67 |
| Gold, oz. .. .. .. .. .. .. | 72 | 88 |
| Silver, oz. .. .. .. .. .. .. | 560 | 529 |

### Hampden-Cloncurry Mines (Q.).

The smelting returns of the Hampden-Cloncurry Copper Mines Ltd. for the last two months were as follow:—

| | *Sept. | †Oct. |
|---|---|---|
| Ore treated, tons .. .. .. .. .. | 5,160 | 5,642 |
| Metals recovered— | | |
| Copper, blister, tons .. .. .. | 509 | 607 |
| Copper, fine, tons. .. .. .. | 503 | 600 |
| Gold, oz. .. .. .. .. .. .. | 141 | 185 |
| Silver, oz. .. .. .. .. .. .. | 4,336 | 4,936 |

*Furnace ran 24 days. Closed down on 29th September to put in new jackets.

†Furnace ran 26 days.

### Mt. Elliott Ltd. (Q.).

The smelting returns of the Mt. Elliott Ltd. for the last two months were:—

| | Sept. | Oct. |
|---|---|---|
| Ore treated, tons .. .. .. .. | 4,212 | 4,461 |
| Blister copper produced, tons .. .. .. .. .. .. | 500 | 480 1-10 |
| Contents— | | |
| Copper, tons .. .. .. .. .. | 495 3-5 | 475 9-10 |
| Gold, oz. .. .. .. .. .. .. | 814 4-5 | 637 |
| Silver, oz. .. .. .. .. .. .. | 1,160 | 1,056 |

### Great Fitzroy Mines (Q.).

The production, revenue and working costs of the Great Fitzroy Mines Ltd. for the last two months were as follow:—

| | *Sept. | Oct. |
|---|---|---|
| Furnace, hours .. .. .. .. .. | 717 | 733 |
| Ore treated, tons .. .. .. .. .. | 2,458 | 2,482 |
| Copper, per cent. .. .. .. .. | 2.67 | 3.48 |
| Gold, dwt. .. .. .. .. .. .. | 3.64 | 4.04 |
| Sintered concentrates, tons .. .. | 1,300 | 1,232 |
| Copper, per cent. .. .. .. .. | 10.97 | 11.96 |
| Gold, dwt. .. .. .. .. .. .. | 7.74 | 9.05 |
| Copper, in blister, tons .. .. .. | 183.51 | 207.41 |
| Gold, in blister, oz. .. .. .. .. | 961 | 1,053 |
| Silver, in blister, oz. .. .. .. .. | 2,371 | 2,129 |
| Mill, hours .. .. .. .. .. .. | 418 | 402 |
| Ore treated, tons .. .. .. .. .. | 6,663 | 7,044 |
| Copper, per cent. .. .. .. .. | 2.44 | 2.61 |
| Gold, dwt. .. .. .. .. .. .. | 2.13 | 2.39 |
| Concentrates, tons .. .. .. .. | 1,290 | 1,328 |
| Copper, per cent. .. .. .. .. | 11.18 | 12.06 |
| Gold, dwt. .. .. .. .. .. .. | 7.85 | 9.11 |
| | £ | £ |
| Revenue .. .. .. .. .. .. .. | 16,581 | 18,540 |
| Price electrolytic copper .. .. | 75/11/4 | 75/10/6 |
| Working expenditure .. .. .. .. | 15,081 | 16,263 |

*Reduced production blister due to stoppages smelting plant, caused by leaky jackets.

# Linking Sydney with North Sydney.

*Written specially for the "Mining Standard."*

By J. J. C. BRADFIELD, M.E., M. INST. C.E.

*Chief Engineer, Metropolitan Railway Construction,*

*Public Works Department, Sydney.*

*New South Wales.*

## HISTORICAL.

To link Sydney with North Sydney, floating bridges, swing bridges, high level bridges, subaqueous bridges, tunnels, and subaqueous tube tunnels have been advocated.

In 1878 Mr. W. C. Bennett, then Commissioner for Roads and Bridges, stated that he favoured a floating bridge from Dawes Point to Milson's Point to carry vehicles, passengers, and if necessary, a railway train.

In 1879 Mr. T. S. Parrott prepared a sketch design of a truss bridge of 7 spans from Dawes Point to Milson's Point, the longest span being 500 feet.

In 1880 negotiations were opened between the Government and Mr. J. E. Garbett, representing a company which was prepared to construct a high-level bridge to the North Shore at a cost of £850,000, upon condition that the Government guaranteed, for a period of thirty years, an amount equal to 3½ per cent. upon the cost of construction. On the 26th October, 1881, the late Sir Henry Parkes, then Premier, signed a Cabinet minute to the effect that "the Ministers (nine) present agreed that Mr. Garbett's proposal, as explained in his letter, be accepted by the Government," and in March, 1882, Mr. Garbett deposited a sum of £5000 as security. Owing to a change of Government, however, nothing further was done, and the deposit was returned in the following year.

Sir John Fowler prepared plans for a suspension bridge to Milson's Point for vehicular traffic at an estimated cost of £400,000.

Tunnel connection to North Sydney was first proposed by Mr. C. O'Neill, M. Inst. C.E., in conjunction with Mr. Gipps, C.E. His proposal was made in January, 1885, and in 1887 the Government was asked to guarantee 4 per cent. on £450,000, the cost of the two tunnels proposed—one for railway traffic, and one for road traffic.

In January, 1888, a deputation waited upon the late Sir Henry Parkes to urge the construction of a bridge as an undertaking fitting to mark the Centenary of the Colony.

Public agitation continued, and in response thereto, in March, 1890, the Government appointed a Royal Commission to inquire into the proposed extension of the railway into the City and the North Sydney connection. Eight schemes were submitted for connecting North Sydney by bridge, whilst at least 4 witnesses favoured a tunnel.

The Royal Commission reported "that at present it was inexpedient to connect the North Shore with Sydney by means of a bridge or tunnel, but the Commission is of the opinion, upon the evidence before it, that, if it should be found necessary to connect North Shore with Sydney, it should be by means of a high-level bridge, and that if it were possible to throw a bridge across in one span, such plan should be adopted."

No action was taken on the report of the Royal Commission of 1891.

From 1896 to 1899 the North Sydney Connection was brought prominently forward by private enterprise, four bills were under consideration by Parliament, two for communication by tunnel (Mr. J. Sulman, F.R.I.B.A. promoter) and two for communication by bridge (Mr. B. C. Simpson, M. Inst. C.E., being the promoter for one, and Mr. William Kenwood for the other). No progress was made with any of these bills.

After two deputations had urged that the construction of the bridge be put in hand by the Government, or failing that, by private enterprise, the Hon. E. W. O'Sullivan, then Minister for Public Works, on the 4th January, 1900, called for competitive designs and tenders. None of the designs received were considered sufficiently satisfactory, consequently the acceptance of a tender could not be recommended.

On March 25th, 1901, the Hon. E. W. O'Sullivan appointed an Advisory Board, the Chairman of which was Mr. J. Davis, M. Inst. C.E., now Director General of Public Works. This Advisory Board called for tenders, and on the 25th November, 1903, presented their report and recommended for selection the design and tender of Messrs. J. Stewart and Co., which was for a cantilever bridge from Dawes Point to McMahon's Point, having a main span of 1350 feet between centres of piers; the northern shore arm was 580 feet long, and the southern shore arm 500 feet long. On the northern side were two approach spans each of 270 feet, but on the southern side there were no approach spans. The deck consisted of a wood-blocked roadway 35 feet wide between kerbs on the eastern side of the bridge; next to this a double line of tramway upon an open deck; and next to the tramway, and adjacent to the western cantilever, a double line of railway also upon an open deck. There was also a footway 10 feet wide on either side of the bridge, outside the cantilevers. See Plan No. 2.

The designs and estimates for the approaches to the main bridge were made by the Public Works Department. The total estimated cost of bridge and approaches was as follows:—

| | £ |
|---|---|
| Main bridge, 3030 feet long, Messrs. J. Stewart and Co.'s tender .. .. .. .. .. .. .. .. .. .. .. .. .. | 1,365,050 |
| Southern approach, including railway to connect with proposed City railway at Crescent-street and roadway to Princes-street at the intersection of the Argyle Cut .. .. .. .. .. .. .. .. .. .. .. .. .. | 330,000 |
| Northern approach, including railway to connect with existing line at Bay-road Station, and roadway to Blue's Point road at the intersection of George-street .. .. .. .. .. .. .. .. .. .. .. .. .. | 180,000 |
| | £1,875,050 |
| Land resumption .. .. .. .. .. .. .. .. .. .. .. .. | 65,000 |
| Total estimated cost of bridge and approaches.. .. | £1,940,050 |

This included a total length of railway of 154 chains, and of roadway and tramway of 82 chains.

The investigation by the Advisory Board was very complete, and at the conclusion of their inquiry in November, 1903, the matter had reached such a stage that, with the condition laid down in the last paragraph of their recommendation, viz., "That it be made a condition of the contract that before any portion of the work is commenced, full working plans are to be supplied by the contractors, and that these are to be submitted to and approved of by us" a tender for the bridge could then have been accepted.

In connection with these competitive designs and tenders the name of the late Mr. Norman Selfe, M. Inst. C.E., should be remembered. Mr. Selfe and the Vereinigte Maschinenfabrick Augsburg and Maschinenbaugesellschaft Nurnberg were the authors of the design of Messrs. J. Stewart and Co., which was recommended for acceptance by the Advisory Board.

The Report of the Advisory Board was presented at a time of temporary financial depression, and no action was taken to accept the design and tender recommended by them.

The next progress was made on the 11th May, 1908, when the Royal Commission on "Communication between Sydney and North Sydney" was appointed to make full and diligent inquiry into the expediency of providing increased and improved facilities of communication between Sydney and the suburbs on the northern side of Sydney Harbour, from the point of view of passenger, vehicular, and freight traffic, and to suggest what, in their opinion, is the best practical method of establishing direct communication between the northern and southern side of the harbour, which will, at the same time, avoid obstruction to harbour navigation, and also the best route for such direct communication.

This Royal Commission presented its report on March 29th, 1909, and, *inter alia*, reported:—

"The best practical and most economical method of establishing direct communication, which will avoid obstruction to harbour navigation, is by subways. A depth of 40 feet of water at low water above the subways was provided for. The railway and tramway subways should permit of rolling stock of standard dimensions being used with electricity as a motive power.

"The following railway, tramway, and vehicular subway schemes are recommended for adoption:—

"Railway subway scheme from Lavender Bay, via Kirribilli Point (Beulah-street) and Fort Macquarie to Moore-street, estimated cost £753,000.

"Tramway subway scheme from Arthur-street, North Sydney, via Milson's Point and Dawes Point, to loop at Barton-street, Circular Quay; estimated cost, £460,000.

"Vehicular subway scheme from Arthur-street, North Sydney, via Milson's Point and Dawes Point, to connect at Pottinger-street with the new road proposed by the Sydney Harbour Trust Commissioners; estimated cost, £502,000."

On 14th December, 1909, the railway subway scheme from Lavender Bay via Kirribilli Point and Fort Macquarie to Moore-street was referred to the Parliamentary Standing Committee on Public Works, the cost estimated by the Royal Commission was £753,000, but the departmental estimate, which provided for the Chief Railway Commissioner's requirements, was £1,101,476. Parliament expired by effluxion of time in 1910 before the Public Works Committee completed their inquiry.

At this time the Department considered a subway would give greater facilities for the railway traffic than the bridge, because via the subway, trains from North Sydney could traverse not only the western side of the city, but also the eastern side, and could be taken direct to the eastern suburbs, show ground, cricket ground, etc., whereas by bridge it was thought that all passengers, except those for the western side of the city, would have to change trains at Wynward Square.

After a deputation from the Master Carriers' Association had waited on the Acting Premier, asking that a bridge should be constructed for the vehicular traffic, the Honorable Arthur Griffith, Minister for Public Works, announced in Parliament on 19th July, 1911, that "Cabinet had that day decided that a definite proposal for a bridge to carry tramway, vehicular, and pedestrian traffic, but not a railway, should be submitted immediately to the Public Works Committee, and concurrently with that, a proposal for a subway to connect the North Sydney Railway system with the City system."

In pursuance of that announcement, on November 30th, 1911, the Minister for Public Works moved:—

(a) "That it be referred to the Parliamentary Standing Committee on Public Works to consider and report upon the expediency of connecting Sydney and North Sydney by means of a bridge."

The bridge and approaches from Dawes Point to McMahon's Point, to carry tramway, vehicular and pedestrian traffic only at an estimated cost of £1,592,000, are as recommended by the Advisory Board, except that provision for railway traffic has been omitted. The estimated cost when revised in 1912 amounted to £1,730,400.

The bridge proposed to consist of steel cantilevers, forming three spans, viz., 500 feet, 1350 feet, and 580 feet; also two deck girder spans of 270 feet each on the northern side, the clear waterway between main piers being 1200 feet; the central 600 feet of this waterway to have a clear headway above high water of 170 feet, reduced to 150 feet near the main piers; the approaches to consist of reinforced concrete arch spans.

(b) "That it be referred to the Parliamentary Standing Committee on Public Works to consider and report upon the expediency of constructing a subway from Circular Quay, via Fort Macquarie and Kirribilli Point, to Lavender Bay, for the purpose of affording railway communication between Sydney and North Sydney."

The subway provides for a double track electric railway on the route recommended by the Royal Commission on the "Communication between Sydney and North Sydney," but with the station on the city side at Circular Quay instead of at Moore-street. The ruling grade is 1 in 39.16 on the city side, and 1 in 50 on the North Sydney side. The subaqueous tunnel is of the type recommended by the Royal Commission, having a depth of 40 feet of water over the top of the tunnel at low water. The estimated cost, exclusive of power, rolling stock, etc., is £1,046,474.

(c) In December, 1911, the Honorable Arthur Griffith, Minister for Public Works, gave the author, then Principal Designing Engineer, permission to submit to the Public Works Committee a proposal for a bridge from Dawes Point to Milson's Point without any piers in the fairway.

## ROUTE OF BRIDGE.

Three routes linking the main avenues of traffic are obviously feasible, viz.:—

Dawes Point to McMahon's Point.
Dawes Point to Milson's Point.
Fort Macquarie to Kirribilli Point.

*Dawes Point to McMahon's Point.*—In giving evidence before the Royal Commission appointed in 1890 to inquire into the proposed extension of the railway into the City and the North Shore connection, Mr. Henry Deane, M. Inst. C.E., Acting Engineer-in-Chief, proposed a bridge from Dawes Point to McMahon's Point. The late Mr. Norman Selfe, M. Inst. C.E., also proposed a bridge on the same route. Similar evidence was given before the Royal Commission appointed in 1896.

In 1901 the Sydney Harbour Bridge Advisory Board, of which Mr. Deane was a member, adopted the route from Dawes Point to McMahon's Point. In calling for competitive designs and tenders the Advisory Board proposed to place the two main piers in the Harbour fairway, and fixed the clear span of the bridge at 1200 feet.

At that time the wharves along Miller's Point were small and irregularly shaped; these have since been replaced. The new wharves are shown on Plan No. 1, whilst the wharves existing in 1901 are shown dotted.

In the past decade there has been a great increase in the size of steamships, and the following table, compiled from a paper by Dr. Corthell before the 12th International Congress of Navigation, Philadelphia, 1912, gives the average dimensions of the largest 20 steamships for each decade since 1851:—

| Year | 1851 | 1861 | 1871 | 1881 | 1891 | 1901 | 1911 |
|---|---|---|---|---|---|---|---|
| Length.. .. .. .... | 245ft. | 310ft. | 365ft. | 460ft. | 507ft. | 599ft. | 740ft. |
| Beam .. .. .. .. .. | 37ft. | 41ft. | 44ft. | 45ft. | 54ft. | 65ft. | 84ft. |
| Draught (loaded) .. | 19ft. | 22ft. | 24ft. | 24ft. | 27ft. | 32ft. | 34ft. |
| Tonnage .. .. .. .. | 1700 | 3000 | 4200 | 4900 | 6980 | 14,150 | 29,000 |
| Speed (knots) .. .. | 9.2 | 10 | 12 | 15 | 17 | 19 | 20 |

The largest steamships afloat to-day are as follows:—

| Name of Ship. | Year when built. | Owners. | Length over all. | Breadth. | Gross tonnage. | Draught loaded. |
|---|---|---|---|---|---|---|
| Lusitania .. .. | 1907 | Cunard | 785ft. | 88ft. | 32,000 | 32ft. 6in. |
| Mauretania .. | 1907 | Cunard | 790ft. | 88ft. | 32,500 | 33ft. 6in. |
| Olympic.. .. .. | 1910 | White Star | 883ft. | 92ft. | 45,000 | 34ft. 6in. |
| Aquitania .. .. | 1913 | Cunard | 902ft. | 97ft. | 47,000 | 34ft. 0in. |
| Imperator .. .. | 1912 | Hamburg America | 905ft. | 98ft. | 50,000 | 35ft. 0in. |

The "Vaterland" launched in April last is yet larger than the "Imperator," whilst a still larger vessel is on the stocks.

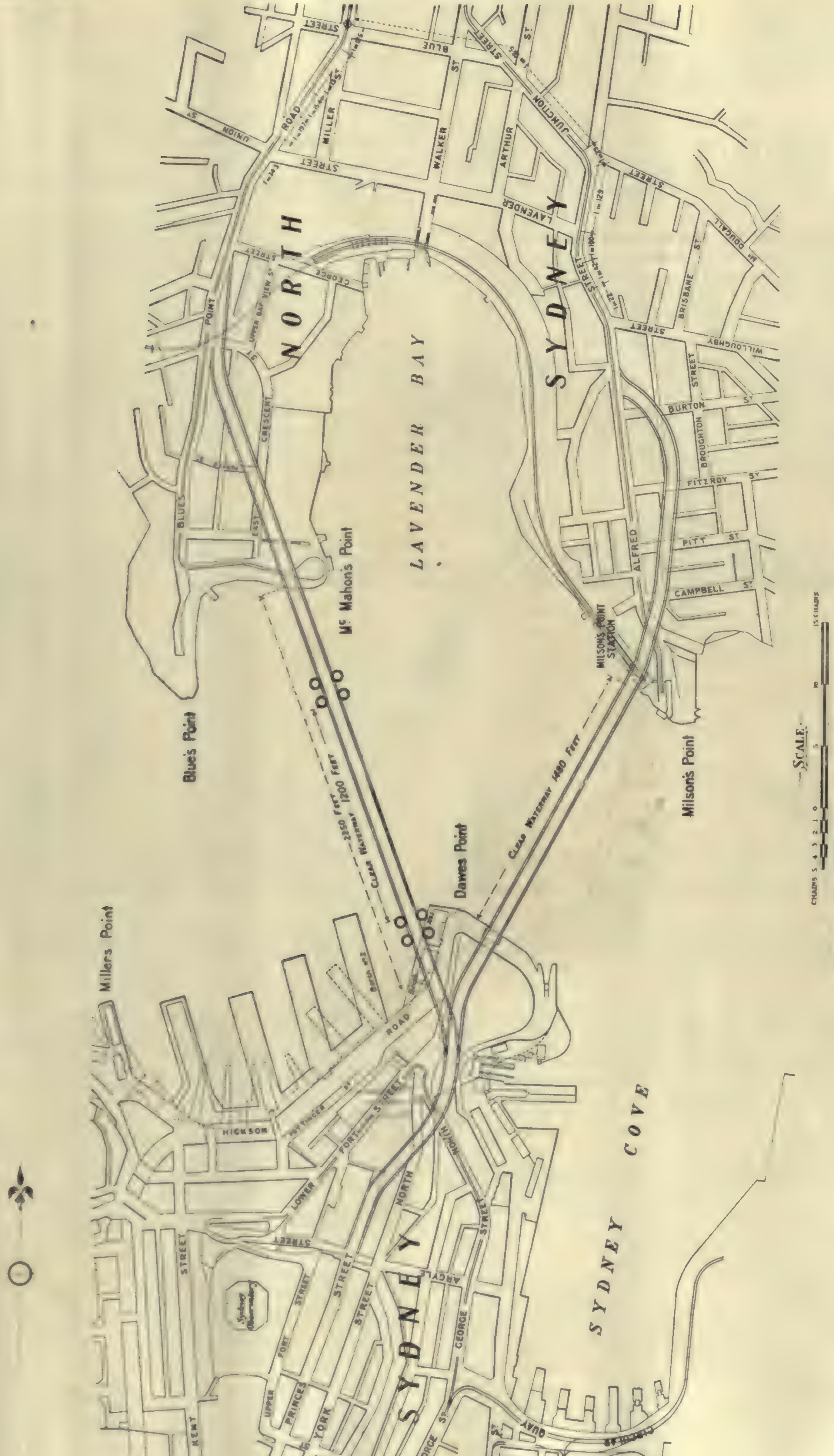
At no very distant date vessels of similar tonnage may trade to this port. The White Star liner "Ceramic" is the largest vessel to do so at present, and her dimensions are:—Length over all 675ft., beam 69ft., draught 34ft. 6in., tonnage 18,270.

The location of the design recommended by the Advisory Board is shown on Plan No. 1, and the elevation and cross section on Plan No. 2. The conditions have changed since the recommendation was made, and the bridge, if built, must inevitably prove an obstruction to shipping. The Southern Pier would render valueless Berth No. 1 at Miller's Point, which the Harbour Trust estimates to be worth £94,600, with a rental value of £5000 per annum, and would also prove a serious obstruction to Berth No. 2, whilst in view of the great increase in the length of steamers during recent years, as shown by the preceding table, the Northern pier would be a menace to navigation, and there would always be the danger of the bridge being wrecked by the collision of a large vessel with one of these piers.

The distance from shore to shore is about 2250 feet, and it has yet to be demonstrated that it is practicable to build a bridge to carry the heavy concentrated loads of a railway with a clear span of that length; in any case the cost would be very great.

*Dawes Point to Milson's Point.*—A bridge on this route would serve the thickly populated parts of North Sydney better than a bridge to McMahon's Point, and with easier grades for the vehicular traffic. The clear span would be 1600 feet between centres of piers. A railway bridge of this span is quite feasible, and would cost only half that of a bridge of 2250 feet clear span. There would be no obstruction whatever to the fairway, as both piers are founded on solid rock on either shore, vide Plan No. 1.

*Fort Macquarie to Kirribilli Point.*—This route is about the same length from shore to shore as the Dawes Point to Milson's



Plan 1—Map of Sydney and North Sydney, Showing Schemes.

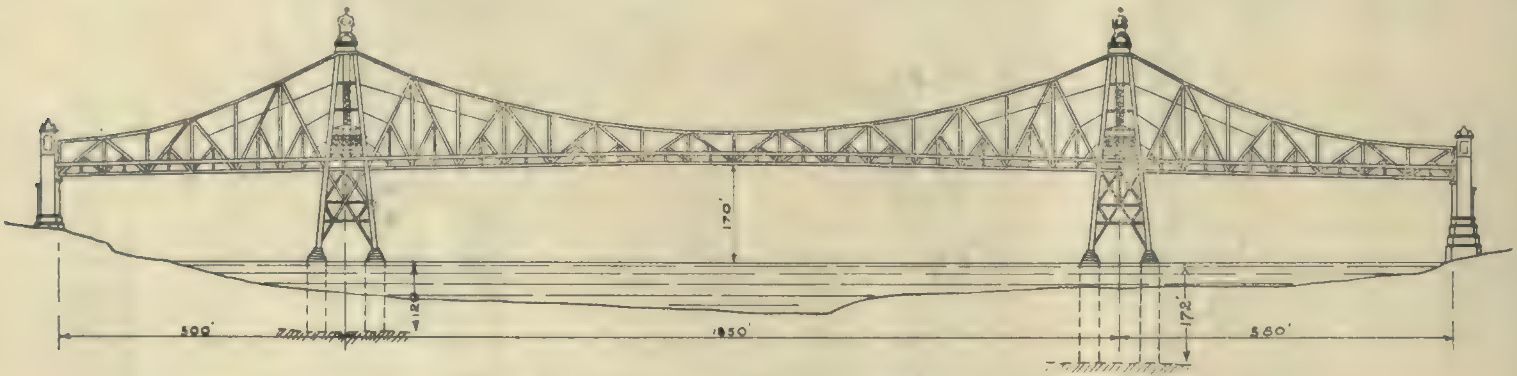
Point route, and offers the same advantages from the constructional standpoint. It would, however, necessitate the vehicular traffic from the business side of the city passing through the already congested streets, whereas by the Dawes Point to Milson's Point route the vehicular traffic could be taken direct to the western side of the city.

*Route Adopted.*—The Dawes Point to Milson's Point route was adopted by the author, and Mr. David Hay, M. Inst. C.E. (of the firm of Mott and Hay), who subsequently came from London at the request of the New South Wales Government to report on the traffic problem of the City of Sydney, upheld the choice of route.

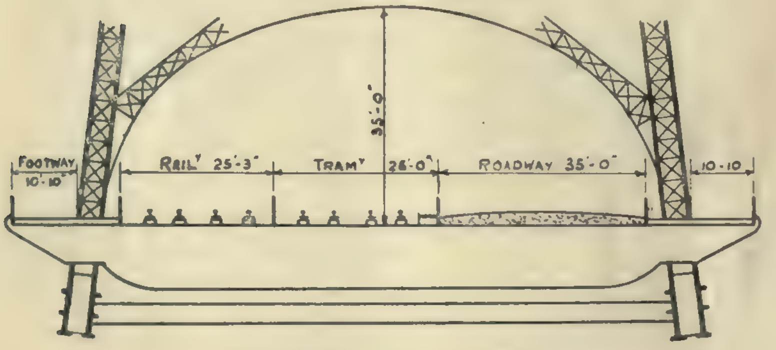
### COMPARISON OF BRIDGE WITH SUBWAYS.

A bridge from Dawes Point to Milson's Point will be compared with the subways recommended by the Royal Commission on "Communication between Sydney and North Sydney." Plan No. 3 shows the location of the subways, and Plan No. 13 shows the location of the bridge.

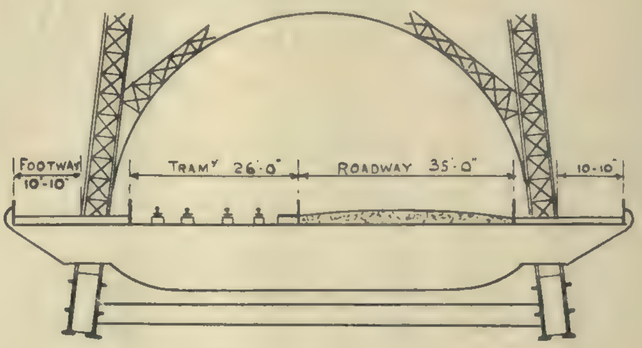
*Railway.*—The railway via bridge would leave the existing Milson's Point railway to the south of Bay-road Station, and would connect with the proposed city railway at Wynward Square Station. After junctioning with the City railway at Wynyard Square, passengers could reach the eastern side of the city, the eastern suburbs, the Show Ground, Cricket Ground, etc., without changing trains. On the northern side of the Harbour, there would be two open-air stations, viz., "North Sydney" between Walker-street and Miller-street parallel to Blue-street, and "Kirribilli," opposite the Town Hall, North Sydney, near Burton-street.



Plan 2—Cross Section and Elevation of Bridge recommended by the Advisory Board, 1903.



Cross Section, with Railway.



Cross Section, without Railway.

The railway via subway would leave the existing Milson's Point railway at the head of Lavender Bay, would connect with the proposed City railway, and the traffic could go to the eastern or western side of the city as required. On the northern side of the Harbour there would be an underground station at Milson's Point, 75 feet below the surface, access to which would be by lifts and steps.

The railway, via bridge, would open up the thickly populated portions of North Sydney right down to Milson's Point, and would form the first section of a Northern Suburbs railway, whereas the railway, via subway, would only be an extension of the Milson's Point railway into the city. This is clearly shown by the revenue anticipated by the Railway Department for the year 1911, viz., £63,550 by bridge, and £22,323 by subway.

The length from Bay-road Station to Wynyard Square by bridge would be 2.6 miles, and the length by subway 3.3 miles. Mr. C. A. Hodgson, Superintendent of Lines, estimated that 238 trains each way per day would have been required to cope with the traffic last year. The saving in train mileage by bridge would have been 332.2 miles per day, or 121,816 miles per annum, and as the traffic increases the saving would be much greater.

The rise from Wynyard Square Station to the bridge is 139 feet, and the fall from the bridge to Bay-road Station is 71.5 feet. By subway the rise to Bay-road Station is 184 feet, and the fall from Wynyard Square to subway is 115 feet. See Plan No. 3a.

Mr. David Hay, in his report, stated that the severer grades and greater distance to be traversed by subway than by bridge would add at least 15 per cent. to the cost of the electric current alone on the haulage of every ton taken over the line from Wynyard Square to Bay-road Station.

The future extensions to Neutral Bay, Mosman, The Spit, Manly, and eventually to Pittwater, would be cheaper, the distance shorter, and the grades easier via bridge than via subway.

*Tramway.*—Although the tramway may not be taken across the Harbour, the facilities via bridge and via subway will be compared.

The tramway, via bridge, would leave the existing North Sydney system at the intersection of Junction and Alfred streets, and passing over the bridge would loop around Wynyard Square on the city side. The tramway, via subway, would leave the existing North Sydney system at the intersection of Junction and Arthur streets, and would join with the existing system at Circular Quay.

The tram, via bridge, could pick up and set down passengers as far as Fitzroy-street, North Sydney, and so serve the thickly populated district between Lavender Bay and Neutral Bay. By subway no passengers would be picked up after passing Arthur-street. On the City side, the tram, via bridge, would run along a new roadway, whereas the tram, via subway, would run along George-street and add very much to the congestion in that already too congested street.

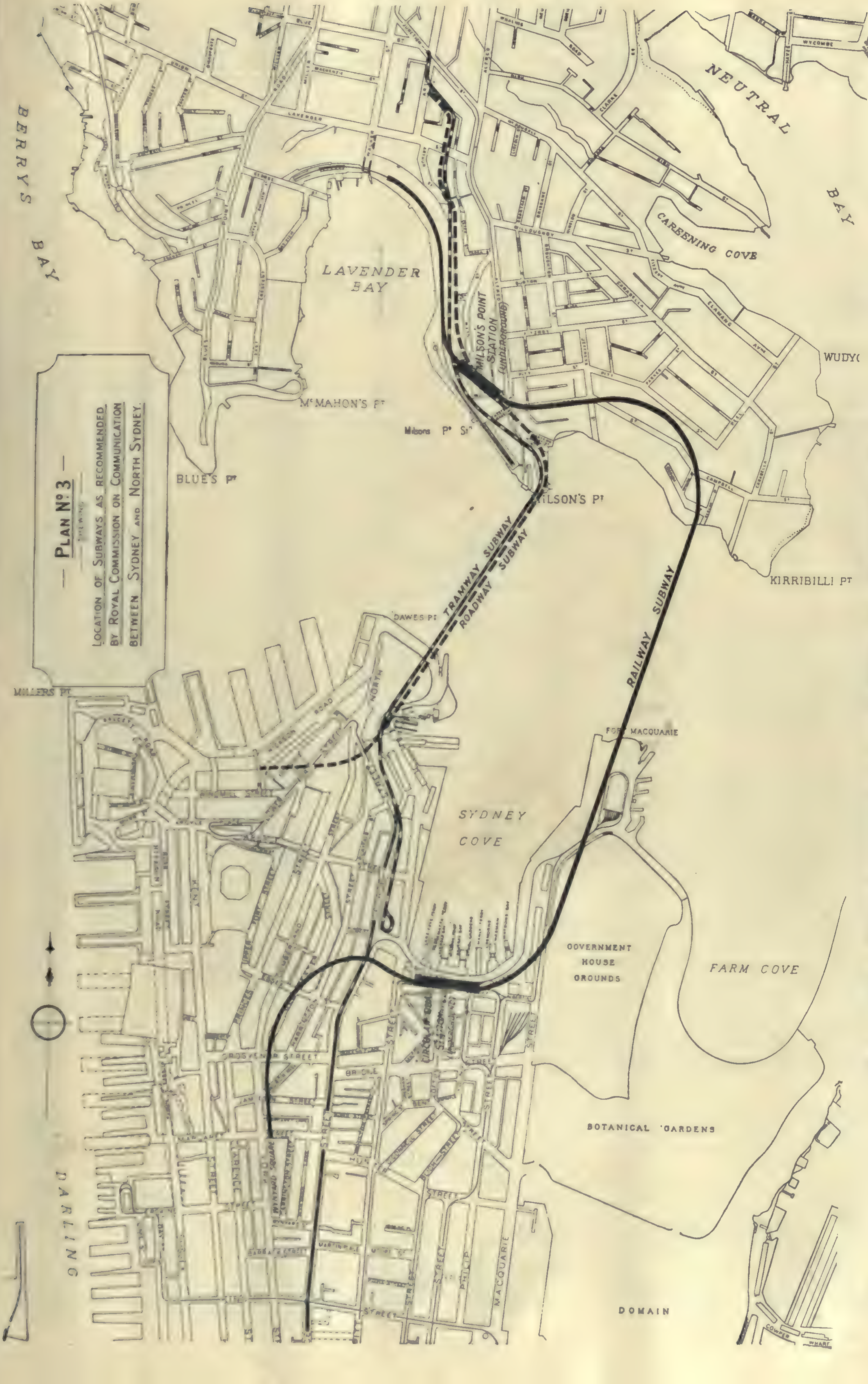
The distance from George-street, opposite the General Post Office, Sydney, to the intersection of Arthur and Junction streets, North Sydney, is 2 miles by bridge or subway. The rise from the General Post Office to the bridge is 138 feet, and the fall from the bridge to Arthur-street 52 feet. The rise by subway to Arthur-street is 200.7 feet, and the fall from the General Post Office to subway is 115 feet. See plan No. 3a.

*Roadway.*—Taking as common points the intersection of Grosvenor-street and Clarence-street, Sydney, and of Blue-street and Miller-street, North Sydney, the length via bridge is 1.88 miles and via subway 2.38 miles, i.e., half a mile less by bridge than by subway. The rise or fall between Grosvenor-street and the bridge is 95 feet, and between the bridge and Miller-street 90 feet. The fall from Grosvenor-street to subway is 161 feet, whilst the rise from the subway to Miller-street is 263 feet. On the city side the vehicular traffic rises or falls only 95 feet by bridge as against 161 feet by subway. On the North Sydney side the rise or fall is 90 feet by bridge, as against no less than 263 feet by subway.

The grades via the subway are 1 in 12 for 330 feet and 1 in 17 for 300 feet on the city side, and 1 in 17 for 3000 feet on the North Sydney side. The worst grade via the bridge is 1 in 18.5 for a length of 1700 feet on North Sydney side. See Plan No. 3a.

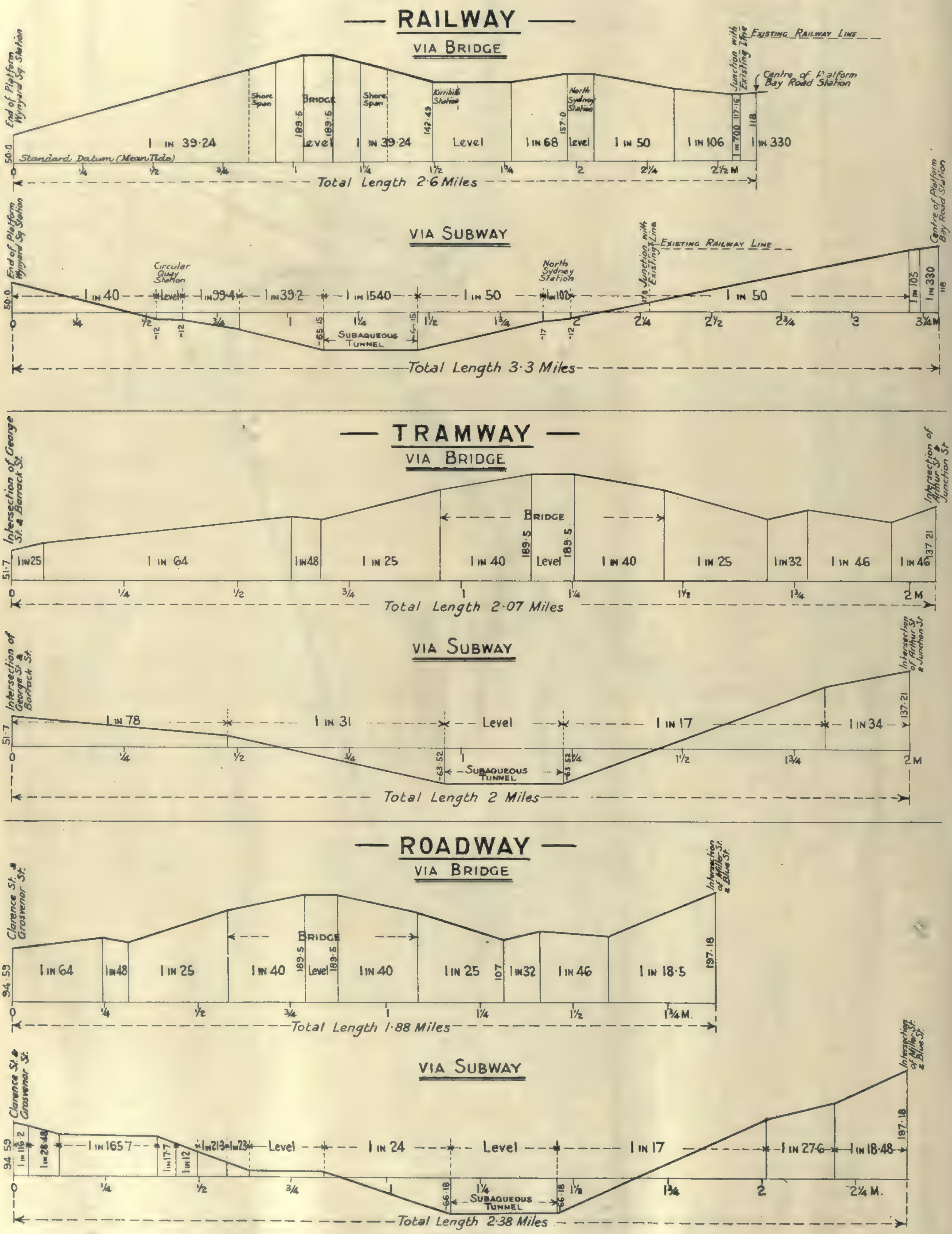
*Cost and Time of Completion.*—A bridge to accommodate four lines of railway, two of which may be used for tramway purposes, a 35ft. main roadway, an 18ft. motor roadway, and a 15ft. footway, is estimated to cost £2,750,000.

The bridge provides for railway connection from Wynyard Square to Bay-road Station, tramway connection from Wynyard



Plan 3—Location of Subways recommended by the Royal Commission on "Communication between Sydney and North Sydney."

# DIAGRAM SHEWING
# COMPARISON OF LENGTHS AND GRADES
## VIA BRIDGE AND VIA SUBWAY.



Plan No. 3A.

Square to the intersection of Alfred and Junction streets, North Sydney, and for roadway connection from Princes-street at Argyle-street, Sydney, to Alfred-street, North Sydney.

To provide equal facilities by subways there would be required:—

- One double track railway subway from Wynyard Square to Lavender Bay.
- One double track tramway subway from Circular Quay, Sydney, to Arthur-street, North Sydney.
- Three vehicular subways from Pottinger-street, Sydney, to Arthur-street, North Sydney.

Cost of Subways.

| | |
|---|---|
| Railway subway | £1,198,000 |
| Tramway subway | 537,000 |
| Roadway Subway (3 at £626,000 each) | 1,878,000 |
| Total | £3,613,000 |
| Cost of Bridge | 2,750,000 |
| Difference in favour of bridge | £863,000 |

The Royal Commission on "Communication between Sydney and North Sydney," in their report in 1909, stated: "Railway, tramway, and vehicular subways could be separately undertaken and completed independently of each other. With a bridge embracing similar facilities, the whole structure must be completed before any of the respective services would be available."

This argument does not hold with the location proposed by the author, as a bridge to carry suburban railway traffic only could be constructed, and later on, as required, one or more bridges constructed to carry tramway, vehicular and pedestrian traffic.

A suspension bridge, to carry a double line of suburban railway, could be constructed for about £1,400,000, whilst the railway subway would cost £1,200,000. The revenue, however, from the bridge would be about three times that derived from the subway.

The Detroit River Subway, constructed in a similar manner to the subways recommended by the Royal Commission on "Communication between Sydney and North Sydney," took nearly 4 years to complete. The contract was signed on August 1st, 1906, and the first train passed through on July 26th, 1910. Allowing for the difference in length, under the most favourable circumstances, a subway for a double line of railway could not be constructed across the Harbour in less than 2½ or 3 years.

A suspension bridge, carrying a double line of suburban railway, could be constructed in about the same time. The cables of the Brooklyn Bridge, opened in 1884, took 2 years to complete; the cables of the Williamsburg Bridge, opened in 1903, were constructed in 1 year; the cables of the Manhattan Bridge, opened in 1909, were constructed in 4 months. The cables of a suspension bridge across the Harbour to carry railway traffic only, would be smaller in section than those for the Manhattan Bridge, and should be easily constructed in 4 months. The towers and cables should be erected in 2 years, and when the cables are across, the work of completing the bridge would be a very simple matter.

*Ventilation, Noise, Drainage and Lighting.*—With a bridge the problems of ventilation, noise and drainage do not arise, and the lighting is confined to the night time.

Artificial ventilation can be successfully applied to the railway and tramway subways where electricity will be the motive power, but the successful ventilating of the roadway subways would present greater difficulties. The dampness and unpleasant odours from both horse and motor traffic could never be entirely eliminated; the cost of ventilation would be a constant annual charge.

In subways the noise caused by the traffic is very great, and lighting would be a constant source of expense.

All tunnels are more or less subject to leakage. The following table, taken from the Proceedings of the Institution of Civil Engineers, Vol. 185, page 90, gives the leakage in various subways:—

| Location. | River or Harbour. | Leakage in gallons per twenty-four hours per lin. foot single bore. |
|---|---|---|
| New York | North River Pennsylvania R.R. | 0.15 |
| Detroit | Detroit River | 0.85 |
| Boston | Harbour | 1.35 |
| New York | East River. Pennsylvania R.R. | 1.00 to 2.00 |
| Sarnia | St. Clair River | 2.46 |
| New York | East River Battery | 1.68 |
| New York | North River Hudson-Manhattan | 2.28 |

To the leakage in the subaqueous portion of the tunnel under Sydney Harbour would have to be added the seepage from the high ground on either shore. The leakage and seepage would have to be pumped out—a continual source of expense.

Mr. Hay reported: "In this connection I may mention the Blackwall and Rotherhithe tunnels under the Thames, two tunnels for vehicular traffic in London with which I am familiar. In these two cases the noise caused by the traffic and the difficulty in securing efficient ventilation, providing artificial light, drainage, etc., are highly detrimental factors."

The following extract from an article in the "London Magazine" by Mr. Foster Fraser is of interest:—

"There are several tunnels for carts and pedestrians under the Thames, and one morning I spent in traversing two of them, Blackwall and Rotherhithe. There is something majestic about the tunnels. What, however, impressed me as strange, both in the Blackwall tunnel, and later, as I walked back through the Rotherhithe tunnel, was how little either of the tunnels is used. Considering the millions of money spent in their construction, they seem almost deserted."

### OBSTRUCTION BY BRIDGE.

The bridge offers no obstruction whatever to shipping, except that the height of pole-masts is limited to 170 feet at high water.

The height of the masts of sailing ships, steam ships, and motor ships requires consideration.

*Sailing Ships.*—The following table gives the height of the masts of the largest sailing vessels which have traded to Sydney or Newcastle:—

| Vessel. | Tonnage. | Height from truck to load line. |
|---|---|---|
| Ship "S. D. Carlton" | 1788 | 187ft. |
| Four-masted barque "Ville du Havre" | 2446 | 187ft. |
| Ship "Great Admiral" | 1406 | 184ft. |
| Ship "Cumberland" | 1740 | 176ft. |
| Ship "Glenelvon" | 1890 | 175ft. |
| Ship "St. Nicholas" | 1688 | 168ft. |
| Ship "Cambuskenneth" | 1785 | 166ft. 6in. |
| Four-masted barque "Waterloo" | 1792 | 165ft. |
| Four-masted barque "Fort George" | 1608 | 164ft. |
| Barque "Melanope" | 1608 | 155ft. |
| Four-masted barque "Inverness-shire" | 2147 | 158ft. |

With a fixed headway of 170 feet some of these vessels would have had to strike their topmasts, but this could be done without much trouble, and is frequently done at sea.

Mr. J. McAusland Denny, of the firm of Denny Bros., shipbuilders, Dumbarton, Scotland, in giving evidence before the Royal Commission on "Communication between Sydney and North Sydney," stated that it might cost £5 to £10 to strike a mast, but the cost would not have to be paid by the authorities here. He considered 160 feet headway sufficient.

*Steamships.*—On July 1st, 1912, there were 7564 steam ships of 2000 tons and over, registered at Lloyds; of these, three only require consideration, viz., the "Lusitania," "Mauretania" and "Olympic." The masts of the "Lusitania" and "Mauretania" are 175 feet above water level when flying light, but as there would always be some cargo and coal in these steamers, they could pass under the bridge. The "Olympic," whose masts are 202 feet high, would require telescopic masts to pass under the bridge. This year the "Imperator" and "Aquitania," with masts about 210 feet above water level, will be in commission, and would also require telescopic masts.

The "Ceramic," "Nestor," "Otway," "Medina," "Mongolia" and "Kanowna" are the largest oversea and inter-State steamships trading to Sydney; all of these could pass under the bridge without telescopic masts. The heights of their masts above load line is as follows:—"Ceramic," 162 feet; "Nestor," 152 feet 8 inches; "Otway," 137 feet; "Medina," 137 feet; "Mongolia," 137 feet; "Kanowna," 129 feet.

Mr. Denny stated in evidence: "In connection with steamers, we build ships with what are called telescopic masts; for example, vessels trading to New Zealand for the New Zealand Shipping Company not only have telescopic masts, but also removable tops on their funnels."

*Motor Ships.*—Ships driven by Diesel oil engines are now being constructed. In the future motor ships may displace steam ships, as steam ships have displaced sailing ships, though it will be difficult to surpass the efficiency of the marine steam engine.

The greater space available for cargo, the lesser cost of the stokehold staff, and other advantages, may make motor ships more economical than steam ships. If so, the tendency will be for masts to diminish in height, as the altitude of the wireless apparatus will be determined by the height of the boat deck, and not by the height of the tops of the funnels, as is to some extent the case at present.

One of the largest motor ships afloat, the "Selandia," of 10,000 tons, is about the size of the mail steamers trading to Sydney; her masts are about 120 feet above water, or 17 feet lower than those of the mail steamers trading here

*Wireless Telegraphy.*—For effective maritime working the aerials of the wireless apparatus require to be about 70 feet above the operating room, which is usually placed on the boat deck. It is this height, aerials to operating room, which affects the efficiency of the plant. A height greater than 70 feet does not give consistently better results. This height, 70 feet, will give a night range of 1750 miles at least with a 2-kilowatt plant—the maximum power allowed in the vicinity of land stations.

The Australian Wireless Company and the Marconi Company, Australia, were asked by the Department whether a headway of 140 feet above water level would be ample provision to make for the aerials for all time.

The Resident Engineer of the Marconi Company, Mr. Fisk, replied, "I think 160 feet would be a much safer estimate; but it might be possible for ships requiring aerials of greater height to make use of telescopic masts. I do not foresee any difficulty in this, so far as the wireless telegraphic apparatus is concerned."

The technical superintendent of the Australian Wireless Company, Mr. Leverrier, replied: "If the aerials are not less than 70 feet above the operating room (boat deck), then 140 feet above water level is ample."

Mr. Leverrier also stated that the average height of the aerials above sea level when a ship is loaded is 115 feet, though he had installed the aerials on four steamers at a height of 130 feet above sea level.

Mr. Hay made inquiries in London from the Marconi Company, and discussed the matter with Captain Sankey, R.E., a director of the company.

Mr. Hay reports: "I understand there is no doubt whatever that 170 feet would clear all except such vessels as the "Olympic" and some of the larger battleships of the British navy. The latter are fitted with telescopic masts, and there would be no difficulty in so equipping any vessel wishing to trade with Sydney."

*Headway Under Existing Bridges.*—The headway under existing bridges is as follows:—

| | | Headway. |
|---|---|---|
| Brooklyn Bridge .... | East River, New York .. . | 135ft. |
| Williamsburg Bridge .. | East River, New York .. . | 135ft. |
| Manhattan Bridge .... | East River, New York .. . | 135ft. |
| Queensboro Bridge.. .. | East River, New York .. . | 135ft. |
| Forth Bridge ........ | Firth of Forth, Scotland.. . | 150ft. |
| Quebec Bridge in course of construction .... | St. Lawrence River, Quebec . | 150ft. |

Two important bridges have been recently proposed, viz., a suspension bridge for road traffic across the Mersey connecting Liverpool and Birkenhead, headway proposed 150 feet, and a suspension bridge to carry railway and road traffic across the Hudson River, New York, headway proposed 170 feet.

## OBSTRUCTION BY SUBWAYS.

The subways recommended by the Royal Commission on "Communication between Sydney and North Sydney" in 1909 provided for a depth of 40 feet of water at low tide above the tops of the subways. The top of the railway subway would be above the bed of the harbour for more than one-third of its length —in places, 15 feet above the bed. The tops of the tramway and roadway subways would be above the bed of the harbour for nearly the full distance across, and in places would be 27 feet above the bed. Silting and scour would inevitably be caused thereby.

In 1881 the maximum draught of the largest steamships afloat was 24 feet; at present it has increased to 35 feet.

To increase the draught of vessels beyond 35 feet would necessitate extensive alterations to existing harbours; still it is impossible to forecast what the draught of vessels will be 20 years hence. Should circumstances require the draught to be increased, the depth of harbours will have to be increased accordingly, and, judging by the past, the draught will increase.

In the Culebra Cut—the most expensive work in the Panama Canal—the depth of water is 45 feet. The tunnels constructed under the Hudson River, New York, have a minimum depth of 70 feet of water from mean sea-level to top of tunnel, whilst those under the East River, New York, have a minimum depth of 79 feet of water from mean sea level. These rivers accommodate the largest vessels afloat.

The Suez Canal has largely controlled the draught of vessels trading to Sydney, but with the advent of boats trading via the Cape, the draught of vessels has increased. In 1912 the deepest laden merchant vessel left Sydney with a draught of 29 feet; this year the "Ceramic" has a loaded draught of 34 feet 6 inches, and the "Nestor" of 32 feet 10 inches.

A depth of 40 feet at low water over the top of the subway was adopted by the Royal Commission on "Communication between Sydney and North Sydney." Allowing for "squat" when under weigh and 2 feet of water under the keel, this would limit the draught of vessels to about 37 feet at low water.

As it is impossible to forecast what the draught of vessels will be in the future, it would not be advisable to construct a concrete steel bar across the Harbour limiting the depth of water to 40 feet at low water for all time by constructing subways. The harbour can be deepened to 60 feet and over right up from the Heads. A depth of 45 feet at least is advisable, preferably 50 feet, as it is possible that vessels which could pass over the subway with 40 feet of water in normal conditions may require to be taken up to the docks and repair shops when disabled and partly sunken, and would require a greater depth than 40 feet.

Dr. Corthell, in his report to the 11th International Congress of Navigation, Philadelphia, 1912, considers provision should be made for ships 1100 feet long, 110 feet beam, and 40 feet draught, requiring a depth of water of at least 45 feet.

To quote Dr. Corthell: "The size of merchant ships is determined by the inexorable laws of commerce, trade, economy of transportation, and the demands of passengers for room and comfort."

"The Panama Canal provides for a depth of 45 feet at the lock entrances; the German Government has radically enlarged the Kaiser Wilhelm Canal, providing a minimum depth of water of 45 feet at the lock entrances."

"The Port of London authority has recently decided that the entrance locks of the enlargements proposed shall be as follows:—

For the South Albert Dock—850 feet long, 110 feet wide, and 48 feet deep on the sills.

For the North Albert Dock—1000 feet long, 120 feet wide, and 52 feet deep on the sills.

For Tilbury Docks—1050 feet long, 130 feet wide, and 55 feet deep on the sills, with means of extending the lock to take vessels 1250 feet long, by the use of a caisson at the inner end."

Regarding the Suez Canal, Dr. Corthell "believes that within a few years this canal will necessarily have to be deepened, in order to retain its traffic, to 13 meters (42.6 feet) at least, allowing for a draught of 12 meters (39.4 feet), with corresponding width to allow for the passage, in two lines, of vessels of 25,000 tons. Note the gradual and evidently reluctant concessions to the steamships in the matter of draught. The company authorised in 1869, 24.6 feet draught; 1890, 25.5 feet; 1898 it widened the canal from 72 feet to 121 feet; 1902, 26.2 feet draught was authorised; 1906, 26.3 feet; 1908, 28 feet, the canal having been deepened to 31.2 feet, and 28 feet was the authorised draught in January, 1911."

The Suez Canal Company requires a vessel to have at least 3 feet of water under her keel. A vessel with a certain draught requires more water when under weigh than when stationary at a wharf. The following observations of the S.S. "Mauretania," made by Mr. Henry N. Babcock, U.S. Assistant Engineer, New York, are interesting. The conditions and results are given following, the general rule being based mostly on forty observations made in 1904:—

Due to leave pier .......................... 9 a.m.
Passed Robbin's Reef—Bow ........ 9.41.22 a.m. } 30 sec.
Stern........ 9.41.52 a.m. }
Passed Romer Light House—Hour not reported.... 30 sec.
Length overall 790ft.—Flood current at Robbin's Reef .. 1 mile
Flood current at Romer........ 0.5 mile
Speed passing Robbin's Reef, 17.4 stat. miles; speed through water, 18.4 miles.

| | M.L.W. depth. | Tide. | Wind. | Sea. |
|---|---|---|---|---|
| At Robbin's Reef .. .. | 40 | 5.0 | Light N.W. | 0.3 |
| At Romer .. .. .. .. | 45 | 5.0 | 0 | 0 |

Observed Draught.

| | At Pier. | At Robbin's Reef. | At Romer. |
|---|---|---|---|
| Forward .. .. | 34.75 | 37.6 | 38.6 |
| Aft .. .. .. .. | 34.75 | 38.6 | 39.4 |

"Density of sea water at Romer would tend to make draught about 0.1 to 0.2 less than at pier.

"The observations generally show that the amount of 'squat' increases:

1. Inversely with depth of water under the keel.
2. Directly with speed.
3. Directly with fineness of ship's lines.

"I have not yet been able to get any definite ratio of variations, other than the crude one (gotten up for pilots) that when a ship is near the bottom, her squat in feet may be about one-fifth of her speed in statute miles per hour.

"The sinking of the ship was equal to 4.65 feet (1.41m.) at Romer, with about 15 feet (4.6m.) under her keel, when stationary."

If subways are constructed, a depth of at least 45 feet of water is advisable—preferably 50 feet. Subways at this latter depth are not likely to limit the draught of vessels in the future, or obstruct the harbour in any way, but the grades for railway, vehicular, and pedestrian traffic would be worse than those proposed by the Royal Commission in 1909, and consequently the working expenses greater.

### BRIDGE OR SUBWAY?

The foregoing facts and figures show:—

(1) Railway communication by bridge is unquestionably better than railway communication by subway.

(2) The tram via bridge would serve the population much better and the revenue would be greater than by subway, whilst the working expenses on account of the better grades would be less by bridge than by subway.

(3) The vehicular and pedestrian traffic would be very much better served by bridge than by subway.

(4) The bridge would produce more revenue than subways. For the year 1911 the estimated revenue from railway traffic only was £63,550 for bridge, and £22,323 for subway. With a toll for vehicular traffic, the bridge would produce a much greater revenue than a vehicular subway.

(5) Subways to provide the same accommodation as the bridge would cost £863,000 more than the bridge.

(6) Railway, tramway and vehicular subways could be separately undertaken and completed independently of each other. At the location chosen, bridges could likewise be undertaken separately. A bridge for suburban railway traffic only would cost about £200,000 more than a subway; it would, however, produce nearly three times the revenue and could be constructed in about the same time as the subway.

(7) Ventilation, drainage and lighting, ever present with subways, are highly detrimental factors, and a continual source of expense. Subways must of necessity be noisy.

(8) The bridge does not obstruct the waterway in any way, or restrict the draught of vessels; it limits the height of pole masts to 170 feet at high water.

(9) Sailing ships are becoming fewer each year, and it is easy to strike the top masts.

(10) All steamships trading to Sydney at present could pass under the bridge. In the future larger steamers will trade to Sydney, but such vessels can be constructed with masts not exceeding 170 feet in height or with telescopic masts.

(11) Motor ships may replace steam ships; if so the tendency will be to reduce the height of masts.

(12) Wireless authorities agree that a headway of 170 feet will be ample for all time, and that masts can be made telescopic if necessary.

(13) Other ports have found it necessary to erect bridges. The headway fixed for the Sydney Harbour Bridge is greater than that provided under any bridge already constructed, whilst the most recent bridge proposed across the Hudson River, New York—one of the most important ports of the world—provides for the same headway as contemplated at Sydney.

(14) The subways recommended by the Royal Commission would restrict the draught of vessels to about 37 feet at low water.

(15) It is possible to construct subways which would provide a depth of 50 feet or more of water; such subways are not likely ever to limit the draught of vessels or interfere with the harbour in any way, but the cost would be greater, and the facilities, for the railway, tramway, vehicular and pedestrian traffic would be worse than with the subways compared with the bridge.

A careful study indicates conclusively that a bridge is the best means of connecting Sydney with North Sydney; it will not obstruct the commerce of the port, will be cheaper than subways, and will afford much better facilities for the railway, tramway and vehicular traffic.

Mr. David Hay, of London, reported "From an engineering and utilitarian standpoint, he considered a bridge would be the best means of connecting Sydney and North Sydney, and that the best and shortest route was the one chosen by Mr. J. J. C. Bradfield in placing his scheme for a one-span bridge before the Public Works Committee."

### IS A BRIDGE NECESSARY?

The Metropolitan area may be divided into the City of Sydney, the suburbs south of the Harbour, and the suburbs north of the Harbour. The following figures, prepared by Mr. H. A. Smith, Acting Government Statistician, show the population of these divisions at each census since the year 1881, and what the population is estimated to reach in the years 1921 and 1931.

TABLE 1.

Density of population, and the number of persons per acre as shown by the Census taken in 1881 and by each subsequent Census.

| Division. | Area in acres. | Census, 3rd April, 1881. Pop. | Persons per acre. | Census, 5th April, 1891. Pop. | Persons per acre. |
|---|---|---|---|---|---|
| City of Sydney .. .. .. .. | 3,327 | 105.901 | 31.83 | 118,358 | 35.57 |
| Suburbs South of Harbour .. | 65,980 | 107.423 | 1.63 | 238,362 | 3.61 |
| Suburbs North of Harbour .. | 48,992 | 14,835 | 0.30 | 32.038 | 0.65 |
| Total, Metropolis.. .. .. .. | 118,299 | 228,159 | 1.93 | 388,758 | 3.29 |

| Division. | Area in acres. | Census, 31st March, 1901 Pop. | Persons per acre. | Census, 2nd April, 1911. Pop. | Persons per acre. |
|---|---|---|---|---|---|
| City of Sydney .. .. .. .. | 3,327 | 126,138 | 37.91 | 119,771 | 36.00 |
| Suburbs South of Harbour .. | 65,980 | 312,907 | 4.74 | 421,162 | 6.38 |
| Suburbs North of Harbour .. | 48,992 | 53,364 | 1.09 | 95,416 | 1.99 |
| Total, Metropolis .. .. .. .. | 118,299 | 492,409 | 4.16 | 636,349 | 5.38 |

TABLE 2.

Total increase and the proportional increase in population between each Census 1881-1911.

| | Increase during Decade. 1881-1891. | | 1891-1901. | | 1901-1911. | |
|---|---|---|---|---|---|---|
| City of Sydney .. .. .. .. | 12,457 | 11.8 | 7.780 | 6.6 | —6,367 | —5.0 |
| Suburbs South of Harbour | 130,939 | 121.9 | 74,545 | 31.3 | 108,255 | 34.6 |
| Suburbs North of Harbour | 17,203 | 116.0 | 21,326 | 66.6 | 42,052 | 78.8 |
| Metropolis .. .. .. .. .. | 160,599 | 70.4 | 103,651 | 26.7 | 143.940 | 29.2 |

| | Increase per cent. per annum. 1881-1891. | 1891-1901. | 1901-1911. |
|---|---|---|---|
| City of Sydney .. .. .. .. .. | 1.12 | 0.64 | — .52 |
| Suburbs South of Harbour .. .. .. | 8.30 | 2.76 | 3.02 |
| Suburbs North of Harbour .. .. .. | 8.00 | 5.23 | 5.98 |
| Metropolis .. .. .. .. .. .. .. .. | 5.47 | 2.39 | 2.60 |

From these tables it will be seen that the population of the Metropolis as a whole increased 70.4 per cent. between 1881 and 1891, or at the rate of 5.47 per cent. per annum; by 26.7 per cent. between 1891 and 1901, or at the rate of 2.39 per cent. per annum; and by 29.2 per cent. between 1901 and 1911, or at the rate of 2.60 per cent. per annum.

During the next ten years the annual rate of increase should be much more favourable. As bearing on the probable growth of population in the Metropolis in the near future, in 1911 the increase in the population of the State exceeded 55,000—being the greatest increase in any year ever recorded. During the five years immediately preceding 1911 the average annual increase was slightly over 33,000.

### FUTURE POPULATION.

Assuming that the population of the Metropolitan area increases at the rates of 3 per cent., 3½ per cent. and 4 per cent. per annum, the population will probably be distributed as shown by Table 3.

TABLE 3.

In Year 1921.

| | 3 p.c. p.a. | 3½ p.c. p.a. | 4 p.c. p.a. |
|---|---|---|---|
| In City .. .. .. .. .. .. | 120,000 | 120,000 | 120,000 |
| In Suburbs Sth. of Harbour | 588,100 | 622,100 | 657,500 |
| In Suburbs Nth. of Harbour | 147,100 | 158,500 | 164,600 |
| Metropolis .. .. .. .. .. | 855,200 | 897,600 | 942,100 |

| | | | |
|---|---|---|---|
| | In Year 1931. | | |
| In City | 120,000 | 120,000 | 120,000 |
| In Suburbs Sth. of Harbour | 805,100 | 897,100 | 997,800 |
| In Suburbs Nth. of Harbour | 224,200 | 249,100 | 276,500 |
| Metropolis | 1,149,300 | 1,266,200 | 1,394,300 |

The earliest date the bridge could be completed would be about the year 1921. The Acting Government Statistician estimates under present conditions, i.e., without the bridge, the population of the suburbs north of the Harbour of 95,416 in 1911 will, by the year 1921 have increased to a number between 147,100 and 164,600. In other parts of the world statistics show that the number of passengers carried by any service increases more rapidly than the population increases. In the Annual Report of the Public Service Commission, First District State of New York, 1910, Vol. 3, Page 22, is an account of an investigation and discussion which indicates that the number of passengers increases as the square of the population.

The ferry service is somewhat congested now during the busy hours of the day; before the bridge can be opened for traffic it will have to cope with at least double the number of passengers, and the time has arrived when the construction of the bridge must be seriously considered.

## THE SERVICES TO BE TAKEN ACROSS THE HARBOUR.

The various schemes for linking Sydney with North Sydney provide either wholly or in part for railway, tramway, vehicular, and pedestrian traffic to be taken across the Harbour. The bridge recommended by the Advisory Board, and the subways recommended by the Royal Commission on "Communication between Sydney and North Sydney" provided for all these services.

The Chief Commissioner for Railways and Tramways, Mr. T. R. Johnson, in giving evidence before the above Royal Commission in 1908, stated that the tramway should not be taken across the Harbour, but that North Sydney should be developed by a system of electric railways to which the tramways should be feeders, and that if a bridge were to be built, provision should be made for four lines of electric suburban railway. The Chief Commissioner also stated that goods traffic would not be taken across the bridge, as other arrangements had been made.

The Royal Commission did not act on the Chief Commissioner's advice, but recommended that the tramway should be the first service to be taken across the Harbour by subway.

The railway proposed by the author and shown by Plan No. 13 would serve North Sydney better than a tramway could, as the travelling public would be transported more quickly and in greater numbers to and from the city and at much less cost than by a tramway service. For the seven years ending June 30th, 1913, the average percentage of working expenses to earnings for the railways, including all non-paying railways and every class of passenger and goods traffic, was 60.08, whilst for the same period for the tramways the average percentage of working expenses to earnings was 82.91. With an electric railway service the ratio of working expenses to earnings would be about 50 per cent., or 32.9 per cent. cheaper than the average for the tramway service for the past seven years.

When roadway communication is brought about either by bridge or subway, there will be a large increase in the vehicular traffic. With bridge connection, on account of the great facilities afforded, the increase will be much more marked than with subway connection. Again, when the hinterland on the northern side of the Harbour is developed—and it is capable of almost unlimited expansion—the vehicular traffic will become very great. At least six lines of vehicular traffic should be provided for, necessitating a roadway width of at least 53 feet.

The pedestrian traffic across the Harbour will always be small, as the least distance to be traversed is 1¼ miles; one footway 15 feet wide should give ample accommodation for the ordinary pedestrian traffic. On special holidays the motor roadway could be used for pedestrian traffic.

A bridge to adequately meet future requirements should provide for a main roadway 35 feet wide for the heaviest vehicular traffic, a roadway 18 feet wide for light motor-car and bicycle traffic, a footway 15 feet wide, and for four lines of suburban electric railway. In the future it may be found necessary to take long distance railway traffic across the bridge, and therefore the two western railway tracks should be also designed to carry heavy electric locomotive traffic. There may eventually be a light goods traffic to and from North Sydney, Mosman, Manly and Narrabeen, and each of the four tracks should be able to carry this class of traffic.

## LOADING.

One of the most important factors in the design of the bridge is the loading to be adopted; reasonable provision must be made for future requirements.

*Long Distance Railway Traffic.*—For this traffic the two western tracks of the bridge will be designed to carry a conventional train 615ft. long, consisting of an electric locomotive 65ft. long, weighing 160 tons, and cars for a length of 550ft., weighing 2000 lb. per foot, as shown by Plan No. 4.

The reasons for adopting this loading will now be given:

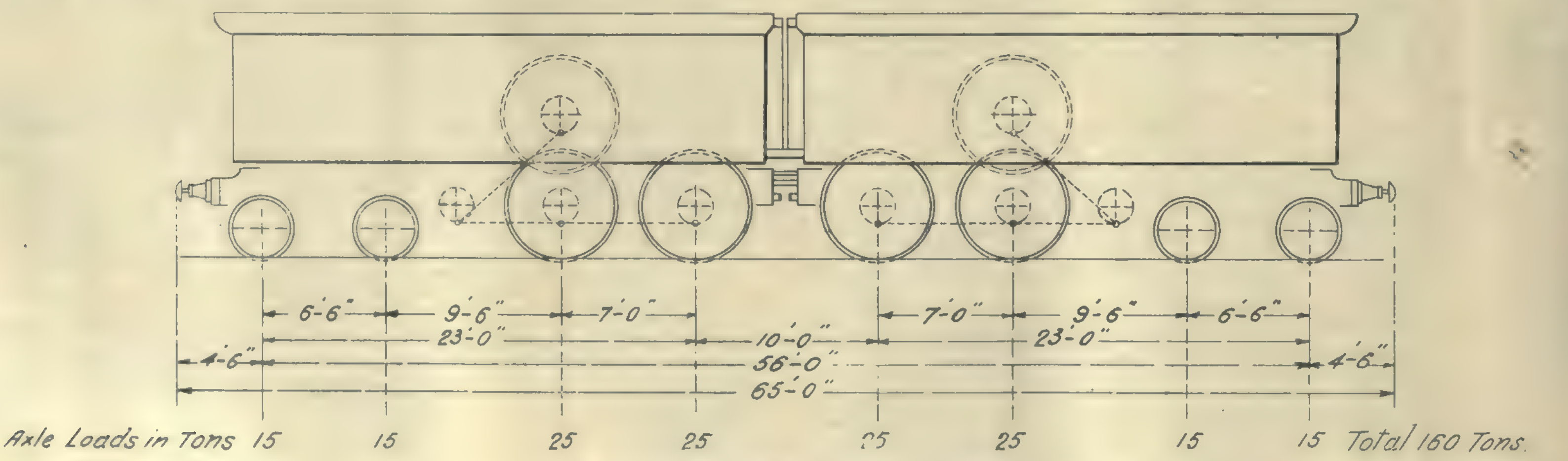
Ordinary long distance trains in New South Wales, consisting of lavatory box cars, weigh 1100 lb. per foot run loaded. The heaviest long distance trains, consisting of sleeping cars with mail van, weigh 1300 lb. per foot run loaded. The above cars are constructed of wood, but in the future it is likely that steel cars will be used, as in America.

The heaviest cars in use in New South Wales are lighter per foot run than the corresponding cars in the United States, which average about 1570 lb. per foot loaded. A comparison of typical American wood and steel cars is given by Table 4, whilst Table 5 shows the heaviest types of modern steel cars for passenger traffic.

TABLE 4.
COMPARISON OF STEEL AND WOODEN CARS.
(Mentioned in Report by the Master Car Builders Convention at Atlanta City.)
(Electric Railway Journal, June 27, 1908, Vol. xxxii.)

| Class or No. | Road. | Material. | Length over body. ft. | Seating capacity. | Weight. | Weight per passenger. | Weight per foot of body. |
|---|---|---|---|---|---|---|---|
| 290-295 | Lehigh Valley | Wood | 70.00 | 77 | 118,000 | 1532.4 | 1685.7 |
| 1015-51 | Frisco | ,, | 70.00 | 80 | 106,200 | 1327.5 | 1517.1 |
| P.L. | Pennsylvania | ,, | 70.00 | 80 | 106,000 | 1325.0 | 1514.2 |
| 1st class | N.Y.C. Lines | ,, | 61.00 | 76 | 92,800 | 1221.0 | 1521.3 |
| P.K. | Pennsylvania | ,, | 53.75 | 62 | 85,000 | 1370.9 | 1581.4 |
| | Average Wood | | 64.95 | 75 | 101,600 | 1355.4 | 1564.0 |
| P-70 | Pennsylvania | Steel | 70.75 | 88 | *116,100 | 1319.3 | 1640.9 |
| Coach | Southern Pacific | ,, | 60.00 | 70 | †107,000 | 1528.5 | 1783.3 |
| Coach | Union Pacific | ,, | 68.00 | 78 | †89,300 | 1144.8 | 1313.2 |
| | Average Steel | | 66.25 | 78.6 | 104,133 | 1331.0 | 1579.2 |

*Includes storage batteries.
†Includes storage batteries and axle generator.



Plan 4—Long Distance Railway Loading.

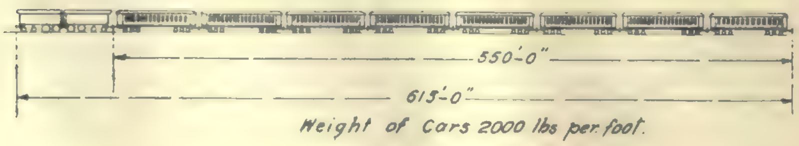


TABLE 5.

MODERN STEEL CARS FOR LOCOMOTIVE SERVICE

(1). Day Coaches for Locomotive Service.

| Railway. | Details of Car. Length over buffers, ft. in. | No. Passengers seated. | Weight empty, lbs. | Weight loaded, pass., 150 lb. lbs. | Weight per foot empty, lbs. | Weight per foot loaded, lbs. | Reference. |
|---|---|---|---|---|---|---|---|
| Pennsylvania R. R. | 80 3⅜ | 88 | 113,500 | 126,700 | 1413 | 1578 | Engineering News, June 20, 1907. |
| Southern Pacific R. | 66 4 | 70 | 107,000 | 117,500 | 1613 | 1771 | Engineering News, Sept. 3, 1908. |
| Union Pacific R.R. | *68 0 | 78 | 89,300 | 101,000 | †1313 | †1485 | Engineering News, Sept. 3, 1908. |
| Southern Rly., U.S.A. | 74 6 | 74 | 110,000 | 121,100 | 1476 | 1625 | Engineering News, Sept. 3, 1908. |
| Long Island R.R. | 67 4 | 72 | 94,500 | 105,300 | 1403 | 1564 | Engineering News, Sept. 3, 1908. |
|  |  |  |  |  | Average. | 1605 |  |

(2). Postal Cars for Locomotive Service.

| Railway. | Details of Car. Length over buffers, ft. in. | To carry tons. | Weight empty, lbs. | Weight loaded, lbs. | per foot empty, lbs. | per foot loaded, lbs. | Reference. |
|---|---|---|---|---|---|---|---|
| Pennsylvania R. R. | 74 9¾ | †25 | 128,500 | †184,500 | 1718 | †2466 | Engineering News, Sept. 3, 1908.<br>Engineering News, June 20, 1907. |
| Southern Pacific R. | 63 0 | †20 | 119,800 | †164,800 | 1901 | †2613 | Engineering News, Sept. 3, 1908. |

(3). Baggage Cars for Locomotive Service.

| Railway. | Length over buffers, ft. in. | To carry | Weight empty, lbs. | Weight loaded, lbs. | per foot empty, lbs. | per foot loaded, lbs. | Reference. |
|---|---|---|---|---|---|---|---|
| Pennsylvania R.R. | *70 0 | 60,000 lb. | 120,000 | 180,000 | †1600 | †2400 | Engineering News, June 20, 1907. |
| Pennsylvania R.R. | *60 10⅛ | 40,000 lb. | 91,000 | 131,000 | †1400 | †2010 | Engineering News, June 20, 1907. |

*Length over end sills exclusive of vestibules. †Approximate.

From Table 5 it will be seen that the heaviest passenger cars weigh 1771 lb. per foot loaded, whilst baggage and mail cars reach 2613 lb. per foot when fully loaded. A train made up of steel cars, sleepers, day coaches, baggage and mail cars and guard's van would weigh, when loaded, about 1800 lb. per lineal foot.

To allow for the heaviest probable passenger traffic, a train 550ft. long, weighing 2000 lb. per foot, has been adopted. This loading is much in excess of the requirements of the long distance traffic in this State at the present time.

To forecast the type of electric locomotive which will be used is, of course, impossible; locomotives differing in power, weight, and wheel spacings will pass over the bridge. Some of these locomotives must be suitable for hauling fast long-distance passenger traffic and light goods traffic.

The leading considerations in drawing up a conventional locomotive for the purposes of design may be summarised as follows:—

(1) The adhesive weight must be sufficient to handle the maximum train on the sharpest curves on the ruling grade.

(2) The total weight must be sufficient to allow the electrical equipment to develop the maximum power demanded.

(3) The conventional locomotive must be suitable for the sharpest curves and the greatest speeds that will be required.

(4) The conventional locomotive should allow other types of equal power and adhesion to pass over any part of the bridge without increase of stress.

The ruling grade will be about 1 in 39, with curves of 8 chains radius; and the author considered that the locomotive should be sufficiently powerful to accelerate up to 20 miles per hour with the maximum train under the above conditions of grade and curve.

On starting, the train resistance will be approximately 2.5 lb. per ton. The grade resistance will be 20 x rate of grade per cent.

A grade of 1 in 39 = 2.57 per cent.

Grade resistance = 20 × 2.57 = 51.4 lb. per ton.

Curve resistance will depend on the rigid wheel base of the cars. This is assumed at 10ft.

Raymond's formula for curve resistance is:—

$$R_c = .4 + (.21 + .035 \times a)\ D,$$

where a = rigid wheel base = 10ft. (assumed).

D = curvature in degrees,

$$D = \frac{5730}{8 \times 66} = 10.8.$$

Thus $R_c = .4 + (.21 + .035 \times 10)\ 10.8 = 6.5$ lb. per ton.

Total resistance at very slow speed:

= 2.5 + 51.4 + 6.5 = 60.4 lb. per ton.

Weight of train, 550ft. at 2000 lb. per foot = 550 short tons.

A locomotive weighing 180 short tons, i.e., 360,000 lb., has been assumed.

Total weight of train = 550 + 180 = 730 short tons.

Tractive effort required to move this train at slow speed = 730 × 60.4 = 44,092 lb.

The tractive effort required to pull the train at a speed of 20 miles an hour will be greater owing to greater train resistance.

The train resistance, at a speed of 20 miles per hour, is as follows:—

Baldwin formula. $R = 3 + \frac{S}{6} = 6.33$ lb. per ton.

Engineering News. $R = 2 + \frac{S}{4} = 7.00$ lb. per ton

where R = resistance in pounds per ton of 2000 lb.
S = speed in miles per hour.

An average train resistance of 6.5 lb. per short ton has been taken.

The total train resistance at 20 miles per hour is, therefore, = 6.5 + 51.4 + 6.5 = 64.4 lb. per short ton.

Total resistance of the conventional train—

= 64.4 × 730 = 47,012 lb.

The available tractive effort of the locomotive must not be less than about 47,012 lbs. Owing to steady torque, the adhesive tractive effort of an electric locomotive is about one-quarter the weight on driving wheels on clean dry rails, and to maintain a speed of 20 miles per hour around 8 chain curves on the ruling grade, the weight on the driving wheels should be at least 4 × 47,012 = 188,048 lb.

To accelerate up to this speed under these conditions, a driving axle load of 100 tons or 224,000 lb. has been adopted, the adhesive tractive effort of which is 224,000 ÷ 4 = 56,000 lb.

To move the conventional train at a very slow speed, the tractive effort required is 44,092 lb.; a margin of 56,000 lb. — 44,092 lb., i.e., 11,908 lb. is, therefore, provided. This is equivalent to 11,908 ÷ 730 = 16.3 lb. per short ton for accelerating.

To maintain a speed of 20 miles per hour the tractive effort required is 47,012 lb.; a margin of 56,000 lb. — 47,012 lb., i.e., 8988 lb. is, therefore, provided, equivalent to a margin of 8988 ÷ 730 = 12.3 lb. per short ton.

It is evident, therefore, that the adhesive weight adopted is sufficient for hauling the maximum train around curves of 8 chains radius on a grade of 1 in 39.

The next requirement to be fulfilled is that the total weight must be sufficient to allow the electrical equipment to develop the maximum power demanded.

The net power demanded around the sharpest curve on the ruling grade to maintain a speed of 20 miles an hour is

$$\frac{47{,}012}{33{,}000} \times \frac{20 \times 5280}{60} = 2500 \text{ H.P.}$$

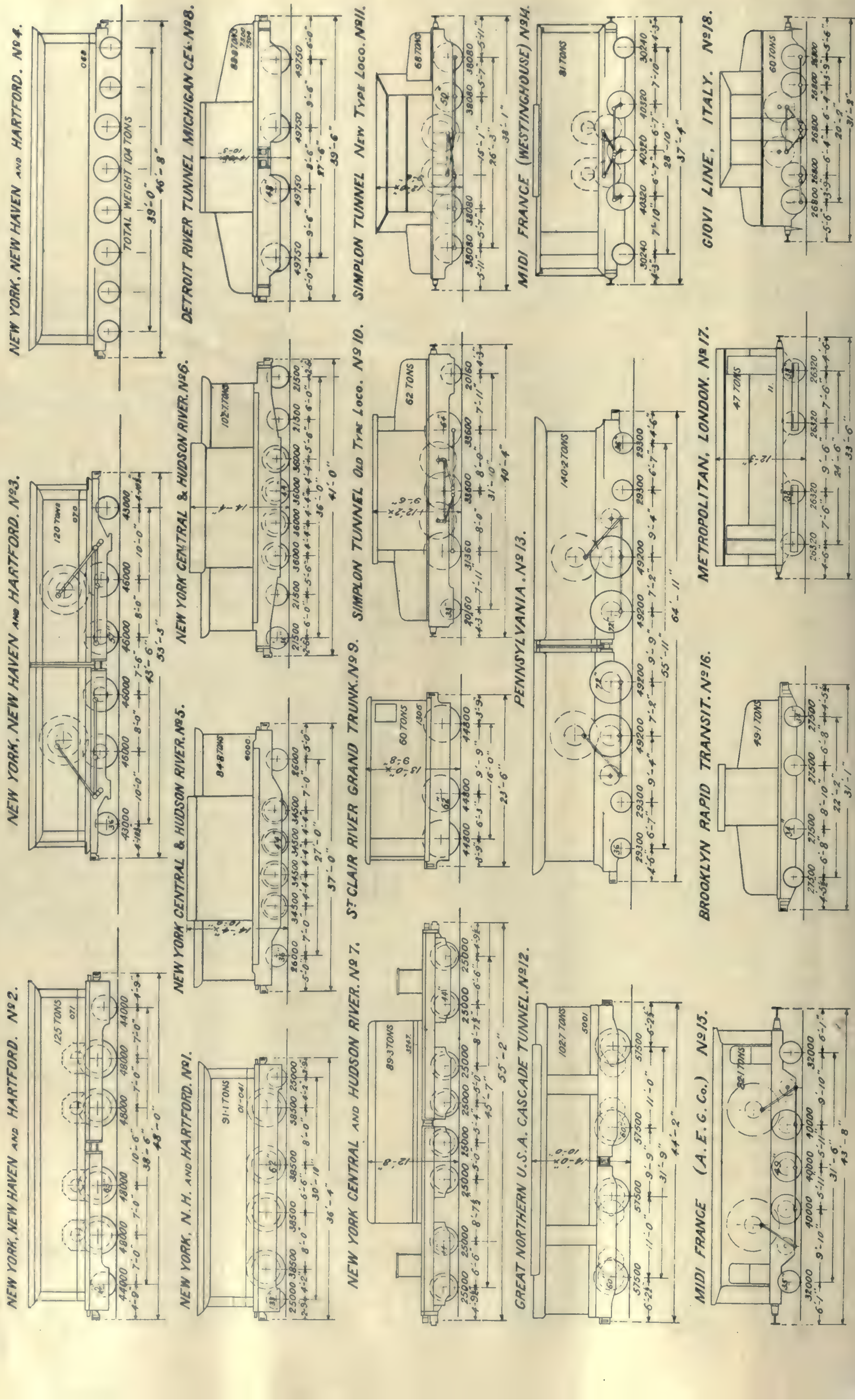
The power required to maintain a speed of 60 miles per hour on a straight level track is 1986 H.P.

Train resistance $= 2 + \frac{S}{4} = 17$ lb. per ton.

Total resistance, 17 × 730 = 12,410 lb.

Horse-power required $\frac{12{,}410 \times 5280 \times 60}{33{,}000 \times 60} = 1986$ H.P.

# TYPICAL ELECTRIC LOCOMOTIVES


NEW YORK, NEW HAVEN AND HARTFORD. Nº 4.
TOTAL WEIGHT 104 TONS
39'-0"
46'-8"
NEW YORK, NEW HAVEN AND HARTFORD. Nº 3.
120 TONS
53'-3"
NEW YORK, NEW HAVEN AND HARTFORD. Nº 2.
125 TONS
48'-0"
DETROIT RIVER TUNNEL MICHIGAN CEL. Nº 8.
39'-6"
NEW YORK CENTRAL & HUDSON RIVER. Nº 6.
102·7 TONS
41'-0"
NEW YORK CENTRAL & HUDSON RIVER. Nº 5.
84·87 TONS
37'-0"
NEW YORK, N.H. AND HARTFORD. Nº 1.
91·1 TONS
36'-4"
SIMPLON TUNNEL NEW TYPE LOCO. Nº 11.
68 TONS
38'-1"
SIMPLON TUNNEL OLD TYPE LOCO. Nº 10.
62 TONS
40'-4"
ST CLAIR RIVER GRAND TRUNK. Nº 9.
60 TONS
29'-6"
NEW YORK CENTRAL AND HUDSON RIVER. Nº 7.
89·3 TONS
55'-2"
MIDI FRANCE (WESTINGHOUSE) Nº 14.
81 TONS
37'-4"
PENNSYLVANIA. Nº 13.
140·27 TONS
64'-11"
GREAT NORTHERN U.S.A. CASCADE TUNNEL. Nº 12.
102·7 TONS
44'-2"
GIOVI LINE, ITALY. Nº 18.
60 TONS
31'-8"
METROPOLITAN, LONDON. Nº 17.
47 TONS
33'-6"
BROOKLYN RAPID TRANSIT. Nº 16.
49·1 TONS
31'-1"
MIDI FRANCE (A.E.G. Co.) Nº 15.
43'-8"

Plan 5—Typical Electric Locomotives.

## TABLE No. 6.

## DETAILS OF TYPICAL ELECTRIC LOCOMOTIVES.

| Company or Railway. | Service. | Wheels. | Horse power of motors Hour rating. | Horse power of motors Continuous rating. | Total weight. Tons 2240 lbs. | Weight on drivers. Tons, 2240 lbs. | Horse power per ton. Hour rating. | Horse power per ton. Continuous rating. | Length over all | Weight per foot of length. | Current. | Reference. | Year built. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1. New York, New Haven and Hartford | passenger | 2-4-4-2 | 960 | 800 | 91.1 | 68.7 | 10.5 | 8.8 | 36ft. 4in. | 5615 lbs. | Single phase | *Burch | 1908 |
| 2. New York, New Haven and Hartford .. | freight | 2-4-4-2 | 1260 | 1120 | 125.0 | 85.5 | 10.5 | 9.0 | 48ft. 0in. | 5833 lbs. | Single phase | *Burch | 1909 |
| 3. New York, New Haven and Hartford . | freight | 2-4-4-2 | 1350 | 1130 | 120.0 | 82.0 | 11.2 | 9.4 | 53ft. 3in. | 5048 lbs. | Single phase | *Burch | 1910 |
| 4. New York, New Haven and Hartford | freight | 4-4-4-4 | 1396 | — | 104.0 | - | 13.5 | — | 46ft. 8in. | 4991 lbs. | Single phase | *Burch | 1911 |
| 5. New York Central and Hudson River | passenger | 2-8-2 | 2200 | 1000 | 84.8 | 61.6 | 26.0 | 11.8 | 37ft. 0in. | 5134 lbs. | Direct | Eng. News 17/11/04 | 1906 |
| 6. New York Central and Hudson River .. .. | passenger | 4-8-4 | 2200 | 1000 | 102.7 | 64.2 | 21.3 | 9.7 | 41ft. 0in. | 5611 lbs. | Direct | Burch | 1909 |
| 7. New York Central and Hudson River .. . | passenger | 4-4-4-4 | 1750 | 1400 | 89.3 | 89.3 | 19.6 | 15.7 | 55ft. 2in. | 3625 lbs. | Direct | Eng. News 1/5/13 | 1913 |
| 8. Detroit River Tunnel, Mich. Cent. Rly. | freight & pas. | 0-4-4-0 | 1100 | 492 | 88.8 | 88.8 | 12.4 | 5.5 | 39ft. 6in. | 5036 lbs. | Direct | Eng. Rec. 12/4/13<br>Burch | |
| 9. St. Clair Tunnel, Grand Trunk Railway .. | freight & pas. | 0-6-0 | 720 | 570 | 60.0 | 60.0 | 12.0 | 9.5 | 23ft. 6in. | 5719 lbs. | Single phase | Eng. News 24/6/09<br>Burch | 1909<br>1908 |
| 10. Simplon Tunnel, old type loco. .. .. | freight & pas. | 2-6-2 | 1100 | 800 | 62.0 | 44.0 | 17.8 | 12.9 | 40ft. 4in. | 3443 lbs. | Three phase | Eng. News 19/11/08<br>Burch | 1907 |
| 11. Simplon Tunnel, new type loco. .. .. .. | freight & pas. | 0-4-4-0 | 1700 | 1100 | 68.0 | 68.0 | 25.0 | 16.2 | 38ft. 1in. | 4000 lbs. | Three phase | Engineering 1/10/09<br>Burch | 1909 |
| 12. Great Northern, U.S.A., Cascade Tunnel . | freight & pas. | 0-4-4-0 | 1900 | 1500 | 102.7 | 102.7 | 18.4 | 14.6 | 44ft. 2in. | 5208 lbs. | Three phase | Engineering 1/10/09<br>R. R. Gazette 15/1/09 | 1909 |
| 13. Pennsylvania .. .. .. .. .. .. .. | passenger | 4-4-4-4 | 2500 | 1600 | 140.2 | 89.3 | 17.8 | 11.4 | 64ft. 11in. | 4834 lbs. | Direct | Eng. News 18/11/09<br>Burch | 1911 |
| 14. Midi, France (Westinghouse) .. .. .. .. | freight & pas. | 2-6-2 | 1500 | 1200 | 81.0 | 54.0 | 18.5 | 14.8 | 37ft. 4in. | 4860 lbs. | Single phase | Engineer 31/1/13 | 1911 |
| 15. Midi, France (A.E.G. Co.) .. .. .. .. .. | freight & pas. | 2-6-2 | 1500 | 1200 | 82.1 | 54.0 | 18.3 | 14.6 | 43ft. 8in. | 4213 lbs. | Single phase | Burch | 1911 |
| 16. Brooklyn Rapid Transit .. .. .. .. .. | freight | 0-4-4-0 | 900 | — | 49.1 | 49.1 | 18.4 | — | 31ft. 1in. | 3539 lbs. | Direct | Eng. News 29/9/10 | 1910 |
| 17. Metropolitan, London .. .. .. .. .. .. | freight & pas. | 0-4-4-0 | — | 800 | 47.0 | 47.0 | — | 17.0 | 33ft. 6in. | 3143 lbs. | Direct | R. R. Gazette 17/1/08 | 1908 |
| 18. Giovi line, Italy .. .. .. .. .. .. .. | freight | 0-10-0 | 2000 | 1440 | 60.0 | 60.0 | 33.3 | 24.0 | 31ft. 2in. | 4312 lbs. | Three phase | Burch | 1909 |
| | | | | | | Average | 17.9 | | | 4676 lbs. | | | |

*"Electric Traction for Railway Trains," E. P. Burch.

## TABLE No. 7.

Comparison of stress effects. Sydney Harbour Bridge conventional loading and existing electric locomotives.

| No. | Locomotive. | End shear in stringers in tons. 35ft. Span. | End shear in stringers in tons. 40ft. Span. | End shear in stringers in tons. 45ft. Span. | End shear in stringers in tons. 50ft. Span. | End shear in stringers in tons. 55ft. Span. | Bending moments in stringers in foot tons. 35ft. Span. | Bending moments in stringers in foot tons. 40ft. Span. | Bending moments in stringers in foot tons. 45ft. Span. | Bending moments in stringers in foot tons. 50ft. Span. | Bending moments in stringers in foot tons. 55ft. Span. | Reactions to cross girders in tons. 35ft. Span. | Reactions to cross girders in tons. 40ft. Span. | Reactions to cross girders in tons. 45ft. Span. | Reactions to cross girders in tons. 50ft. Span. | Reactions to cross girders in tons. 55ft. Span. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | ONE LOCOMOTIVE. | | | | | | | | | | | | | | | |
| | Sydney Harbour Bridge .. .. .. .. .. .. .. | 33.2 | 36.2 | 39.4 | 42.0 | 44.1 | 234 | 302 | 374 | 452 | 538 | 46.6 | 50.8 | 54.1 | 56.6 | 58.7 |
| 13. | Pennsylvania .. .. .. .. .. .. .. .. | 29.1 | 31.8 | 33.9 | 36.8 | 38.7 | 206 | 266 | 329 | 392 | 474 | 41.0 | 44.6 | 47.5 | 49.7 | 51.6 |
| 12. | Great Northern, U.S.A., Cascade Tunnel .. .. .. .. | 28.1 | 30.9 | 33.2 | 35.0 | 36.5 | 188 | 255 | 318 | 382 | 445 | 36.2 | 38.0 | 39.7 | 40.7 | 41.7 |
| 3. | New York, New Haven and Hartford .. .. .. .. .. | 27.7 | 30.6 | 32.8 | 34.6 | 36.4 | 204 | 262 | 325 | 390 | 465 | 39.3 | 41.9 | 43.9 | 45.6 | 46.9 |
| 6. | New York Central and Hudson River .. .. .. .. .. | 29.9 | 31.4 | 32.6 | 33.6 | 34.5 | 243 | 302 | 365 | 430 | 494 | 39.2 | 40.7 | 41.8 | 42.7 | 43.6 |
| 8. | Detroit River Tunnel, Michigan Central Railway .. .. | 27.1 | 29.3 | 31.0 | 32.4 | 33.5 | 196 | 250 | 306 | 382 | 417 | 33.2 | 34.6 | 35.8 | 36.6 | 37.4 |
| 14. | Midi, France (Westinghouse) .. .. .. .. .. .. .. | 24.2 | 25.9 | 27.5 | 28.8 | 29.9 | 198 | 248 | 299 | 350 | 400 | 31.6 | 32.6 | 33.6 | 34.3 | 34.8 |
| 7. | New York Central and Hudson River .. .. .. .. .. | 19.9 | 21.6 | 22.9 | 24.3 | 26.2 | 142 | 184 | 225 | 284 | 340 | 28.9 | 30.8 | 32.4 | 33.6 | 34.6 |
| 9. | St. Clair Tunnel, Grand Trunk Railway .. .. .. .. .. | 23.7 | 24.5 | 25.2 | 25.6 | 26.1 | 183 | 221 | 259 | 296 | 334 | 25.6 | 26.2 | 26.6 | 26.9 | 27.2 |
| 11. | Simplon Tunnel, new type loco. .. .. .. .. .. .. | 21.2 | 22.8 | 24.1 | 25.1 | 25.9 | 136 | 176 | 218 | 259 | 301 | 24.0 | 25.2 | 26.2 | 27.0 | 27.6 |
| 18. | Giovi Line, Italy .. .. .. .. .. .. .. .. .. | 21.3 | 22.4 | 23.2 | 23.8 | 24.4 | 164 | 201 | 238 | 276 | 313 | 24.3 | 25.0 | 25.6 | 26.0 | 26.4 |
| | TWO LOCOMOTIVES. | | | | | | | | | | | | | | | |
| 6. | New York Central and Hudson River .. .. .. .. .. | 30.6 | 33.2 | 35.9 | 39.1 | 42.6 | 243 | 302 | 369 | 488 | 565 | 43.5 | 49.8 | 56.0 | 60.6 | 64.5 |
| 11. | Simplon Tunnel .. .. .. .. .. .. .. .. .. .. | 22.8 | 24.6 | 26.9 | 29.3 | 31.4 | 158 | 200 | 242 | 295 | 354 | 31.9 | 35.6 | 39.2 | 42.2 | 44.5 |
| 18. | Giovi Line, Italy .. .. .. .. .. .. .. .. .. | 22.0 | 24.4 | 26.9 | 29.3 | 31.9 | 155 | 202 | 247 | 307 | 370 | 33.2 | 36.5 | 39.1 | 41.2 | 42.5 |
| 7. | New York Central and Hudson River .. .. .. .. .. | 19.9 | 21.6 | 23.5 | 25.5 | 27.2 | 148 | 188 | 235 | 284 | 340 | 29.8 | 32.8 | 36.5 | 40.6 | 44.5 |
| 8. | Detroit River Tunnel, Michigan Central Railway .. .. | 27.0 | 29.3 | 32.2 | 34.8 | 37.7 | 194 | 249 | 306 | 375 | 445 | 40.2 | 45.0 | 49.8 | 53.6 | 57.0 |
| 12. | Great Northern, U.S.A., Cascade Tunnel .. .. .. .. | 28.0 | 30.9 | 33.4 | 36.6 | 39.2 | 204 | 255 | 318 | 386 | 466 | 41.3 | 47.4 | 52.5 | 57.4 | 61.4 |
| 14. | Midi, France (Westinghouse) .. .. .. .. .. .. .. | 25.7 | 28.2 | 30.8 | 33.5 | 36.5 | 198 | 248 | 301 | 383 | 455 | 37.8 | 43.2 | 47.5 | 50.7 | 53.5 |
| 3. | New York, New Haven and Hartford Railway .. .. .. | 27.7 | 30.6 | 33.2 | 35.9 | 38.4 | 204 | 261 | 325 | 390 | 465 | 41.2 | 45.8 | 51.0 | 57.0 | 62.2 |

The maximum output of the locomotive would be required around 8 chain curves on the ruling grade of 1 in 39. These conditions are the worst the locomotive is at any time likely to meet. The lengths of maximum grade would be short, and there appears to be no objection to run the locomotive at the hour rating on short lengths which would take at the most 5 or 10 minutes to negotiate; consequently, the horse-power required at the driving wheels at hour rating is 2500. Allowing for mechanical losses the horse-power of the motors would be about 2800 at the hour rating. A locomotive, with an hour rating of 2500 H.P. net, would have a continuous rating in excess of 1986 H.P., consequently it could haul the maximum train of 550 short tons on a straight level at 60 miles per hour without exceeding the continuous rating.

Table No. 6 shows the ratio of power to weight for representative locomotives of the present day. These locomotives are shown on Plan No. 5.

From an inspection of Table No. 6 it is clear that a ratio of 17.5 : 1 can be readily obtained; it is about the average figure and has been adopted for the purpose of deriving the weight necessary to develop the 2800 horse-power required of the motors. Weight required and adopted = 2800 ÷ 17.5 = 160 tons.

The articulated type adopted can be made flexible enough to negotiate the sharpest curves; for high speed work, truck wheels are in general necessary, and the centre of gravity of the locomotive should be high, because the higher the mass of the locomotive is placed above the axles, the less will be the restraining influence against lateral motion on the part of the wheels. The mass of the locomotive may take the general direction of the track while the wheels follow all the little irregularities in its surface and alignment. The greater the restraining influence to lateral motion, the greater is the side pressure on the rails due to irregularities in alignment. This side pressure is probably not a serious consideration for speeds less than 40 miles an hour. A disastrous wreck occurred on the New York Central lines through track destruction in March, 1907. The cause of the track destruction is attributed to excessive lateral shocks from the low centre of gravity type of locomotive adopted, when travelling at high speed.

The conventional locomotive adopted is similar to the locomotive running on the Pennsylvania Railway, U.S.A.; these locomotives are required to attain a speed of 60 miles an hour, or over, and to haul a train weighing 550 American tons on 2 per cent. grades. The conditions are very similar, but not so exacting as those required for Sydney.

Having derived the total weight necessary, the question of arranging the wheel base must be considered.

The author does not consider it necessary to design the bridge for an electric locomotive exceeding 5500 lbs. per foot run. This weight is exceeded in only one or two cases in present day electric locomotives, as shown on Table 6, the average weight being 4676 lbs. per foot. Had more examples of the lighter types been included in the table, the average would be even less. The heavy New York Central and Hudson River locomotive (No. 6) in Table 6 has now been superseded by a type (No. 7) weighing considerably less per foot, although much greater in tractive power. The tendency of the New York, New Haven and Hartford railway has also been to reduce the weight per foot.

With a weight per foot of 5500 lbs., the total length required for 160 tons will be (160 × 2240) ÷ 5500 = 65 feet.

A distance of 4ft. 6in. from end wheel to buffer is a fair average figure, so the wheel base will be 56 feet.

Having derived the minimum wheel base, the question of arranging the wheels and the distribution of load had to be considered.

There are two general types which may be used:—

(1) An equal weight distribution over axles.

(2) Uneven weight distribution.

In case (1) the axles would in general be all driving; but as the adhesive weight necessary is only 100 tons, truck wheels may be used to make up the extra 60 tons required. It is not considered necessary to design for a greater axle load than 56,000 lbs. Only one electric locomotive in the world has a greater axle load than this, i.e., the Great Northern, U.S.A. loco. (No. 13), the axle load being 57,500 lbs. The whole 100 tons adhesive weight can be carried by 4 driving axles, each with a load of 25 tons (56,000 lbs.); the remaining 60 tons by two bogies, one at each end. This arrangement will give greater stresses than an even division of 20 tons over 8 axles, and in consequence it was adopted.

Some railroads show a tendency to eliminate truck wheels from their electric locomotives, but others have found their use necessary. The wheel spacings adopted are based on the latest Pennsylvania passenger locomotive, a type which fulfils the conditions to be met with here. A closer bunching of the driving axles would give worse stresses in short spans, but a concentration of power on a shorter wheel base than that proposed is not considered at all a likely contingency.

The New York Central locomotive of 1913 has the power spread over a much greater wheel base than the previous types.

Table No. 7 has been prepared to show the comparative stress effects of the conventional loading and existing heavy electric locomotives either singly or coupled for the stringer spans to be used in the proposed bridge.

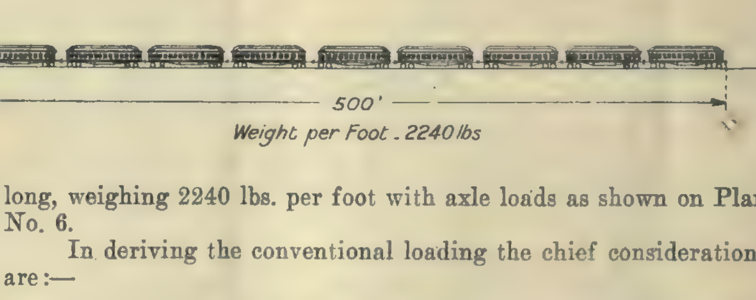
For single locomotives the stress effects of the proposed loading are greater throughout except in one case of bending on a 35ft. span. In this case one of the N.Y.C. & H.R.R. locomotives (No. 6) vide Plan No. 5, exceeds the conventional loading by 4 per cent., but the latest type of locomotive adopted by this company (No. 7) with greater power and adhesion than No. 6, gives considerably less stresses.

With two coupled locomotives the stresses are generally less than those caused by the conventional locomotive loading, but where exceeded, the corresponding power and adhesions are in general more than proportionately greater than the requirements. For example, in the reactions to cross girder, two coupled Great Northern locomotives, exceed the reaction from the Sydney Harbour Bridge conventional load, by about 5 per cent., but the adhesion of the Great Northern locomotives is over 100 per cent. greater, and the power 35 per cent. greater than the requirements for Sydney. Similarly with the coupled N.Y.C locomotives the adhesion is 28 per cent. greater and power 57 per cent. greater, while the stresses can be only about 12 per cent. greater than those caused by the conventional load.

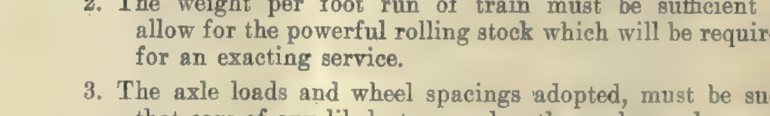
A contingency may of course arise in connection with the Sydney Harbour Bridge that a standard locomotive may become inadequate, and if trains are then double headed the total weight of locomotives may exceed the actual requirements, and the weight for which the bridge is designed. Such a train would increase the stresses in the bridge, but it was not thought necessary to increase the weight of the conventional locomotive above actual requirements, because the contingency can be avoided by using one or two locomotives per train, not exceeding 160 tons in weight, or by so regulating the traffic that two trains heavier than the conventional loading are not on the main span at the same time.

On account of the cost involved some definite limit had to be fixed for the loading. The conventional load adopted will, it is thought, reasonably meet future requirements, whilst it will not impose undue restrictions on the locomotive engineer in the future. It is difficult now to foresee what electric locomotives may be required, but it should not be difficult for the locomotive engineer in the future, to design electric locomotives capable of doing the work required, without exceeding the maximum stresses provided for in the bridge.

*Suburban Railways.*—The two eastern railway tracks are to be designed for suburban electric railway traffic, viz., a train 500 feet long, weighing 2240 lbs. per foot with axle loads as shown on Plan No. 6.



Plan 6—Suburban Railway Loading.



In deriving the conventional loading the chief considerations are:—

1. The train must be long enough to meet the probable demands of traffic.
2. The weight per foot run of train must be sufficient to allow for the powerful rolling stock which will be required for an exacting service.
3. The axle loads and wheel spacings adopted, must be such that cars of any likely type or length can be used.

For the suburban passenger service multiple unit electric trains made up of motor cars or motor cars and trailers, will be used, and heavy axle loads will be required for the motor cars.

The longest suburban trains at present in use in Sydney, consist of 10 cars about 50 feet long each seating 60 passengers.

For a quick electric passenger service, the tendency is in the direction of small trains at frequent intervals; consequently a train 500 feet long seating about 600 people was considered the maximum provision required.

The suburban railway service of Sydney at present worked by steam locomotives, consists of one "S" class locomotive weighing 72 tons, and wooden cars about 50 feet long weighing approximately 1000 lbs. per foot loaded; from 7 to 10 cars are generally used. The average train weighs about 1250 lbs. per foot run, including the weight of the engine.

The weight per foot run of the suburban trains in the future will inevitably be greater than the present steam service. The multiple unit electric trains in London at the present time do not exceed 1600 lbs. per foot run. The American inter-urban trains weigh from 1400 to 1700 lbs. per foot run. Numerous railway motor cars about 50-60 feet long are in use in and about New York City. The car of this type giving the greatest weight per foot is used by the Long Island Railroad Co.; it is 51 feet long and weighs 106,000 lbs. when heavily loaded, or 2080 lbs. per foot, the axle loads at the motor end being 30,800 lbs.

Table No. 8 gives particulars of some typical modern steel electric railway motor cars and some steel trailing cars for suburban locomotive service.

As the grades in the suburban zone on the northern side of the Harbour will be heavy, there will probably be needed cars heavier than are in use elsewhere for similar traffic at the present day. On this account a load of 1 ton (2240 lbs.) per foot was considered a reasonable figure to adopt to allow for possible developments.

The stress effects caused by short and long cars, will be considered in conjunction with the conventional suburban loading adopted.

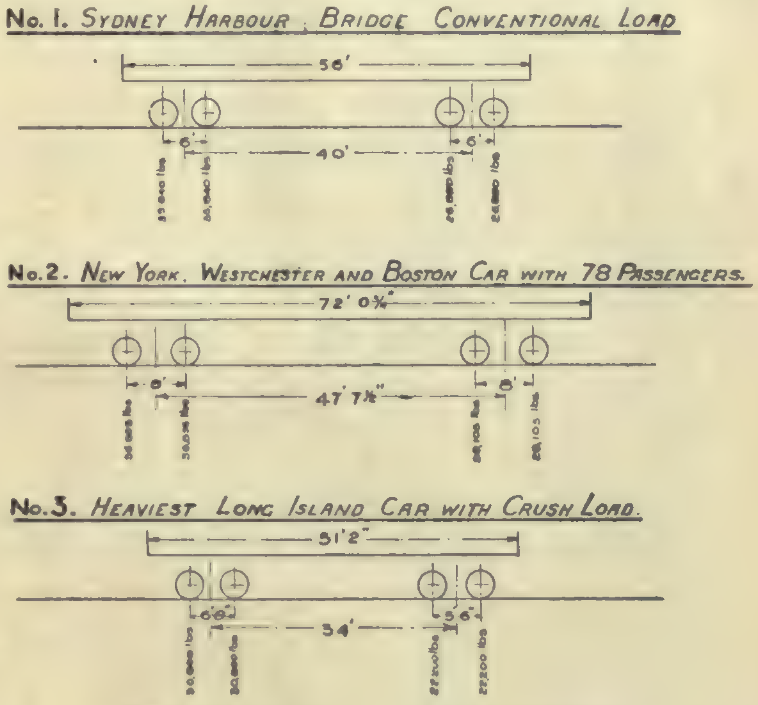
Plan No. 7 shows the wheel arrangement of three types of car.

1. The conventional loading adopted for the Sydney Harbour Bridge.
2. A car 72 feet long in use on the New York, Westchester and Boston Railway
3. A car 51ft. long, the heaviest motor-car in use on the Long Island Railway.

Table No. 9 shows the maximum bending moments and shears in the stringers, and reactions to cross girders due to trains of the cars shown by Plan No. 7. Nos. 2 and 3 are representative of heavy long steel cars and the heaviest type of short car respectively. In calculating bending moments, etc., motor ends of cars are taken adjoining.

On examining the Table, it will be seen that the conventional load assumed for the Sydney Harbour Bridge gives the greatest stresses. Owing to the lesser distance between wheels of adjoining cars, short cars can give worse stresses on certain spans than long cars of the same weight per foot run. For this reason a short car was adopted for conventional load.

Cars of equal weight, driving on all four axles, will give less stresses throughout, than if arranged with motors at one end only; consequently, the latter arrangement was adopted, and it is a type much used for suburban electric cars.


No. 1. Sydney Harbour Bridge Conventional Load
56'
6'
40'
6'
No. 2. New York. Westchester and Boston Car with 78 Passengers.
72' 0¾"
8'
47' 7½"
8'
28,105 lbs
No. 3. Heaviest Long Island Car with Crush Load.
51'2"
6'8"
34'
5'6"
22,200 lbs

Plan 7—Conventional Loading. Passenger Cars.

While it is to be admitted that there are in existence much heavier motor cars than those for which the suburban tracks of the bridge are designed (e.g., the 174,000 lb. 70ft. car of the Newhaven Railroad, and the 84 ton 76ft. car of the State Railways of France), still, the suburban train adopted should be able to cope with any possible demands of the passenger traffic. The weight per foot run and the heavy axle loads demand a strength

## TABLE No. 8.

### WEIGHTS, ETC., OF STEEL PASSENGER CARS.

SUBURBAN TRAILING CARS FOR LOCOMOTIVE SERVICE.

| Railway. | Length over buffers. | Pass. seated. | Weight empty. | Weight loaded. | Weight per ft. empty. | Weight per ft. loaded. | Reference. |
|---|---|---|---|---|---|---|---|
| Illinois Central R.R. | 71ft. 11¼in. | 100 | 82,800 | 97,800 | 1150 | 1360 | Eng. News, Sept. 3, '08. |
| Pennsylvania R.R. | 64ft. 5¾in. | 72 | 75,000 | 85,800 | 1163 | 1330 | Eng. News, June 20, '07. |
| ELECTRIC MOTOR CARS. | | | | | | | |
| New York Central R.R. | 60ft. 0in. | 64 | 105,500 | 115,100 | 1758 | 1918 | Eng. News, Sept. 3, '08.<br>Eng. News, Nov. 16, '05. |
| Interborough Rapid Transit | 51ft. 5in. | 46 | 79,400 | 85,840 | 1544 | 1669 | Proc. Inst. C.E., 1913. |
| Long Island R.R. | 51ft. 2in. | — | 83,000 | — | 1622 | 1782 | Eng. News, Sept. 3, '08.<br>Eng. News, Nov. 2, '05. |
| Metropolitan Elevated, Chicago | 47ft. 6¾in. | 48 | 60,000 | 67,200 | 1261 | 1413 | Eng. News, Sept. 3, '08. |
| New York Subway | 51ft. 0in. | 44 | 73,400 | 80,000 | 1439 | 1569 | Elec. Rly. Jr, Oct. 2, '09<br>Elec. Rly. Jr, Oc. 22, '10 |
| Hudson and Manhattan R. | 48ft. 2in. | 44 | 69,600 | 76,200 | 1443 | 1582 | Eng. News, Sept. 3, '08. |
| New York, Westchester and Boston R. | 72ft. 0¾in. | 78 | 119,000 | 129,920 | 1653 | 1804 | Eng News, June 12, '13 |
| | | | | | Average | 1677 | |
| | | | | | With crush load, say | 1800 | |

## TABLE No. 9.

### COMPARISON OF STRESS EFFECTS DUE TO ELECTRIC RAILWAY CARS.

| | Bending moment in stringers. | | | Shear at end of stringers. | | | Reaction at cross girder from two stringer spans. | | |
|---|---|---|---|---|---|---|---|---|---|
| Span of stringers. | N.Y., Westchester & Boston Rly. car. Ft. tons. | Long Island car. Ft. tons. | Sydney Harbour Bridge conventional load. Ft. tons. | N.Y., Westchester & Boston Rly. car. Tons. | Long Island car. Tons. | Sydney Harbour Bridge conventional load. Tons. | N.Y., Westchester & Boston Rly. car. Tons. | Long Island car. Tons. | Sydney Harbour Bridge conventional load. Tons. |
| 35 | 117 | 128 | 157 | 17.6 | 18.2 | 21.9 | 21.4 | 20.8 | 24.7 |
| 40 | 148 | 163 | 197 | 19.5 | 19.4 | 23.2 | 22.8 | 22.3 | 25.6 |
| 45 | 181 | 196 | 236 | 21.0 | 20.3 | 24.2 | 23.9 | 24.0 | 27.0 |
| 50 | 222 | 231 | 276 | 22.2 | 21.0 | 25.0 | 25.1 | 25.8 | 28.6 |
| 55 | 262 | 264 | 316 | 23.2 | 21.9 | 25.6 | 26.4 | 28.2 | 30.5 |

of bridge well in excess of present-day requirements for similar traffic, and there is, as far as can be foreseen, an ample margin for future development.

*Goods Traffic.*—When North Sydney, Mosman, Manly, and Pittwater are connected to the city by rail, a goods traffic will develop. The train load adopted for the suburban passenger traffic is heavy enough to enable goods traffic weighing about 2240 lb. per foot run, hauled by electric locomotives weighing about 50 tons, to be taken over any of the railway tracks. Many such locomotives, each developing about 900 horse-power, are in general use for interurban goods and other traffic in Britain, Europe, and America. They are of a type having a bogie at each end and all four axles driving.

Table No. 10 gives the bending moments and other stress effects in various parts of the deck produced by the conventional suburban cars adopted, and by the locomotives of the Brooklyn Rapid Transit Co., followed by fully loaded steel trucks weighing about 1 ton per foot run. The 15-ton "S" trucks of N.S.W.R. were used in the calculations.

adopted with that of the New York standard load (27 tons), Table No. 11 has been prepared.

TABLE No. 11.

Comparison of Stress Effects from Sydney Harbour Bridge Conventional Load for Main Roadway, with 60,000 lb. Conventional Load for New York City.

| Span of Stringer. | Maximum bending moments in stringers, tons x feet. S.H.B. Loading. | Maximum bending moments in stringers, tons x feet. New York Loading. | Maximum end shear in stringers, tons. S.H.B. Loading. | Maximum end shear in stringers, tons. New York Loading. |
|---|---|---|---|---|
| 30 | 109 | 93 | 17.3 | 15.4 |
| 40 | 170 | 150 | 19.8 | 17.9 |
| 50 | 242 | 217 | 22.1 | 20.3 |
| 60 | 325 | 295 | 24.4 | 22.6 |

It will be seen that in every case the loading adopted for the Sydney Harbour Bridge gives the greater stresses. In other words,

TABLE No. 10.

LIGHT GOODS TRAFFIC. COMPARISON OF STRESS EFFECTS WITH SUBURBAN CARS.

| Span of stringers. | Bending Moment. S.H.B. conventional suburban cars. ft. tons. | Bending Moment. Brooklyn R.T. locos. & 15-ton trucks. ft. tons. | End Shear. S.H.B. conventional suburban cars. tons. | End Shear. Brooklyn R.T. locos. & 15-ton trucks. tons. | Reaction to cross girder for two stringer spans. S.H.B. conventional suburban cars. tons. | Reaction to cross girder for two stringer spans. Brooklyn R.T. locos. & 15-ton trucks. tons. |
|---|---|---|---|---|---|---|
| 30 | 118 | 94.4 | 20.2 | 16.1 | 23.5 | 21.7 |
| 40 | 197 | 162.0 | 23.2 | 19.5 | 25.6 | 26.2 |
| 50 | 276 | 239.0 | 25.0 | 22.8 | 28.6 | 30.1 |
| 60 | 355 | 355.0 | 26.5 | 25.5 | 33.1 | 34.2 |

The type of locomotive used by the Brooklyn Rapid Transit Company is shown on Plan No. 5, Fig. 16.

From an inspection of this Table, it is evident that light goods traffic, weighing 1 ton per foot, hauled by 50-ton locomotives, can safely be taken across the suburban railway tracks.

The long distance tracks are designed for a heavier loading than the suburban, and thus, any traffic that can be taken over the suburban tracks can also pass over the long distance tracks. Hence the conventional suburban trains and local goods traffic could be taken over any of the four railway tracks, but, of course, the heavy locomotives, for which the long distance tracks are designed, could not pass over the suburban tracks without greatly exceeding the limits of stress adopted.

*Main Roadway.*—The loading adopted is as follows: —

Cantilevers and Suspended Span.—A uniform load of 100 lb. per square foot, so placed to give maxima stresses.

Deck System.—The concentrated loading shown on Plan No. 8 in any position to give maxima stresses, the remainder of floor to be covered with 100 lb. per square foot.

For closely packed heavy vehicular traffic a distributed load of 100 lb. per square foot may obtain over the whole bridge; it is not considered possible that it can be exceeded. The average heavy traffic will be very much less. The high figure was adopted so that no restriction or regulation of the roadway traffic will ever be needed.

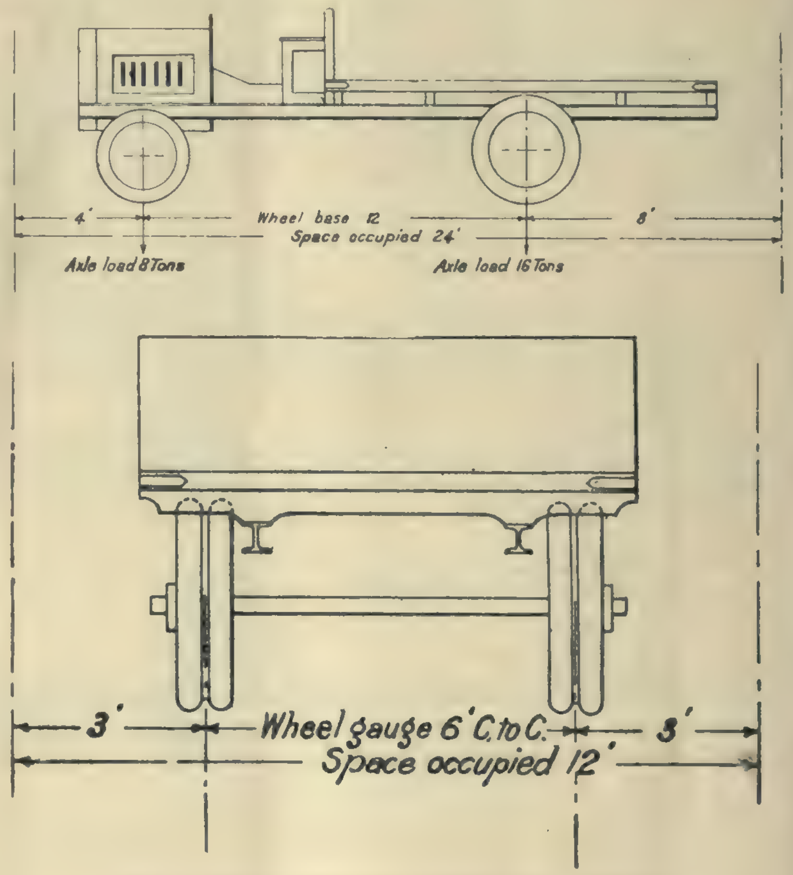
The decks of the most recent long-span bridges across the East River, New York, were designed for 48,000 lb., equally distributed on four wheels, i.e., 12,000 lb. per wheel, wheel base 10ft. x 5ft. wide. The motor lorry, however, renders it imperative to adopt a heavier loading. Motor lorries, weighing about 34,000 lb., are in use in America, the distribution of weight on rear axle being about twice that on the front, thus there is a rear axle load of 10 tons (Engr. Record, Dec. 7, 1912). The Department of Bridges, New York City, have increased their standard loading to four 15,000 lb. wheel loads, wheel base 12ft. x 8ft., space occupied 30ft. x 12ft., total load 60,000 lb., or 27 English tons.

Motor trucks carry on the rear axle about twice the weight that is carried on the front axle, and in deriving the conventional load, this unequal distribution of loading has been taken into consideration.

A load lighter than the standard adopted by the Department of Bridges, New York, gives greater stresses, particularly on the "I" beams, etc., of the deck, if there is uneven weight distribution over the axles. For the Sydney Harbour bridge a conventional load of 24 tons—8 tons carried on the front axle and 16 tons carried on the rear—has been adopted, wheel base 12ft. x 6ft.; space occupied, 25ft. x 12ft.

To compare the stress effects of the conventional 24-ton load the heavier load evenly distributed on 4 wheels recently adopted

by the Department of Bridges, New York, could be carried by the Sydney Harbour Bridge with less stresses in the deck, than those given by the conventional load adopted.



Plan 8—Main Roadway, Concentrated Loading.

*Motor Roadway.*—The loading adopted is as follows:—

Cantilevers and Suspended Span.—A uniform load of 80 lb. per square foot, so placed to give maxima stresses.

Deck System.—A uniform load of 100 lb. per square foot, or a number of conventional cars, as shown on Plan No. 9. When arranged in series the end clearance is to be taken at 5ft.

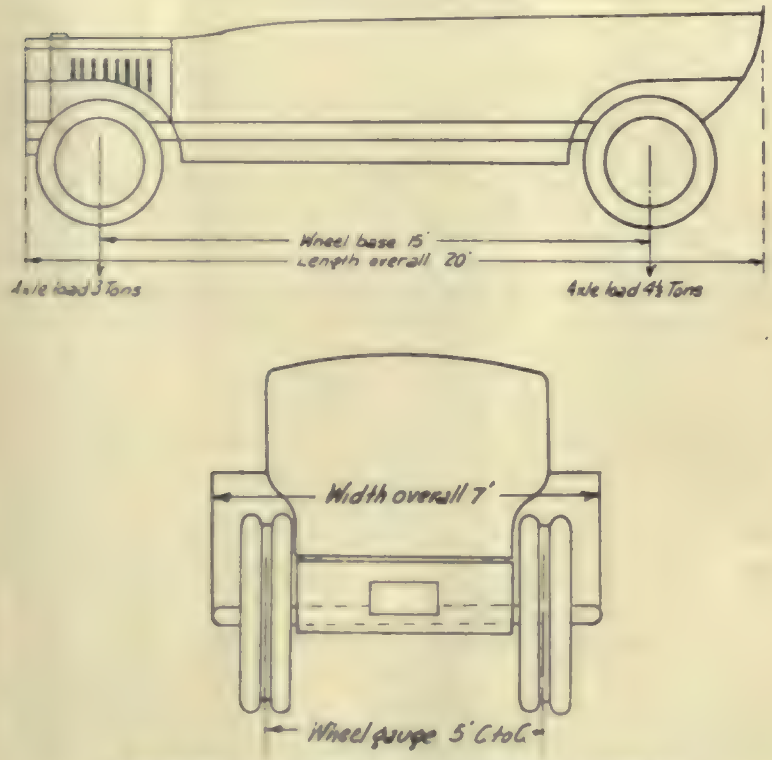
The motor roadway will accommodate the heaviest passenger motor car and cycle traffic, but it is not intended to carry heavy lorries—these must traverse the roadway. The motor roadway may also accommodate crowds viewing a Harbour spectacle, etc.

The heaviest tourist cars in Sydney at present do not weigh more than about 4 tons loaded.

The conventional car adopted weighs 7½ tons, with an axle loading of 4½ tons, thus provision is made for very greatly increased weights in motor cars.

With two cars abreast and a space of 3ft. between the cars, the distributed load, due to the heavy conventional motor car adopted, is 80 lb. per sq. foot.

If, on special occasions, the motor roadway is used for pedestrian traffic, isolated crowds for small areas may reach 100 lb. per square foot, but over the whole area of the motor roadway the weight could not exceed 80 lb. per square foot; consequently, 80 lb. per square foot was adopted for the design of the cantilevers and suspended span, whilst the higher figure was adopted for the deck.



Plan 9.—Motor Roadway, Concentrated Loading.

*Footway.*—The loading adopted is 100 lb. per square foot for deck system, reduced to 80 lb. per square foot for cantilevers and suspended span. The loading to be so placed to give maxima stresses.

Isolated crowds for small areas may reach 100 lb. per sq. foot, but over the whole area of the footway the weight could not exceed 80 lb. per square foot.

### TYPE OF BRIDGE.

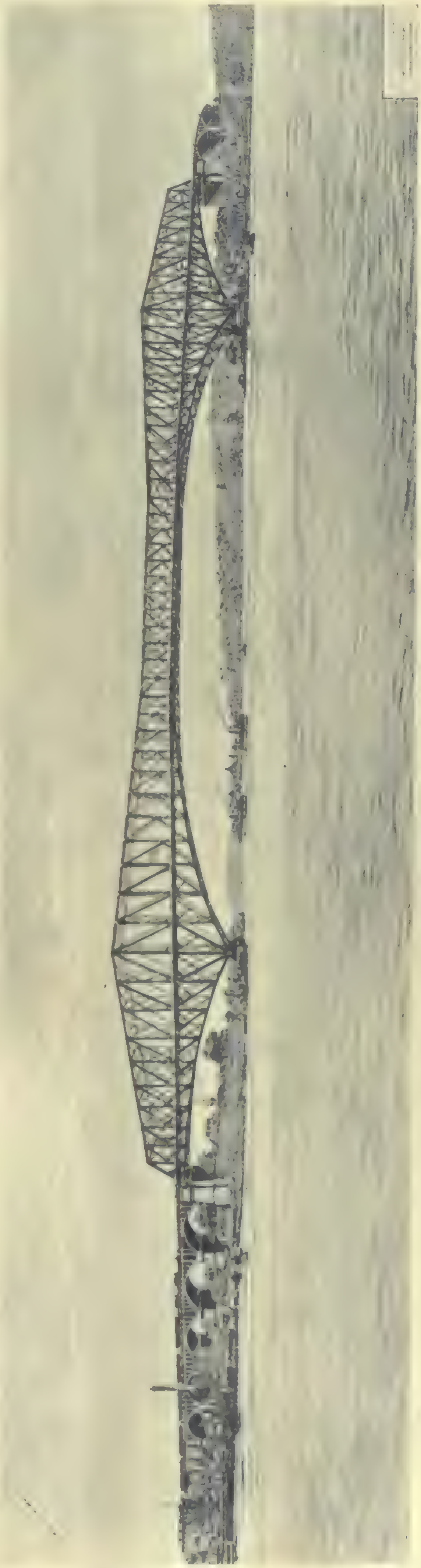
The clear span of 1600ft. between centres of main piers necessitates either a cantilever or a suspension bridge.

A suspension bridge would be more graceful than a cantilever bridge; but a cantilever bridge would be the more rigid.

Assuming that each bridge is manufactured outside the State, a suspension bridge would be slightly cheaper than a cantilever bridge, chiefly on account of the Federal tariff. All metalwork manufactured in the United Kingdom is subject to an import duty of 25 per cent., elsewhere of 30 per cent.; but the high-grade steel wire forming the cables of the suspension bridge is exempt from duty.

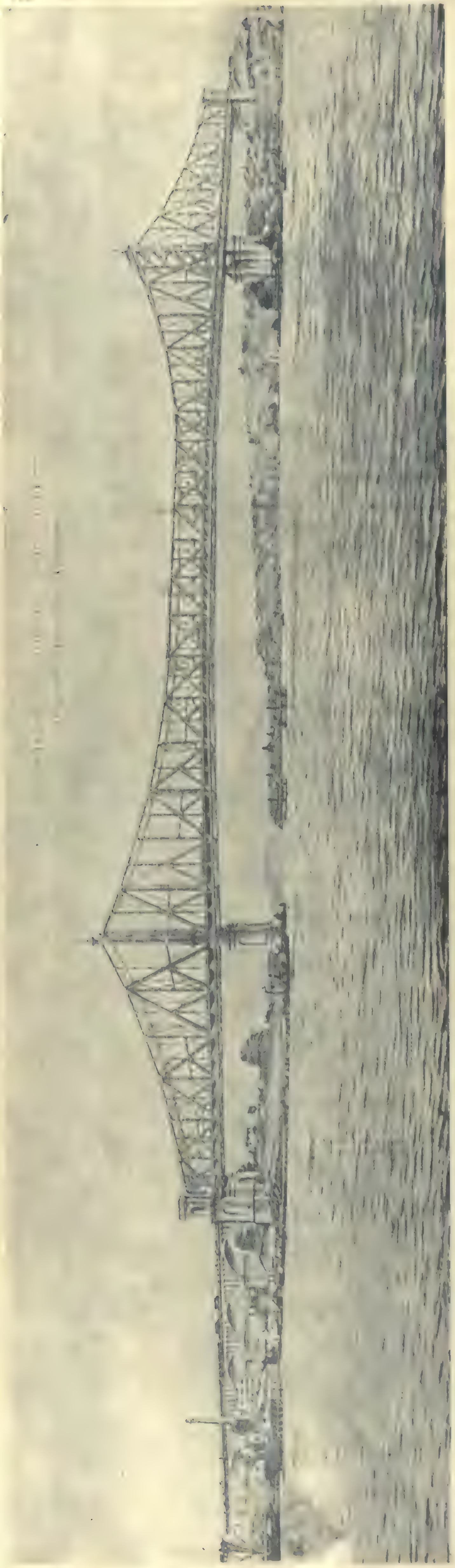
A cantilever bridge is a rigid structure, and the stresses can be accurately determined; a suspension bridge is a flexible structure, and the stresses are more or less indeterminate. If, in addition to vehicular and pedestrian traffic, the bridge had to carry suburban electric railways, or suburban railways and tramways, the suspension type would be as suitable as the cantilever type; but as the bridge must provide for heavy electric locomotive traffic a cantilever bridge should be adopted.

Two proposals, with estimates for cantilever bridges, were submitted by the Author to the Parliamentary Standing Committee on Public Works, viz., a cantilever bridge with the lower chord curved and the top chord almost horizontal, as shown on Plan No. 10, and a cantilever bridge with the lower chord horizontal and the top chord curved, as shown on Plan No. 11, each providing for four lines of railway, a main roadway 35ft. wide, a motor roadway 18ft. wide, and a footway 15ft. wide. A bridge of the first type, with a headway of 170ft. over the central 600ft., reducing to 60ft. at the piers, was estimated to cost £2,600,000; whilst a bridge of the second type, with a headway of 170ft. over the central 600ft., and a headway not less than 156ft. over the whole fairway, was estimated to cost £2,750,000.



Plan 10.—Elevation of Bridge, with Low Piers.

As the latter design, Plan No. 11, gave better facilities for shipping, and was generally considered to have the better appearance, the Public Works Committee recommended its adoption.



Plan 11—Elevation of Bridge, with High Piers (Bridge recommended by the Public Works Committee, 1913.)

## DESCRIPTION OF BRIDGE.

The elevation and cross section of the proposal recommended by the Parliamentary Standing Committee on Public Works are shown by Plans Nos. 11 and 12, and a bird's eye view of the locality is shown by Plan No. 13.

The bridge will consist of nickel steel cantilevers supporting centre girders, also constructed of nickel steel. The anchor or shore arms of the cantilevers are each 500ft. long, the harbour or cantilever arms are each 520ft. long, whilst the centre girders are 560ft. long. The main piers supporting the cantilevers are placed 1600ft. apart, centre to centre. The total length of the steelwork is 2600ft.

Provision is made between the main girders for four lines of electric railway, and a roadway 35ft. wide. Outside the main girders on the Eastern side is a motor roadway, 18ft. wide, between handrails, and on the Western side a footway, 15ft. wide. The main girders are vertical, 94ft. 6in. apart, centre to centre.

The central 560ft. of the bridge is level, with grades of 1 in 39 on either side; the railways, roadway, and footways being all on this grade.

A headway of 170ft. above high water is provided for the central 600ft. of the bridge, whilst a headway, not less than 156ft., is provided over the whole fairway.

The cantilevers are seated on cast steel bearings, which, in turn, are seated on pyramids of rolled steel joists and concrete to distribute the weight equally over the tops of the piers.

The upper and lower chords are braced against the wind. The wind pressure on the central span is transferred to the cantilever arms by a pin connection and sliding cross-head to allow for expansion movements.

Sway or transverse bracing is provided between all vertical members of the bridge for rigidity.

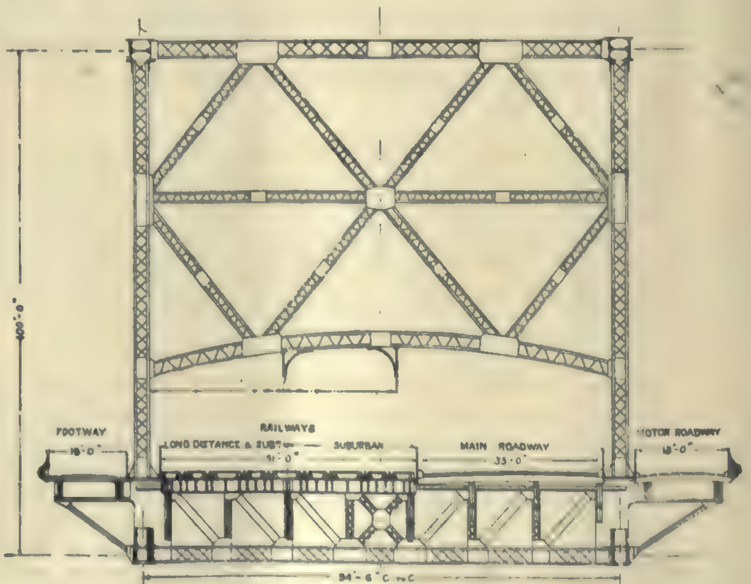
The trusses of the centre of suspended span are 100ft. deep between centres of chords, the chords being parallel. The depth of cantilevers at the towers is 270ft. between chord centres. The web systems are of the Warren type throughout, all main members being inclined. Panels are subdivided, and there are minor supporting and stiffening members.

The contour of the cantilever arms on the upper chord is parabolic with a horizontal tangent at the ends adjoining the suspended span. The contour of the anchor arms is a circular arc, the tangent to which, at the end of span, is not horizontal. These two curves are chosen arbitrarily to fit in with panel lengths and obviate objectionable slopes to some of the stiffening members.

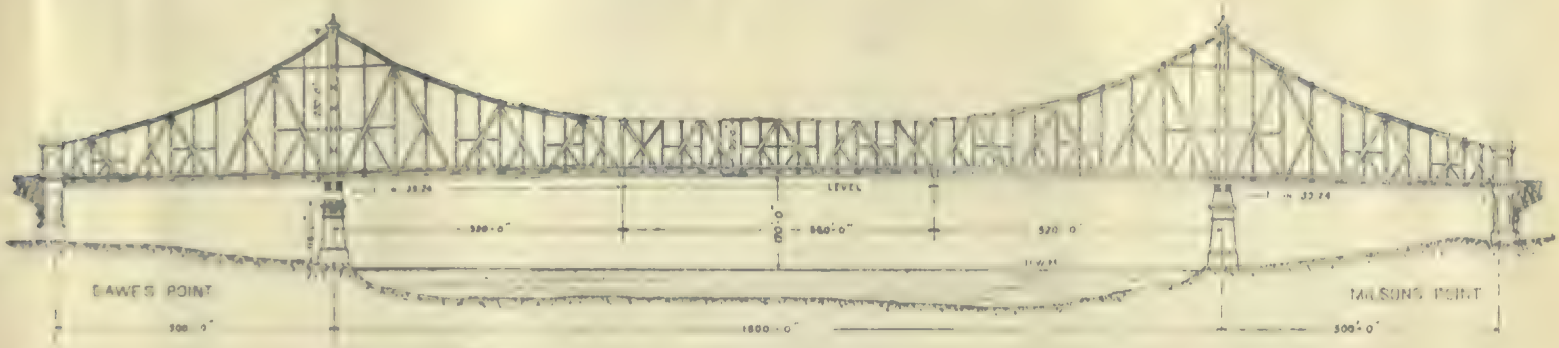
Eyebars will be used for tension chord members, which will, therefore, be much lighter than if built of plates and shapes owing to loss of efficiency at the riveted joints and the lower unit stresses allowed for built members. Eyebars will also be easier to erect than built up members, particularly near the towers. The cantilever method of erecting the suspended span precludes the possibility of constructing the suspended span with eyebar chords, since the tension chord will be in compression during erection.

The method of erection will be to construct the anchor arms on falsework after the main and anchor piers are completed, then build out the cantilever arms, making direct use of the anchor arms for support. The suspended span would also be built out by the cantilever method, the construction from both sides would meet at the centre of the bridge. On completing the suspended span, the cantilever connections will be freed, so that the span will act as an independent truss supported on the ends of the cantilevers.

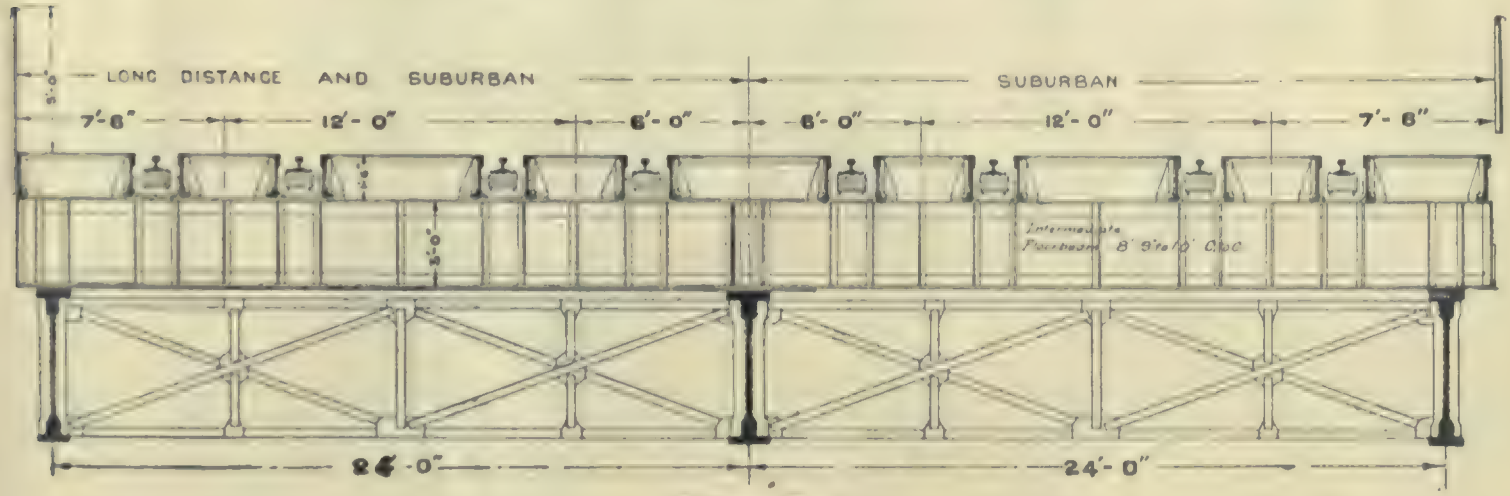
It would be practicable to construct the suspended span on staging on a large pontoon, float the span into its correct position



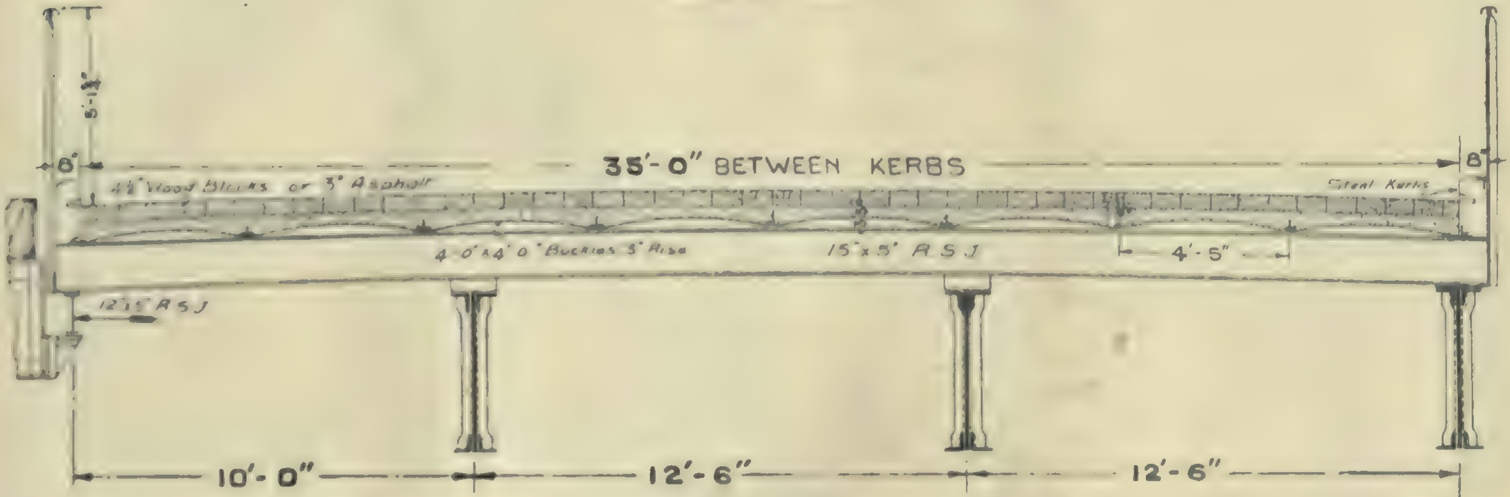
Plan 12.—Cross Section.



Plan 12—Elevation of Bridge (Bridge recommended by the Public Works Committee, 1913).

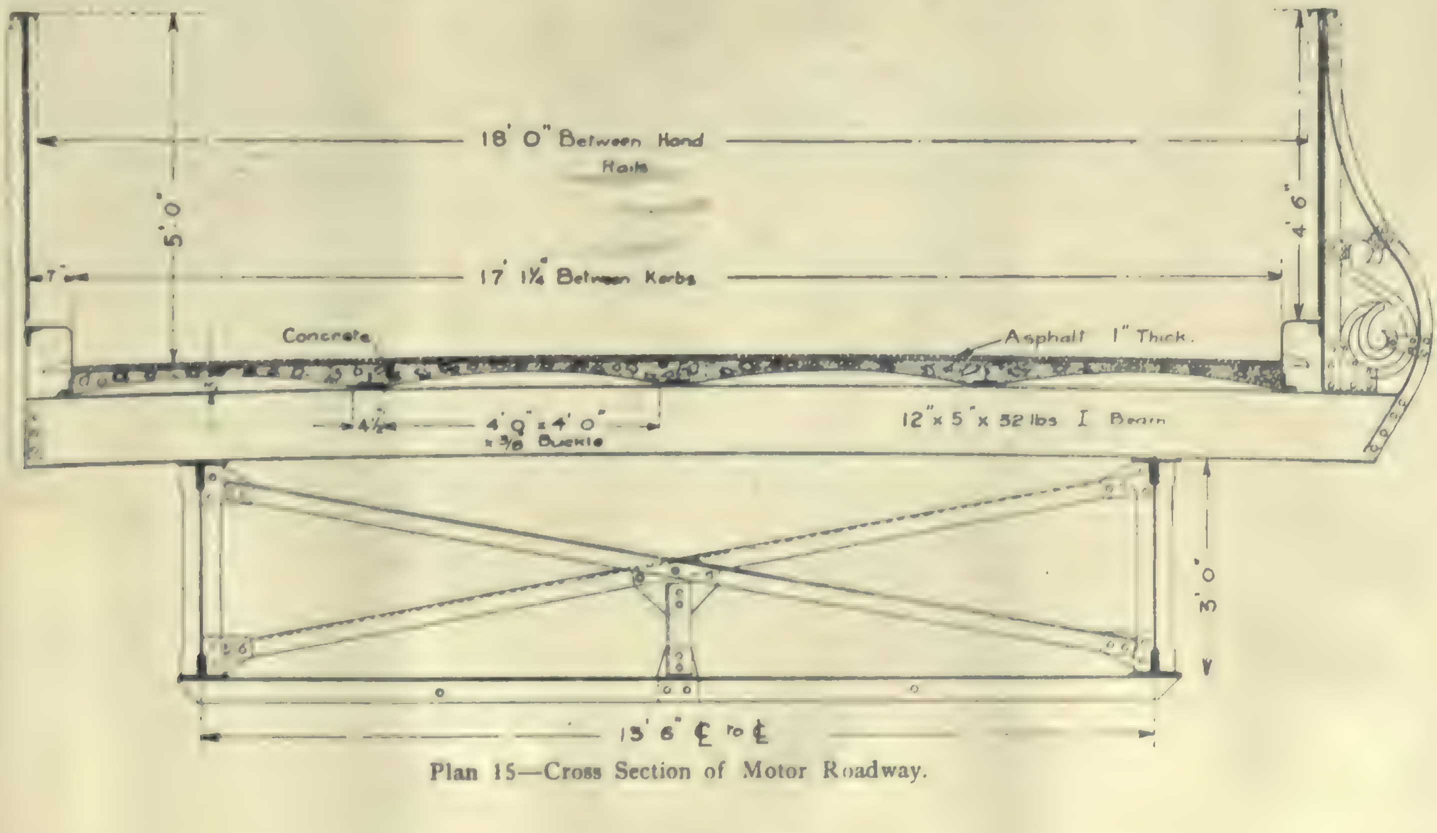


Railway Tracks.

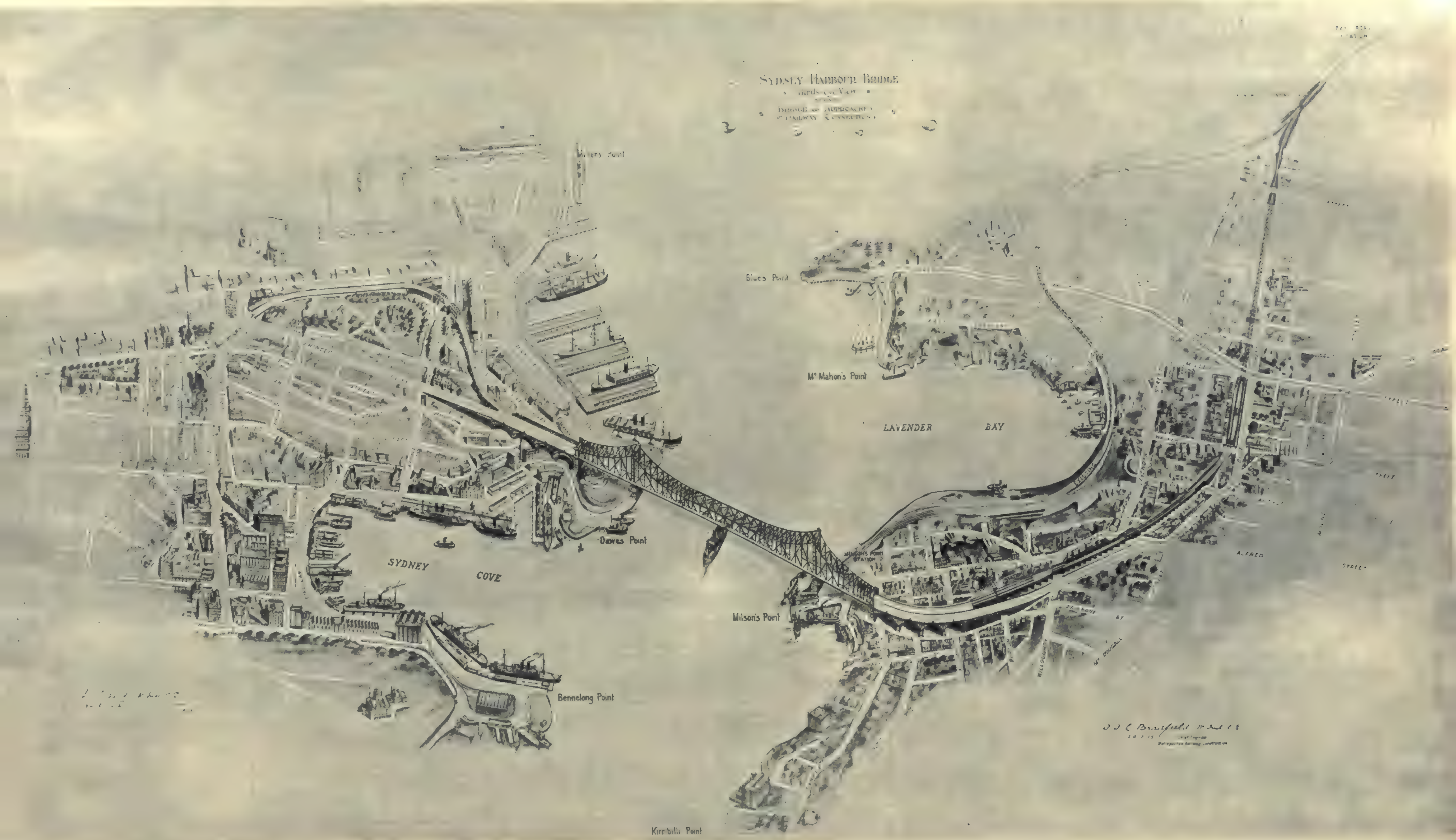


Main Roadway.

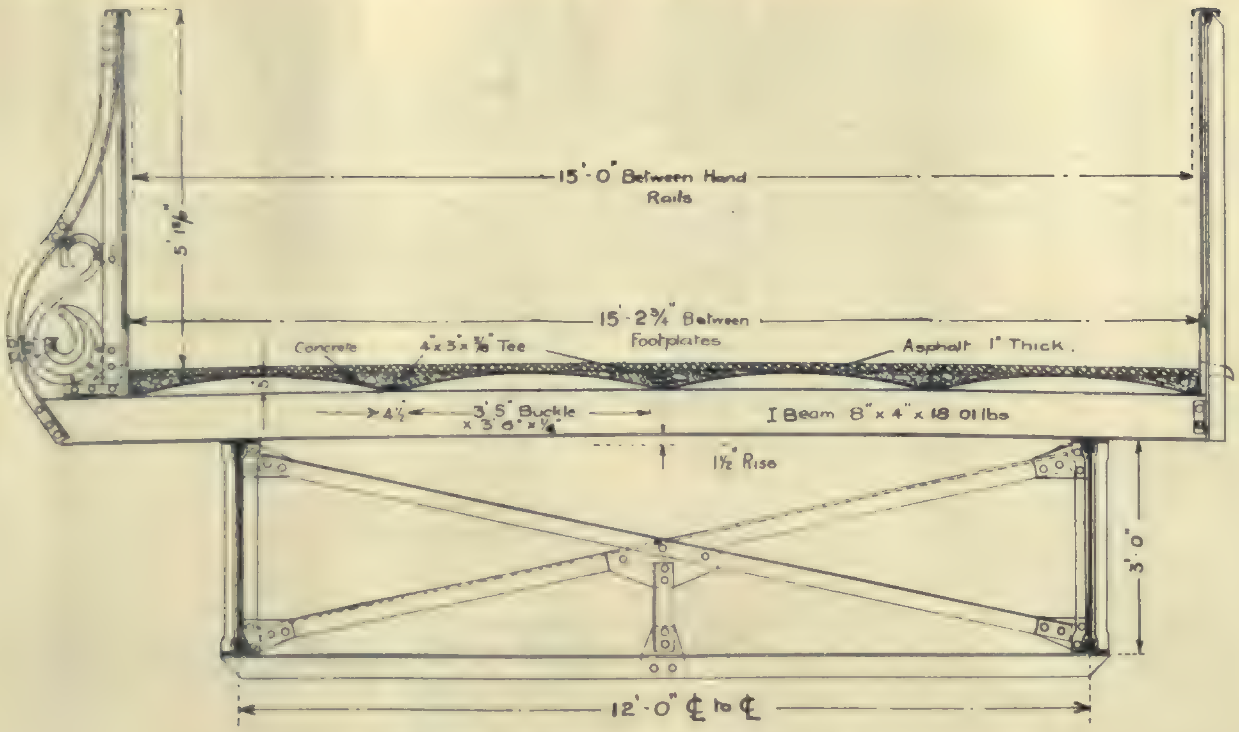
Plan 14—Cross Section of Railway Tracks and Main Roadway.



Plan 15—Cross Section of Motor Roadway.



Plan 13—Bird's Eye View of Bridge.



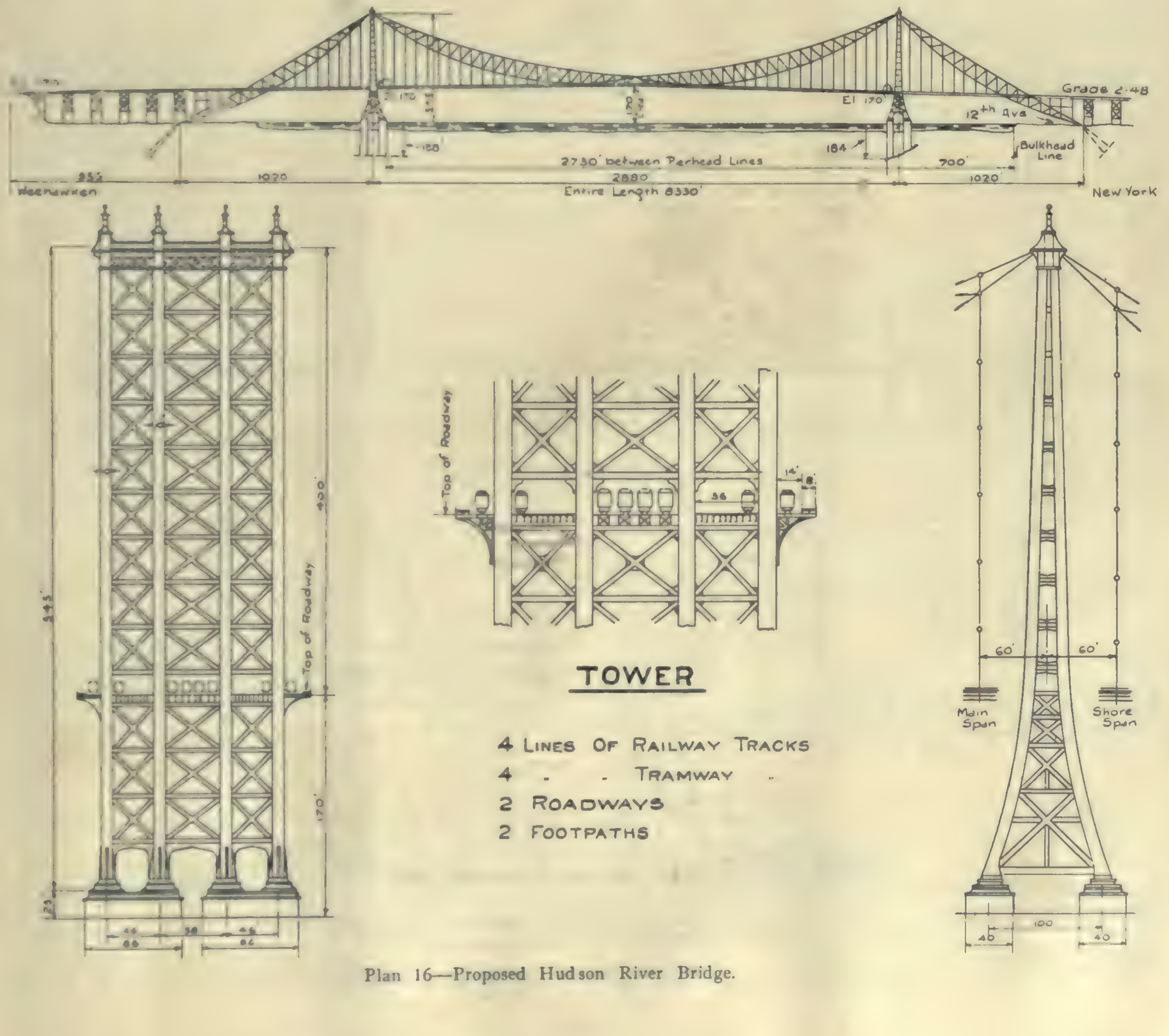
Plan 15—Cross Section of Footway.

at high water, and lower it to its final resting place on the ends of the cantilevers as the tide fell.

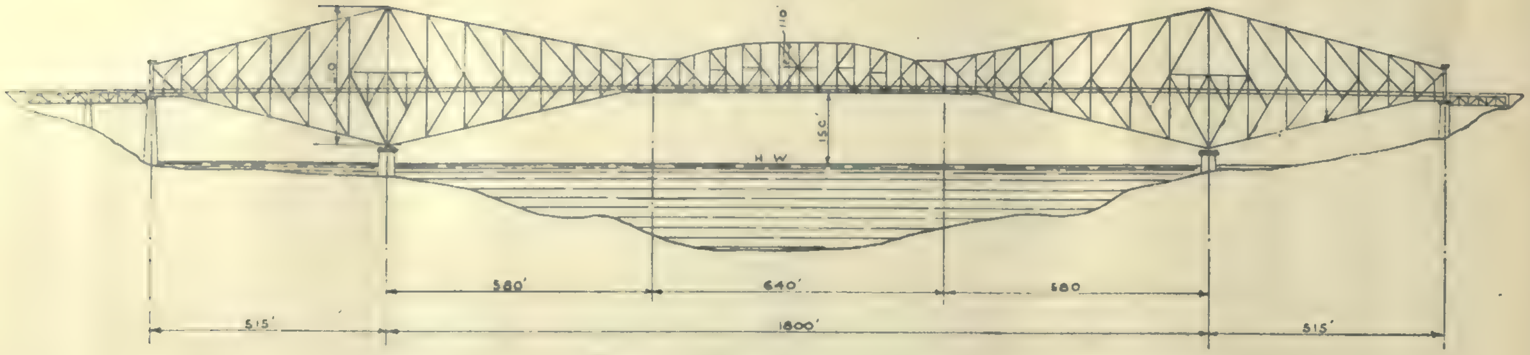
The floor systems, with the exception of the main cross girders, are to be constructed of carbon steel. This was found desirable in order to minimise secondary stresses due to the deflection of the various girders, etc. The higher unit stresses of nickel steel would cause greater deflections than would be the case for carbon steel members, other things being equal.

Since the size of webs, etc., of most of the girders is decided by minimum allowable thickness of metal rather than from stress considerations, the use of nickel steel would in this case be an unwarranted expense.

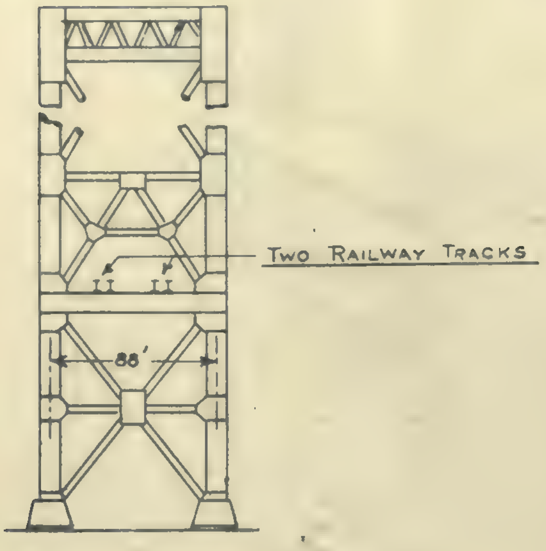
Plan No. 14 shows a cross section of the railway tracks and of the main roadway. The railway tracks are carried on three stringers throughout the bridge. An intermediate system of floor beams is placed upon the stringers; on these floor beams rest built



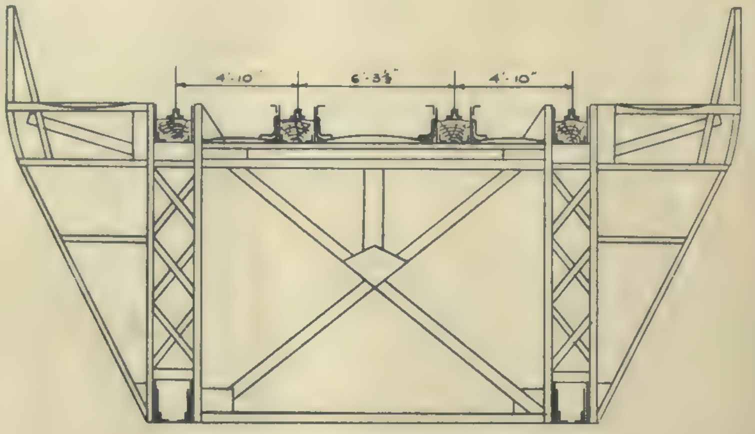
Plan 16—Proposed Hudson River Bridge.



Plan 17—New Quebec Bridge.

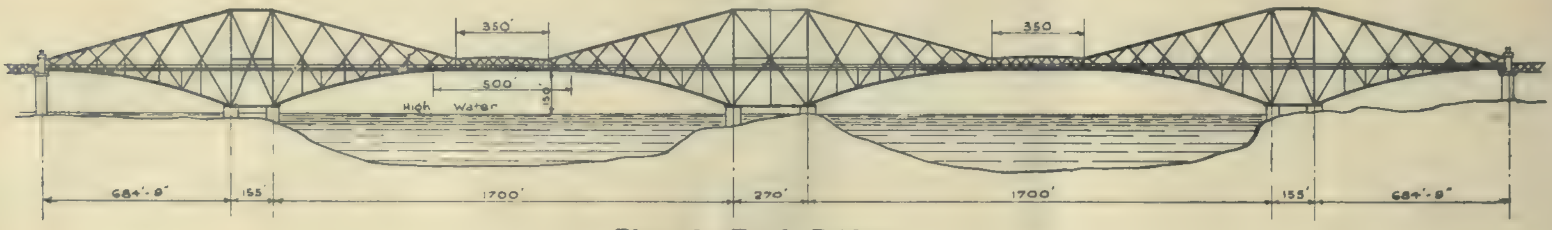


Plan 17.—Section at Pier.



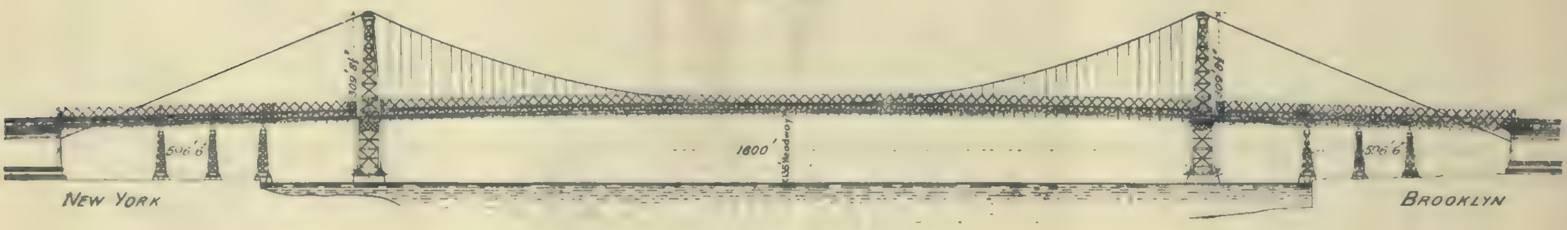
Plan 18.—Section of Internal Viaduct.

Elevation.

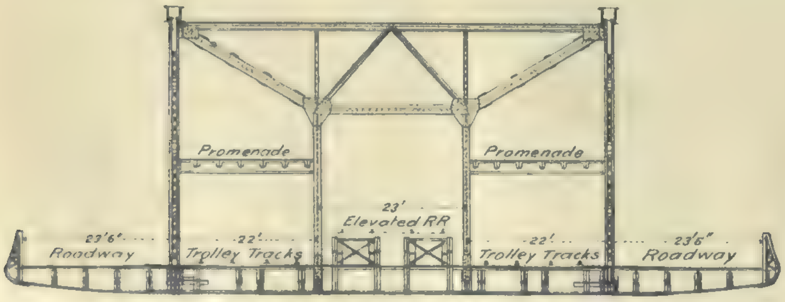


Plan 18—Forth Bridge.

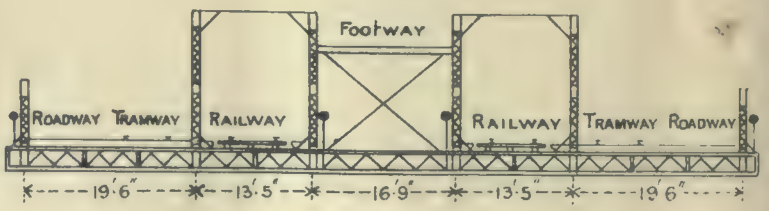
Elevation.



Plan 19—Williamsburg Bridge.

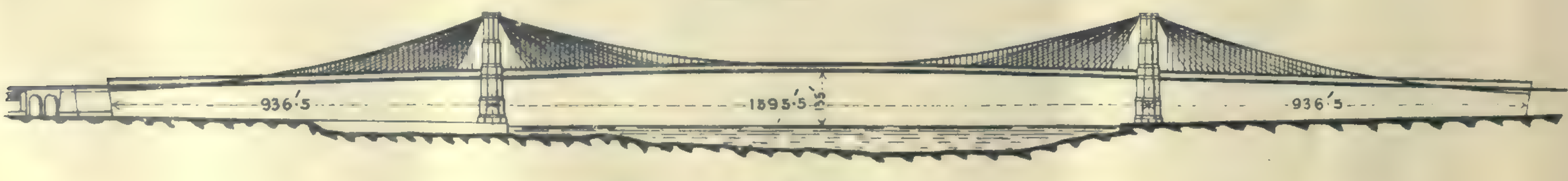


Plan 19.—Cross Section.



Plan 20.—Cross Section.

Elevation.



Plan 20—Brooklyn Bridge.

troughs which carry the rails. The rails are fastened to longitudinal wooden sleepers inside these troughs. The upper flanges of the troughs are braced at appropriate intervals, and there is a general covering of ¼in. steel plate over the whole floor.

The flooring of the main roadway will consist of wood blocks, or rock asphalt, carried on coke concrete, having a minimum thickness of three inches above the buckle plates. The buckle plates are ⅜in. thick, and are carried on 15in. x 5in. rolled joists placed on longitudinal plate girder stringers.

Plan No. 15 shows the general arrangement of motor roadway and footway. The motor roadway is designed for lighter motor traffic, and has a wearing surface of one inch of rock asphalt carried on coke concrete with buckle plates, as in the main roadway.

The footway, also, has buckle plate flooring with a wearing surface of one inch of rock asphalt, there being a filling of coke concrete, level with the top of buckle plates.

The kerbs of main roadway and motor roadway consist of steel plates and sections, the handrails are also of steel and are latticed with 1¾in. x ¼in. bars, leaving openings about 6in. square.

### DESCRIPTION OF NORTHERN APPROACH.

The northern approach commences at the northern anchor pier of the main bridge in Campbell-street, and consists of steel arch spans with piers of varying widths, as the spans are on an 8 chain curve. These arches are of the three hinge spandrel braced type, about 180ft. span on centre line.

The steel arch spans continue to Fitzroy-street, thence onwards the construction is steel girder viaduct. Between Fitzroy-street and Willoughby-street the first railway station, "Kirribilli," is situated; Burton-street passes under the station about the centre of platforms.

The 15ft. footway on the bridge reaches natural surface at Burton-street, the same steps being used for access to the bridge or "Kirribilli" station.

From Burton-street the main and motor roadways are carried on filling between retaining walls and reach natural surface at Willoughby-street. The roadways continue and junction with Alfred-street between Lavender-street and Junction-street.

A double line of railway crosses Willoughby-street on skew plate girder spans, continues on viaduct to Alfred-street, which is crossed by a through truss span, thence on viaduct to Arthur-street, which is crossed by plate girder spans, and reaches the natural surface on the eastern side of Walker-street, which is closed to vehicular traffic.

"North Sydney" station is situated parallel and adjacent to Blue-street, between Walker-street and Miller-street. Access to this station is provided by an overhead bridge from Walker-street. The main entrance is in Blue-street, the station offices and bridge leading to platforms being on the existing level of the street. This station will probably be the terminus of the North Sydney tramway system.

On leaving North Sydney station, the double line of railway passes in cut and cover under Blues Point-road, and thence via a tunnel, emerging in the vicinity of Bank-street, and connects with the existing railway to the south of Bay Road station.

### DESCRIPTION OF SOUTHERN APPROACH.

The southern approach commences at the anchor pier of the main bridge on the reserve at Dawes Point, and consists of steel arch spans. These are of three hinged spandrel braced type, about 185ft. span. At the end of the arch spans the roadway is carried on viaduct and between retaining walls until the natural surface is reached at the intersection of Argyle-street and Princes-street.

At the end of the arch spans two lines of railway curve to the south and west; two additional lines can be constructed when the traffic warrants it.

The footway is taken under the railway at the end of the arch spans, and then follows along the roadway. The railway is carried on steel viaduct, Upper Fort-street and Lower Fort-street being crossed by steel arch spans.

Argyle-place is crossed by steel truss spans. The railway is then carried by girder viaduct and on filling between walls till the natural surface is reached, a little before the junction of Crescent and Princes-street. Here the railway passes underground and connects with the underground City railway at Wynyard-square station.

### COMPARISON WITH NOTABLE BRIDGES—PROPOSED, UNDER CONSTRUCTION, OR BUILT.

(1) Suspension Bridge over the Hudson River at New York, Plan No. 16.

This bridge, if constructed, will quite eclipse the Forth and Quebec bridges.

The design recommended by the Interstate Commission is a stiffened cable suspension bridge, the "cables" being formed of eyebars. The proposed clear span is 2880ft. centres of towers; clear headway for shipping 170ft. The bridge is to be designed to carry four lines of railway, four lines of tramway, two roadways, and two footways. The total weight of traffic to be carried is 20,000 lb. per lineal foot of bridge. Estimated cost of bridge, £8,400,000.

(2) Cantilever bridge over the St. Lawrence River at Quebec, Plan No. 17.

The first attempt to bridge the St. Lawrence at this site resulted in the collapse of the bridge about half completed in 1907; some 80 workmen lost their lives.

Another bridge is now under construction; when completed it will have the longest clear span in the world, viz., 1800ft. centres of piers. Clear headway for shipping, 150ft. for a length of 640ft. The bridge has been designed for a double line of railway to carry 5000 lb. per foot of track; the total weight of traffic to be carried is 10,000 lb. per lineal foot of bridge.

(3) Cantilever bridge over the Firth of Forth, Plan No. 18.

This bridge, the most important yet constructed, was completed on 4th March, 1890, at a cost of over £3,000,000. Span centre to centre of towers, 1912ft. 6in.; clear span, 1700ft.; clear headway for shipping, 150ft. for a length of 500ft. The bridge has been designed for a double line of railway to carry 1 ton per foot of track; total weight of traffic to be carried is 4480 lb. per foot of bridge.

(4) Suspension bridge over the East River at New York, Williamsburg Bridge, Plan No. 19.

This bridge was completed in six years, of which the cables took one year to construct. It was opened for traffic in 1903. Clear span, 1600ft. centres of towers; headway for shipping, 135ft. The bridge has been designed for a double line of railway, four lines of tramway, two roadways, and two footways, including cycle tracks.

(5) Suspension bridge over the East River, New York, Brooklyn Bridge, Plan No. 20.

This bridge was completed in 1884, and took 14 years to construct, of which the cables occupied 2 years. Clear span, 1595ft. 6in. centres of towers; headway for shipping, 135ft. The bridge has been designed for a double line of railway, a double line of tramway, two roadways, and one footway.

(6) Suspension bridge over the East River, New York, Manhattan Bridge, Plan No. 21.

This bridge was opened for traffic on December 31, 1909. On account of improved methods, the cables took only four months to construct, as against two years for the cables of the Brooklyn Bridge and one year for those of the Williamsburg Bridge. Clear span, 1470ft. centres of towers; headway for shipping, 135ft. The bridge has been designed for four lines of railway, four lines of tramway, one roadway, and two footways.

(7) Cantilever Bridge over the East River, New York, Blackwell's Island or Queensboro Bridge, Plan No. 22.

This bridge was opened for traffic in 1909. The largest clear span is 1182ft. centres of piers; headway for shipping 135ft. The bridge has been designed for a double line of railway, four tramway tracks, a roadway and two footways. The bridge was intended to carry traffic aggregating 16,000 lbs. per lineal foot, but the safe load is estimated by Professor Burr to be 8442 lbs. per lineal foot.

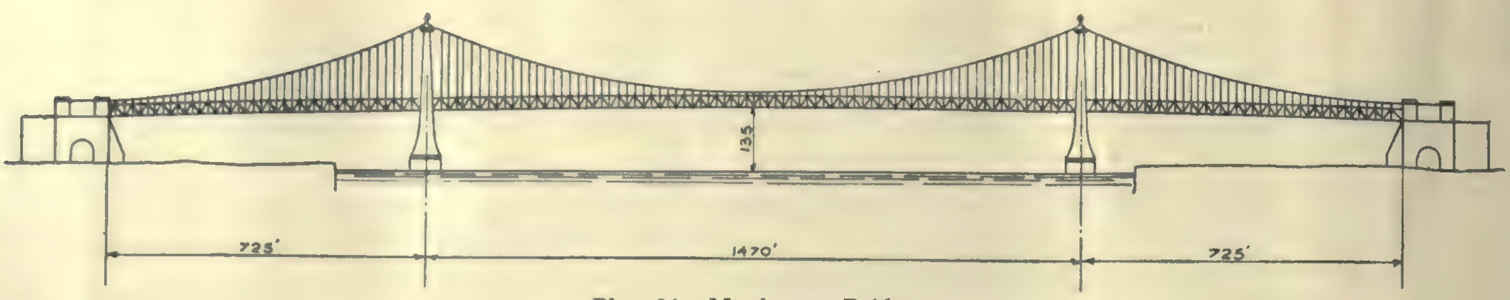
(8) Truss Bridge over the Mississippi River at St. Louis, Plan No. 23.

This bridge—668ft. span—though much shorter in span than any of the foregoing, has been included, as it is the longest truss span bridge yet erected. The bridge carries on the lower deck a double line of steam railway, and on its upper deck a roadway 30ft. wide and two 6ft. footpaths. Provision is made on the roadway for a double line of tramway.

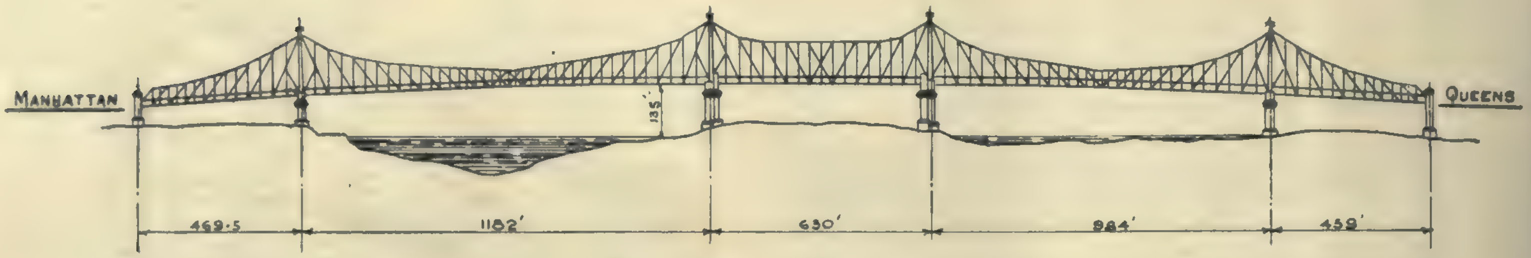
For length of span the proposed Sydney Harbour Bridge, Plan No. 12, would rank third in the world, viz., Quebec Bridge, 1800ft.; Forth Bridge, 1700ft.; Sydney Harbour Bridge, 1600ft.; Williamsburg Bridge, 1600ft. For headway for shipping, the Sydney Harbour Bridge would rank first, viz., 170ft. headway as against 150ft. headway for the Quebec and Forth Bridges, whilst it is to be designed to carry traffic aggregating 14,600 lbs. per lineal foot of bridge, as against 10,000 lbs. per lineal foot for the Quebec Bridge and 4480 lbs. per lineal foot for the Forth Bridge.

The Sydney Harbour Bridge would be the first long span bridge, the main girders of which would be constructed entirely of nickel steel.

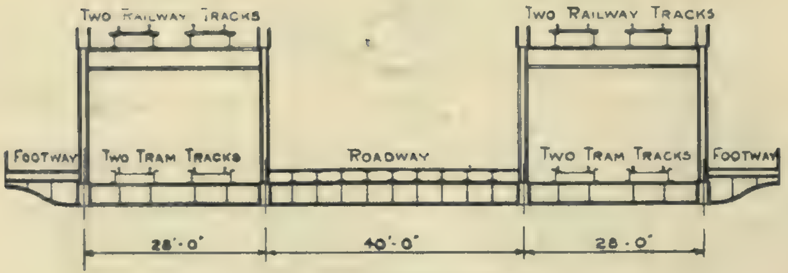
A truss bridge from Dawes Point to Milson's Point, similar to the St. Louis Municipal Bridge shown on Plan No. 23, providing for the same traffic as the cantilever design recommended, with railway connections from Bay Road to Wynyard Square, could be constructed for about £2,000,000, but it would be objectionable in that there would be one pier in the centre of the fairway. To keep the fairway unobstructed will cost about £750,000, but in view of the recent unprecedented growth in the length and tonnage of shipping this expenditure is warranted, as in equity the water-borne traffic should receive first consideration.



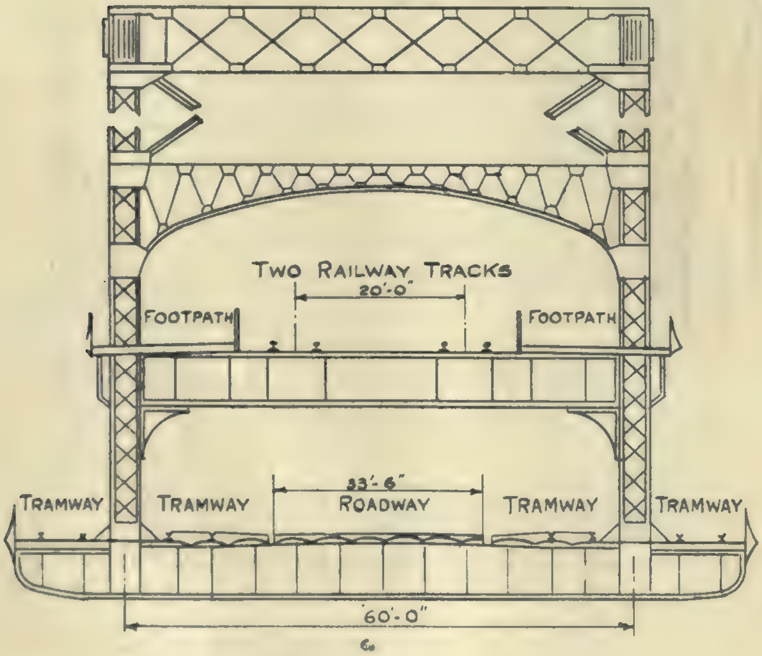
Plan 21—Manhattan Bridge.



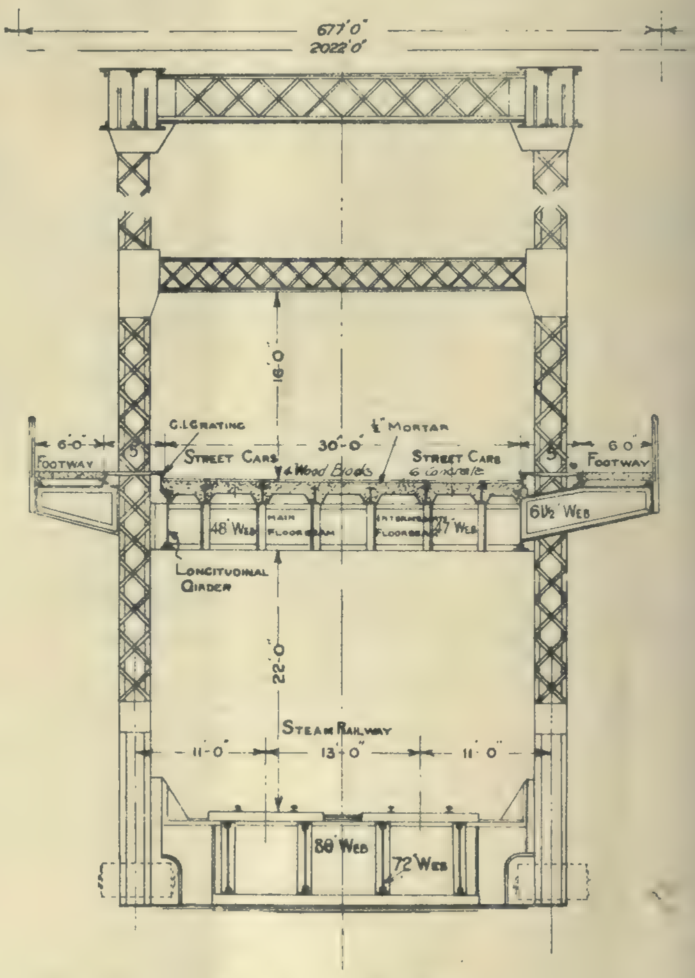
Plan 22—Queensboro Bridge.



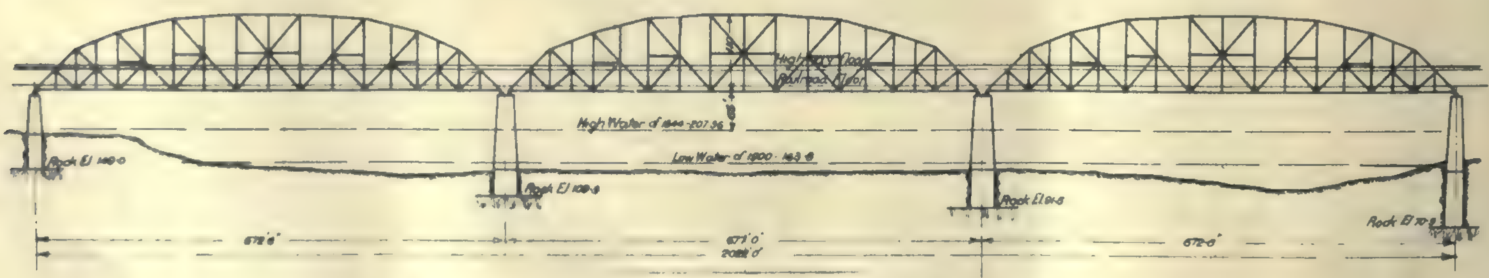
Plan 21.—Cross Section.



Plan 22.—Cross Section.



Plan 23.—Cross Section.



Plan 23—Municipal Bridge over Mississippi River, St. Louis.

### UNIT STRESSES.

It is the usual practice to adopt higher working stresses for long span bridges than obtain for bridges of shorter span. The main factors justifying this practice are as follows:—

(1) For bridges of long span, the maximum live load stress will in general not exceed about 45 per cent. of the total stress, whilst for bridges of shorter span it may, and often will, exceed 80 per cent. of the total stress.

For Sydney Harbour Bridge, Plan No. 12, typical members of the suspended span show ratios of live load stress, including impact, to total stress of 45 per cent. for the truss adjacent to the railways and of 38 per cent. for the truss adjacent to the roadway, whilst for the main members of cantilever arms, the live load stress will not exceed one-third of the total stress.

For the St. Louis Municipal Bridge, Plan No. 23, in the main compression chord members, the ratio of live load to the total stress is 46 per cent., exclusive of impact.

For the Queensboro' Bridge, Plan No. 22, in the main compression chord members, the ratio of live load to total stress is 45 per cent., exclusive of impact.

For the original Quebec Bridge the estimated stresses for the main chord member were: Dead, 11,249 tons; live, 4000 tons. The ratio, live load to total stress was 26 per cent. exclusive of impact. This was a cantilever railway bridge of 1800ft. span, which collapsed during construction in 1907, and is now being erected on a new design.

For short span bridges the ratio of live stress, including impact to total stress, is much greater. Typical chord members of a 200ft. span Pratt truss single track railway bridge as erected in New South Wales, give a ratio of 78 per cent.; the corresponding ratios for 157ft. and 120ft. truss spans are 79 per cent. and 81 per cent. respectively, and for the standard 66ft. single track plate web girder bridge the ratio of live load, including impact to total stress, is 84 per cent.

In deriving these figures impact is based on the Formula—

$$I = S\left(\frac{300}{L + 300}\right) \text{ where}$$

I = impact stress to be added to the live load stress S.

And L = loaded length of bridge in feet, which produces the maximum live load stress in member.

These examples show that the ratio of live load stress to total stress for long span bridges, is much less than for bridges of shorter span.

The dead load exerts a constant stress, the live load exerts a continually varying stress—the smaller the range in the value of this stress, the less likely is the steel to become fatigued and develop brittleness; consequently where the range of stress is smaller, a higher working stress can safely be adopted.

(2) In the case of long span bridges carrying mixed traffic, the maximum live stress possible will seldom, if ever, be realised unless the bridge carries traffic heavier than that for which it was designed, as it is only remotely possible that the traffic will at any time be disposed as is assumed in the calculations for maxima live stresses.

On the other hand, the members of short span bridges, also the cross girders and stringers of long span bridges, may frequently receive the maximum stresses for which they are designed.

To give the calculated maxima stresses in members of the Sydney Harbour Bridge, trains of the maximum weight adopted would have to be in definite positions on all four tracks, the main roadway fully or partially loaded to 100 lbs. per sq. foot according to the position of the member under consideration, whilst the pathway and motor roadway would similarly have to be fully or partially loaded to 80 lbs. per sq. foot at the same instant. Whilst such combinations of loading are possible, they are also improbable, and a unit stress can be used in conjunction with the total calculated stress, higher than if the total stress could ordinarily be realised in practice.

The working stresses proposed by the various authorities for nickel steel are derived from the results of practice in the use of carbon steel combined with the relative strength of the two materials when tested. The general practice is to allow for nickel steel a 50 per cent. increase over the stresses, proved satisfactory for carbon steel, the apparent reason being that nickel steel is about 50 per cent. stronger than carbon steel. This practice has been in general followed for Sydney Harbour Bridge, except in the matter of bearing stresses and shear on rivets. The soft nickel steel rivets would give results about 16 per cent. better than carbon steel rivets as proved by tests, so approximately this increase in unit stress has been allowed for in stresses on rivets. The results of tests carried out in America in connection with the Manhattan, Blackwell's Island and Quebec Bridges, show that nickel steel plates, shapes and eyebars can be manufactured with an ultimate tensile strength ranging from 85,000 to 100,000 lbs. per sq. inch, with an elastic limit of 50,000 lbs. per sq. inch for plates and shapes and 48,000 lbs. for full sized eyebars.

A working stress of 30,000 lbs. per sq. inch, i.e., 3/5 of the elastic limit, has been adopted on the net area. This will allow a factor of safety of about 3 on the ultimate tensile strength and a factor of safety of 1⅔ on the elastic limit.

The tests of 1/4 full-sized model columns of the Quebec Bridge compression members and of 1/2 full-size model columns of the St. Louis Municipal Bridge, indicate that full-sized nickel steel compression members can be constructed to develop an elastic limit of 40,000 lbs. per sq. inch and an ultimate strength of quite 60,000 lbs. per sq. inch. The maximum working stress to be adopted for nickel steel, in compression is 24,000 lbs. per sq. inch, i.e., 3/5 of the elastic limit of full-sized columns. This will allow a factor of safety of 2½ on the ultimate strength of full-sized members, and 1⅔ on the elastic limit.

To accurately estimate the stresses to which the members are subjected under normal conditions of loading is impossible.

In the design of the Queensboro Bridge the normal live load was estimated to be 50 per cent. of the maximum live load possible, and two sets of calculations were necessary, one for normal or regular loading, and the other for the maximum possible, i.e., the congested loading. With the normal loading unit stresses applicable to small span bridges were adopted; for congested loading a higher unit stress approaching 4/5 of the elastic limit of the material was adopted.

In the calculations for the Sydney Harbour Bridge the method adopted is to calculate the maxima possible stresses due to all conditions of loading, and with these maxima stresses to use a working stress higher than would be used for short span bridges.

Different unit stresses have been adopted for members subject to a combination of loads and for members not subject to a combination of loads.

Throughout the bridge combined stresses from bending due to a member's own weight; additional bending moments set up in columns due to deflection, also deflectional stresses in all members and other secondary stresses must be added to direct stresses and any total fibre stress kept within the limits stated.

*Members Subject to a Combination of Loads (Class I.)*—In determining the sectional areas, the unit stresses set forth below are to be used in conjunction with:

(a) The maximum possible stress from the combined railways, roadway, motor roadway and footway, together with dead load stress and impact.

(b) Dead load and one half maximum live load, combined with wind stresses.

(c) All wind and sway bracings.

| | | |
|---|---|---|
| Tension. eyebars .. .. .. | Nickel steel | 30,000 lbs. per sq. in. on net area. |
| Tension, built members.. .. | Nickel steel | 28,000 lbs. per sq. in. on net area. |
| Tension, built members .. .. | Carbon steel | 20,000 lbs. per sq. in. on net area. |
| Compression .. .. .. .. .. | Nickel steel | 28,000 — 90 L ÷ r with a max. of 24,000 lbs. per sq. in. on the gross area. |
| Compression .. .. .. .. .. | Carbon steel | 20,000 — 80 L ÷ r with a max. of 15,000 lbs. per sq. in. on the gross area. |
| Shear, machine driven rivets | Nickel steel | 16,000 lbs. per sq. in. |
| Shear, machine driven rivets | Carbon steel | 14,000 lbs. per sq. in. |
| Shear, hand driven rivets .. | Nickel steel | 12,800 lbs. per sq. in. |
| Shear, hand driven rivets .. | Carbon steel | 11,200 lbs. per sq. in. |
| Bearing, machine driven rivets .. .. .. .. .. .. | Nickel steel | 30,000 lbs. per sq. in. |
| Bearing, machine driven rivets .. .. .. .. .. .. | Carbon steel | 26,000 lbs. per sq. in. |
| Bearing, hand driven rivets | Nickel steel | 24,000 lbs. per sq. in. |
| Bearing, hand driven rivets | Carbon steel | 21,000 lbs. per sq. in. |
| Bending in pins .. .. .. .. | Nickel steel | 40,000 lbs. per sq. in. in outer fibre. |
| Bending in pins .. .. .. .. | Carbon steel | 26,000 lbs. per sq. in. in outer fibre. |
| Bearing on pins .. .. .. .. | Nickel steel | 30,000 lbs. per sq. in. on diameter of pins. |
| Bearing on pins .. .. .. .. | Carbon steel | 26,000 lbs. per sq. in. on diameter of pins. |
| Shear on pins .. .. .. .. .. | Nickel steel | 16,000 lbs. per sq. in. |
| Shear on pins .. .. .. .. | Carbon steel | 14,000 lbs. per sq. in. |

*Members not Subject to Combined Loads (Class II.)*.—In determining the sectional areas the unit stresses set forth below are to be adopted for the following members:—

The web members of cross girders and all other bridge members, which do not depend on a combination of live loadings, to produce the maximum possible stress.

| | | |
|---|---|---|
| Tension .. .. .. .. .. .. .. .. | Nickel steel | 25,000 lbs. per sq. in on net area. |
| Tension .. .. .. .. .. .. .. .. | Carbon steel | 17,000 lbs. per sq. in. on net area. |
| Compression .. .. .. .. .. | Nickel steel | 24,000 — 80 L ÷ r with a max. of 20,000 lbs. per sq. in. on gross area. |
| Compression .. .. .. .. .. | Carbon steel | 17,000 — 70 L ÷ r with a max. of 12,500 lbs. per sq. in. on gross area. |
| Flange stress .. .. .. .. .. | Tension on flanges of plate girders, stringers, etc., and extreme fibre stress on tension side of rolled beams, troughs, etc., 16,000 lbs. per sq. in. | |
| Web shear .. .. .. .. .. .. .. | Plate girders or beams, 7500 lbs. per sq. in. of gross area. | |
| Shear, machine driven rivets | Nickel steel | 14,000 lbs. per sq. in. |
| Shear, machine driven rivets | Carbon steel | 12,000 lbs. per sq. in. |
| Shear, hand driven rivets .. | Nickel steel | 11,200 lbs. per sq. in. |
| Shear, hand driven rivets .. | Carbon steel | 9,600 lbs. per sq. in. |
| Bearing, machine driven rivets .. .. .. .... .. .. | Nickel steel | 25,000 lbs. per sq. in. |
| Bearing, machine driven rivets .. .. .. .... .. .. | Carbon steel | 21,500 lbs. per sq. in. |
| Bearing, hand driven rivets | Nickel steel | 20,000 lbs. per sq. in. |
| Bearing, hand driven rivets | Carbon steel | 17,000 lbs. per sq. in. |
| Bending in pins .. .. .. .. | Nickel steel | 33,000 lbs. per sq. in., in outer fibre. |
| Bending in pins .. .. .. .. | Carbon steel | 22,000 lbs. per sq. in., in outer fibre. |
| Bearing on pins .. .. .. .. | Nickel steel | 25,000 lbs. per sq. in., on diameter of pins. |
| Bearing on pins .. .. .. .. | Carbon steel | 21,500 lbs. per sq. in. on diameter of pins. |
| Shear on pins .. .. .. .. .. | Nickel steel | 14,000 lbs. per sq. in. |
| Shear on pins .. .. .. .. .. | Carbon steel | 12,000 lbs. per sq. in. |

It will be noted that unit stresses, 6 per cent. less than for eyebars, are specified for built tension members. This is considered advisable owing to the lesser strength of built members as proved by test, the wide thin plates having a tendency to tear when heavily stressed.

It was considered desirable that compression members acting as columns should be well within the limits of bending under axial load for ideal conditions, viz., the material to be homogeneous and the line of stress to be coincident with the neutral axis of the member. Any theory which considers the bending stresses involved by axial load is inapplicable, and to keep the struts well within the limits of rigidity, either the working stress of long struts must be low or a definite limit placed on the value of L ÷ r. This limit was fixed at 100.

During the inquiry by the Advisory Board in 1902-3 the question was raised whether Euler's formula should be used in designing the compression members. The author does not think this formula should be used. Euler's formula (for pinned columns) is:

$$P = \frac{\pi^2 EI}{L^2} \text{ where}$$

P = least axial load necessary to cause a small lateral deflection in column.
E = modulus of elasticity.
I = moment of inertia.
L = length of column.

It is evident that Euler's formula cannot differentiate between nickel and carbon steel since both of these have about the same coefficient of elasticity.

The following table shows the comparison of the bending strength of columns as given by Euler's formula and the working stresses adopted for the Sydney Harbour Bridge.

TABLE No. 12.

BENDING STRENGTH OF EULER'S FORMULA AND WORKING STRESSES.

| $\frac{L}{r}$ | Euler's Formula lbs. per sq.in. | Sydney Harb. Bdge. Nickel Steel. Class 1. lbs. per sq. in. | Sydney Harb. Bdge. Nickel Steel. Class 2. lbs. per sq. in. | Sydney Harb. Bdge. Carbon Steel. Class 1 lbs. per sq. in. | Sydney Harb. Bdge. Carbon Steel. Class 2. lbs. per sq. in. |
|---|---|---|---|---|---|
| 40 | 185,055 | 24,000 | 20,000 | 15,000 | 12,500 |
| 60 | 82,247 | 22,600 | 19,200 | 15,000 | 12,500 |
| 80 | 46,264 | 20,800 | 17,600 | 13,600 | 11,400 |
| 100 | 29,609 | 19,000 | 16,000 | 12,000 | 10,000 |
| 120 | 20,562 | 17,200 | 14,400 | 10,400 | 8,600 |

Taking the maximum value of unit stress allowed in the design of columns, when L ÷ r = 100, the least load causing bending by Euler's formula is 29,609 lbs. per square inch, whereas the working stress adopted for nickel steel is 19,000 lbs. per square inch, so the ratio of the congested load stress to the least load causing bending is never more than 1 : 1.55.

As no question of general bending due to direct stress is involved, where columns are straight and have no external influence causing bending, it is clear that failure under test would be due to local buckling, weakness of details, or irregularities of manufacture. Nickel steel is better able to resist these secondary stresses, and in this way nickel steel columns have a greater strength than columns of carbon steel.

TABLE No. 13.

| | *Waddell. | Queensboro. | Manhattan. | †St. Louis. | Sydney Harbour. |
|---|---|---|---|---|---|
| Tension eyebars .. .. .. .. .. .. .. .. .. .. | 30,000 | 39,000 | | 32,000 Dead<br>16,000 Live | 30,000 |
| Tension, built members .. .. .. .. .. .. .. | 28,000 | | 40,000 | 26,000 Live<br>13,000 Dead | 28,000 |
| Compression in chords .. .. .. .. .. .. .. | 30,000—120 L ÷ r | Carbon Steel | 40,000—150 L ÷ r | Dead<br>34,000 — 110 L ÷ r<br>Live<br>17,000 — 55 L ÷ r<br>30,000 Dead, 15,000 Live Max. | 28,000—90 L ÷ r<br>Max. 24,000 |
| Compression, other struts with fixed ends .. .. .. | 27,000—120 L ÷ r | | | | |
| Compression, struts with pinned ends .. .. .. .. | 27,000—160 L ÷ r | | | Dead<br>28,000 — 90 L ÷ r<br>14,000 — 45 L ÷ r<br>Live | |
| Shear, shop or machine driven rivets .. .. .. .. | 14,000 | | | 14,000 | 16,000 |
| Shear, field or hand driven rivets .. .. .. .. | 11,200 | | 20,000 | 11,200 | 12,800 |
| Shear, pins .. .. .. .. .. .. .. .. .. .. .. | 25,000 | 24,000 | | 14,000 | 16,000 |
| Bending, pins .. .. .. .. .. .. .. .. .. .. | 50,000 | 48,000 | | 36,000 | 40,000 |
| Bearing, shop or machine driven rivets .. .. .. .. | 30,000 | | | 22,000 | 30,000 |
| Bearing, field or hand driven rivets .. .. .. .. | 24,000 | | 35,000 | 17,600 | 24,000 |
| Bearing, pins .. .. .. .. .. .. .. .. .. .. | 38,000 | 48,000 | | | 30,000 |

*"Nickel Steel for Bridges," Proc. Am. Soc. C.E., Vol. 63, June, 1909.

†Municipal Bridge, St. Louis, Boller and Hodge, Engineers.

The properties of carbon steel are well known, but nickel steel as a commercial product is of comparatively recent origin, and few examples of its use for bridge construction can be quoted, although it has been largely used in the construction of ships for His Majesty's Navy.

The most important bridges built either partly or wholly of nickel steel are:—

Queensboro Bridge.—Plan No. 22. The eyebars are constructed of nickel steel.

Manhattan Bridge.—Plan No. 21. The stiffening trusses are constructed of nickel steel.

Bridge over the Mississippi River at St. Louis.—Plan No. 23. The main trusses are constructed of nickel steel.

Table No. 13 shows a comparison of the unit stresses for nickel steel bridges already erected, Waddell's specification for nickel steel bridges, and the Sydney Harbour Bridge specification.

Stresses as high as were used in the Manhattan Bridge would not be satisfactory for a cantilever bridge. A failure of the stiffening trusses of a suspension bridge would not necessarily entail the collapse of the structure. On the other hand the failure or buckling of one main member of a cantilever bridge could cause a complete wreck of a large part of the structure.

It is very doubtful if the high stresses for rivets used in the Manhattan Bridge will ever be repeated for any structure, being above the limit at which initial slip of the joint will take place.

The stresses for tension members and columns would also be too high for a cantilever bridge from the points of view of safety first and longevity second.

By plan No. 22 it will be seen that there are a greater number of lines of traffic over the Queensboro Bridge than are proposed for the Sydney Harbour Bridge, and in consequence there is more likelihood of the calculated stresses being realised in the Sydney Harbour Bridge. From this point of view, there is some justification for somewhat lower stresses in the latter, or vice versa, assuming either to be correct. It is to be noted, however, that the question of safe working stress is largely a practical consideration. The unit stresses adopted for small span bridges are derived almost entirely from the results that practice has proved good and sufficient to cover all the deficiencies of design and manufacture where these are as good as are generally obtained. Where both are good, much higher unit stresses than are allowed could undoubtedly be used without the least risk of failure of the structure.

The ratio between the ultimate strength of the main members as a whole, and ordinary heavy working load, viz., one-half the maximum theoretical load, will be about 3 : 1 for struts and 4 : 1 for tension members. The lower factor is considered satisfactory for struts, because questions of stability rather than fatigue are the leading considerations, the elastic limit for struts bearing a higher ratio to the crushing strength than is the case in tension members.

A comparison may be made of the specification for the St. Louis Bridge with Sydney Harbour Bridge. Consider a typical chord member of the suspended span of Sydney Harbour Bridge.

The stresses estimated are:—

| | |
|---|---|
| Dead Load .. .. .. .. .. | 1945 tons. |
| Live Load .. .. .. .. .. | 1440 tons. |
| Impact .. .. .. .. .. .. | 143 tons. |
| Total .. .. .. .. .. .. .. | 3528 tons. |

Bending stresses involve a fibre stress of 1100 lbs. per sq. inch. The quantity L ÷ r is about 40, thus the unit stress allowed is 24,000 lbs. per square inch, less 1100 for bending stress = 22,900 lbs. per square inch.

Area required = 345 square inches.

Using Buller and Hodge's specification for the St. Louis Bridge:—

Area required for dead load = 145 square inches.
Area required for live load = 215 square inches.

360 square inches.

This is an increase of about 4.3 per cent. over that demanded by Sydney Harbour Bridge specification, but the maximum calculated stresses for St. Louis Bridge would approach much nearer those that would be realised under the specified loadings than in the case of Sydney Harbour Bridge, with its greater number of lines of traffic, and thus the slight discrepancy in the sections demanded by the specifications would not be without justification.

## THE BRIDGE AND THE PROPOSED METROPOLITAN RAILWAYS.

The bridge, by means of the proposed City Railway, will connect North Sydney and the Hornsby to Milson's Point Railway with the existing railways at Redfern. Plan No. 24 shows the location of the City Railway with suburban railway connections to the Northern, Eastern and Western Suburbs.

The City Railway will consist of an underground three track loop railway around the City, with stations at and parallel to the existing Central Station; under George-street, in front of the Town Hall; under Wynyard-square; under Circular Quay; at St. James-road under Hyde Park, and at Liverpool-street also under Hyde Park.

The location of the Northern Suburbs Railway, via the bridge, has already been described. After the bridge is constructed, a double line of electric railway will doubtless be constructed to serve the thickly populated districts near St. Leonard's Park, and along the Military-road to the Spit Junction and Mosman. Eventually, this railway will be extended to Manly and Pittwater.

The Eastern Suburbs Railway will junction with the City Railway at St. James' Station in Hyde Park, and proceed via the Domain, Darlinghurst, Paddington, Woollahra, Edgecliffe, Waverley, Coogee, Randwick, Kensington and Waterloo, joining the Illawarra line between St. Peter's and Erskineville Stations. Loops are proposed to deal with the traffic to the Sports Ground, Show Ground, and Randwick Racecourse.

The Western Suburbs Railway will join the proposed City Railway at Wynyard-square Station, pass under Darling Harbour by subway, thence through Balmain, Leichhardt and Annandale, and join the Main Suburban Railway between Newtown and Stanmore Stations.

When the Metropolitan Railways are completed, given a suitable train service, a passenger from the Northen side of the Harbour can journey, without changing trains, to any railway station existing to-day, or proposed in connection with the City Railway and the Eastern and Western Suburbs Railway. Through trains can be run from the Northern Suburbs to the Sports Ground, the Show Ground or the Randwick Racecourse, to accommodate the holiday traffic.

## THE FINANCIAL ASPECT.

Interest, sinking fund to cover renewals, maintenance charges and probable earnings will now be considered.

### *Interest.*

The bridge is estimated to cost £2,750,000, to which should be added £250,000 to provide for power, rolling stock, and electrical equipment, or £3,000,000 in all, the interest on which, at 4 per cent., will amount to £120,000 per annum.

### *Sinking Fund.*

The cuttings, embankments, masonry piers and approaches are taken as having an infinite life, and no sinking fund is required.

The renewals and maintenance of the rails, longitudinals, and sleepers are covered in the railway working expenses.

The steelwork of the main bridge and the bridges in approaches is taken as having a life of 100 years. The sinking fund, to replace at 4 per cent. interest, is .081 per cent. The total value of the steelwork, including 10 per cent. for contingencies, is £1,980,000; the sinking fund at .081 per cent. amounts to £1604.

The wood-blocking will have a life of twenty years. The prime cost is £15,937; the sinking fund to replace at £3.358 per cent. per annum is £535.

The asphalt on footpath and motor roadway is taken as having a life of ten years. This was the life recently on the Pyrmont Bridge, where the asphalt has been renewed. As the old asphalt can be melted over again and relaid, it is not necessary to provide a sinking fund to cover the full amount.

The cost of the asphalt is £9308, and, allowing the value of the asphalt when it needs renewing to be £4654, a sinking fund must be provided to produce £4654, which, at 8.33 per cent., equals £387.

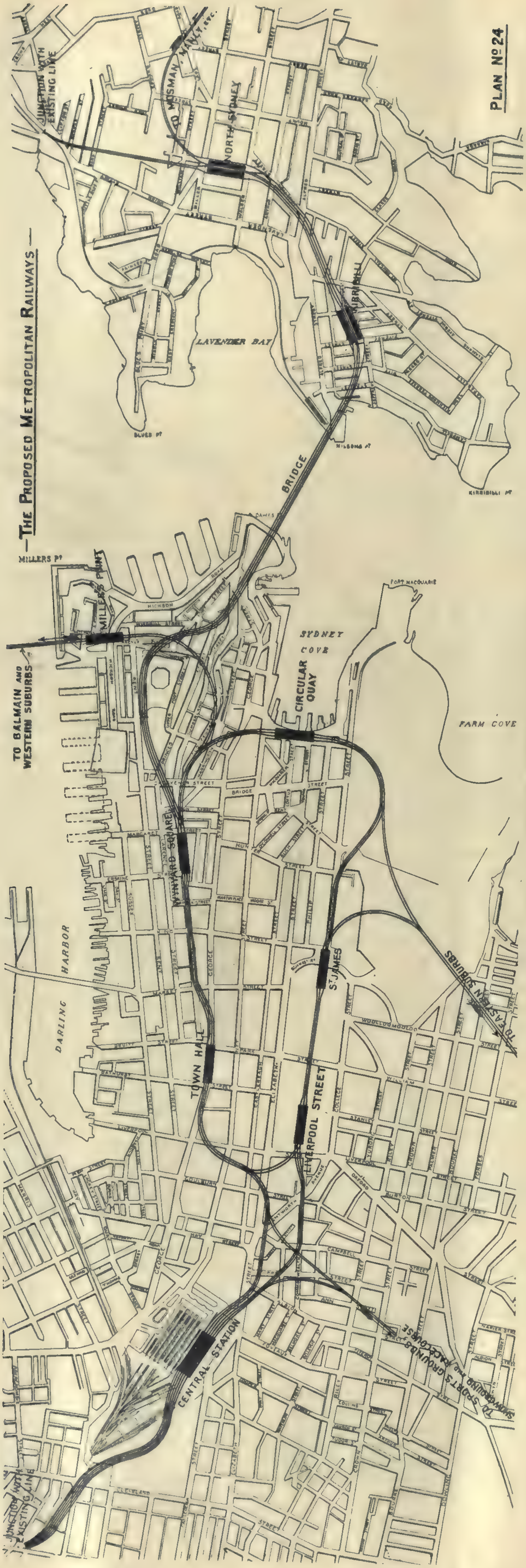
### *Total Sinking Fund.*

| | |
|---|---|
| Steelwork—Life 100 years .. .. .. .. .. .. .. .. | £1604 |
| Wood-blocking—Life 20 years .. .. .. .. .. .. .. | 535 |
| Asphalt—Life 10 years .. .. .. .. .. .. .. .. .. | 387 |
| Total .. .. .. .. .. .. .. .. .. .. .. | £2526 |

### *Maintenance of Main and Motor Roadways and Footway.*

The following is based on information obtained from the City Council:—

*Top Dressing.*—To maintain the roadways, they must be top-dressed with tar and sand three times in the year, at a cost of 2½d. per square yard each time.



Plan 24.—Proposed Metropolitan Railways.

The footway needs top-dressing once a year, at a cost of 3d. per square yard.

| | |
|---|---|
| Tarring and sanding roadway, 32,446 sq. yds., at 7½d. .. | £1015 |
| „ „ „ footway, 7,400 „ „ 3d... .. | 92 |
| Total .. .. .. .. .. .. .. .. .. .. .. | £1107 |

*Sweeping.*—During the day, block-boys will be employed. Each will look after 200 yards of roadway, and nine boys will be required in all. The wages range from 15s. to 30s. per week; in this estimate the average salary is taken at 25s. per week.

9 boys, at 25s. per week .. .. .. £585 per annum

At night, a sweeper would be employed for the bridge and approaches; one would be sufficient. A sweeper costs £45 per annum; a man and horse would cost 12s. per day for seven days in the week, or £218 per annum. Allowing the sweeper to be replaced every year, the total cost for night cleaning would be £263.

Total cost of cleaning by day and night .. .. £848

*Watering.*—A watering-cart and driver would cost, including repairs, £248 per annum. One cart kept constantly employed would be sufficient.

*Summary.*

| | |
|---|---|
| Top dressing .. .. .. .. .. .. .. .. .. | £1107 |
| Sweeping .. .. .. .. .. .. .. .. .. | 848 |
| Watering .. .. .. .. .. .. .. .. .. | 248 |
| Total .. .. .. .. .. .. .. | £2203 |

*Lighting.*—The bridge and approaches will be lighted by 10-ampere flame arc lamps, spaced about 120 feet apart. The footpath and motor roadway on the main bridge will be lighted with 50-candle power incandescent lamps, spaced on an average about 40 feet apart, fixed to the vertical members of the bridge.

The arc lamps will be suspended from the cross-bracing about 30 feet above the deck of the bridge, and from pole standards on the approaches; 39 arc lights and 122 incandescent lamps will be provided. The cost of installing, including feeder cables, switches, standards, lamps, and all connections will be £2280.

*Cost of Current.*—The lamps are assumed to be burning 12 hours a day. Each arc lamp requires about 460 watts, including all losses, and each metallic filament lamp 60 watts. At the City Council's rates, the cost of current would be about £1036 per annum.

*Trimming and Cleaning.*—Carbons for flame arc lamps cost £7 5s. per annum per lamp.

Annual cost for the 39 lamps .. .. .. £282 15 0

An electrical mechanic would be constantly employed for cleaning and repairing; annual cost, about £200. Total for trimming and cleaning, £482 15s.

*Renewals.*—A metallic filament lamp is accepted as having a life of 1000 hours. With 122 lamps in use for twelve hours daily, there would be an average yearly renewal of 534 lamps, at 30s. per dozen, equalling £66 15s.

Arc light renewals are taken at 15 per cent. per annum of the number in use. Cost of 39 arc lamps and electrical equipment, £390. Hence renewals will cost £58 10s.

Total cost of renewals .. .. .. .. .. £125 5 0

*Mains and Wiring.*—These will require renewing. The cost of renewals is taken at 8 per cent. per annum.

Estimated cost of mains, £825; renewals, at 8 per cent., £66.

*Summary.*

| | | | |
|---|---|---|---|
| Cost of current .. .. .. .. .. .. .. | £1036 | 0 | 0 |
| Trimming and cleaning .. .. .. .. .. | 482 | 15 | 0 |
| Renewals of lamps .. .. .. .. .. .. | 125 | 5 | 0 |
| Renewals of mains and wiring .. .. | 66 | 0 | 0 |
| Total .. .. .. .. .. .. | £1710 | 0 | 0 |

### *Painting.*

Mr. James Fraser, Engineer-in-Chief for Existing Lines, gave in evidence before the Royal Commission on Communication between Sydney and North Sydney, that "the Hawkesbury Bridge, erected in 1889, has only been painted once since, viz., in 1904, at a cost of £2678." This is equivalent to about 8¼d. per square yard.

In this estimate it is assumed that the Sydney Harbour Bridge will require painting every ten years, the cost of which, viz., 420,000 square yards, at 1s. 1½d. per square yard, = £23,625, or an annual charge of £1968.

### *Supervision and Other Services.*

At the Pyrmont and Glebe Island Bridges, ten men are constantly employed at the two bridges, painting and repairing them.

The labour for cleaning, watering, top-dressing, lighting and painting has been allowed for. In addition, there would be the labour necessary to provide for inspection, collecting tolls, and renewals.

To provide for any renewals that may be necessary, to inspect the bridge systematically, to collect tolls for the vehicular traffic, and assist generally, the services of twelve men have been provided for, average salary, £150 per annum, or £1800 in all; also that of an officer in charge at £450 per annum to supervise, bringing the total cost for supervision and other services to £2250 per annum.

*Total Annual Charges.*

| | |
|---|---|
| Interest on capital .. .. .. .. .. .. .. | £120,000 |
| Sinking funds .. .. .. .. .. .. .. .. | 2,526 |
| Maintenance, roadways and footways .. | 2,203 |
| Lighting .. .. .. .. .. .. .. .. .. | 1,710 |
| Painting .. .. .. .. .. .. .. .. .. | 1,968 |
| Supervision and other services .. .. .. | 2,250 |
| Total .. .. .. .. .. .. .. .. | £130,657 |

*Earnings.*

The Superintendent of Lines, Mr. C. A. Hodgson, in his evidence before the Public Works Committee, stated that, if the railway only were taken over the bridge, the probable revenue would be as follows:—

| | |
|---|---|
| From Milson's Point Railway .. .. .. .. | £7,550 |
| From new passengers .. .. .. .. .. .. | 56,000 |
| Total .. .. .. .. .. .. .. .. | £63,550 |

This estimate was based on the assumption that the North Sydney traffic terminated at Wynyard-square Station, and did not connect with the proposed City Railway and the proposed Eastern and Western Suburbs. As the Station "Kirribilli," which will serve the population right down to Milson's Point, was not proposed when Mr. Hodgson's estimate was framed, no allowance was made for it, nor for any revenue from parcels or other traffic. Including these factors, a revenue of probably £90,000 would have been derived in the year 1912.

For an electric railway service, the working expenses will be 50 per cent. of the earnings, so the net revenue from the railway for the year 1912, after providing for all railway maintenance charges and working expenses, would have been about £45,000.

Last year Mr. Todd, Manager of the Sydney Ferries Ltd., supplied figures which gave the value of the vehicular ferry traffic at £15,000 per annum.

The cost of collecting the revenue from the vehicular traffic has already been provided for under Supervision and Other Services.

The net revenue received last year would probably have been £45,000 from the railway, and £15,000 from the vehicular traffic, or £60,000 in all.

For the year ending 30th June, 1907, 10,082,128 tramway passengers were carried on the North Sydney Tramways, whilst for the year ending June 30th, 1913, no less than 20,905,010 passengers were carried, i.e., the traffic has doubled itself in six years, or at the rate of about 12.92 per cent. per annum.

The Chief Commissioner has stated that the suburban railway traffic to and from the Central Station is increasing at the rate of 15 per cent. per annum, i.e., it is doubling itself every five years. If the bridge were commenced, the rate of expansion at North Sydney would probably be greater than 15 per cent. per annum.

The shortest time in which tenders could be invited, a tender accepted, and a cantilever bridge constructed to provide for railway, vehicular and pedestrian traffic would be seven years; i.e., if it was decided to go on with the work at once, it would be the end of the year 1920 before the bridge would be opened.

Assuming that the passenger traffic increases at the rate of 10 per cent. per annum, the probable net revenue—after providing for all working expenses—of £60,000 anticipated for the year 1912 would be £128,620 at the end of the year 1920. At 12½ per cent. per annum, the anticipated net revenue would be £153,950, whilst at the rate of 15 per cent. per annum, it would amount to £183,540.

Interest, sinking funds, maintenance, and all working expenses not otherwise provided for, amounts to £130,657 per annum.

The statistics of all important cities show that the urban passenger traffic increases more rapidly than the population does; the traffic increases as the square of the population or thereabouts. The population of the suburbs North of the Harbour is increasing at the rate of 6 per cent. per annum; i.e., it will double itself in 11.9 years. If the traffic increases as the square of of population, at the end of 11.9 years it should be four times the present amount; i.e., it should increase at the rate of 12.36 per cent. per annum as against 6 per cent. for the population.

The annual reports of the Chief Railway Commissioner show that the North Sydney tramway traffic has been growing at the rate of 12.9 per cent. per annum. This, of course, may be a coincidence, but it indicates that the North Sydney tramway traffic is increasing as the square of the population, as is found in New York, Boston, and other large cities.

Whilst it is to a large extent speculation for anyone to say when the bridge will be financial, statistics indicate that the traffic is increasing at the rate of about 12½ per cent. per annum, and that the railway revenue and a toll for vehicular traffic—should it be decided to charge a toll—should return sufficient revenue to meet all charges about the time the bridge could be opened for traffic, i.e., the end of the year 1920.

### *Acknowledgments.*

At an interview with the Honourable Arthur Griffith, Minister for Public Works, in November, 1911, and subsequently in January, 1912, the author explained his proposal for a one span bridge from Dawes Point to Milson's Point, and the reasons therefor.

The Minister gave instructions that the author, then Principal Designing Engineer, should be freed from all other duties to enable him to investigate his proposal, and give the necessary authority to obtain all information. Subsequently, on June 25th, 1912, the Minister issued the following instruction:—

"I have had occasion to consult Mr. Bradfield with regard to several matters in connection with the City Traffic, North Sydney Bridge, and Mr. Hay's Report. Mr. Bradfield informs me that if the Government determined to go on with the bridge, it would probably take about two years before the Department would be in a position to call for tenders, and, in the case of the City Transit, that a considerable time would be required after the receipt of Mr. Hay's report, to get matters into a forward state.

"Once Parliament has given the necessary authority for the carrying out of any of these works, the public would never tolerate such a delay, and I must ask, therefore, that steps be at once taken to push the work forward as far as possible in every detail, in order that a minimum of time only, will be required subsequently to give effect to the Government's desires whatever they may be. For this purpose, the services of Mr. Bradfield should be set exclusively apart as Designing Engineer for these works, and he be given authority to prepare all the preliminary work he can."

In conclusion, the author desires to express his thanks to Mr. J. Davis, M. Inst. C.E., Director-General of Public Works, for permission to publish this paper, and to Mr. L. M. Roberts, B.E., Designing Engineer, and Mr. R. Y. Smith, both of the Metropolitan Railway Construction Branch, for their assistance in preparing same.

---

# Power Gas Producers.

By

MATTHEW C. COATES, A.M.I.E.E.

Power gas has taken such a prominent position during recent years, due principally to the development of the internal combustion engine, that it becomes necessary nowadays for engineers to acquire some knowledge of the principles and designs of both gas producers and engines in order to determine their values as an economical method of developing power either in individual units where an engine is directly connected with its own producer or a central gas plant distributing gas to engines and furnaces within reasonable limits of distance from the location of the gas producing plant.

The rapid development of producers and the enormous strides made in the design of internal combustion engines have resulted in manufacturers placing within the reach of engineers reliable plant for the development of power and heat for industrial purposes, which it is safe to say has in many instances revolutionised the driving and manufacturing methods previously adopted.

It is not the intention of the author to lead the readers of this article to suppose that power gas is the cheapest means of producing power in every instance, as so many local conditions have to be taken into consideration, but more to point out how important it is for engineers, who are called upon to advise their principals or clients on any particular power scheme, to have the necessary knowledge of this subject to make a close comparison of gas power production, with steam, electric and water power, taking into account all the local conditions as to available fuel and methods of operation.

The subject of "Why is Gas Power more economical than Steam Power?" cannot be dismissed by saying "Well, it isn't," neither can the question be logically answered by saying "Because it is."

The question can only be settled by engineers giving the matter close consideration, taking into account every feature of design, economy, reliability, fuel and working cost, with due allowance in each case for interest, renewals and depreciation.

It is a well-known statement of manufacturers of suction gas plants, for instance, that 10 b.h.p. can be produced for 1d., or, stated in other words, 1 b.h.p. for 1-10th penny. I do not say that these statements are misleading, as they have been accomplished. But under what conditions? That is the point. What were the fuel costs, wages, cost of water, etc. When statements of a similar nature are made it is impossible to arrive at any idea as to how they will compare with other propositions unless the above particulars accompany the statement. In some instances to the lay mind it has conveyed the idea that one-tenth of penny per b.h.p. hour is a standard figure, and a result which the purchaser may expect. Finding due to increased fuel, water, and labour costs, the result is an increased cost per b.h.p. hour, detrimental remarks and criticisms have been levelled at the suction gas plant, whereas in many instances the economy has been all that could be achieved under the circumstances, but a lack of knowledge on the subject led to expecting too much out of the plant, and prevented them seeing how such results were not obtained.

Passing now to types of power gas producers which interest us here in Australia generally, they have been mostly confined to:—

(1) Suction gas producers.

(2) Pressure producers for non-bituminous fuel.

(3) Pressure producers for bituminous coal.

The term "suction gas producer" has been given to a gas producer to which a gas engine acts as an exhauster, using the piston as the pump or pull.

Producers have, of course, for many years been operated by the pull of a chimney or the action of an exhausting fan. The novelty implied in the current use of the term "suction gas producer" is therefore limited to the operating of a producer by the exhausting action which the gas engine effects when taking in its charge. The reactions by which the gas is formed and the nature of the gas is in no sense novel.

The theory of the suction gas producer is admirably presented in *Fig. 1,* which represents an extended diagram of a suction gas plant. Professor Dalby, M.A., who prepared the diagram for a lecture delivered before the British Association in 1906, describes the action as follows:—"The gas engine acts as a pulse to the system and is shown on the right. The piston moving out on the charging stroke reduces the pressure all through the apparatus and air enters at the points A and B. Referring to the air entering at A, it traverses the passage and receives heat in the region H, thereby increasing its capacity for absorbing moisture. At this point water enters, and the heated air becomes saturated and then passes through the fire in the gasifying chamber, where, for each pound of carbon, 4½ lbs. of air and about

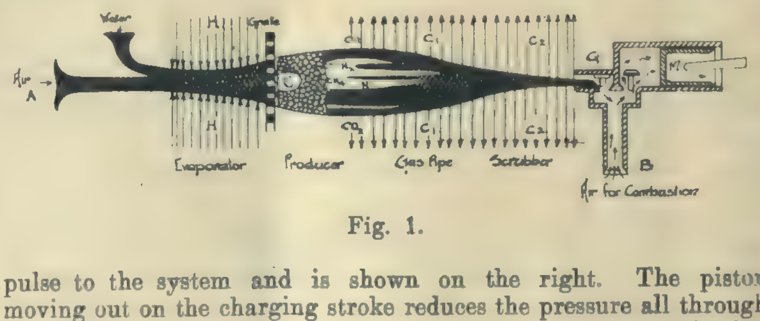


Fig. 1.

0.084 lbs. of water enter into combination, and on leaving the producer each 100 lbs. of gas contains about:—

| | lbs. |
|---|---|
| Carbon oxide | 29 |
| Hydrogen | 1½ |
| Marsh gas | ½ |
| Nitrogen | 57 |
| Carbonic acid | 12 |
| | 100 |

"This gas, being in a highly heated condition, is very low in density, and must be cooled to the lowest extent to permit of the engine cylinder being filled with the highest possible weight of gas. The gas is therefore cooled down to somewhere about the temperature of the atmosphere in the region of C1, C2. The gas from the producer enters the cylinder through the valve G, but the air for its combustion is admitted through the air pipe B, which is controlled by a valve so as to cause sufficient suction to be set up in the producer to provide the requisite proportion of gas. The air valve on the engine in some, if not all cases, requires adjustment to suit the changes in the load when the power requirement is liable to alterations lasting over considerable periods."

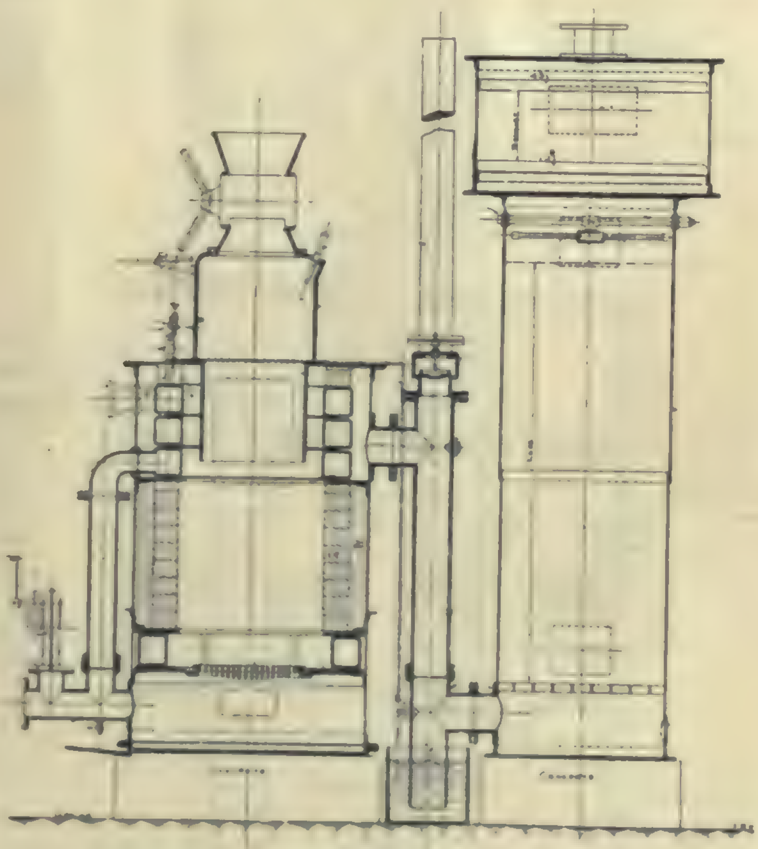


Fig. 2.

Having now described the theory of the suction gas producer we pass on to some of the practical problems which have faced the manufacturers.

Since M. Benier, Paris, in 1891, took out a patent for a producer in which the air and steam for the gasification of the fuel in the generator was drawn in by the suction of the gas engine piston on its charging stroke, the battle has waged in the development of these plants around the three essential points, viz.:—Fuel consumption, low capital cost, reliability.

Although M. Benier took out the above patent, it is believed that the credit of putting the first suction gas plant on the market belongs to an Englishman named John Taylor.

There can be no doubt that in these times, when internal combustion motors are being applied to every purpose of motive power both on land and sea, the scientific and practical problems which after all are fundamental and necessary to rapid progress require very serious consideration.

One of the most serious difficulties the designers of suction gas plants has had to face has been the irregular supplies of gas due to clinker formation, with poor qualities of fuel, due in a large measure to the engine taking irregular supplies of gas on varying loads, thus being unable to maintain the fire at an even temperature. In a large measure these difficulties have been successfully overcome. Another serious difficulty was the successful elimination of tar, etc., from the gas, the presence of which in some earlier plants proved so detrimental to the successful operation of the gas engine. Taking now the most generally used and most successful plants working in Australia, we have:—

The Crossley Producer.
The Campbell Producer.
The Cambridge Producer.
The Dowson Producer.
The Fielding and Platt Producer.
The Hornsby Producer.
The Kynoch Producer.
The Robson Producer.
The Tangye Producer.

While the above producers are those most commonly used in Australia, there are other designs of producers on the English, American and Continental market possessing unique features in their design and construction. Amongst the English makers, besides those above mentioned, are the "Butler," "Grice," "Mersey," "Scotia." While the principle is much the same in most of the types mentioned, the details of the generating chamber and accessories and the method of working vary to accomplish the end in view, and numerous inventions have been developed in details. As regards fuel the most suitable fuels available in Australia are charcoal, coke, brown coal, and some bituminous non-caking coals, which have all been attended with good results when used in properly designed producers under proper conditions.

Wood, wood shavings, leather, cuttings, tan bark, etc., have been used more or less successfully, and it is safe to predict that satisfactorily long runs will be accomplished with producers burning wood directly charged, at less frequent intervals than at present, into the generator without first being converted into charcoal.

I will now proceed to investigate the different designs of producers, their construction and method of operation.

Space will not permit illustrating every type of producer, nor could any good purpose be served, so it is considered sufficient to illustrate only a few of the most used.

To begin with, every plant has its gas generator containing the fuel to be gasified with suitable means of charging, a vaporiser either embodied in the design of the generator or separate and external to the generator, and the scrubbing and cooling apparatus.

In laying the following designs before readers the idea is to demonstrate six of the leading designs of producers as used in Australia. There are others, but I am of opinion that those described are such as will give good results when used under proper conditions, and, therefore, are all that are necessary to describe for the purposes of this article.

*Crossley Producer,* as illustrated in *Fig. 2,* is of very substantial design, in which the hot gases before leaving the generator are made to circulate around the vaporiser, heating it sufficiently to immediately evaporate the governed charge of water which is drawn in on each suction stroke of the engine.

The air, before passing through the fuel, is drawn through the vaporiser, where it mixes with the steam, and after being superheated the mixture passes through the fire. The hot gases also circulate around the fuel container before leaving the generator, thus heating the fuel before it descends into the combustion zone.

It will be seen that the re-generative system is therefore used to the fullest extent, and that as far as possible the sensible heat of the gases is recovered and returned to the generator. After leaving the generator the gases pass down the main pipe to the coke scrubber, the heavier portions of solid matter contained in the gas falling into the water seal at the bottom of the pipe.

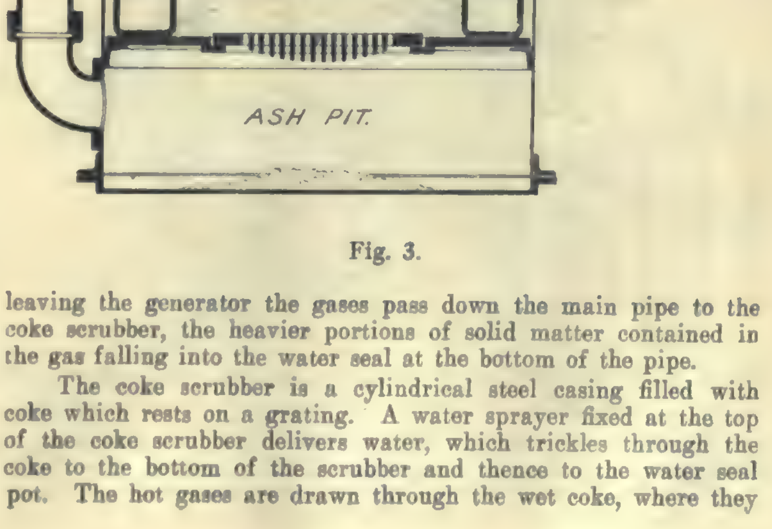


Fig. 3.

The coke scrubber is a cylindrical steel casing filled with coke which rests on a grating. A water sprayer fixed at the top of the coke scrubber delivers water, which trickles through the coke to the bottom of the scrubber and thence to the water seal pot. The hot gases are drawn through the wet coke, where they

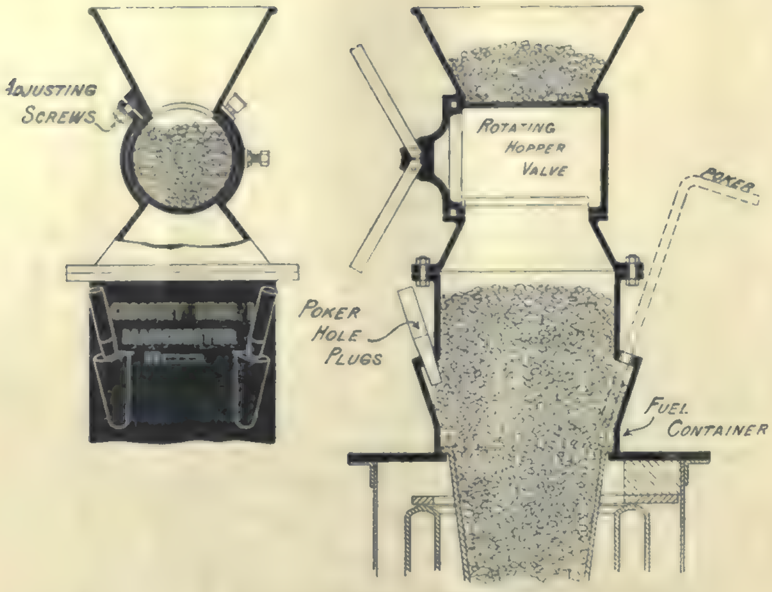


Fig. 4.—Feeding Hopper.

are cooled and cleaned, and pass from thence to the sawdust scrubber fixed on the top of the scrubber, where they are finally cleaned and dried. The gas supply pipe to the engine is fixed on the top of the sawdust scrubber.

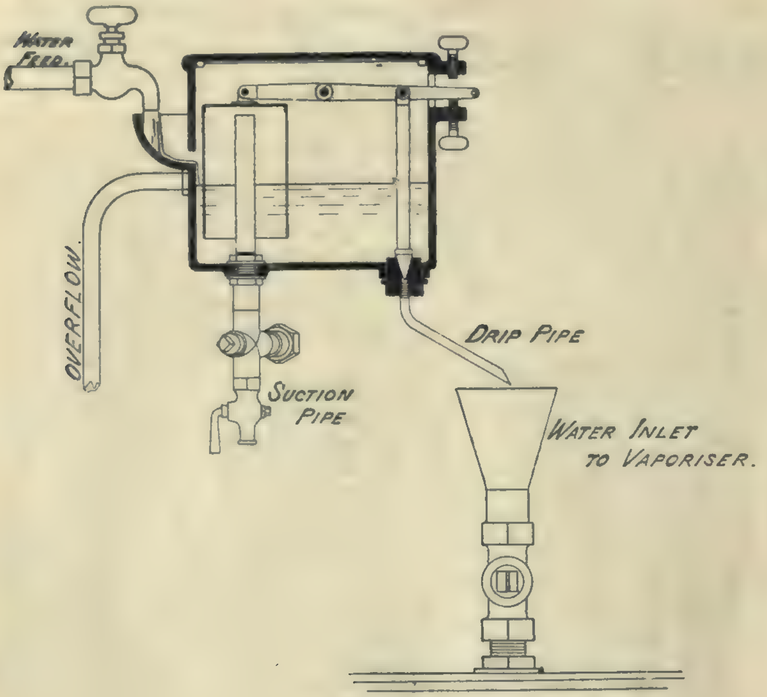


Fig. 5.

The scrubbers are provided with cleaning doors for conveniently removing the dirty coke and refilling the coke scrubbers, an operation which is only necessary once or twice a year.

Some of the details of this plant are interesting, and are herewith illustrated:—*Fig. 3*, section through generator; *Fig. 4*, through feeding hopper; *Fig. 5*, automatic water feed to vaporiser; *Fig. 6*, the vaporiser; *Fig. 7*, the sawdust scrubber.

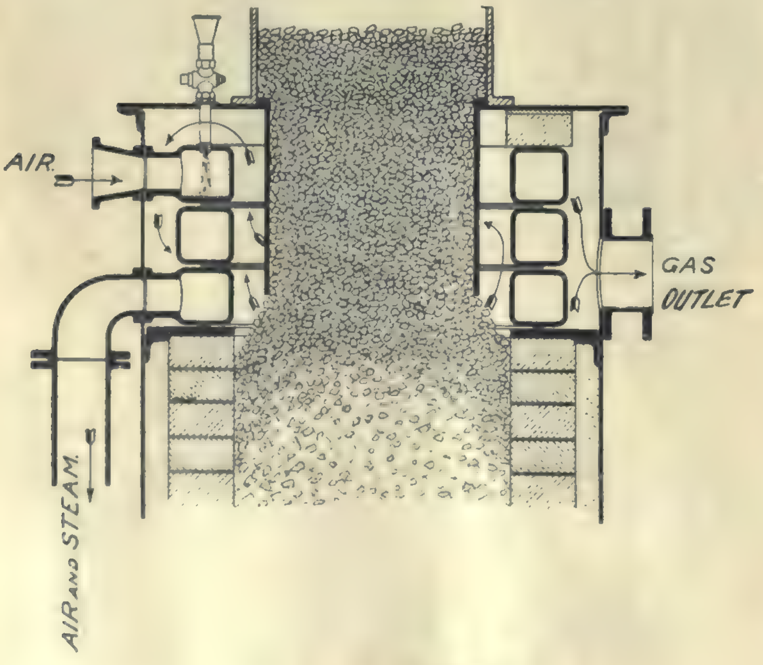


Fig. 6.—The Vaporiser.

The section all clearly demonstrate the construction of the plant and passage of the gases.

The most interesting and important feature is shown in *Fig. 5*, viz:——

"The automatic water feed to vaporiser, it is well known, must be thoroughly reliable in all designs of plants to maintain a correct temperature in the fires under varying loads. In this device a water tank is provided, into which a constant supply of water is admitted, the delivery of water to the vaporiser being controlled by a needle valve connected to the end of a light bell sealed by water, which is connected with the interior of the generator by means of a pipe. The operation is such, that when the engine sucks a charge of gas a vacuum is formed in the bell, which is drawn down, thus opening the valve and allowing the right amount of water to run into the vaporiser. This system ensures that the amount of steam raised is in proportion to the load on the engine. An overflow to the seal pot is provided.

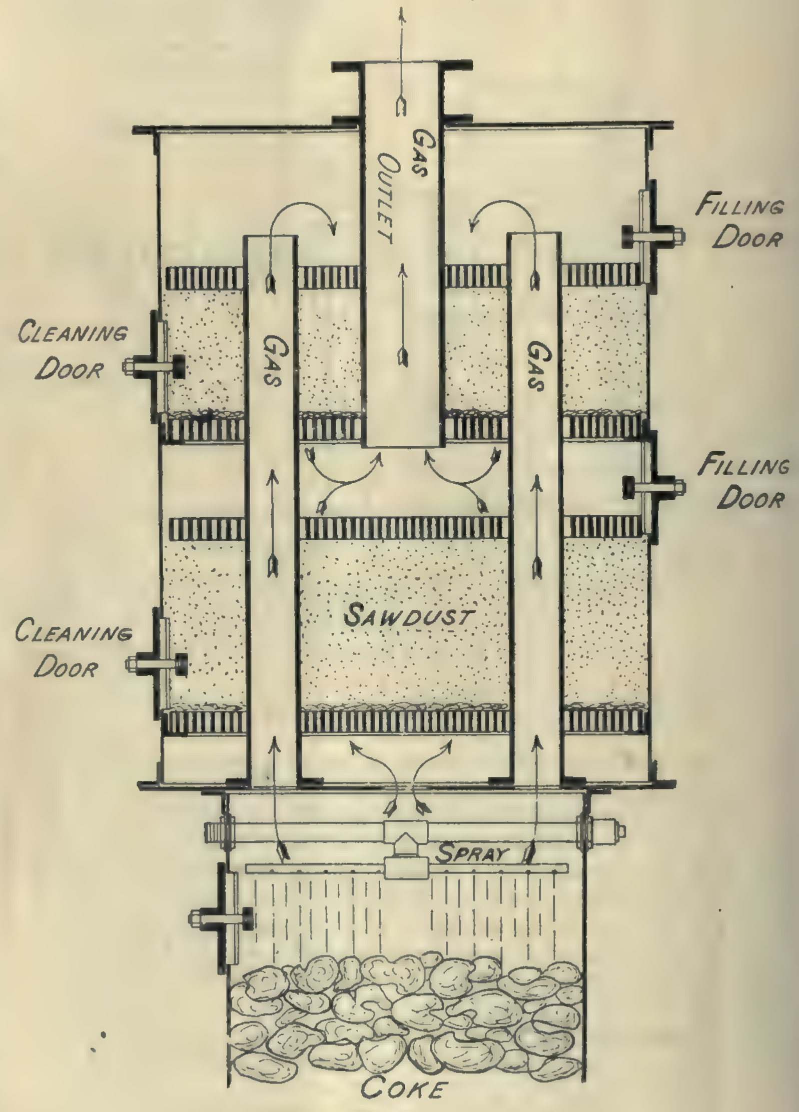


Fig. 7.—Sawdust Scrubber.

*Cambridge Producer.—Fig. 8* shows the section of a Cambridge gas producer, which has been designed, patented and manufactured in Australasia.

There are some novel features in this plant, as will be seen from the illustration.

The generator is built of mild steel in a cylindrical form, having an inner space lined as usual with firebrick for the reception of fuel and an outer space for air, and a certain amount of water for vaporisation purposes.

It will be noted that in this design of producer the suction is down through the bed of fuel, a departure from other types of suction gas producers, and also that secondary air is introduced into the fuel about half way up the fuel bed. The generator is filled with the usual charging hoppers, plug cocks, and vent pipe for the waste gases when starting, cleaning doors, etc. The scrubbing and cooling arrangements do not call for any special mention.

Some consumption tests on various fuels on these producers may be of interest:—

| Fuel. | Size of Plant. | Length of Run. | Fuel per B.H.P. | Remarks. |
|---|---|---|---|---|
| Box Blocks .. | 70 h.p. | 4½ hours | 2.15 | No tar on Engine Valves. |
| Brown Coal .. | ,, | 5 ,, | 1.805 | White Saline Deposit. |
| Bandamba Coal | ,, | 6 ,, | .92 | No Deposit. |

The other fuels gasified in these producers are coke, charcoal, N.Z. lignite and some bituminous non-caking coals, and show from tests that it is a very economical producer requiring a minimum amount of attention.

*Dowson Producer.—Figs. 9, 10, 11* show sections through Dowson producers which call for special mention, as the designer, Mr. Dowson, has been associated with gas producers from the earliest stages, and was the first to devise a simple plant to make a cheap fuel gas to drive gas engines (1878).

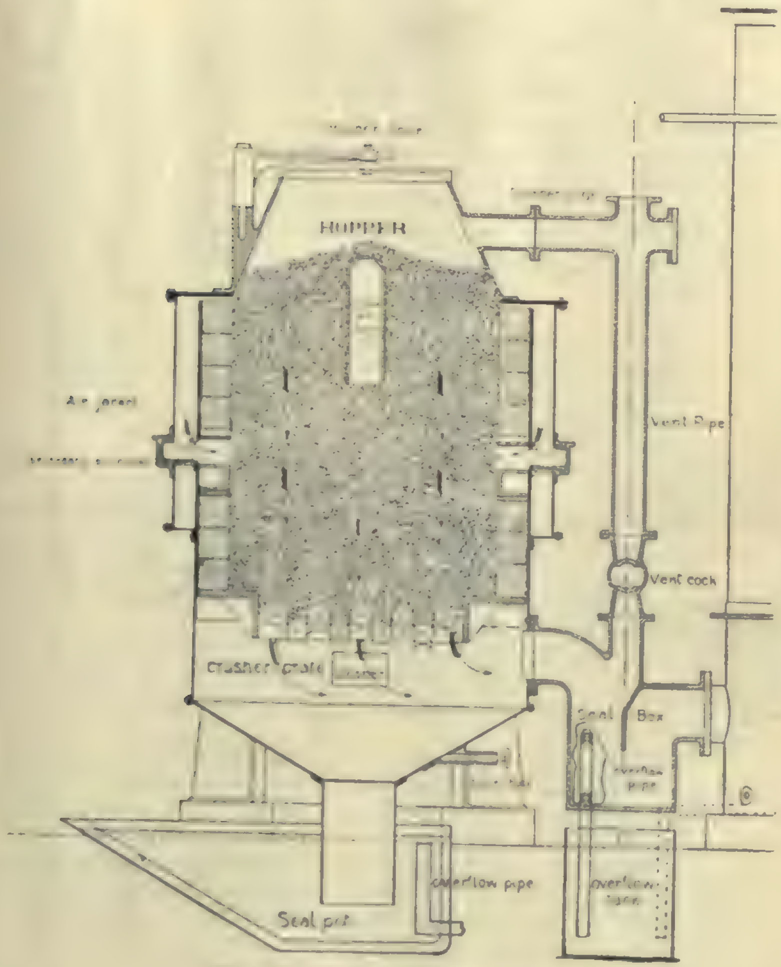


Fig. 8.—Cambridge Producer.

The Dowson and Mason Gas Plant Co., who have acquired the whole business of the Mersey Engine and Producer Co. Ltd., not only manufacture the "Dowson" producers, but also manufacture the "Mersey" and "Duff" producers, as well as the well-known "Weardale" furnaces for all classes of heating work. Their operations cover a large and varied experience in producer work in all parts of the world. Their principal standard designs are:—

*Fig. 9.*—"Dowson" steam jet pressure plants with boiler producer, coke scrubber, sawdust scrubber, and small gas holder.

*Fig. 10.*—"Dowson" suction gas plant with producer, starting fan, coke scrubber, and sawdust scrubber.

*Fig. 11.*—"Dowson" bituminous plant with producer, vaporiser, wood grid scrubber, coke scrubber, and sawdust scrubber.

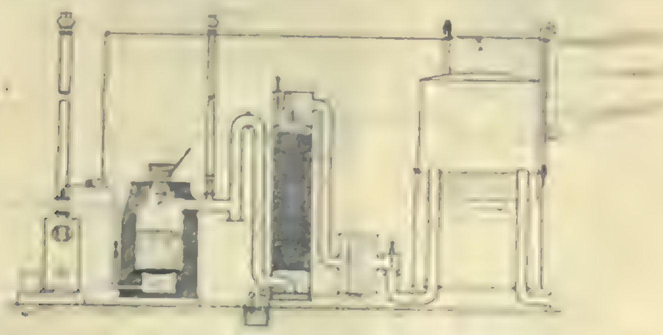


Fig. 9.—"Dowson" Steam-Jet Pressure Plant, with Boiler, Producer, Coke Scrubber, and Small Gasholder.

The sections clearly illustrate the construction of the plants and the passage of the gases, and it is only necessary to add that:—

*Fig. 9.*—This type of plant can be used where there are two or more gas engines, or when there are engines and heating work, or when there is heating work only requiring small jets of gas. This plant is worked with anthracite, charcoal, or coke, the usual consumption being about 13 lbs. anthracite or charcoal, or 14 lbs. coke per 1000 cubic feet.

*Fig 10* does not call for any special description, with the exception that the fuel consumption works out on anthracite or charcoal about 1 lb. per b.h.p., and on coke a little over on an average size engine, a fair average for suction plants.

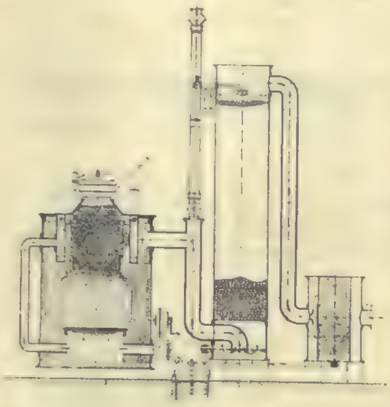


Fig. 10.—"Dowson" Suction Gas Plant, with Producer, Starting Fan, Coke Scrubber and Sawdust Scrubber.

*Fig. 11* is a double acting producer, i.e., air is drawn in through the top and through the bottom of the fuel column. It is designed for using bituminous coal, which is fed in at the top, and the fire burns downwards. The hydrocarbons are distilled off and various useful reactions take place.

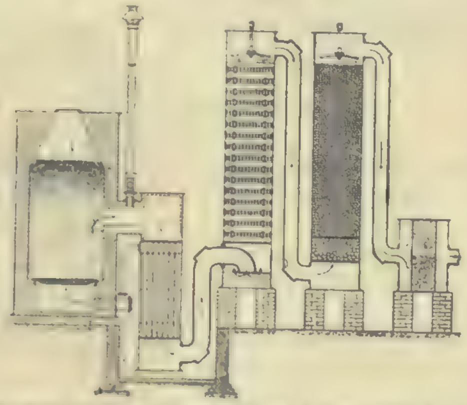


Fig. 11.—"Dowson" Bituminous Plant, with Producer, Vaporiser, Wood-grid Scrubber, Coke Scrubber, and Sawdust Scrubber.

The remaining coke sinks into the lower part of the producer, and is converted into ordinary producer gas by the mixture of air and steam, which is drawn in at the bottom.

The gases are taken off about half way between top and bottom of the producer. There is no external fire, and the gas is made as quickly as it is consumed.

When working with ordinary bituminous coal or with lignite and several other fuels, the tar is removed altogether in the producer and no tar extractor is used. The hot gases, after leaving the producer, are passed through and cooled in the vaporiser, at the same time raising steam required for gas making. It is then further scrubbed and cooled on its way to the engine.

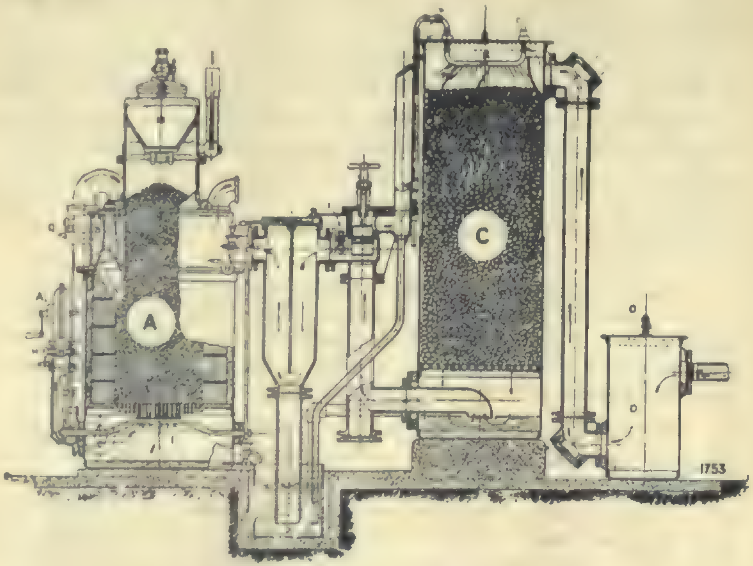


Fig. 12.—Hornsby Producer.

This plant can be used for either power or heating, but when used as a suction plant there is a fan to start it, as in ordinary suction plants, but when the gas is passed into a holder there is a fan or blower to draw the gas from the plant and deliver it to the holder, thence to the engines and heating apparatus.

In regard to the maintenance, this is comparatively small in comparison to steam plants.

About £4 per annum up to, say, 100 b.h.p. producer.
About £15 per annum on, say, 500 b.h.p. producer.

From a series of investigations into standby losses, it was shown that producers ranging from 100 to 400 b.h.p. each consume on an average about 3½ lbs. per producer per hour.

*Hornsby Producer.*—*Fig. 12* shows a section through a Hornsby Producer. This plant is of simple and strong construction, and has the internal type of vaporiser, as in the previous producers. The grate area in the producer is well proportioned and of ample area for the work, so that the temperature of the fire is never excessive, thus increasing the life of the brickwork and firebars.

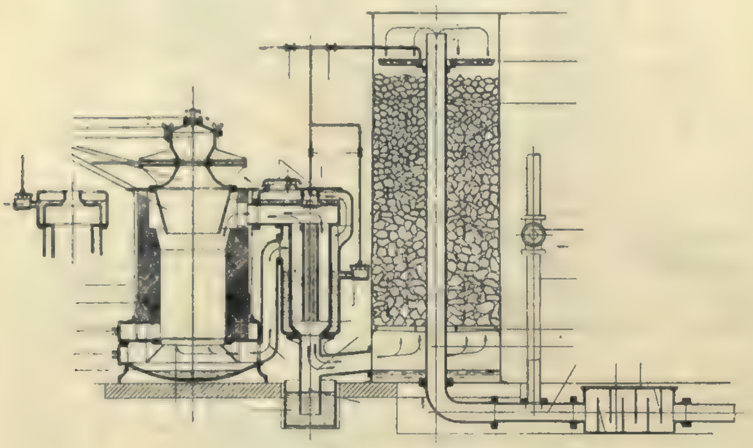


Fig. 13.—Kynoch Producer.

The plant is fitted with a simple and strong type of hopper hand-fan, cleaning doors, with the usual scrubber, and expansion box.

The vaporiser can be shut off when the engine is not working, thus preventing production of gas.

*Kynoch Producer.*—*Fig. 13* shows a section through a Kynoch Producer, in which it will be noticed that it differs from the majority of the suction gas producers shown, inasmuch that it has an external vaporiser. The object, of course, being that the vaporiser is more accessible and easily taken to pieces and cleaned, and does not take any live heat from the generator. It raises steam at the same time, cools the gas on its way to the scrubber. The points in this plant are cast iron generator bottom, external vaporiser, slide feed on hopper. The scrubbers, etc., are much the same as other plants.

*Tangye Producer.*—*Fig. 14* shows a section through a Tangye Producer. The general design is much the same as some of the other producers, having internal vaporiser. The producer is of very substantial design and of simple construction, all the parts being easily got at. Its fuel consumption is the same as the other well-designed producers described.

As before mentioned, there are many other types and makes of suction producers, but space does not permit reproducing them.

Having now described some of the best known producers as used in Australia, we can proceed to consider the questions to be borne in mind in deciding and selecting a suitable plant for moderate powers. The point is, to have an apparatus which will turn as many heat units in the available fuel as possible into force or work.

The arrangement which accomplishes this most perfectly is said to have the highest thermal efficiency. It is, therefore, obvious that a close study of the fuels available at the location of the proposed power unit is necessary, taking into consideration calorific values and cost delivered to site.

In selecting the proper type of plant to be used, it is necessary to consider the uses to which power gas can be put in the particular scheme under consideration.

Suction gas, generally speaking, is usually best when there are not more than two or three gas engines to operate, and when the engines are near the plant. Long mains are not desirable for suction work.

Pressure gas made with a jet of steam is certainly best for nearly all kinds of heating work, due to the fact that the calorific power of average pressure gas made with a jet of steam is about 10 per cent. higher than that of suction gas, or of pressure gas made with an air blower.

The conditions of load under which the plant will work is also of extreme importance, so as to determine as near as possible the size of producer which will meet the normal working conditions and secure the maximum economy from the plant.

If the load is varying, say, for instance, a works running a night shift with, perhaps, only 40 per cent. to 50 per cent. load factor, then it might work out cheaper to meet this condition of working with a separate producer. The question of water supply is also to be considered, an adequate supply being necessary for supply to scrubber and vaporiser, and also, of course, to the cylinder jackets.

Having decided on the most suitable fuel, and arrived at the cost of fuel and water, specifications and lay out of the proposed engine and producer room should be prepared, embodying the conditions of working, cost of fuel and water, and tenders called requesting guaranteed consumption of fuel and water, for the whole installation delivered, erected, and carefully tested to ensure that the guaranteed consumptions are fulfilled.

It can be taken as fairly accurate that modern gas engines will have a fuel consumption of about, according to the quality of fuel:—

| | Coal & Coke. | Charcoal. | Wood (box). |
|---|---|---|---|
| 20 to 50 b.h.p. | 1⅜ lbs. | 1⅜ lbs. | 3 lbs. |
| 50 to 100 b.h.p. | 1⅛ lbs. | 1⅛ lbs. | 2½ lbs. |
| 100 to 200 b.h.p. | 1 lb. | 1 lb. | 2 lbs. |
| 200 to 400 b.h.p. | ⅞ lb. | ⅞ lb. | 1⅞ lb. |

These figures are sufficiently accurate to work out any comparative costs.

Water supply to scrubber and vaporiser would average about 2 to 2½ gallons per b.h.p. hour.

The cylinder jacket water need not enter so much into the question, as this is continuous, and the loss and subsequent make-up is only that due to evaporation.

In the larger power units the scrubber water can be suitably treated and again returned to the scrubbers, as the author has done on one or two occasions, but on the smaller sizes it would not pay.

In coming now to the installation and operation of the plant, too much emphasis cannot be given to the importance of installing the plant in a reasonably spacious, well-ventilated, and generally clean building, with producers separate from the engines.

In the opinion of the author, this is of great importance, and inattention to these details has ruined some installations in a short time. If they are not properly attended to trouble would only follow, and reflect discredit on all parties concerned.

Some plants have been struck away in a corner with scarcely room to get between engines and producers, half buried in coke and dirt, with the inevitable result, trouble. "Out of sight, out of mind."

*Fig. 15* shows a typical lay-out of a suction gas driven electric power station which the author designed and constructed, the capacity being three 120 k.w. direct coupled sets. These engines were of the Hornsby type direct coupled to Siemens generators, and on test gave the following results, with good, clean coke for fuel:—

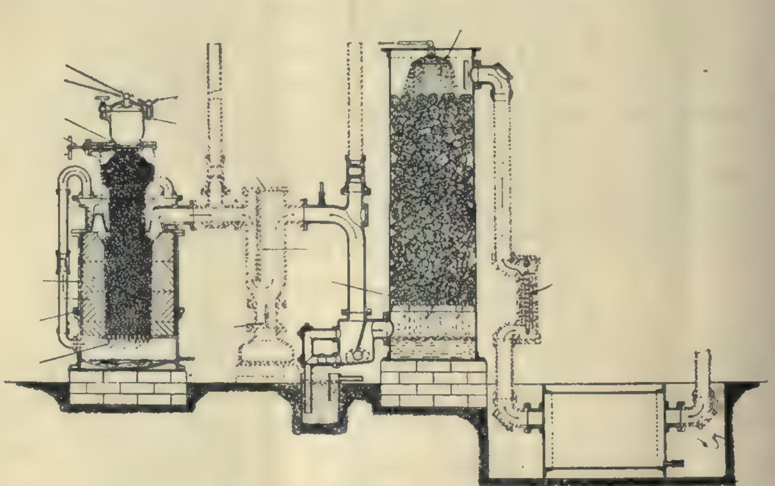


Fig. 14.—Tangye Producer.

Average i.h.p., 221.2; average b.h.p., 182.1; average revolution, 172; coke consumption per b.h.p. hour, .846 lbs. coke; water consumption per b.h.p. hour, 1.7 gallons.

The load was applied by external water resistance and kept constant throughout a six-hour load run.

The station has since been considerably added to.

The success of a power station plant in a large measure depends on the engineer in charge, who will insist on regular charging at the generators, keeping clean fires, keeping temperatures in the plant correct, clean and tight, valves and joints on the engine and plant, and generally a clean engine and producer room. These factors enter into almost any kind of power plant, and why not a suction gas plant? Many people have the mistaken idea that these plants can be stowed away in any out-of-the-way hole; and, as long as a

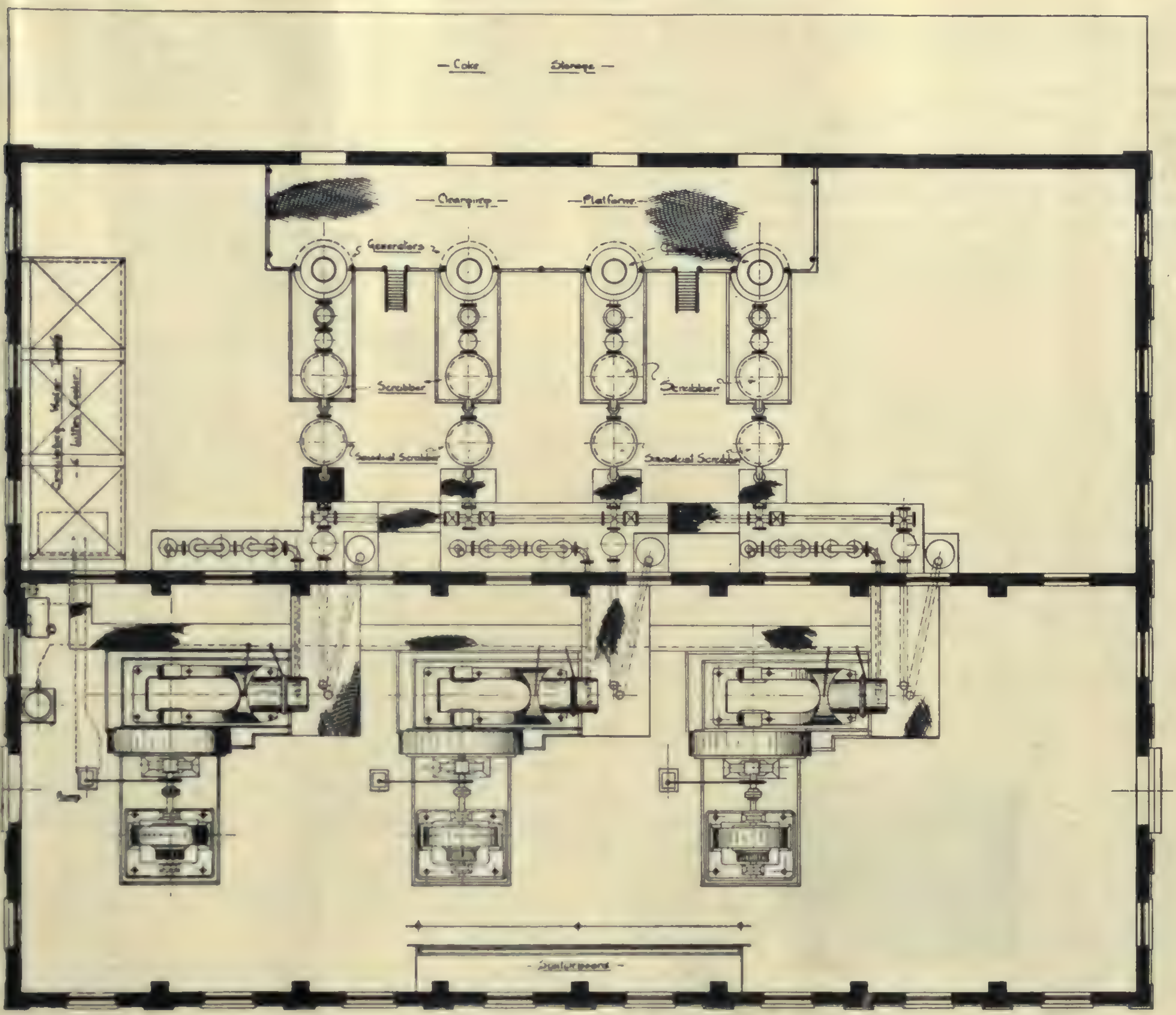


Fig. 15.—Lay-out of Gas Plant.

few buckets of coke are pitched into it occasionally by any unskilled labour, everything will be alright.

If the station is of any size it would pay to get the best engineer possible, who would maintain the efficiency in fuel consumption, an important factor, and keep down maintenance costs.

Passing now to the larger types of producers, notably the Dowson Mond and Morgan Patents, these are largely used for both power and heating.

In connection with furnace work, it was Bischof, of Magdesprung, in the Harz, who made the first gas producer, but no great advance was made until Frederick Siemens brought out his combination of gas producer and regenerative furnace, in 1857. This important invention and improvements on same was developed on scientific and practical lines by many manufacturers, until to-day we are in a position to apply this cheap source of power and heating to almost any proposition where power and heating are required.

It is well known that almost all bituminous fuels throughout the world, including brown coal, peat, lignite, wood, coke (oven and pit refuse), can be satisfactorily gasified in suitably-designed producers.

Bituminous fuels vary very considerably in their behaviour in gas producers, but some producers are designed to cover a wider application than others in the case of refractory and highly caking fuels. With care and observation, the conditions required for the gasification of any suitable fuel can be ascertained and established permanently.

The physical properties of fuels, especially in the case of small bituminous slacks, have also an important effect upon the rate of gasification. Generally speaking, fuel with a high-fixed

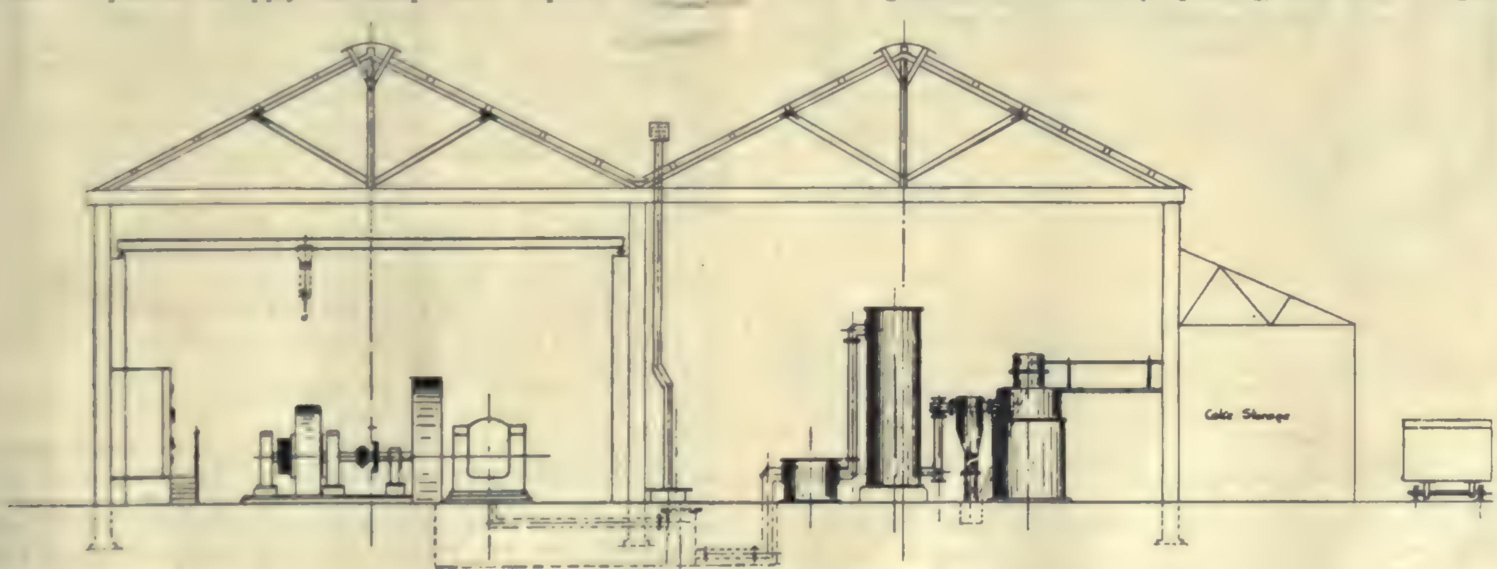


Fig. 16.—Sectional Elevation.

carbon value and a correspondingly high heating power is the best for use in gas producers, while, where the recovery of ammonia is under consideration, a high percentage of nitrogen is of the first importance. Other properties being satisfactory, an English slack coal containing about 12,000 heat units per pound and not more than, say, 15 per cent. fine dust, which will pass through ⅛ of an inch mesh, is very suitable for producer work.

One of the main factors to be observed is the quantity of steam in the blast, which has a most important effect on the general mechanical working of the producer and on the quality of the gas. By the use of a proper quantity of steam, the formation of clinker is practically avoided, and the producer is prevented from becoming too hot, while its capacity in regard to rate of gasification is greatly increased.

The operation of these plants, either with or without bye-product recovery, for power or heating work is simple and perfectly safe.

Producer gas is the cheapest gas made per unit of heat, and contains more of the original energy in the fuel than any other gas, and, therefore, eminently adapted for use in furnace work.

The great economical advantage of gas firing over direct coal firing is due to the fact that gas can be applied with much greater precision, and that the heat once generated in the furnace can be conserved indefinitely and in a degree not approachable with direct firing. By the simple manipulation of valves, a suitable furnace can be maintained at any desired temperature.

There are several furnaces in operation in Australia supplied for heating purposes for angle bars, billets, etc., working on Dowson gas producers. In a direct coal fired furnace it is necessary, in order to obtain complete combustion, that an intense local heat should be maintained in the grate or fuel bed, where certain physical and chemical changes take place, and as a number of these changes absorb heat, the temperature resulting from the simultaneous ignition of the combustible gases is appreciably lowered. It is thus more economical to lead off the combustile gases from the fuel bed before combustion takes place, and to apply them where the heat is actually required, namely, the furnace hearth. This can only be done by the preliminary gasification of the fuel in a closed chamber (such as a gas producer), and though small but unavoidable losses of sensible heat by radiation and conduction occur in this method, it is a fact that very material reductions are made in the weight of the fuel used, and that many metallurgical operations impracticable with direct coal firing are performed.

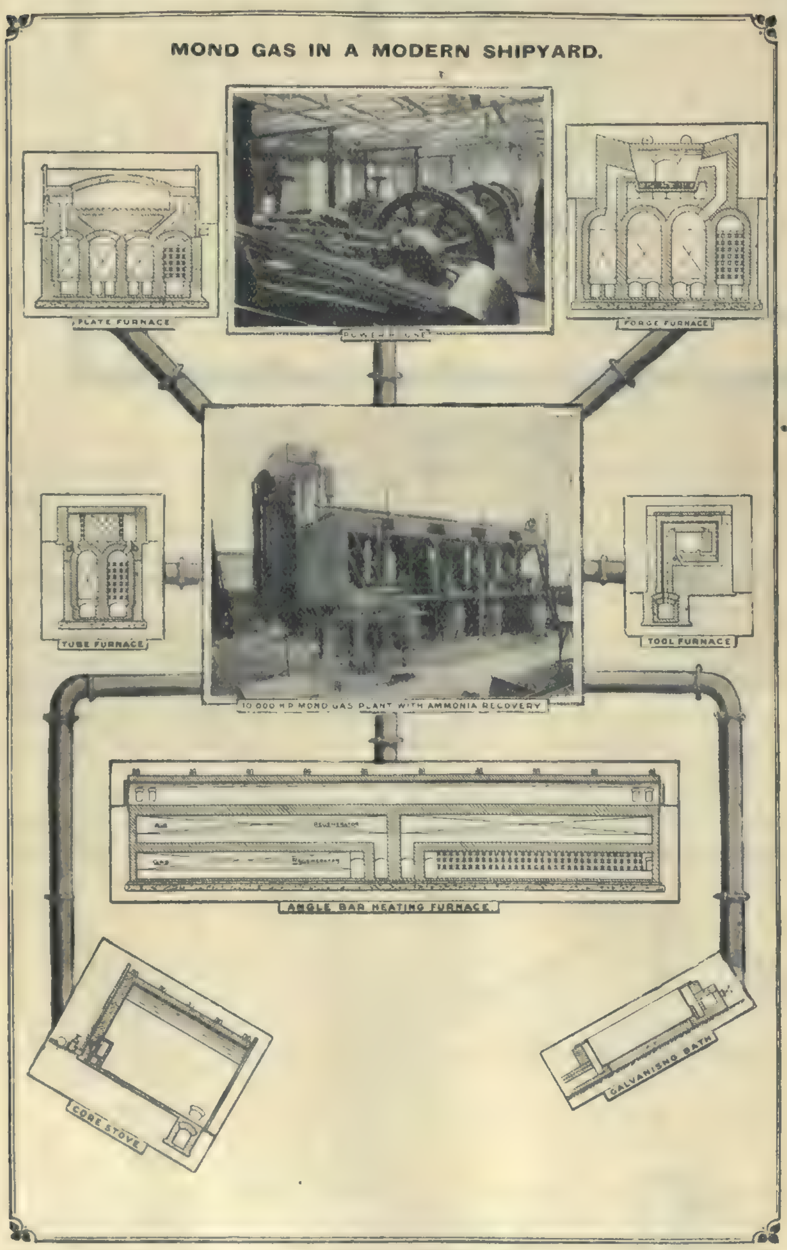

MOND GAS IN A MODERN SHIPYARD.
PLATE FURNACE
POWER HOUSE
FORGE FURNACE
TUBE FURNACE
TOOL FURNACE
10,000 H.P. MOND GAS PLANT WITH AMMONIA RECOVERY
ANGLE BAR HEATING FURNACE
CORE STOVE
GALVANISING BATH

Fig. 17.—Mond Gas in a Modern Shipyard: Gas Producer and Furnace Plant.

*Fig. 17* shows a Mond gas plant in a modern shipyard, in which it will be noticed the gas is employed for both power and heating. The gas is conveniently conveyed in pipes to the gas engines, as well as all the heating furnaces about the yard, without any applicable loss through leakage or deterioration.

It might here be useful to readers to give some figures in regard to the flame temperatures of Mond gas, as well as suitable temperatures for various operations and other useful data:—

The Melting Points of Various Metals.

| | Deg. C. | | Deg. C. |
|---|---|---|---|
| Sulphur | 115 | Copper | 1,000 |
| Tin | 230 | Cast Iron (White) | 1,135 |
| Lead | 360 | Cast Iron (Gray) | 1,220 |
| Zinc | 415 | Steel, Hard | 1,410 |
| Aluminium | 660 | Steel, Mild | 1,475 |
| Silver | 960 | Palladium | 1,900 |
| Gold | 1,250 | Platinum | 1,775 |

Flame Temperatures of Mond Gas in Furnaces.

| | Deg. C. | |
|---|---|---|
| Without Pre-Heating Air or Gases | 900 | 1,100 |
| Continuous Air Recuperation | 1,100 | 1,200 |
| Reversing Air Regeneration | 1,200 | 1,400 |
| Continuous Air and Gas Recuperation | 1,200 | 1,400 |
| Reversing Air and Gas Regeneration | 1,400 | 1,800 |

Suitable Temperatures for Various Operations.

| | Deg. C. | |
|---|---|---|
| Annealing Steel | 500 | 700 |
| Annealing Malleable Iron | 650 | 750 |
| Annealing Malleable (Cupola Iron) | 800 | 950 |
| Annealing Glass | 300 | 700 |
| Working Glass | 700 | 900 |
| Melting Glass | 1,100 | 1,600 |
| Foundry Core Ovens | 160 | 200 |
| Enamelling Ovens (Cycle, etc.), White | 60 | 70 |
| Enamelling Ovens, Red and Green | 120 | 130 |
| Enamelling Ovens, Black | 140 | 150 |
| Galvanising | 420 | 440 |
| Tinning | 250 | 260 |
| Burning Pottery | 1,200 | 1,350 |
| Glazing Pottery | 800 | 1,100 |

Producer gas is used extensively now in all classes of works for heating purposes, and may be used for firing boilers, annealing malleable iron castings, chains, enamelling, japanning, tinning, tempering, heating workshops, laundries, core ovens, furnaces of all description, etc. It can also be used advantageously in nearly all large heating and melting operations. Except for annealing or other low temperature work, the air supply for combustion should be pre-heated by the waste heat from the furnaces in recuperative or reversing regenerative chambers.

For the highest heats, as in melting steel and glass, the gas itself is also pre-heated by similar means; thus the bulk of the otherwise wasted heat is utilised.

For the economical melting of steel and glass, the gas producer is now absolutely essential, and there are thousands in use for this purpose. For instance, in the United States Steel Corporation Gary Works there are some 200 10ft. diameter Morgan Gas Producers at work, which seems to be a well-designed and a much-used producer with many labour saving devices embodied in its design, one of the devices being the "George" Patent Automatic Feed and Distributor, which is an arrangement of an inclined slowly rotating water-cooled feeding spout, a simple apparatus which may be relied upon to feed and distribute the coal fine and coarse uniformly and continuously over the entire surface of the fire.

It is obvious that an arrangement of this description will give a more continuous and unchangeable supply of good reliable gas whose heating value is not varying every few minutes, as may be the case with hand firing where the coal is dumped into the centre of the fire and roughly pushed around with bars to distribute it over the fire.

By means of the automatic feed comparatively thin uniform fires may be provided at a constant level.

Another feature of the Morgan-Chavanne continuous gas producer is the adoption of a revolving bottom, by the action of which the ashes are uniformly and continuously removed laterally from the bottom of the producer through the water seal in the circular ash pan. The top of the fuel in the producer is thus kept level and constantly at the same height, which is of great importance for the regular working of the producer.

The driving power required by the "George" feeds and the "Chavanne" revolving bottoms is comparatively small. The power required to operate a four producer plant, each producer gasifying 16 tons of fuel per 24 hours, did not exceed 2.4 h.p., or 0.6 h.p. per producer. The revolving bottom can be set in motion or stopped as required, thus regulating the rate of gasification, and effecting a great saving in power.

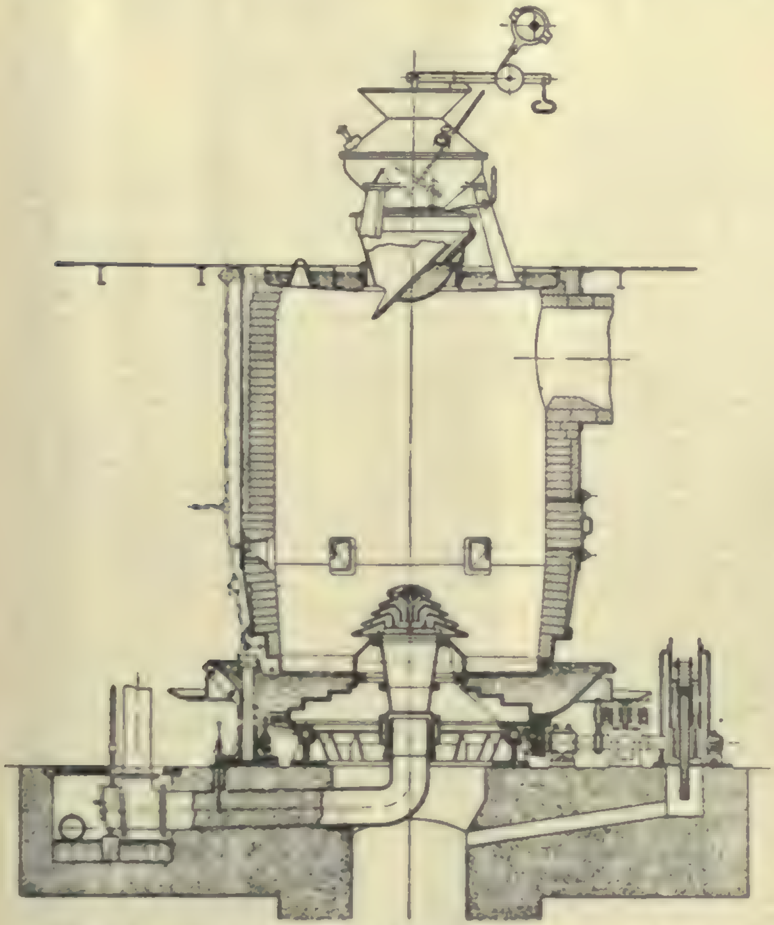


Fig. 18.—Morgan-Chavanne Revolving Bottom Producer. (This design shows the Automatic Feed and Distributor and the Revolving Bottom with Conveyor for delivery of the ashes at a fixed point.)

*Fig. 18* shows a section through a Morgan-Chavanne revolving bottom producer, with conveyor for delivery of the ashes at a fixed point, also the automatic feed and distributor. These producers are made in standard sizes having internal diameters of brickwork 8ft. to 10ft.

The capacity naturally depends on the character of the fuel; but as a fair average it may be taken that a 10ft. Morgan continuous producer gasifies 9 to 11 tons, and a 10ft. Morgan-Chavanne producer 16 to 22 tons of fuel per 24 hours. The capacity of the 8ft. producers runs about 25 per cent. to 30 per cent. less.

In these producers for furnace work it may be taken generally that the economy secured over coal fired furnaces ranges from 25 per cent. to 50 per cent. according to the work dealt with and the type of furnace used. The advantages gained are:—

Cheap quality of coal may be used.

Minimum amount of labour.

Heating value from 75 per cent. to 85 per cent. of total heat energy in fuel.

Abolition of smoke nuisance.

Regular quality of gas and regulation of same.

Obviates the necessity of carrying coal and ashes through works.

Saving in fuel costs of 25 per cent. to 50 per cent.

Some particulars of these plants may be useful.

One ton of good rough slack produces about 150,000 cubic feet of Mond gas of a calorific value of 140 B.T.U. per cubic feet. In a large gas engine the consumption is about 60 cubic feet per i.h.p.

One ton of slack gasified will produce about 2500 i.h.p. for one hour.

The quantity of steam required to work the "Mond" heating producer is ½ lb. per lb. of fuel gasified.

For this purpose exhaust steam at 2 lbs. pressure, if available, is quite satisfactory.

Cold slabs for plate mills have been heated for a fuel consumption of about 2½ cwt. per ton of metal.

In a wire annealing furnace two to three cwt. of bituminous coal was used per ton of wire annealed.

In conclusion, it has been found impossible to touch upon the types and designs of gas engines or the utilisation of blast furnace gases; but the author hopes that he has demonstrated the uses to which producer gas can be applied, and in some measure supplied information, which may be of some use to those whose time is limited, and, therefore, unable to keep in touch with the rapid development of this cheap source of power and heat.

Considerable progress has been made in Australia, and producer gas is now being used for driving power stations, for town lighting, irrigation, mining, mill and factory driving, furnace work; and one of the latest uses in which there is a great future is its application to the operation of the "Humphrey" internal combustion pump, which is making such rapid strides in England.

The author thanks the various manufacturers for illustrations, blocks, and information kindly supplied to him.

CRITCHLEY PARKER PUBLICATIONS.

**Past and Present Metal Markets.** W. E. Figgis. Book and 2 Charts, 15/-. Posted, 16/3; foreign, 16/5.

**Coalfields and Collieries of Australia.** F. Danvers Power. 440 pages, 229 illustrations, demy octavo. 25/- nett. Posted, 25/3, foreign, 26/8. (Size, 9 x 6.)

**High Explosives.** W. R. Quinan. 224 pages, royal octavo, 21/-. Posted, 21/3; foreign, 22/4. (Size, 10 x 7.)

**Power.**
*(Issued under authority Sydney Municipal Council.)*
2/6 nett; post free.

**Australian Mining and Metallurgy.** Donald Clark. 600 pages, royal octavo. 21/- nett. Posted, 21/4; foreign, 22/9. (Size 10 x 7.)

**Gold Refining.** Donald Clark. 134 pages (plates), demy octavo. 12/6 nett. Posted, 12/7; foreign, 13/1. (Size, 9 x 6.)

**West Australian Mining Industry.**
*(By authority W.A. Government.)*
250 pages, crown folio. 10/- nett. Posted, 10/2; foreign, 10/8. (Size, 14½ x 10.)

**New South Wales Mines and Minerals.** 250 pages, crown quarto. 5/- nett. Posted, 5/4; foreign, 5/7. (Size, 10 x 7½.)

**Victoria, and its Mining Resources.**
*(By authority Victorian Government.)*
84 pages, crown quarto. 3/- nett; post free.

**Mining and Railway Map of Australia.** (In preparation.) Cloth, 21/-.

**Ventilation of Mines.** Johann Sarvaas. 60 pages. 2/7 post free.

**Australasian Joint Stock Coy's Year Book.** R. L. Nash (Financial Editor, "Daily Telegraph," Sydney). 600 pages, demy octavo, 10/6 nett. Posted, 10/8; foreign, 11/9. (Size, 9 x 6.)

**Australian Mining Standard.** Issued every Thursday, 26/- per annum. British possessions, 32/6; foreign, 34/8; post free.

*Also published, but now out of print.*

**Tasmania and its Mineral Wealth.**
*(By authority Tasmanian Government.)*

**Metallurgy of Tin.** P. J. Thibault. Demy octavo. 12/6.

**Resourceful Queensland.**
*(By authority Queensland Government.)*

**Electrical Progress of Australasia.**

**Sydney: 12-14 O'Connell-street.** **Melbourne: 376 Flinders Lane.** **London:** Hill Publishing Co., 6 Bouverie St., Fleet St.

# ENGINEERING AND ELECTRICAL SECTION

Australian
General Electric Co.
217 Clarence Street, Sydney.
Tel.—Central, 3495, 4397; City, 2381.
"Penfold House," Cr. Queen and Little Collins Sts., Melbourne.
Tel.—Central, 2647.
Representing—
GENERAL ELECTRIC CO., U.S.A.
The
BRITISH THOMSON-HOUSTON CO. LTD., of Rugby, England.
The GUARANTEE of EXCELLENCE on GOODS ELECTRICAL

## WIND POWER.

### Application for Generation of Electrical Energy.

(Continued from issue of Nov. 6.)

By W. H. Myers.*

### The Storage Battery.

Let us call to mind a few of the main points connected with the installation and maintenance of a lead battery:—

The first charge of the battery must be carried on as continuously as possible, particularly for, say, the first 10 to 12 hours, and generally takes from 40 to 60 hours to complete at normal charging rate. After the first charge, however, the operations are simple. Cleanliness, particularly with regard to the purity of the acid and water used, avoidance of excessive dust or damp, good ventilation, adding distilled water to keep the plates covered, are obviously points to be carefully observed, and an occasional overcharge of the battery will help to maintain its capacity.

There is nothing in the wind-mill scheme for electrical generation to prevent all these points being followed, except possibly as regards the first charge. If a steady wind for 10 to 12 hours is not available (and, except in Adelie Land, it never will be a certainty), the first charge of a lead battery must obviously be furnished by some other means than the wind-mill as prime mover. It is a simple matter to provide against an excess of over-charging, although from the wind-mill point of view, this provision will seldom be necessary with properly proportioned wheel, generator and battery.

One is not so biassed in favour of the electro-wind-mill scheme as to consider that the life of a lead battery, working in conjunction with a wind-mill-driven generator, will be as long as a battery working under ideal conditions with regard to charging current. But it should be remembered that, with suitable apparatus, the maximum peak of charging current seldom, if ever, will exceed the maximum, and there is no reason whatever to suppose that the life of the battery will be materially lessened by the somewhat irregular method of charging. I may mention that, as a fact of interest in this connection, I particularly observed the condition of the battery attached to the plant installed at Mr. Waite's residence in Adelaide, and this was found to be in excellent condition, although it had been continuously in service for over two years. There was no sign observable of any deterioration or buckling of the plates, and the battery, under the present conditions, should last for quite the full period mentioned. With the advent of the Edison battery, an additional means has been provided of making the wind-mill apparatus "fool-proof," although, of course, at the present comparatively high first cost of such batteries one has to seriously consider the alternative provision before deciding as to whether one is a "fool" or not. This remark is not confined to batteries, however. The use of the Edison battery also obviates the necessity, and cost, of making provision for a continuous first charge, as the wind-mill-driven generator will suffice in this case.

Having thus dealt briefly with the main features of the battery side of the question, which appears to have unduly biassed some people against the electro-wind-mill scheme, I propose to turn to another section of these notes, viz.:—

### Wiring of Buildings.

A matter which will almost immediately arise when one is proposing to instal an electro-wind-mill plant for lighting purposes is the portion of the initial cost of the installation which relates to the wiring. It was my pleasant fancy, when first considering the details of the scheme, that, when such low working voltages as 12½, 25, and 50 volts were proposed, the cost of wiring per "lighting point" might be very considerably reduced, as, owing to the entire absence of fire risk, or even liability to shock, I thought that an opportunity was at last provided of reverting to the former system of open wiring, which at the initial stages of the development of electrical supply schemes, did yeoman service. For many years, this system was used successfully and safely, but with increasing voltages necessarily required alteration.

But I was mistaken; not that my technical reasoning was in any way faulty, but that I had not taken account of the bulwark of sweet unreasonableness which has grown up around the interpretation of the Fire Underwriters' Rules for Electric Wiring, which, like the wiring itself, are apparently run in conduit—and screwed conduit at that. Without in any way attempting to belittle the efforts of our President and others similarly situated, to safeguard the public interest, and the interests of the Fire Insurance Companies, by insisting on safe standards of wiring, I am sure that members will agree with me that the regulations which govern the wiring of premises at a voltage of 240 volts, or over, should be very liberally interpreted in the case of the lower voltages mentioned; I may mention that it is next to impossible to start a fire, even with bare conductors, at such voltages. I am given to understand that, in New South Wales, some slight departures from these Rules have been allowed, but, as pointed out by me in a previous paper to this Association, the matter of providing a definite list of amendments to the Rules, so as to cover such low voltage schemes, should, I think, be given early attention, in order that developments in this direction should not be stifled; also that contractors and others shall know exactly how they stand. I exclude, of course, low voltage supply from autotransformers from this category and refer merely to separate circuits, either A.C. or D.C., up to, say, 60 volts supply pressure. I trust that some expression of opinion on the subject will soon be given by the Association, or the coming Australian Society of Electrical Engineers, which should do more than my puny efforts have done; possibly our President may be able to assist us in the matter, which is likely to become of more and more importance as the electric lighting plants in country buildings, etc., increase in number. Time and space again prohibit any further remarks on this subject, and I will now turn to the last section of my paper, viz.,

### Practical Services.

Herein I propose to leave, to some extent, the beaten track of matters of present actual fact, and indulge in a little cautious prophesying.

There is no doubt that the main field of operation of apparatus of the nature described will be in providing light for country, suburban and seaside residences, etc. At the same time, however, I think that it will be found that this is by no means the only sphere of usefulness. Taking the lighting question first, I would draw your attention to the fact that, ere long, it will be quite possible to provide a good, reliable electric light, of, say, 20 candle-power, in each compartment of a two or three-room dwelling, for a sum of money which, at first cost, will probably not exceed £6 or £7, and the small electro-windmill apparatus should, practically, cost nothing to maintain, after its installation, for a great many years. What this means, in comparison with the present system of kerosene lamp and candles, will be readily understood by those who know something of the discomforts of bush-life after the day is done. I have given the above figure as to cost after some consideration, although such plants are not yet being designed or manufactured. From this starting point, working up to the engineering structures, such as, for instance, the fairly large electro-wind-mill plant erected at Mittagong railway station, and now under trial for the Chief Commissioner for Railways and Tramways, there is a very large scope indeed for the commercial utilisation of the apparatus, and, speaking without prejudice, I may say that it is sincerely to be hoped that the pioneering work done by the company now operating under the Turnbull Patents will find a reward in the direction, or Mecca, to which we are nearly all groping. I would like to add, although it should not be necessary in these times, that a provision of a supply of electrical energy, at any rate, where the larger plants are concerned, also makes available the modern comforts which only electrical energy can furnish, viz., electric fans, flat irons, motors for domestic appliances of all kinds, etc.

Let us now turn to the application of such plants to pumping, irrigation and general motive power for farms.

I am inclined to believe that, although in many cases the conditions may be more favourable at the present prices prevailing for storage batteries, the wind-mill, cum-generator, cum-battery proposition will not be largely utilised for motive power of any magnitude, or for electric cooking, even though plants of this nature are in service in Denmark.

In pumping schemes on a small scale, however, there will be quite a considerable adaptation of these equipments, particularly in cases of similar nature to those where wind-mills are now used for direct mechanical pumping, and also where such direct pumping cannot be employed. For instance, it will be quite a simple matter to place the electro-wind-mill plant on the summit of a hill, where the wind will usually be most useful, and connect the wiring from the generator, per medium of poles, trees, fences, etc., to a motor-driven pump at the edge of the stream, or water-well, in a valley adjoining. No battery, of course, is then necessary, and the action, as has already been proved, is quite automatic, the pump starting and stopping with every breeze that blows; it is quite safe to say that the overall efficiency of such a combination will be higher than any directly mechanical system of pumping, which, moreover, in a great many cases would not be practicable at all. In one notable case in Australia, owing to the heavy duty required of the pumps, the ordinary wind-mill, although preferred, has been found too costly to maintain (mainly due to the reciprocating action of the pumps), and recourse has been made to a system of suction gas engine-driven plants, which, although involving heavy standby fuel, and also attendance charges, has been found the more satisfactory. Here, alone, is a useful field for the electro-wind-mill plant.

Other cases, too, exist where the standby provision of a storage battery in the usual fashion will allow of a sufficient water supply being maintained where the ordinary wind-mill pump would be out of action. This matter will appeal to users of septic tanks in certain parts of the country, also to owners of gardens in many places. It must not for a moment be imagined that, in cases where one may anticipate that a period of "useless" wind will exist on occasions, for longer than, say, one week, the electro-wind-mill plant will be ruled out of court. There is, in my opinion, great scope for the use of the plants, even in such cases, particularly in Australian country towns, where the question of *street* lighting by electricity is frequently debated, but where any proposal made is thought commercially impracticable, mainly on account, not of the first cost, but of the annual cost of maintenance and fuel, whether oil, wood, coal, coal-gas or even petrol-gas. I consider that, in such cases, the only solution lies in the adoption of the village lighting methods, now largely carried out in Denmark. In this method of lighting an electro-wind-mill plant and battery is ordinarily used, but, during the very small proportion of the year when the wind conditions, for such comparatively large energy outputs, are unfavourable, a small, cheap standby oil-engine-driven set is used to keep the batteries charged; the operation of this standby plant, when thus required, need not necessarily involve any special difficulty or expense. I think one may confidently look forward to an early adoption of this method of town lighting on quite a large scale, as soon as the public becomes familiar with the use of such equipments as are now being erected.

---

*A paper read before the Electrical Association of New South Wales.

But I shall not weary you with any further instances of this nature, which could be multiplied tenfold. As a small item of interest, however, I should add that these plants should be found of special interest in conjunction with wireless telegraphy outfits, and in view of the figures furnished by Professor David, Douglas Mawson, and others, as to the velocity and constancy of the winds that blow in the land of the South, it is a thousand pities that the development of such plants was not sufficiently advanced to have enabled one or two such to have been provided for our courageous explorers. The unfortunate results obtained from the plant supplied with Captain Scott's first expedition would have been avoided with a properly designed equipment. In the vicinity of the "Hell's Hole of Wind," Mawson could have provided his staff with even electrical cooking without difficulty—the annual wind-power not utilised there would probably suffice for all power requirements in Australia if transmittable.

In concluding these notes, I desire to express my best thanks to the following gentlemen, who have given me material assistance in providing the exact data upon which my conclusions are based: —

The Federal Meteorologist, Mr. H. A. Hunt (Wind data in Australia).

Mr. Lawrence Birks, B.Sc., etc., New Zealand (Wind data in New Zealand).

Mr. Broe, electrical engineer, Sydney (Proceedings of Electro-Wind-mill Society of Denmark).

Mr. Peter Waite, of Adelaide (for particulars of Child's Plant as above mentioned).

Mr. H. Leverrier, Australian Metal Co. (for particulars of the plant supplied by the A.E.G Co.)

Mr. Wilson, divisional officer, Sydney Observatory (for some data re wind velocities in New South Wales).

M. Koefod, of the Lands Department, who kindly translated from the Danish some particulars of the Denmark plants.

And to Mr. Turnbull (and the directors of the Automatic Wind Motor Co.), for providing a great deal of the ammunition which I have fired at you this evening, and who also allowed me the use of the working plant exhibited. Mr. Turnbull also prepared the lantern slides, which, I hope, have made the subject chosen more interesting.

---

## TECHNICAL EDUCATION.

### Thorough Reorganisation.

It is evident, in the light of remarks made by Mr. James Nangle, the new Superintendent of Technical Education in New South Wales, to a representative of the "Sydney Morning Herald," that the example set by the Victorian Education Department in reorganising the whole system of education in that State and the practical linking of primary, secondary and technical schools with the University of Melbourne, has been appreciated in the older State, though the two schemes may not be identical. Speaking of the Sydney Technical College, with which he has been connected for nearly 30 years, Mr. Nangle compared it with "a magnificent diamond mine, full of intrinsic worth, but as yet requiring to be shaped and polished," and his own accession to control is to be signalised by the commencement of this cutting and polishing process. Not that he would claim initiation in the matter; the new scheme is the outcome of numerous conferences amongst those responsible for educational matters, and Mr. Nangle is fortunate that his new appointment synchronises with the maturity of the scheme. Chief amongst the reforms to be brought in will be the appointment of advisory committees, the conservation of energy, and a scheme by which pupils will be compelled to have a full primary knowledge of a subject before they approach higher branches; for instance, they must have a knowledge of mathematics before they touch physics.

"The problem of properly training young men to supply the demand for efficient tradesmen," says Mr. Nangle, "is of national importance, and it has necessarily always had much attention. The reorganisation of the whole system of education in this State has had the attention of the Director of Education for some years. The primary schools have been placed on a good basis, and a system of secondary schools has been established, making a broad road to the University. With a view to bringing the industrial interests of the State into sympathy with the scheme and ensuring that it shall really be capable of supplying what is lacking in the workshop training, representatives of both employers and employees in each trade were asked to confer with the Director of Education and to assist in drawing up a scheme. Many conferences have been held at which representatives readily attended, and most sympathetically and thoughtfully discussed the matter. Whilst necessarily the different courses of instruction differ as regards details, there has been a remarkable agreement as to the main lines on which the scheme should be conducted.

"Broadly speaking, the new system of technical education will be divided into two divisions: (1) Trade courses in trade schools for apprentices; (2) higher courses in technical colleges for journeymen to prepare for a position of foreman or manager, or with a view to completion of his studies at the University.

"The conferences so far held have dealt only with the trade school courses. These courses of instruction are to be strictly confined to giving that part of the trade training and knowledge which under modern conditions cannot be obtained in the workshop or manufactory, and are to extend over the whole period of apprenticeship in each trade. Only youths apprenticed or actually working at a trade will be admitted to the courses; but a youth or journeyman will be allowed to take a course in an allied trade, a general knowledge of which would benefit him in his own special trade. For example, a carpenter having finished his carpentry apprenticeship course, would be allowed to take courses in other building trades to enable him to obtain that knowledge which would fit him for the position of foreman, clerk of works, or builder.

"With a view to securing the best results from attendance at the trade schools, a certain standard of preparation, such as the leaving certificate of the continuation schools, must be reached before admission to the trade schools. This is very necessary in order to guard against what would be a serious waste of time both by the teachers and students if unprepared students had to be taught in a trade school what should have been learned in the school preceding it. Some idea of the courses of instruction to be given in the trade schools will be gathered from the following, which is the course of subjects agreed upon to form the supplementary education of apprentices in the structural building trades:—Practical mathematics, including technical arithmetic, elementary algebra, elementary geometry, and elementary trigonometry, practical plane and solid geometrical drawing, freehand and model drawing (special trade course), elementary mechanics and properties of materials, setting-out drawing in connection with practical work, practical exercises, construction drawing and building construction.

"The scheme to be effective must embrace a very complete system of recording the progress of each student, and will also provide for keeping his master or employer continuously informed of his attendance and progress at the school. Both employers and employees have a keen interest in any scheme that will tend to produce really competent tradesmen. We have in this country in operation a system of industrial laws which have been enacted with a view to securing safe working conditions, a living wage, and conservation of trade rights and privileges. Lest we, in our endeavour to procure these advantages, place ourselves in an unsound economic position, it is vitally necessary that we shall balance them with greater trade skill and operative efficiency on the part of the tradesmen and those directing them. It is quite comprehensible that a technically well-educated tradesman, trained to do the maximum amount of work with the minimum amount of effort, employed in a healthy workshop and under the most skilful direction, can, from the business point of view, be given shorter hours and paid more money, and will be a better citizen than a partially-skilled, slovenly man, working under unhealthy conditions and badly directed. It is to the interests of employers in this State, therefore, to assist in perfecting the means of providing for highly efficient tradesmen. There is also another aspect of the matter. In good times comparatively inefficient men can be sure of employment, but in this country they must be paid a minimum wage. In such times the employer will find it rather unprofitable to have to pay indifferent workmen the same wages as the efficient ones. Consequently, he must feel that it is to his interest to do everything possible towards providing that the minimum of efficiency shall be of a pretty high standard. On the other hand, in bad times, the inefficient workman will have little chance of employment, since under our laws they will not be able to work for low wages, and the employer will choose only those who are efficient. It is, therefore, equally a matter of the greatest importance to every tradesman to become as efficient as possible.

"The Technical College has been run too much 'on its own.' We are producers, and must consult the consumers. We must find out if we are up to date, if the men we are turning out are efficient. Therefore, advisory committees, consisting of representatives of masters and tradesmen, are to be appointed for each group of trades. These committees are to make periodical inspections of the schools, and furnish reports on results of teaching and on equipment."

---

## PORT PHILLIP HEADS.

### Deepening the Channels.

The proposals of the Melbourne Harbour Trust to deepen the Hobson's Bay and Yarra channels, so as to give access to its wharves, piers, and docks to vessels of heavier tonnage than hitherto, drew attention to the fact that a greater depth of water would be required at the Heads to permit such vessels to enter the port with safety. Work intended to give considerably increased depth at the entrance was commenced a couple of years ago, but the progress made has been very unsatisfactory, and early last month the Minister of Public Works, Mr. Hagelthorn, met the Harbour Trust and discussed plans for expediting the work. The Minister has now written to the Trust upon the subject, and explains that although the Government undertook the deepening of the entrance at the Heads in August, 1911, it had been found impossible to commence operations until the following year. To-day the depth along the "gullet" showed an increase from 37ft. to 39ft. by an average width of 450ft. and a length of 1500ft. The expenditure showed a considerable increase during the last two years, as follows:—1909-10, £2842; 1910-11, £2366; 1911-12, £4400; 1912-13, £5220, and 1913-14 (estimated), £8000. The Engineer of Ports and Harbours, Mr. C. W. Maclean, and the Marine Surveyor, Mr. T. H. Smith, the officers directly engaged upon the work, could not suggest anything further than their proposition of two blasting parties instead of one. Their objections to more were that they would probably lead to a serious disaster and loss of life to blasting parties; but they admitted that after the duplicated method had been in operation for some time experience might point to further duplication being practicable. It was considered necessary, therefore, to seek other advice, and negotiations were now in progress to obtain the services of Sir Maurice Fitzmaurice, who was visiting Australia to advise the Commonwealth Government on harbour works. The navigable depth at the Heads was now 29ft. (8ft. being allowed for the scend of vessels), which was sufficient for the approach channel to the railway pier at Port Melbourne. At a recent conference the Secretary for Public Works, Mr. E. T. Drake, suggested that the proposition to deepen 6ft. could be divided with a view to obtaining the advantage of further depth at an earlier period. This view was not entertained by the conference, but Mr. Drake pursued his proposition, and Messrs. Maclean and Smith had now recommended a two-proposition scheme, which enabled a depth of 40ft. to be obtained first, and 43ft. eventually. The results of working under the two schemes would be as follow:—

| Season. Nov. to July. | Deepening to 43ft. | Deepening to 40ft., and later to 43ft. |
|---|---|---|
| 1913-14 | 37 | 37 |
| 1914-15 | 37 | 37 |
| 1915-16 | 37 | 40 |
| 1916-17 | 37 | 40 |
| 1917-18 | 37 | 40 |
| 1918-19 | 43 | 40 |
| 1919-20 | 43 | 43 |

It was recognised that the division of the work would lengthen the whole process by one year; but under the 6ft. proportion scheme there would be no additional depth of water for six years, while under the other scheme there would be 3ft. additional depth in two and a half years, which would be of considerable advantage to the port, and would, it was considered, keep pace with the deepening of the inside channels. Owing to the extraordinary difficulties surrounding the problem, the engineers were reluctant to give anything like a definite estimate as to the time required for doing the work; but the foregoing table might be regarded as fairly reliable. A report from Sir Maurice Fitzmaurice might admit of alterations and modifications, but it appeared that the best course to pursue at present was for the work at the Heads to be proceeded with on the two parties method, and a deepening to 40 feet at first and 43 feet later on. As the approach channel to Port Melbourne, which required deepening throughout, was partly under the control of the trust and partly under the control of the Public Works Department, the Harbour Trust should undertake the whole of the work, the State paying its share of the cost. The South channel, which now had a depth of 33 feet, would be deepened, and for this purpose a dredge was being hired by the department from New Zealand to undertake the work.

The chairman of the Harbour Trust, Mr. G. F. Holden, has stated that the departmental scheme would harmonise with that of the Trust, and that that body had notified its acceptance of the Minister's proposal.

## TO PREVENT COLLISIONS.

### Two Safety Inventions.

Two men of inventive bent, working independently and on different lines, but with the same object in view, have recently devised apparatus for averting railway accidents through collision, and each claims to have succeeded.

According to the London "Daily Mail," Mr. A. R. Angus, a wealthy Australian, went to England three years ago, with the firm intention of building an accident-proof railway. He leased 12 miles of permanent way from the West Somerset Mineral Railway Company at Watchet, purchased two powerful locomotives from the Great Western Railway Company, and quietly, but with untiring energy, proceeded to solve the problem. In a letter dated September 11, 1913, Mr. Angus stated that he had realised his ambition. He claimed also that he could provide a satisfactory answer to the question raised in the leading article of "The Daily Mail:" The repeated failures of the human elements raise the question whether some means of automatically stopping a train when the signals stand at danger cannot be introduced.

"At the invitation of Mr. Angus (writes the newspaper correspondent) I rode in the cab of one of his engines over his accident-proof system. The little railway is entirely devoid of the ordinary signals. At first we ran at the rate of 60 miles an hour over a track devoid of traffic, passing over the three sections into which the line is divided. As the engine entered each section a bell with a deep note sounded, denoting that the line was clear.

"'Now,' said Mr. Angus, 'we will see what happens when another engine is on the line.' He rang through from a control box to headquarters and instructed the driver of the other locomotive to run into a section. It is a single-line railway, so the second locomotive was on our line direct ahead.

"'We will make a rush at speed for that engine,' said Mr. Angus. 'The driver will pretend to take no notice of it, and we will see what happens.' The driver opened the throttle and the locomotive started off. Its speed became greater and greater. Ahead on our line was the other locomotive. There seemed no apparent reason why we should not crash into it. Then suddenly the whistle of the engine shrieked; yet the driver had touched nothing in the ordinary course.

"This shrill whistle would be the warning to the driver that he was in immediate danger, but our driver for the occasion was supposed to be deaf. A moment or so after the whistle there came a hissing of steam and the grinding of brakes. The engine slowed abruptly and stopped dead. Still the driver had touched nothing. The brain of the engine saved us from disaster.

"How it is all done became evident from an examination of the permanent way and control boxes. Each section of the line is guarded at both ends by three ramps (metal contrivances between the rails), which are connected by telegraph wires to an instrument in a control box. The locomotive is also fitted with an electrical contrivance brought into contact with the ramp by a shoe depending from the engine. The brain of the engine automatically telegraphs to the instrument in the control box, which instrument telegraphs back that the section is free from traffic. A bell rings in the cab of the engine to notify the driver. If, however, the section is blocked, the brain in the same way causes a whistle to blow, when the driver should stop the train. If he fails to do so, then, and only then, does the locomotive, by means of the electrical contrivance, take the control out of his hands. It shuts off steam and applies the brakes. He cannot then drive until freed by some responsible person at a control. In the controls everything is similarly automatic.

"The system absolutely eliminates the personal element. If the driver makes an error the train stops. If the man at the control makes a mistake the same thing occurs. If the machine breaks the train still stops."

The second device alluded to is an application of wireless telegraphy to the same end—not merely to warn signalmen, engine-drivers, and guards of a risk of accident, but absolutely to bring the train to a standstill if necessary, by shutting off the steam and applying the brakes. This, so far as we are aware, is the first time that wireless has been applied to produce an entirely mechanical effect, and the invention is due to Mr. Christoph Wirth, of Nuremberg, Germany, unless we except the control of boats and torpedoes by that means, which is really electrical and not mechanical. Mr. Wirth's invention is primarily a wireless signalling apparatus, whereby the importance of the "human element" is certainly minimised, if not reduced to nothingness. The receiving apparatus must be installed on the train, the luggage van being excellently adapted to the purpose. The pressure of a button or the turn of a crank suffices for sending a message from any station or special despatching station erected along the line. A message may be conveyed to the enginedriver warning him of danger, or should the danger be imminent, the Westinghouse brake may be applied by the agency of the wireless, without the medium of the enginedriver. In fact, even the steam may be cut off, so that the train stops of itself. The train may be brought to a complete standstill in 27 seconds, there being no jolt. Should circumstances require, it may be effected more swiftly. The telephone or telegraph wires along the line act as the antennae, without this in the least interfering with the regular telephone or telegraph service. It would be advisable to establish transmitting stations every 80 or 100 kilometres. The apparatus are relatively cheap to manufacture, the requisite number for a whole train hardly costing any more than a single Westinghouse brake. There is every probability, therefore, that the invention will not have to wait long for the railway authorities to adopt it. In fact, the Bavarian Minister of Traffic has already entered into negotiations with the electrophysical laboratory of Messrs. Wirth, Beck, and Knauss, of Nuremberg, the owners of the patents, and a trial is now being made along the Nuremberg-Grasenberg railway.

## FIRST-AID IN ELECTRICAL ACCIDENTS.

"I believe that no loss of human life from industrial currents of electricity occurred before 1879," said Dr. A. J. Jex-Blake in his Goulstonian Lectures, 1913. The lecturer went on to say that "in 1879 a stage carpenter was killed at Lyons by the alternating current of a Siemens dynamo that was giving a voltage of about 250 volts. at the time. The man became insensible at once, and died in 20 minutes; artificial respiration was not applied. The first in this country (England) took place at a theatre in Aston, outside Birmingham, in 1880, where a bandsman short-circuited a powerful electric battery, became insensible, and died in 40 minutes. Since that date the annual number of deaths from electric shock has steadily increased, particularly during this century."

A correspondent whose professional relations and experience give him warrant of authority to discuss accidents due to electrical shocks, emphasises the seriousness of shocks from comparatively low voltage currents (say, 110 to 500 volts), says a writer in the "Engineering Magazine," but calls attention to the fact that the Schaefer or "Prone Pressure" method of resuscitation has recently been adopted by the joint commission of American Medical Association and the National Electric Light Association in preference to the Sylvester method of artificially producing respiration.

This method, which is equally applicable to cases of drowning or asphyxiation from whatever cause, defines five points to be especially remembered. These are:—

1. Quick starting of respiration.
2. Position of the patient.
3. Position of the operator.
4. Mode of Operation.
5. Speed and duration of operation.

The details are further described, and on account of the importance of the subject in its relations to industrial safety, we quote in full.

First.—It is essential in every case to start artificial respiration as soon as possible. The patient should, of course, be taken to a location where it is possible to work and where air is reasonably pure. Time, however, must not be lost in taking the patient out of doors or any further away from the scene of the accident than is absolutely necessary, since a delay of 60 seconds in beginning artificial respiration may be fatal.

Second.—Patient should be laid upon his stomach, face turned to one side, mouth and nose free from ground and foreign substances removed from mouth or throat.

Third.—The operator kneels straddling the patient's hips, or kneels at the side of the hips, facing the patient's hips.

Fourth.—The operator places his spread hands with arms straight upon the lower ribs of the patient. The pressure should be begun lightly and increased to the end of the period. The pressure must be uniform, as sudden thrusts are injurious. Pressure is exerted by the heel of the hand. In relieving the pressure at the end of the downward stroke, the elbows should be snapped open and the pressure removed as quickly as possible.

Fifth.—The downward motion (pressure) should occupy a period of 3 seconds, and the free, non-pressure period should occupy 2 seconds.

The complete cycle of 3-second pressure and 2-second free should be repeated an indefinite number of times, and unless a physician gives instructions to the contrary the artificial respiration should be continued for at least three hours.

It will be noted that the proper rate of respiration is 12 times per minute and the danger is that in the excitement of the occasion the rate will exceed 15 times per minute, above which rate the active respiration itself becomes a grave danger. If possible, it is well to have an assistant hold a watch and regulate the number of respiratory cycles per minute, with 14 as an average.

The operator should rely upon assistants to loosen the clothing on the patient's neck and do any other work which is necessary, including keeping space free so that the patient will have plenty of air. It should be especially noted that absolutely no liquids of any kind should be given the patient until he is fully conscious. It should be further noted that after the patient becomes conscious he should not be allowed to try to arise immediately, as the heart is liable to be very much weakened, and it may produce a relapse, which is even more dangerous than the first shock. Holding a cloth saturated with aromatic spirits of ammonia near the nose of the patient acts as a respiratory stimulus.

## FEDERAL RAILWAYS.

### East-West and North-South.

An interesting report has been made to the Assistant-Minister of Home Affairs, Mr. Kelly, by Mr. Deane, engineer-in-chief for Commonwealth Railways, on water supply in connection with the Port Augusta-Kalgoorlie line, in which he states that over the greater part of the 1060 miles of country through which the railway will pass there are no water courses of any size, which fact (he says) indicates that the streams carrying off the rainfall are so little concentrated that opportunities of holding up volumes of water by the construction of dams is reduced to a minimum. Mr. Deane continues: At the eastern end water courses are more in evidence, but heavy falls of rain are scarce, and the volumes available for collection of moderate amount. The rainfall over the whole area served by the line probably does not average more than 7 inches, and there are occasionally long intervals of two to five years during which falls of rain are too scanty for collection. The estimated cost of water supply for locomotives, station and domestic purposes was carefully investigated in 1909 from the data provided during the trial survey of the line. The requirements of locomotives were based on the assumption that the quantity used would be at the rate of 50 gallons per mile. This will form, of course, by far the greatest portion of the needs. Several schemes were investigated in which the conveyance of the water in steel pipes from the Kalgoorlie water supply, the building of dams and large reservoirs, and the preparation of artificial surfaces for the rapid collection of rainfall were considered, and the total estimate arrived at was £609,000. Subsequently the matter was again investigated, and two circumstances contributed towards the reduction of the estimate. One was that the suitability of wood-stave pipes as a substitute for the very corrosible steel pipes as used on the Kalgoorlie water supply presented itself, whereby not only could a cheaper material be adopted, but the allowance for excessive size to provide for a gradual reduction of the carrying capacity of the pipes would be determined from consideration of their primal carrying capacity alone. The second fact was that the Western Australian Government had put down a bore on the Nullabor Plains, at what was called No. 3 bore, at a spot on the surveyed line, about 345 miles from Kalgoorlie, and had tapped a copious supply of fresh water. The total arrived at for the revised estimate was £456,000.

In view of the fact that the use of locomotives of the internal combustion type, instead of steam, will lead to a great reduction in water requirements, the scheme has not yet been fully entered upon, but work has been done which, in any case, will form a commencement of it. In order that the more urgent needs of the steam locomotives, which must for the preesnt be used at either end, might be met, twenty water tank waggons, each of 2400 gallons capacity, are being built, and it is proposed to add to these a number of water tank waggons of 8500 gallons capacity, which will render possible the conveying of water for the locomotives, as they can be filled at either end of the line and taken along with the train. These tank waggons are estimated to cost £11,040 in all. Rock catchments are now being surveyed in several places, bores are being sunk, and sites for reservoirs are being investigated. At 53 miles from Port Augusta a scheme for a reservoir to hold 4,000,000 to 6,000,000 gallons is being worked out. The cost of these works, for carrying out which arrangements are being made, it is estimated, will not exceed £150,000, but should difficulties occur which might increase the expenditure to £200,000, there will still be a saving of £256,000 due to the use of locomotives of the internal combustion type.

At the West Australian end 60 miles of road formation have been completed and five miles 62 chains of line laid, while in South Australia 40 miles of road are made and 33 miles of line laid. Those figures refer to the main line only; in addition, sidings have been laid and a branch line to the ballast pit, which represent five miles 17 chains in Western and 12 miles 41 chains in South Australia. At the western end 726 tons of 80 lb. rails and 12,012 sleepers have been used, and 4148 tons of rails and 68,640 sleepers on the South Australian side. There are still on hand 15,770 tons of rails, representing 125 miles, and 190,108 standard sleepers, representing 91 miles, in Western Australia, and 15,444 tons of rails, representing 123 miles, and 144,097 standard sleepers, representing 69 miles, in South Australia, exclusive of 1704 tons of lesser weight rails and 37,665 sleepers other than standards laid in sidings and the ballast pit line and on hand at the depot. The expenditure to date has been £831,000.

A cable message received in Melbourne last Saturday stated that 2345 tons of 80 lb. rails and 155 tons of fishplates had been shipped by the steamer "Mashona" for Port Augusta. "The Times" (London) states that the smaller steel manufacturers complain bitterly that the Steel Trust is monopolising the Commonwealth business, and assert that the prices being paid for railway material are unduly high.

Unlike the East West line, that which will cross the continent from North to South is in the hands of the Minister of External Affairs, who controls the interests of the Northern Territory, as well as those of Papua. It will be remembered that, a week or two ago, before the Royal Commission reached the Katherine River, Mr. Glynn wired instructions for it not to proceed further in its search for the most favourable routes for railways in the Territory, but to report as early as possible on the work done to date. The Commission has since reached the Katherine, and received those instructions, but so far its reply has not been received.

In Adelaide last week Mr. Glynn had a consultation with Mr. Chalmers, of the firm of Lawrence and Chalmers, with whom an agreement was made some months ago to make a flying survey of the north-south railway. A preliminary report on the part of the survey from Oodnadatta to Birt Plains, in the vicinity of Alice Springs (a distance of about 330 miles), was six weeks ago presented to the Minister by Mr. Lawrence. That gentleman is now engaged on a survey of a section of the east-west line, about 120 miles long. Mr. Glynn was informed that Mr. Chalmers is about to prepare his report on the section from Birt Plains to Newcastle Waters, a distance of about 450 miles; also, that, in connection with the stretch of country to the Katherine River (about 250 miles), and from Newcastle Waters to Camooweal (about 360 miles), he was now collecting materials and marshalling facts for working up a separate statement. At different times both Messrs. Lawrence and Chalmers have, in addition, given Mr. Glynn a good deal of private information as to the character of the country through which they have passed in carrying out their flying examination. A survey was made about 26 years ago by Mr. Graham Stewart, who is now engineer-in-chief for railways in South Australia. This route is, in the main, adhered to, the Minister states, and covers the 330 miles from Oodnadatta to Birt Plains. Investigations for alternative routes have been made, and, in some cases it has been found that a deviation would give the easier grade of 1 in 100, while in others severe curves would be avoided.

## MELBOURNE TRAMWAYS.

### Motor 'Bus Competition.

The possibility that, at any rate within a few years if not immediately, a central municipal body or the Government itself may take control of the whole of the metropolitan and suburban tramways, so far from making the various suburbs chary about borrowing and spending money on new lines to serve their own districts, seems almost to have spurred them on to get their lines while they have the predominant voice. For months past—in fact, for three or four years—there has been an almost feverish haste in this direction, and no sooner is one new line put in hand or another one completed than two or three others are being warmly advocated. No less than four Bills are now before Parliament in various stages, and plans are rapidly maturing for the drafting of others. The effect is to bring outlying areas into readier communication with the city, for, although the intermediate suburbs are benefited by multiplying the lines which traverse them in different directions, the termini are in most cases in districts which have hitherto been poorly served by any means of public transport. To-day will witness the long-postponed opening of a line connecting Caulfield and Malvern, but Caulfield has another scheme in hand to connect it with Brighton. St. Kilda is interested in quite a number of new ventures, either extensions to its seaboard of other lines or entirely new lines which either terminate there or pass through its area; it is also seeking to take over from the Railway Commissioners the existing St. Kilda-Brighton line. Away to the east Surrey Hills and Box Hill are hoping that the Camberwell Council will carry out the Whitehorse-road scheme, in which case the Nunawading Shire Council will seriously consider linking up those suburbs with Camberwell, and the question of route is already being discussed, the Whitehorse-road line being regarded as a certainty.

Mr. Prendergast has not yet recovered from his recent tour in England and Europe, and one night last week gave the Australian Tramway Employees' Association the benefit of his observations "when he was abroad." Motor 'buses, he said, could not compete with tramways when the tramways were operated in the interests of the public, provided they were not given exclusive rights to go to the heart of the city, as in London. Mr. Prendergast did not say how he thought the traffic in the heart of the City of London could be managed if tramways were laid along the streets. But he thought the Melbourne tramways could not be expected to compete with motor 'buses, although the said 'buses had no exclusive right to enter the city. But Mr. Prendergas was speaking at a "smoke night," and his points were not easily seen. For some reason, or reasons, the Hackney Carriage Committee of the Melbourne City Council has refused several applications for penny-section routes for motor 'buses within the area controlled by the council. Suburban routes have been secured, and the Melbourne Motor Omnibus Co. contemplated creating a network of services from the heart of the city to various of the nearer suburbs, running the lines on the penny-section principle. This company has already a dozen motor 'buses running, and by to-day another half-dozen are expected to be landed.

Some of the suburban municipalities which have not yet committed themselves to a tramway scheme are still divided in their preference for trams or motor 'buses, and the St. George's-road Tramway Conference last week considered estimates of the cost, working expenses and probable profits of the two systems. It was stated that six miles of single track from Fitzroy to Preston, properly equipped for nine cars an hour at busy times, would cost £55,000, while the upkeep and operation, including interest and reinstatement and sinking funds, would be £11,625, and revenue is estimated at £11,900, leaving a profit of £275. On the other hand, 10 motor 'buses would cost £10,000, with £2200 for repair shops, car sheds, etc., or a total of £12,200; the working costs, interest, etc., and share of road maintenance, would be £8200, and the revenue £10,200, giving a profit of £2000 a year. The conference, however, passed a resolution in favour of electric tramways as against motor 'buses, and decided to ask the councils concerned for authority to draft a Bill for presentation to Parliament.

## BRISBANE TRAMWAYS.

### Government to Purchase After 1920.

In spite of the protestations of some of the suburban municipalities, the Government Bill for extending the Brisbane tramways in certain directions passed its third reading last Thursday. Several municipalities are complaining that their claims to better travelling facilities were overlooked, and at a conference of representatives of the city councils of Brisbane and South Brisbane, and the town councils of Ithaca and Hamilton, for the purpose of inquiring into the tramways question, held on the previous Monday, it was resolved that a letter be written to each of the metropolitan representatives in Parliament, asking them to endeavour to delay the Bill for the purpose of inserting further clauses to allow of additional extensions being carried out as soon as possible, viz., Ithaca (to Frazer's-road and to Stennett's Corner), James-street and Bowen Hills (city), West End and Annerley road (South Brisbane), and Hamilton (Racecourse-road); and further, that the Premier be notified of the course adopted. An effort will now be made to introduce amendments in the Legislative Council.

The Bill is represented by the Attorney-General, Mr. T. O'Sullivan, as a short validating Bill to precede the issue of Orders-in-Council. It was suggested some time ago that the Government might possibly construct the proposed extensions. The agreement lately made, however, provides that upon application by the Brisbane Tramway Company the essential Orders-in-Council will be issued. and the extensions must be carried out by the company at its own expense. The manager of the company has intimated the preparedness of his company to begin the work immediately. The agreement provides that the power of compulsory purchase shall be exercised as if the tramways and all the extensions were one tramway constructed under one Order-in-Council. This will effectually preclude the possibility of their being taken over in a piecemeal fashion. The power of compulsory purchase may be exercised at any time after September 20, 1920, and this will settle finally the question with regard to the extension of the franchise from time to time. The agreement further provides that nothing in it shall modify, alter, or prejudice the rights of any of the parties, or of the local authorities in respect of the amount of purchase money payable upon such compulsory purchase, or the basis upon which it shall be determined. The agreement is subject to ratification by Parliament during the present session. Application has been made already for Orders-in-Council with regard to some of the extensions.

## MUNICIPAL COUNCIL OF SYDNEY.

The following recommendations of the Electric Light Committee of the above were adopted at last week's meeting of the Council:—

That the resolution of council on 4th July, 1911, providing for the purchase of the electric light undertaking of the municipality of Redfern, be varied in so far as it provides for the handing over by the Redfern Council to the City Council of all its street mains, so that such mains shall be excluded from the purchase, the council having subsequently on 1st July, 1913, agreed to the purchase of such mains, and that approval be given for the execution by the town clerk of the agreement as submitted by the city solicitor, in which the Redfern council's street mains have not been included

That the automatic switches in connection with the electricity supply mains separating each section from the surrounding sections be rearranged and a number of new ones provided, and that authority be given for the expenditure of £1200 on this work, the cost to be charged to capital.

That consumers' electric supply meters be obtained under existing contracts from—Lawrence and Hanson Ltd., 20 300 amp. 240 volt ampere hour D.C. meters; Ferranti Ltd. (Standard Waygood Co.), 1000 5 amp. and 300 10 amp. 240 volt 50 p.p.s. A.C. meters; W. G. Watson and Co. Ltd., 150 10 amp., 100 25 amp., and 25 100 amp., 240 volt maximum demand indicators: at an estimated cost of £2340.

That an offer by Mr. H. Isaacs to supply metal filament lamps be accepted for 200 200 c.p. 240 volt lamps made by Messrs. Siemens Bros., at the price of 4s. 6d. each, the lamps to be tested for burning before they are accepted.

## TWO LARGE CONTRACTS.

### £225,000 for Electric Plant.

Acting on the advice of Mr. C. H. Merz, the Victorian Railways Commissioners have accepted the tender of Siemens Brothers Dynamo Works Ltd. for supplying the switchgear and accessories for the electric power station in connection with the suburban electrification scheme, the amount being £140,000. The whole plant will be manufactured in Great Britain. The same firm secured the contract for supplying rotary converters and other plant for the twelve sub-stations to be erected. Mr. Merz has informed the Commissioners that this work is being proceeded with satisfactorily. For the manufacture of the large condensing plant required the tenders submitted by the G. Weymouth Proprietary Ltd., of Richmond (V.), have been accepted, the total amount being £85,251, made up as follows:—Twin condensers, hot water wells, and circulating water systems, £67,863 11s. 10d.; air and water extraction pumps and equipment, £8967 11s. 6d.; circulating water pumps and sump pumps with motors, £8419 15s. 6d. The Railways Commissioners express their satisfaction that a local firm should have secured this important contract in competition with overseas tenderers.

## NORTH ILLAWARRA LIGHTING.

(From Our Correspondent.)
Wollongong, November 8.

The North Illawarra municipal council at a recent meeting appointed a committee to get information about a lighting scheme (electric) for the main south coast road. The committee obtained from Mr. Sellers, superintendent of the Bellambi Co.'s mines, particulars for such an installation from their South Bulli colliery, similar to that provided for the Bulli shire. The substation from which the current from the colliery plant passes to the wires of the shire is fair on the borders of the North Illawarra municipality. The report stated that 100 lights placed three chains apart would be adequate; the lights on the road which pass through the village of Corrimal and the more populous parts of the road might be 60 c.p. and the rest 40 c.p. This would give 5000 c.p. per hour, which, plus 10 per cent. allowance for line losses, would necessitate a current consumption of 6.87 kw. per hour. The cost of installation was estimated at £775, and the annual cost would be £2 10s. per lamp, burning six hours per night seven nights per week. From Mr. R. B. Cram, the contractor who installed the light for the Bulli shire, there was, accompanying this report, an offer to instal on the same terms, namely, time payment extending over 10 years, with 7 per cent. interest. The mayor estimated that a rate of three-farthings would provide for the annual cost of the scheme. The council did not receive the report favourably. Aldermen wanted the light for the villages in the municipality rather than for the main road, and said the report was not comprehensive enough. It was argued that the main road installation would be the ground of the larger scheme, as branches could be extended from it on either side. The report was remitted to the committee for more information as to extensions. It was evident, however, that the council, which is near the end of its term, was not inclined to take on any new and costly projects, although it had agreed to the appointment of the committee.

## BRITISH AND EUROPEAN DEVELOPMENTS.

(From Our Correspondent.)

London, October 10.

Manchester Corporation has had to face the necessity for supplementing its existing generating stations, in order to keep pace with the remarkable growth of the demand for electricity for all purposes. The maximum load has been going up by 3000 to 4000kw. per annum for some years past. It is now proposed to purchase an 11 acre site at Trafford Park, where, by degrees, a 100,000kw. plant can be built up, supplementing the Stuart-street and Dickinson-street stations. The first section suggested is 25,0000kw., sufficing until the year 1919, and it is reckoned that, whereas the existing plants work out at £20 per kw., the Trafford Park plant will be less than one-half that figure. On coal carriage alone it is expected to save something like £17,000 a year by location at Trafford Park, in addition to which the Manchester Ship Canal will be available for furnishing condensing water.

The Marquis of Winchester, at the annual meeting of the Victoria Falls and Transvaal Power Co. Ltd., on September 26, stated that the profit for the past year had been £446,380, an increase of £123,286, as compared with the previous year. They were not, however, paying a larger dividend than before, because labour troubles in South Africa and war clouds in Europe were factors in the situation. In regard to future dividends, they had made a calculation, based on actual figures of working the business, and, assuming that the profit per unit remained the same, and that the notified demands of the mines for power came on at the dates expected, in 1916 they would be in a position to distribute a dividend of 10 per cent. per annum on preference shares, and one of 4 per cent. per annum on the ordinary stock, the back dividend on the preference shares having been met in the intervening years. This result would have been obtained without the utilisation of the great power of the Victoria Falls, which was still in reserve as a great hydro-electric problem when the development of Rhodesia was sufficiently forward to demand attention. In January, 1915, the installed plant in the stations of both the Victoria Falls and the Rand Mines Power Supply Co. would be about 265,000h.p. When the company was formed, fears were entertained by the Transvaal Coal Owners'. Association and the Government of the Transvaal, who then controlled the railways, that the general consumption of coal would fall off. At that time the mining companies were their chief consumers of round coal. The small coal was more or less lost to the collieries; indeed, it cost them money to dispose of it on their dump heaps. At a matter of fact, now they had, by selling that coal to this company, been enabled to dispose of their round coal under more satisfactory conditions. The Brakpan station was started in September, 1908, and the coal output for that year was 2,942,000 tons. For the twelve months ended September 30, 1912, it was 4,592,000 tons, an increase of 1,650,000 tons. These and other figures were advanced by the Marquis to show that the company had done no harm to the coal mining industry of the Transvaal. Another point touched upon in his speech was the indebtedness of the company to the South African Government for their response to the appeal of the South African management for adequate protection for the company's power stations during the recent strikes. Mr. A. E. Hadley, managing director, who had recently returned from a visit to Johannesburg, and had also been on a visit of inspection, with Mr. Bernard Price, their engineer-in-chief, to all the large power stations in America, addressed the meeting on the technical advantages of the Rand system. The total power supplied along the 50 miles of reef at present amounted to 140,000h.p., and the further business in sight, necessary to meet the requirements of consumers, represented an increase of 40 per cent. on this figure. The enterprise ranked as the largest supply company in the British Empire, and it was only slightly exceeded by two or three in the whole world. Their boilers were burning, on an average, 1½ tons of coal per minute. Mr. Hadley said that, if they were about to design and lay out the system again, with the benefit of all power station experience of the last five years, they would not make material modifications. Experience had brought about improvements in details, and these had already been added, or were being introduced as opportunity occurred, rendering the system more reliable. Obsolescence was an important point in many earlier installations, so that their own position was very satisfactory. Lightning troubles were severe on the Rand, but this aspect of their undertaking had been carefully studied and the difficulties had been perceptibly reduced during the last two seasons. Their generating plant was working with a lower coal consumption than in the case of any other installation that he had seen, and they were still improving in this respect.

The much advertised gas exhibition is running at Shepherd's Bush, but, from the observations passed by electrical eye-witnesses, electricity has little to fear. Of course just now while the exhibition is being advertised in the newspapers, there is also a good deal of "editorial" (more or less!) matter appearing in praise of gas. Perhaps the high colour has been put on so thickly by the Gas Publicity Committee because the papers have also been unable to resist the fascinations of electricity as exhibited at the "Daily Mail" Ideal Home Exhibition. The electrically equipped house with its hundred varied devices for lighting, cooking, water heating, carpet warming, and much automatic service—*La Maison Electrique*—to which full reference was made here several weeks ago, has made a successful appeal to the mind of the journalist, and between now and October 25th there will doubtless be a fairly constant stream of visitors anxious to see the *piece de resistance* of the exhibit, the automatic electric table which serves up meat and drink and takes away your platters—but not your complaints—when you have finished. In the bedroom you awake in the morning, and instead of ringing for the chambermaid or other attendant you speak aloud your wishes and beside the bed there rises by means of a lift through the floor just the very things you require—shaving water, hot rolls, coffee, etc. This and much more like it is of course very ingenious and very pretty, and it will promote a good deal of surprised comment at the wonderful things that you can do by electricity, but some of the critics are asking whether this kind of thing will bring consumers on to electric supply mains. However that may be, it is all to the good if we can make the people talk, for benefit will be sure to come indirectly, in addition to which there is a good display of devices and applications which cannot fail to interest the class of crowd that always attends the Ideal Exhibition, generally a class that can well afford to adopt electricity for many domestic purposes.

Another thing at Olympia that will also strongly appeal to the popular fancy is found in a quite unexpected direction, namely, the garden section of the gallery. Mr. Cook of Orpington has shown considerable enterprise in lighting his extensive fowl-houses (holding 6000 birds) by electricity during dark mornings and early nights. In this way he has so deceived his birds with his lights in imitation of the sun, that they think it is summer all the year round, and lay from 30 to 40 per cent. more eggs. There are 300 lamps of from 8 to 32 c.p., the largest sizes being switched on from 6 p.m. until 9.30; then the 16's take their place for half an hour, an dthe 8's for a quarter of an hour, until at 10.15 gross darkness covers the hen coop. During the run of this exhibition Mr. Cook is interesting the public by running experiments concerning the egg-producing capabilities of electrically influenced birds to prove their greater capacity in respect to output. Incubation (electric) is also carried out on a large scale and with great success on the same poultry farm. The reader might wonder what is the effect upon the bird of having to turn out more eggs because the day is longer, but don't you see that they have more hours to feed in, if they do have to put up with less sleep than formerly? An eight hours day movement with chanticleer as tub-orator will surely threaten Mr. Cook.

## STEEL WORKS AT NEWCASTLE.

### "Lucky to Get Them."

(From Our Correspondent.)

Newcastle, November 4.

Speaking on the 3rd inst. at the Eight-hour Demonstration in Newcastle, says our Newcastle correspondent, Mr. Cann, State Treasurer, referred to the establishment of iron and steel works at Port Waratah, by the Broken Hill Proprietary Co. He had been told, he said, that the Government had given enormous concessions to a rich proprietary company. "The fact is," said Mr. Cann, "that this instance is the sole one in the State of a Government making the people who are getting the improvements to pay for them. We are making a deep-water channel up to the works, and the company has to pay 5 per cent. on the cost of constructing it. At the same time, it will be used by vessels shipping coal, and thus benefit the port in other ways." (A voice: "You are giving them a monopoly in the manufacture of steel rails.") Mr. Cann: "There is a monopoly now, but this one will be in Newcastle, and you will benefit." He added that he did not wish to say one word in detraction of the iron ore deposits of the State, but the Government would not be justified at present in spending 10s. to develop them. The company opening at Port Waratah had enormous quantities of ore in sight, and this could be obtained cheaply. In his opinion, Newcastle was lucky to get the steel works. There were 50 other places in the Commonwealth that wanted them, and he congratulated Newcastle upon being successful in getting them, and upon what had already been accomplished toward the establishment of the works. Mr. Cann's remarks evoked cheers from a large section of the crowd of workers assembled on the ground where he spoke. Mr. Cann has since explained that what he wished to emphasise in referring to the iron ore deposits of the State was that the Government would not be justified in spending money in developing an industry that was already in the hands of private enterprise. All the known deposits of iron ore in the State were now in the hands of private people or corporations, and there could be no justification for the Government building works to develop something they had no hold upon, and which was now in private hands.

## MISCELLANEOUS.

Mr. H. A. Warden, a New South Wales schoolmaster stationed at Narrabri, has erected an experimental wireless station there of such power as to be capable of receiving messages over a distance of 2000 miles, from Fremantle and Broome, in Western Australia. He has described his experiences in the "Public Instruction Gazette," and states that the boys at the school have been deeply interested and insisted on taking an active share in fitting up the aerial set and rigging and furnishing the room in which the plant was installed. So great and so steady has been the interest shown by the boys in the instrument that it has been possible to render it of high educational value. Ships are located, cargoes discussed, and their probable route worked out in the school, thus bringing the boys into intimate touch with the commercial world.

* * *

The Marconi Wireless Telegraph Co. proposes to lower the charges on its Pacific system, as well as those for transmission across the Atlantic between Great Britain and Canada to 5d. a word for ordinary messages, and to make some reduction in the "deferred" rate. It also hopes, by means of the duplex and automatic systems, to send 100 words a minute. A Canadian cablegram making an announcement similar to the above states that the shore stations of the new Atlantic systems will be at Glace Bay in Nova Scotia, and Clifden, in Ireland, at each of which the duplex system will be installed. The only difficulty is in connection with the land line from Clifden, but when this has been overcome it is believed that 100 words a minute can be put through and the charge will be reduced from 7½d. to 5d. per word.

* * *

It has been announced by the Imperial Postmaster-General, Mr. Herbert Samuel, that in connection with the construction of the second of three high-power wireless stations to form part of the Empire chain, no "Marconi monopoly" will be recognised, but tenders will be received from any wireless company which can demonstrate practically to his satisfaction its ability to give an efficiency over a radius of 2000 miles by day and night. Applications have to be in by the 21st inst.

* * *

Mr. Wynford Brierley has offered to present free to the British railway companies his patent signalling apparatus, designed to prevent disasters like that at Aisgill. Mr. Brierley's invention is now in use on the Austrian State railways, and it has also been declared satisfactory by the Board of Trade. It is worked by duplicate contrivances, one of which is fixed to the side of the metals and the other in the engine. By a mechanical or an electrical device the apparatus on the metals comes into contact with the engine, causing a bell to ring in the cab. Mr. Brierley's invention does not bring the train to a standstill, but merely directs the attention of the driver to the fact that his signals are at danger.

* * *

Every year now sees large additions to the staff of employees in the Victorian railway service, and last year's quota was 329, as against 389 in 1911-12. During the last six years there have been 1786 new permanent appointments.

* * *

The Warrnambool (V.) Town Council has appointed a committee to report upon the proposal to introduce an electric power scheme for the town. The committee is to inquire into the financial aspect of the question, ascertain the measure of support likely to be forthcoming from the public, and what effect, if any, such a scheme would have on the municipal gasworks.

# Invited and Accepted Tenders

It is particularly requested that the information regarding contracts open, and the successful tenderers, be forwarded to The Editor not later than Monday of each week.

The following contractions are used throughout:—S—supply; D—delivery; M—manufacture; C—construction; E—erection; P—purchase; I—installation; R—removal. Where no contractions appear, supply and delivery is understood. The date at the beginning of each paragraph refers to the closing of tenders.

## INVITED.

### Commonwealth.

Specifications, tender-forms, etc., for tenders invited for the Postmaster-General's Department of the various States under this heading may be had as follows:—Victoria—Various State G.P.O.'s. New South Wales—Departmental Stores, Sydney, and various G.P.O.'s in other States. South Australia—Adelaide, Melbourne, Sydney and Brisbane G.P.O.'s. Western Australia—Departmental Stores, Perth, and various G.P.O.'s in other States. Queensland—Various State G.P.O.'s. All States—Various G.P.O.'s. If the specifications, etc., may be had elsewhere, in addition, the places will be given in parentheses.

POSTMASTER-GENERAL'S DEPARTMENT, Melbourne.—9th December.—S. and D. of 1000 reinforced concrete poles, as per schedule No. 959.

11th December (extended from 11th November). — D. and E. of eight automatic telephone switchboards at the Ascot, Canterbury, Malvern, Cheltenham, Footscray, Oakleigh, Sandringham, and Williamstown Telephone Exchanges, as per schedule No. 953.

16th December.—S. and D. of one common battery multiple switchboard at the Telephone Exchange, Wills-street, Melbourne, as per schedule No. 968.

30th December.—S. and D. of telephone material, as per schedule No. 976.

27th January, 1914.—S. and D. of switchboards, telephones, etc., as per schedule No. 990.

POSTMASTER-GENERAL'S DEPARTMENT, Sydney.—19th November.—S. and D. of 450 bells, magneto, as per schedule No. 333.

19th November.—S. and E. of 618 wooden poles and erection 70 miles wire.

19th November.—S. and E. 100 wooden poles and erection 26½ miles wire.

22nd November.—S. and D. of 50,000 pattern "B" insulators, as per stores schedule No. 345.

3rd December.—S. and D. of 8000 jointing sleeves, for use with galvanised iron wire.

3rd December.—S. and D. of 181 tons wire, galvanised iron, 400, 200, and 60 lbs. per mile, as per stores schedule No. 346.

3rd December.—S. and D. of 3 miles wire, copper, No. 18 L.S.W.G., and I.R. insulated, as per stores schedule No. 347.

3rd December.—S. and D. of 48,500 insulators, porcelain (brown and white), as per stores schedule No. 348.

3rd December.—S. and D. of 42,000 spindles, steel, galvanised.

3rd December.—S. and D. of 1500 stay rods, as per stores schedule No. 349.

3rd December.—S. and E. of about 104 wooden poles and erection 4 miles wires.

3rd December.—S. and E. of 324 wooden poles and 14½ miles wires.

18th March, 1914.—S., D. and E. at the Telephone Exchanges, Epping, Ryde, Hunter's Hill, Drummoyne, Wahroonga, Paddington and Waverley, Sydney, of seven (7) automatic switchboards, with associated equipment, as per schedule No. 179.

POSTMASTER-GENERAL'S DEPARTMENT, Brisbane.—13th November.—S. and D. of all material necessary to repair 28¼ miles telegraph line, as per stores schedule No. 156.

19th November.—Bronze wire, as per schedule No. 273.

26th November.—S. of all material specified and labour for erection about 170 miles H.D. copper wire from Inglewood to Mungindi.

1st December.—S. of all material specified, and erection about 107½ miles H.D. copper wire to Roma and Pickanjinnie.

17th December.—S. and D. of insulators, as per stores schedule No. 280.

31st December.—S. and D. of insulators, as per stores schedule No. 282.

7th January, 1914.—S. and D. of switchboards, as per schedule No. 274.

7th January, 1914.—S. and D. of telephone instruments, as per stores schedules Nos. 275, 276 and 277.

7th January, 1914.—S. and D. of protectors, parts, etc., as per schedule No. 278.

POSTMASTER-GENERAL'S DEPARTMENT, Perth.—19th November.—S. and D. of rectangular dry cells.

3rd December.—S. and D. of H.D. copper wire.

10th December.—S. and D. of 60 tons galvanised iron wire.

21st January, 1914.—S. and D. of switches, telegraph line with plugs.

POSTMASTER-GENERAL'S DEPARTMENT, Adelaide.—26th November.—S., fitting and erection of 229 wooden poles.

POSTMASTER-GENERAL'S DEPARTMENT, Hobart.—1st December.—S. and D. of dry cells, as per schedule No. T. 84.

DEPARTMENT OF HOME AFFAIRS.—Kalgoorlie-Port Augusta Railway.—28th November (extended from 5th November).—M., S., D. and E. of 4 locomotive engines and tenders (N.S.W. "P" type); tender capacity, 4500 gallons of water, and approx. 7½ tons of coal.

18th November.—M., S. and D. of six-wheel brake vans, complete.

2nd December.—600 pairs of wheels and axles (9in. x 4½in. journals).

2nd December.—S. and D. of 15 bogie cattle waggons and 30 bogie sheep waggons. (See advertising columns.)

FEDERAL TERRITORY.—26th November.—S. of pumping plant for Canberra.

DEPARTMENT OF HOME AFFAIRS.—Quarantine Station, Sydney.—24th November.—S. of boiler plant for Quarantine Station.

DEPARTMENT OF DEFENCE—Small Arms Factory, Lithgow, N.S.W.—29th December.—P. of scrap steel, brass, jute bags, whale oil, etc.

12th January.—S. of iron and steel for manufacture of rifles.

### States Invited.

### Victoria.

RAILWAY DEPARTMENT.—14th November.—S. and D. of fire lamp shields.

19th November.—S. and D. of circuit breakers.

19th November.—M., S. and D. of metal gates.

19th November.—S. and D. of galvanised plain and barbed wire.

19th November.—M., S. and D. of 18 railway tricycles.

19th November.—M., S. and D. of 25 tons 7-8in. steel fishbolts and nuts for 60 lb. rails.

19th November.—Autometer speed recorders.

19th November.—M., S. and D. of cast steel wheel centres for A2 engines and new truck stock.

19th November.—Brass locomotive tubes.

19th November.—150 tons pig iron.

19th November.—[illegible] tons sulphate of copper, best quality, for electrical purposes, battery material.

26th November.—S. and D. of 1000 cast steel blooms for axles for electric motor bogies.

30th November.—Resilvering mirrors.

3rd December.—Steel blooms, for piston rods.

3rd December.—S. and D. of vulcanised rubber electric light wire.

10th December.—M., S. and D. of one 15-ton crane for Ballarat.

7th January (1914).—S. and D. 10,000 porous pots for batteries.

SPECIAL NOTICE !

**The Mount Morgan Gold Mining Co. Ltd.**

ARE PREPARED TO PURCHASE Ores, Concentrates and Furnace Products, containing Gold and Copper, at most favourable rates.

ALSO TO INSPECT MINING PROPERTIES with a view to Developing, Financing, or Purchasing same.

Address:—MR. B. MAGNUS, GENERAL MANAGER, MOUNT MORGAN, QUEENSLAND.

**P & O.** COMPANY'S ROYAL MAIL STEAMERS
FOR MARSEILLES, PLYMOUTH AND LONDON.

Leave Sydney on the subjoined dates, calling at usual ports.

FIRST AND SECOND SALOON ONLY.

| Steamer, | Tons. | Commander. | Noon. | Melb., 3 p.m. |
|---|---|---|---|---|
| MEDINA | 12,500 | Notley | Nov. 15 | Nov. 18 |
| MONGOLIA | 10,000 | Lewellin | Nov. 29 | Dec. 2 |
| MACEDONIA | 10,500 | Bennett | Dec. 13 | Dec. 16 |

PASSAGE MONEY TO LONDON—
Single, £41 16s. to £82 10s.
Return, £69 6s. and £123 4s.

Return Tickets between Inter-State Ports are available for return by Orient, Messageries Maritimes, and N.D.L. steamers having room.

SPECIAL HOLIDAY RETURN TICKETS to COLOMBO are now issued, available for two months. Fares from Sydney, £45 2s. first saloon, and £31 18s. second saloon.

A. GORDON WESCHE, Superintendent IN AUSTRALIA, 63 Pitt-street, Sydney.

**The COLONIAL MUTUAL FIRE Insurance Company Limited.**

Principal Office: 60 MARKET-ST., MELBOURNE.

Branches in all the States.
Transacts Fire, Guarantee, Employers' Liability, Marine, Burglary, and Plate Glass, Accident, Workers' Compensation and Live Stock Insurances.
Send for Prospectus.
W. TUCKER, General Manager.

*Harringtons* Ltd

ANALYTICAL & METALLURGICAL DEPT.

Highest prices given for all gold, silver or platinum residues, etc.
Lowest fees for all kinds of Assay, Analytical, and Metallurgical work.
Expert Advice on Ore Treatment, Bullion Refining, Smelting, etc., etc., Directed by a qualified Analyst from Messrs. Johnson and Sons, London: Assayers and Refiners to Bank of England, H.M. Mint, The Council of India, etc.

HARRINGTONS LTD.
386 George Street, Sydney.

7th January.—S. and D. of best steel boiler plates.

7th January.—S. and D. copper rod.

7th January.—S. and D. copper plates.

7th January.—S. and D. of cast steel wheel centres.

7th January.—S. and D. of steel blooms for crank pins.

7th Jan.—S. and D. of locomotive brass boiler tubes.

7th January.—S. and D. of best Yorkshire iron angles.

7th January.—S. and D. of locomotive seamless copper tubes.

7th January.—S. and D. of steel channel bars.

14th January.—S. and D. of five feed lubricators.

14th January.—S. and D. of 100,000 lineal yards tarpaulin canvas.

14th January.—S. and D. of high speed twist drills.

14th January.—S. and D. of one concrete mixer.

21st January.—S. and D. of one high speed lathe.

21st January.—S. of hydraulic jacks.

28th January.—S. and D. of 200 forges and rolled steel disc wheels.

28th January.—M., S., D. and E. of one three-phase alternator, complete, at Newport.

4th February.—S. and D. of 1500 felt body blocks.

4th February.—S. and D. of 25 five-feed lubricators.

VICTORIAN RAILWAYS COMMISSIONERS, State Coal Mine.—17th November.—S. and D. of enamel paint.

17th November.—S. and D. of brasses and frame rings.

17th December.—S. and D. of one motor-driven ventilating fan. (See advertising columns.)

STATE RIVERS AND WATER SUPPLY COMMISSION.—6th December.—M. and S. of one centrifugal pump and quick revolution steam engine about 800h.p.

### New South Wales.

PUBLIC WORKS DEPARTMENT.—8th December.—M., S. and D. of steel bridges for Cooperbung and Piper's Creeks, on fifth section, North Coast Railway, viz., Wauchope to Kempsey. (See advertising columns.)

22nd December.—M., S. and D. of twenty 20-

A.U.S.N. Co. Ltd.

*Fast, Regular, and Comfortable Passenger Steamers* (also carrying cargo) from and to MELBOURNE, SYDNEY, ADELAIDE, FREMANTLE, BRISBANE, and all QUEENSLAND PORTS.

Passage Tickets interchangeable, with other Inter State Companies, on certain conditions.

Full Particulars at

COMPANY'S OFFICES

at all principal Australian Ports.

The Mount Lyell Mining & Railway CO. LIMITED.

Purchasers of Ores containing Copper, Gold and Silver. Rates obtainable on application to the Secretary

Manufacturers of Coke for Smelting and Foundry Purposes, Acids, Etc.

HEAD OFFICE—
39 QUEEN-STREET, MELBOURNE.

D. G. LUMSDEN,
Secretary.

THE

-PACIFIC CABLE BOARD-

Best route to Great Britain, Canada, New Zealand, Germany, etc.

New Direct Cable to Auckland from Board's Sydney Office opened December, 1912.

A Week End rate is now available between Great Britain and Australasia.—Rate 9d. per word, with minimum of 18/- (24 words). Week End Cable Letters are accepted up to midnight on Saturday for delivery in Great Britain on the following Tuesday morning.

TARIFF PER WORD "VIA PACIFIC."

| | Ordinary. | Daily Deferred. |
|---|---|---|
| GREAT BRITAIN .. .. .. .. | 3/- | 1/6 |
| GERMANY .. .. .. .. .. .. .. | 3/- | 1/6 |
| NEW ZEALAND .. .. .. .. .. | 4½d. | — |
| CANADA .. .. .. .. .. .. .. | 2/4 | 1/2 |
| U.S.A. .. .. .. .. .. .. .. .. .. | 2/4 to 2/8 | 1/2 to 1/4 |
| ARGENTINE, BRAZIL, CHILI and PERU .. .. .. .. | 5/8½ | 2/10¼ |

West Indies, Central America, and other rates, on application.

Cable forms, Deferred and Week End Regulations, may be obtained at—

THE PACIFIC CABLE BOARD,

77 Pitt Street, Sydney. Tel., City 1346 (3 Lines).
408 Collins Street, Melbourne. Tel., 2588.

J. Milward, Manager in the Pacific, 77 Pitt Street, Sydney.

ton cart weighbridges, ten 20-cwt., and forty 10-cwt. weighing machines for railway station yards. (See advertising columns.)

27th January.—M., S. and D. of steel bridges for Saltwater and Smith's Creeks; for Christmas, Warrel, and Snaky Creeks, and Lagoon, at 216 miles 60 chains; and for Bucca Creek, on the 5th, 6th and 8th Sections, respectively, North Coast Railway, viz., Wauchope to Kempsey, Kempsey to Macksville, and Coff's Harbour to Glenreagh. (See advertising columns.)

RAILWAY DEPARTMENT.—26th November. —C. and S. of two bogie water sprinklers. (See advertising columns.)

26th November.—S. of one 2000 lb. storage battery freight truck. (See advertising columns.)

14th January, 1914.—S. of 2 electrically driven turbine pumps, 50 gallons per minute. (See advertising columns.)

SYDNEY HARBOUR TRUST.—17th November.—S. and D. of structural steelwork for premises, corner Sussex and Napoleon-streets.

METROPOLITAN BOARD OF WATER SUPPLY AND SEWERAGE.—24th November.—S. and D. of centrifugal pump casings, with spindles, rings, etc., for Ryde Pumping Station. (See advertising columns.)

15th December.—M. and D. of one turbine centrifugal pumping plant for Crown-street Pumping Station. (See advertising columns.)

## Queensland.

TREASURY DEPARTMENT.—(Babinda Central Sugar Mill)—24th November.—S. D. and E. of small electric generating plant, motive power, and all accessories. Shafting, brackets, and travelling crane for 30 cwt. Tools for fitting shop. Bar iron and piping. One locomotive, about 12 tons loaded, 2ft. gauge.

6th January, 1914.—S. and D. of 23 miles of steel rails, 28 lb. per lineal yard, with all fastenings, to be delivered at Cairns Wharf in July, 1914.

HOME SECRETARY'S DEPARTMENT.—25th November.—S. and D. of drugs and chemicals.

RAILWAY DEPARTMENT.—18th November. —S. of 60,000 tons of coal per annum from collieries in the central district for the requirements of the central division for a period of three years from Jan. 1, 1914.

25th November (extended from 11th November). —S. of cement. (See advertising columns.)

## Western Australia.

GOVERNMENT TENDER BOARD.—20th November.—S. of copper firebox, tube plates for Railway Department.

20th November.—1000 yards roofing canvas.

20th November.—200,000 yards tarpaulin canvas.

20th November.—S. of sewerage fittings.

4th December.—S. of 16,000 gallons oil.

18th December.—S. and D. of copper plates, pipes, bars, and sheets, for Railway Department.

18th December.—Mill rolled plate glass for Railway Department.

## South Australia.

SUPPLY AND TENDER BOARD.—18th November.—P. of 200 tons of mixed scrap, consisting of dogspikes, fishplates, fishbolts, crop end of rails, etc.

18th November.—S. and D. 210 tons calcium carbide.

25th November.—S., D. and stacking 200 miles galv. wire netting (100 miles 42 x 1½ x 18g. and 100 miles 36 x 1½ x 18g.).

6th January, 1914.—S. and D. of 1500 bars chain iron, various sizes.

RAILWAY DEPARTMENT.—18th November.— S. and D. of 1137 bars of copper.

18th November.—C. of bridge for Millswood subway.

13th January.—C. of 12 bogie goods break vans, with passenger compartments, 3ft. 6in. gauge.

PUBLIC WORKS DEPARTMENT.—16th December.—S. and E. at Renmark of complete pumping plant.

MINES DEPARTMENT.—29th November.—P. of Parramatta and Yelta mines plant and machinery. (See advertising columns.)

## New Zealand.

PUBLIC WORKS DEPARTMENT.—17th November (extended from 31st October).—S. of telephone instruments and accessories for Lake Coleridge power scheme.

PUBLIC SERVICE TENDER BOARD.—17th November.—1000 bolts, double "J."

17th November.—1 mile cable, D.C.L.C., armoured, 104 pairs.

17th November.—2 miles cable, D.C.L.C., armoured, 78 pairs.

17th November.—1 mile cable, D.C.L.C., armoured, 52 pairs.

17th November.—1 mile cable, D.C.L.C., armoured, 26 pairs.

17th November.—¼ mile cable, lead-covered, silk and cotton insulated, 312 pairs.

17th November.—¼ mile cable, lead-covered, silk and cotton insulated, 624 pairs.

17th November.—4000 castings, 53 lbs., 6 hole.

17th November.—4000 castings, 40 lb., 6 hole.

17th November.—3000 clamps, Messenger, with coach screws and bolts.

17th November.—2400 covers, bicycle (more or less).

17th November.—2400 tubes, bicycle (more or less).

17th November.—600 covers, motor-cycle (more or less).

17th November.—600 tubes, motor-cycle (more or less).

17th November.—Motor-cycles and bicycles spare parts for—1 gross chains, Renold's, ½in. by 3/16in., 114 links; 150ft. chain, Renold's, 5/8in. by ¼in.; 1 gross pairs mudguards, steel, with screw in stays; 1½ gross outfits, Woodgate's Patch-quick; 72 pairs pedals, rubber, 4in., genuine B.S.A.; 2 gross plugs, sparking, Bosch, single point; 72 saddles, Brook's B10; 3 dozen stays, spare, for mud-guards.

17th November.—100,000 insulator bolts, Sinclair.

17th November.—100,000 insulator cups, Sinclair.

17th November.—2 tons metal, jointers'.

17th November.—200 reams paper, brown.

17th November.—2500 plugs, single current.

17th November.—5000 porous pots, Leclanche No. 1.

17th November.—1000 telephones, table.

17th November.—5 tons wire, copper, annealed, binding, 60 lb. per mile.

17th November.—100 tons wire, copper, hard-drawn, 200 lb. per mile.

17th November.—100 tons wire, iron, galvanised, 200 lb. per mile.

17th November.—100 tons wire, iron, galvanised. 150 lb. per mile.

17th November.—7000 zincs, Leclanche No. 1.

## General.

KORUMBURRA MUNICIPAL POWER HOUSE (Jas. D. Batty, engineer-in-charge).—17th November.—P. of 130 Hart Accumulator Cells.

BALLARAT WATER COMMISSIONERS (V.) (Alex. Fraser, Secretary).—11th December.—C. of reservoir embankment, on the Moorabool River. (See advertising columns, 6th November.)

SHIRE OF SWAN HILL.—2nd December.—S. and D. on site of all machinery and labour for duplication of electric power plant at Swan Hill.

BRISBANE METROPOLITAN WATER AND SEWERAGE BOARD.—13th January.—S. and D. of material for aerial ropeway.

10th February.—S. and D. of steam crane excavator.

ELDERSLIE STATION, Winton, W. Q'land.— 19th November.—Sinking and completion of an artesian bore, maximum depth 4500 feet.

CITY OF LAUNCESTON (T.) (C. W. Rocher, Town Clerk).—24th November (extended from 13th October).—Section i., S. and D. of transformers, etc.; section ii., S. and D. of feeder cable. etc.; section iii., S., D. and E. of high tension switchboard, etc.

CHRISTCHURCH CITY COUNCIL (H. R. Smith, town clerk).—5th January, 1914.—S. and D. of series street lighting plant and accessories. Specifications may be seen Town Clerk's office, Melbourne.

HAMILTON ELECTRIC SUPPLY CO.—13th November.—P. as going concern, plant, land and rights of business.

ELECTROLYTIC REFINING AND SMELTING CO. LTD., Port Kembla (N.S.W.).—22nd November.—Engineering, electrical, chemical and general stores, for years 1914 and 1915.

BURNT CREEK G.M. Co. (S. J. Warnock, Collins-street).—1st December.—P. of heap of slimes and sand. near Dunolly (V.). (See advt. columns.)

MELBOURNE HARBOUR TRUST COMMISSIONERS.—18th November.—S. and D. of 80 cast steel bucket links for dredge "John Nimmo,"

SHIRE OF HEIDELBERG (H. J. Price, Secretary).—13th November.—S. of 400 gallon water cart.

SHIRE OF PRESTON (Arnold Dean, Secretary).—15th November.—E. of brick substation for electric supply.

SHIRE OF SWAN HILL (Wm. Bird, Shire Secretary).—2nd December.—S. and D. of necessary machinery for duplication of electric power plant. (See advertising columns.)

THE SULPHIDE CORPORATION LTD., Central Mine.—6th December.—S. of stores for year 1914. (See advertising columns.)

CYANIDING.—P. of 200,000 tons (about) of sands and slime.—James Paton, Main-street, Stawell (V.). (See advertising columns.)

CHRISTENSEN'S AJAX G.M. CO., Daylesford (Norman G. McLeod, 31 Queen-street).—21st November.—P. of whole mining plant standing on above leases. (See advertising columns.)

Dunlop Mining Goods

Are now used with satisfaction in most of the Leading Mines of Australasia – Their QUALITY & WEAR are UNSURPASSED

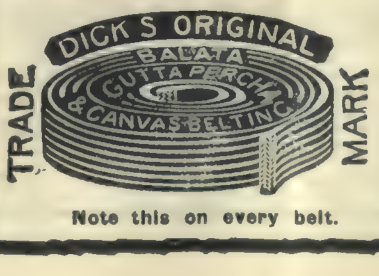
Tenders & Samples submitted
Correspondence invited
Send for Illustrated Catalogue

The DUNLOP RUBBER Co. of AUS. Ltd
108 Flinders St. MELBOURNE.
& ALL STATES

Dunlop Rubber Belting

Is more efficient than Leather belting for Outdoor & Wet Work.

Sample & Price on application



Note this on every belt.

Be sure you get

"DICK'S"

We know there are numerous imitations. Dick's maintains its high reputation for strength and efficiency. Every belt guaranteed. Sole agents·

JAMES HARDIE & CO.

Melbourne and Sydney.

MUNICIPAL COUNCIL OF SYDNEY.—26th November.—Alteration to Sir Wm. Manning Markets, at Haymarket, in order to convert into a hippodrome. (See advertising columns.)

HYDRAULIC SLUICING PLANT (T. Herron Wilson, 99 Queen street).—P. of above, comprising about 1000ft. piping, valves, and nozzles, complete, etc.

## ACCEPTED.

### Commonwealth.

POSTMASTER-GENERAL'S DEPARTMENT, Victoria.—S. and D. of 333 tons sulphate of copper, amount not to exceed £9624—Mond Nickel Co., London.

S. and D. of 15 switchboards, magneto, non-multiple, for 50 lines, £28 14s. 3d. each; 35 switchboards, magneto, cordless, fully equipped for 10 lines, £12 4s. 3d. each—Western Electric Co. Ltd.

POSTMASTER-GENERAL'S DEPARTMENT, New South Wales.—S. and D. of 5000 strips and protectors, single pole, with carbon plate arrestor to operate to 500 volts, D.C., and fuse 5 amperes, to operate to 7½ amps., £1 7s. 6d. per strip—Western Electric Co. Ltd.

POSTMASTER-GENERAL'S DEPARTMENT, Queensland.—3244 cross arms, tubular, galvanised iron, 46in., 2s. 1d. each; 3322 cross arms, tubular, galvanised iron, 74in., 3s. 3d. each—Messrs. Stewarts and Lloyds (Aust.) Ltd.

200 tons wire, galvanised iron, 400 lb. per mile, £10 1s. 6d. per ton; 150 tons wire, galvanised iron, 200 lb. per mile, £10 19s. per ton—Messrs. Brabant and Co.

80 steel date stamps, face 1in. dia., 26s. 9d. each—Messrs. C. G. Roeszler and Son.

30 steel date and time stamps, face 1in. dia., 33s. 3d. each—Messrs. Quirk and Morton.

39 tons bolts, ½in. dia., £20 16s. 6d. per ton; 6 tons staples, £16 14s. per ton—Messrs. Webster and Co. Ltd.

100 gross bridle rings, 10s. 6d. per 100; 100 gross bridle rings, 14s. per 100; 80 gross bridle rings, 16s. per 100; 50 gross bridle rings, 18s. per 100—Messrs. Boehme and Owen.

168 covers and frames, cast iron, for manholes, 2ft. x 1ft. 6in., £1 10s. 1d. each—Messrs. Horden and Lewis.

3 tons nails, lead headed, 1½in. x 8 in., £23 per ton—Mr. William Weston.

2500 pole roofs, 24 gauge, g.i., 10in. x 14in., 23s. per 100; 3000 pole roofs, 24 gauge, g.i., 12in. x 17in., 30s. per 100; 4500 pole roofs, 24 gauge, g.i., 14in. x 20in., 43s. per 100; 2000 pole roofs, 24 gauge, g.i., 15in. x 21in., 49s. per 100; 2000 pole roofs, 24 gauge, g.i., 16in. x 23in., 56s. per 100; 3500 pole roofs, 24 gauge, g.i., 13in. x 18½in., 37s. 6d. per 100—Mr. William Parker.

308 potheads, cast iron, No. 1 size, 2s. 0 12 77d. each; 156 potheads, cast iron, No. 5 size, 4s. 5 11 13d. each; 44 potheads, cast iron, No. 6 size, 5s. each—Siemens Bros. Dynamo Works Ltd.

300 potheads, cast iron, No. 3 size, 2s. 10d. each; 200 potheads, cast iron, No. 4 size, 3s. 6d. each—Messrs. Noyes Bros. (Sydney) Ltd.

1 ton solder, 1s. 5d. per lb.; 2 tons solder, 1s. 1½d. per lb.—Mr. Lewis Holmes.

700 bottles solution, soldering, "Baker's," in ½ pint stone bottles, 5d. each—Messrs. Paul and Gray Ltd.

20,000 spindles, steel, galvanised, 6d. each; 20,000 spindles, steel, galvanised, 4½d. each—Messrs. Williams and Co.

10,000 thimbles, galvanised iron or steel, ⅜in., 1.45d. each—The Lawrence and Hanson Electrical Co. Ltd.

2000 cells, glass, for Callaud battery, 8¾in. high x 6¼in. diameter, 2s. 8½d. each; 1000 cells, glass, 7d. each—The Brisbane Electrical Co.

6000 cells, glass, 3½in. x 3½in. x 6¼in. high, 4s. per doz.—The British General Electric Co. Ltd.

POSTMASTER-GENERAL'S DEPARTMENT, South Australia. — 50,000 binders, copper, for 100 lb. wire pattern "B" insulators, 3s. 1d. per 100; 10,000 binders, copper, for 100 lb. wire pattern "A" insulators, 3s. 4½d. per 100; 33,500 binders, copper, for 200 lb. wire pattern "A" insulators, 5s. 9d. per 100; 5000 binders, copper, for 300 lb. wire pattern "A" insulators, 7s. 1d. per 100; 5000 binders, copper, for 400 lb. wire pattern "A" insulators, 8s. 3d. per 100; 83,500 tapes, copper, for 200 lb. wire pattern "A" insulators, 5s. 1½d. per 100; 5000 tapes, copper, for 300 lb. wire pattern "A" insulators, 5s. 11½d. per 100; 5000 tapes, copper, for 400 lb. wire pattern "A" insulators, 7s. 6d. per 100; 1026 cells, Leclanche, glass, 3½in. x 3½in. x 6¼in., 4d. each; 4000 sacks, for Meidinger cells, ½d. each; 3000 tubes, glass, for Meidinger cells, ½d. each; 3000 zincs, for Meidinger cells, 8½d. each; 400 coppers, for gravity cells, 5d. each; 600 coppers, for gravity cells, 5d. each—The India Rubber, Gutta Percha and Telegraph Works Co. Ltd.

2000 sleeves, jointing, for h.d. copper wire, 113 mils., 8s. 9d. per 100; 5000 sleeves, jointing, for h.d. copper wire, 80 mils., 4s. 4d. per 100; 5000 sleeves, jointing, for h.d. copper wire, 67 mils., 3s. 9d. per 100; 2 tons salammoniac crystals, £34 17s. 6d. per ton; 6 tons sulphate of magnesia, £6 2s. 6d. per ton—Theodore Zwicker and Co.

40,000 tapes, copper, for 100 lb. wire pattern "B" insulators, £1 0s. 3d. per 1000; 5 tons wire, bronze, 70 lb. per mile, £94 19s. per ton; 5000 leads, for Meidinger batteries, 2 3-8d. each—British Insulated and Helsby Cables Ltd.

20 tons wire, hard-drawn copper, 100 lb. per mile, £83 4s. per ton; 10¾ tons wire, hard-drawn copper, 200 lb. per mile, £83 4s. per ton—R. Johnson, Clapham and Morris Ltd.

100 cells, dry, square, type "Y," 2s. 6d. each—S. Hoffnung and Co. (British Ever-ready Electrical Co. Ltd).

450 suspenders, brass, for gravity cell, 8d. each; 2800 zincs, for gravity cell, Star pattern, 1s. 5d. each—A. W. Dobbie and Co.

500 spindles, "J," steel galvanised, ¾in., 1s. 10½d. each; 6000 spindles, "J," steel galvanised, 5-8in., 1s. 5½d. each—A. Simpson and Son Ltd.

POSTMASTER-GENERAL'S DEPARTMENT, Western Australia.—150 arresters, lightning, 7s. each; 200 arresters, lightning, 5s. 5d. each; 100 detectors, £1 15s. 3d. each; 18 sounders, 4 ohms, 9s. each; 12 sounders, 40 ohms, 9s. 10d. each; 100 jacks, ¼in., three-part, 8.10d. each; 30 miles wire, tinned copper, No. 20 L.S.W.G., rubber insulated, assorted colours, £3 13s. per mile; 5 miles wire, tinned copper, No. 22 L.S.W.G., rubber insulated, £2 17s. 6d. per mile—British Insulated and Helsby Cables Ltd.

100 detectors, to be in aluminium case, £3 5s. each; 6 bells, trembling, 5in. gong, 7s. each; 150,000 staples, for stapling wire, 4s. 9d. per 1000; 50 miles wire, twisted pair, tinned annealed copper, vulcanised, india rubber insulated, taped and braided, £11 4s. per mile; 70 miles wire, tinned, copper, rubber insulated and braided, £5 7s. per mile; 100 miles wire, twisted pair, outside distributing, £17 15s. per mile—The General Electric Engineering Co.

20 keys, open circuit, Morse, 19s. 6d. each; 6 resistance boxes, with coils of 10, 20, 30, 40, 100, 200, 300 and 400 ohms resistance, with 8 plugs, £2 18s. 6d. each; 50 switches, plug reversing, with two plugs, 13s. 6d. each; 30 switches, plug cut out with plug, 8s. each; 25 bells, trembling, 12in. gong, £2 3s. 6d. each; 20 generators, 5 magnet, 500 ohms resistance, £1 1s. 6d. each; 100 mouth pieces, microphone, 6½d. each; 100 switches, lever, single, two way, 2s. 2d. each; 25 switches, lever, single, three way, 2s. 8d. each; 25 switches, lever, double, two way, 5s. 11d. each; 12 translators for Cailho working, having four windings, two primary and two secondary, each 75 ohms, terminating on 6 terminals, three each end of base, 11s. 9d. each; 6 translators, for Cailho working, having four windings, two primary and two secondary, each with 150 ohms, terminating on 6 terminals, three at each end of base, 12s. 6d. each; 50 brushes, battery, steel, 3s. 6d. each; 30,000 binders, copper, for 70 lb. copper wire, £1 1s. 6d. per 1000; 50,000 binders, copper, for 100 lb. copper wire, £1 17s. 6d. per 1000; 40,000 binders, copper, for 200 lb. copper wire, £2 19s. per 1000; 75,000 staples, for stapling wire, steel tinned or coppered, insulated 5-8in., 5s. 2d. per 1000; 50 draw tongs, 1s. 1d. each—The India Rubber, Gutta Percha and Telegraph Works Co. Ltd.

100 bells, magneto, 7s. 4d. each; 100 bells, magneto, 8s. each; 50 bells, magneto, 18s. each; 500 bases for fuse, double porcelain, 1s. each; 150 cords, 4 conductor, 1s. 1d. each; 100 cords, 4 conductor, 1s. each; 10,000 fuses, in glass tube, metal ends, 1 4-5d. each; 50 handles for micro telephones, 3s. 3d. each; 100 micro telephones, consisting of one receiver, one microphone, cord, 4 conductor, plug 4 part, 17s. 6d. each; 500 nuts, hexagonal head, 1d. each; 200 rings, metal, 6d. each; 50 telephone condensers, £2 13s. 6d. each; 200 telephones, magneto, wall pattern, £2 13s. each; 250 telephones, magneto, table pattern, £2 10s. each; 20 telephones, common battery, table pattern, with generator, £2 10s. each; 15 telephones, common battery, table pattern, with switch, single extension and intercommunication and generator, for use at main substation, £4 10s. each; 150 translators, duplex, 9s. 10d. each; 50 cords, 3 conductor, 5d. each; 50 cords, 5 conductor, 4ft. long, 1s. 6d. each; 100 cords, 5 conductor, for switchboard operators' outfits, 1s. 8d. each; 200 coils retardation, about 600 ohms resistance, 1s. 7½d. each; 25 counters, recording to 99999, for use on switchboards, 5s. each; 50 indicators, ironclad, about 1000 ohms, with electrical replacement, 9s. each; 50 indicators, ironclad, 1000 ohms resistance, mounted singly, 6s. each; 150 indicators, gravity restoring bull's eye, 3s. 10d. each; 200 keys, combined listening and ringing, 6s. 6d. each; 100 keys, ringing, to break two and make two contacts, 4s. each; 10 receiver heads, with three enclosed terminals, 10s. 6d. each; 100 sockets, for supervisory lamps, 5¼d. each; 20 switchboards, magneto, cordless, 6 line, fully equipped, £6 each; 20 switchboards, magneto, wall pattern, 15 lines, £10 1s. each; 15 switchboards, magneto, wall pattern, 25 lines, £14 9s. 6d. each; 6 switchboards, magneto, non-multiple, 100 lines, with outgoing junction jacks, £41 15s. each; 50 switchboards, common battery, cordless, £7 12s. 6d. each; 40 switchboards, common battery, cordless, £9 17s. 6d. each; 10 switchboards, common battery, cordless, £15 5s. each; 10 telephonometers, with mechanical attachment for electrical alarm circuit, £1 5s. 6d. each; 50 telephone sets for attendants, complete, with microphone (breast pattern), receiver (head pattern), £1 10s. each; 100 cells, dry, 3s. each; 100 cells, dry, 3s. 8d. each—J. Bartram and Son Pty. Ltd.

20 bells, trembling, 3in. gong, 4s. 4d. each; 25 telephones, portable, £2 15s. 10d. each; 12 telephones, portable condenser, £2 12s. each; 100 relays, line, to make one contact, two coils each, 500 ohms, 5s. 6d. each; 30 relays, supervisory, to break one and make one contact, 50 ohms resistance, 5s. 4d. each; 30 relays, cut off, to break three and make three contacts, 83⅓ ohms resistance, 8s. 5d. each; 10 miles 13 yards telephone cable, paper insulated, lead covered, telephone, 416 pairs, 12½ lb. conductors, £1090 per mile; 211 yards cable, paper insulated, lead covered, telephone, 312 pairs, 12½ lb. conductors, 1214 yards cable, paper insulated, lead covered, telephone, 260 yards, 12½ lb. conductors, 308 yards cable, paper insulated, lead covered, telephone, 208 pairs, 12½ lb. conductors, 84 yards cable, paper insulated, lead covered, telephone, 156 pairs, 12½ lb. conductors, 50 milliammeters, £1 19s. 4.8d. each—Siemens Bros. Dynamo Works Ltd. (Australasian Branch).

200 bases, porcelain, for mounting fittings constituting protector double pole, 1s. 2d. each; 2 lb. carbon, granulated, for microphone, 14s. 9d. per lb.; 2500 fuses, with heat coils for protector, 10½d. each; 50 howlers, with funnel, mounted on wooden base, 12s. 6d. each; 1500 protectors, for use at subscribers' telephone stations, 2s. each; 200 telephones, common battery, wall pattern, £1 1s. each; 100 telephones, common battery, table pattern, £1 5s. each; 35 telephones, common battery, with switch, single extension and intercommunication, and generator, for use at main station, £4 4s. 11d. each; 500 coils, heat, for main distributing frame, 2½d. each; 300 fuses, 4 ampere, in fibre tube, with connecting nuts, etc., 4½in. over all, 9d. each; 1000 fuses, 4 ampere, tubular, with fibre shell, 1s. each; 100 indicators, 120 ohms resistance, mounted singly with local contacts, 3s. 9d. each; 10 strips indicators, ironclad, 600 ohms resistance (in strips of 15), with local contacts, £3 17s. 6d. per strip; 100 indicators, ironclad, 600 ohms resistance, mounted singly, with local contacts, 4s. 9d. each; 100 jacks, ¼in., 3s. 3d. each; 100 lamps, line, 24 volt, 9d. each; 100 plugs, ¼in., two part, 11d. each; 25 plugs, five part, 1s. 11d. each; 30 relays, ringing, to break one and make one contact, two coils, each 500 ohms resistance, 12s. 6d. each; 30 relays, cut off, to break four and make four contacts, 83⅓ ohms resistance, 15s. each; 30 sockets, five part, with 4 7-8in. wood screws, 1s. 11d. each.; 6 switchboards, magneto, non-multiple, 200 lines, with outgoing, junction jacks, £77 each—Western Electric Co. (Australia) Ltd.

200 condensers, foiled paper, 0.25 microfarad, 11d. each; 200 condensers, foiled paper, 0.5 microfarad, 1s. 2d. each; 200 condensers, foiled paper, 1.0 microfarad, 1s. 4s. each; 1000 condensers, foiled paper, 2.0 microfarad, 1s. 9d. each; 27,000 insulators, porcelain, pattern "A," minimum insulation resistance 100,000 megohms, 5 7-8d. each; 1 mile wire, two twisted conductors, tinned, copper, rubber insulated, cotton covered, braided, flame resisting, £4 9s. 6d. per mile; 15 miles wire, two twisted tinned copper conductors, tinned copper, wool insulated and braided, £3 7s. 6d. per mile—J. C. Fuller and Son.

150 boxes, cable distributing, 5 pairs, 8s. 3d. each; 250 boxes, cable distributing, 13 pairs, 14s. each; 200 boxes, cable distributing, 26 pairs, £1 2s. 6d. each; 50 boxes, cable distributing, 39 pairs, £1 10s. each; 150 boxes, cable distributing, 52 pairs, £2 each—W. T. Henley's Telegraph Works Co. Ltd.

15,000 zincs, for gravity cells, Star pattern, 1s. 2¾d. each—H. Armstrong Ltd.

10,000 binders, copper, for 300 lb. copper wire, £3 per 1000; 10,000 sleeves, jointing, maximum diameter of 80 mils., £1 19s. 1d. per 1000; 7000 sleeves, jointing, maximum diameter of 113 mils., £3 10s. 6d. per 1000; 5000 sleeves, jointing, maximum diameter of 138 mils., £3 17s. 6d. per 1000; 50,000 tapes, copper, for 70 lb. copper wire, 14s. 2d. per 1000; 10,000 tapes, copper, for 100 lb. copper wire, 15s. 6d. per 1000; 10,000 tapes, copper, for 200 lb. copper wire, £1 18s. 4d. per 1000; 2 tons wire, iron galvanised, 60 lb. per mile, £15 9s. 9d. per ton; 30 tons wire, iron galvanised, 200 lb. per mile, £11 12s. per ton; 80 tons wire, iron galvanised, 400 lb. per mile, £10 14s. 4d. per ton; 10 tons wire, bronze, 50 lb. per mile, £83 12s. 8d. per ton; 3 miles cable, switchboard, silk and cotton insulated, £63 9s. 6d. per mile; 100 miles wire, twisted pair, £19 per mile—Malloch Bros.

10,000 sleeves, jointing, for use with hard-drawn copper wire, having a maximum diameter of 67 mils., £1 15s. 10d. per 1000; 25,000 insulators,

(Continued on page 458.)

### HUGH MACKENZIE LESLIE'S.

Australian Letters Patent No. 3665, dated Jan. 17, 1912, for "Improvements in the Treatment of Ores by the Cyanide Process," and No. 3666, dated Jan. 17, 1912, for "Improvements in the Extraction of Metals from Their Ores."

Notice is hereby given that the above patentee is prepared to license the manufacture of the above patented inventions or to sell or otherwise dispose of the patents on reasonable terms, or offers, proposals, or suggestions, from any person, firm, or corporation desirous of using, exercising, and/or vending the patented inventions in Australia, or of otherwise supplying the requirements of the public in respect to said inventions, will be favourably considered. Specifications and drawings of the patents may be inspected at the capital cities of the States, and at the address below. For the Proprietor, FRED WALSH, Patent Attorney, George and Wynyard streets, Sydney.

---

### HERBERT BROWN'S.

Australian Letters Patent No. 3656, dated Jan. 16, 1912, for "Improvements in and Relating to Electric Signalling on Railways."

Notice is hereby given that the above patentee is prepared to license the manufacture of the above patented invention or to sell or otherwise dispose of the patent on reasonable terms, or offers, proposals, or suggestions, from any person, firm or corporation desirous of using, exercising, and/or vending the patented invention in Australia, or of otherwise supplying the requirements of the public in respect to said invention, will be favourably considered. The specification and drawings of the patent may be inspected at the Customs Houses dress below. For the Proprietor, FRED WALSH, of the capital cities of the States, and at the ad- Patent Attorney, George and Wynyard-sts., Sydney.

---

### MILL FOREMAN WANTED.

FIRST-CLASS MAN.

Salary — £500 per annum.

Apply, with References and Fullest Personal Information,

MOUNT MORGAN GOLD MINE,
QUEENSLAND.

---

### ONE HUNDRED MACHINE MINERS WANTED.

PERMANENT JOB.

Contract Miners last year averaged 17/4 per Shift.

Wages Miners, 11/- per Shift.

Apply on Job—

MOUNT MORGAN GOLD MINE,
QUEENSLAND.

---

### THE MOUNT LYELL MINING AND RAILWAY Co. Ltd.

(Incorporated in Victoria, Austraiia, August 11, 1903).

NOTICE is hereby given that the Annual Meeting of the Mount Lyell Mining and Railway Company Limited will be held in the Board Room (7th floor), Broken Hill Chambers, 31 Queen-street, Melbourne, on Friday, November 28, 1913, at 3 o'clock in the afternoon.

Business:

1. To receive and consider the balance-sheet and profit and loss account for the half-year ended September 30, 1913, and the reports of the directors and auditors.
2. To elect two directors in place of Mr. Colin Templeton and Mr. P. C. Holmes Hunt, who retire by rotation. They are eligible for re-election, and offer themselves accordingly.
3. To elect a London director in place of Sir John A. Cockburn, K.C.M.G., who retires by rotation. He is eligible for re-election and offers himself accordingly.
4. To appoint auditors. Messrs. A. G. S. Williams and Thomas Woodward retire in terms of the Articles of Association, but offer themselves for re-election.
5. To transact any other ordinary business which may be transacted at any annual meeting.

By order of the Board,
D. G. LUMSDEN, Secretary.
Dated November 1, 1913.

---

### EDNA MAY GOLD MINING CO. N.L., Westons, Western Australia.

NOTICE is hereby given that a Dividend (the first) of One Shilling per share, and a Bonus of One Shilling per share, has been declared, payable at the registered office of the Company, 31 Queen-st., Melbourne, on Friday, December 5, 1913. Transfer books will close on November 28, at 5 p.m., and remain closed until December 6.

FRED. TRICKS, Manager.
31 Queen-st., Melb., Nov. 11, 1913.

---

### THE SULPHIDE CORPORATION LIMITED.

CENTRAL MINE, BROKEN HILL.

TENDERS are invited for the Supply of Stores for the year 1914. Conditions of contract and schedules can be obtained frm Messrs. Gibbs, Bright and Co., Sydney, Melbourne and Adelaide, and also at the Central Mine General Office, Broken Hill. Tenders to be sealed, addressed, and delivered to the Manager, Central Mine, Broken Hill, on or before Saturday, December 6, 1913. Neither the lowest nor any tender necessarily accepted.

JAMES HEBBARD,
Manager, Central Mine.

---

### BURNT CREEK G.M. CO. NO LIABILITY.

TENDERS are invited, returnable at the Company's office, 375 Collins-st., Melbourne, on or before Monday, December 1, for the Purchase of a Large Heap of Slimes and Sand, situated at the Company's No. 2 shaft, near Dunolly. Specifications may be seen at the mine or the Company's office. Terms, 10 per cent. deposit, and the balance payable either in cash or by monthly payments of 10 per cent. on the purchase money. Highest or any tender not necessarily accepted.

S. J. WARNOCK, Manager.

---

### THE MOUNT LYELL MINING AND RAILWAY Co. Ltd.

NOTICE OF DIVIDEND.

Notice is hereby given that a Dividend (the seventeenth) of One Shilling and Threepence per share, amounting to £80,424, has been declared, payable on Monday, December 15, 1913.

Transfer books close on Monday, November 24, at 4 p.m.

By order of the Board,
D. G. LUMSDEN, Secretary.
39 Queen-st., Melb., Nov. 6.

---

### NOTICE TO CYANIDERS.

TAILINGS HEAP FOR SALE.

For Sale, by Tender, Tailings Heap, in Stawell, containing about 200,000 tons of Sand and Slime. Good water supply.

For further particulars, apply to—
JAMES PATON, Main St., STAWELL.

---

### COPE'S CREEK DREDGING COMPANY N.L.

NOTICE is hereby given that the Directors have this day declared a Dividend (the thirty-sixth) of Sixpence per share on all shares in the Company, payable at the registered office of the Company, 109 Pitt-street, Sydney, on and after November 7, 1913.

By order of the Board,
R. VERNON SADDINGTON, Manager.

The transfer books of the Company will be closed from November 4 to 7, both days inclusive.

---

### THE LONG TUNNEL GOLD MINES N.L.

NOTICE is hereby given that an Extraordinary General Meeting of the shareholders in the abovenamed Company will be held at its registered office, 60 Queen-st., in the City of Melbourne, in the State of Victoria, on Tuesday, November 25, 1913, at 3.30 o'clock in the afternoon, to consider, and, if thought desirable, to pass the following resolutions, namely:—(1) That this Company be and is hereby authorised from time to time to borrow, for the purposes of the Company, any sum or sums of money not exceeding twenty thousand pounds in the aggregate, for such period or periods and upon such terms in all respects and upon such security or securities as the directors may deem prudent over the whole or any part of the property, assets and undertaking of the Company for the purpose of securing the repayment of all such money or moneys as aforesaid or any moneys now owing or liability already incurred by the Company and interest thereon. (2) That the minutes of this meeting be and are hereby confirmed.

Dated at Melbourne, October 27, 1913.

By order,
GEO. E. DICKENSON, Manager.

---

### PUMPS.

One 10in. Centrifugal Pump, complete (by Pulsometer Engineering Co.). This pump is quite new, and has Foot Valve and Strainer, £40.

One set of 4-Throw Hydraulic Pumps, geared, vertical pattern (by Clyde Engineering Co.). Pumps are gunmetal, and all mounted on heavy base, 700 lb. working pressure, with fast and loose pulleys, complete, £80.

One set of 3-Throw Hydraulic Pumps, vertical pattern, plungers, 2in. x 4in., £35.

One set Geared Horizontal Duplex Double Acting Pumps (by Otis Co.), Plunger, 6½in. bore by 12in. stroke. Air vessels complete, driving pulley, 36in. x 7in., £40.

One Deane Sinking Pump,, 7in. x 3½in. x 12in., new, £50.

STANDARD WAYGOOD HERCULES LTD.,
SYDNEY.

---

### TO MINING COMPANIES, MACHINERY MERCHANTS AND OTHERS.

CHRISTENSEN'S AJAX G.M. CO. N.L.

TENDERS are invited for the Purchase of the whole of the Mining Plants, etc., at present standing upon the above Company's leases at Daylesford. Schedule may be inspected at the above company's office, or on application to the Mining Manager at Daylesford. Tenders to be forwarded to the Manager, registered office, not later than November 21, 1913. Deposit, 10 per cent.

NORMAN G. McLEOD, Manager.
Registered Office, 31 Queen-st., Melb.

---

### MT. BISCHOFF EXTENDED TIN MINING Co. N.L., Waratah, Tasmania.

The Half-yearly General Meeting of shareholders will be held on Monday, November 24, 1913, at 3 o'clock p.m., at the Company's office, Lombard Buildings, 17 Queen-street, Melbourne. Business: To receive reports and balance-sheets; to elect five directors and one auditor for 12 months; general business. JOHN DITCHBURN, Manager.

---

## Australian Mutual Provident Society.

**Holds the World's Record for Largest Bonuses.**

NEXT ANNUAL DISTRIBUTION OF PROFITS

As at 31st December, 1913.

All participating Policies issued in the Ordinary Department before the Close of the Current Year will share in the Cash Bonus to be then allotted.

| | |
|---|---|
| Cash Bonus divided for year 1912 .. .. .. .. .. .. .. .. .. .. .. .. | £936,971 |
| Yielding Reversionary Additions to Policies of over .. .. .. .. .. .. | £1,640,000 |
| Total Cash Bonuses Distributed .. .. .. .. .. .. .. .. .. .. .. .. .. .. | £17,790,073 |

Society is Purely Mutual. No Shareholders.

All the Profits Earned Belong to the Participating Policyholders.

Total amount paid to Members or their Beneficiaries, £37,345,236.

NOW IS THE TIME to effect an assurance or a further assurance on your life in order to reap the benefit of this year's Bonus.

Write for full particulars to the

**Head Office: 87 Pitt-street, Sydney;**
or any District Office or Agent of the Society.

RICHARD TEECE, F.I.A., F.F.A., F.S.S.,
General Manager and Actuary.

H. W. APPERLY,
Secretary.

## Commonwealth of Australia.

Department of Home Affairs,
Melbourne, October 30, 1913.

### KALGOORLIE TO PORT AUGUSTA RAILWAY.

### TENDERS FOR BOGIE CATTLE AND BOGIE SHEEP WAGGONS (4ft. 8½in. GAUGE).

TENDERS, addressed to the Secretary, Department of Home Affairs, Melbourne, will be received **up to 11 a.m., on Tuesday, December 2, 1913,** for the Manufacture in Australia, Supply and Delivery of—

15 Bogie Cattle Waggons, and
30 Bogie Sheep Waggons.

Plans, specifications, etc., will be on view on **and after November 5, 1913, at the following** offices: Commonwealth Railways, 84 William-st., Melbourne; Commonwealth Works Director, Customs House, Sydney; and Commonwealth Works **Registrars, Brisbane, Adelaide, Perth and Hobart.** The charge for each copy of the specification will be £1/1/-, and for each plan 5/-, which must **be paid before the documents can be issued.**

**Tenders are to be endorsed "Tender for Bogie** Cattle and Bogie Sheep Waggons," and are to be accompanied by the deposit mentioned in the form of tender.

JOSEPH COOK,
Minister of State for Home Affairs.

---

**Department of Home Affairs,**
**Melbourne, November 10, 1913.**

### KALGOORLIE-PORT AUGUSTA RAILWAY.

### GALVANISED IRON WIRE.

Quotations, addressed to the Engineer-in-Chief for Commonwealth **Railways, 84 William-street,** Melbourne, will be received up to 11 a.m. on December 1 for the Supply and Delivery of the following:—

Galvanised Iron Wire to Fremantle and Port Augusta, respectively:—
200 lb. per mile, as per postal specification No. 301, 22 tons.
60 lbs. per mile, as per postal specification No. 5, 2 cwt.

Half the above quantity for delivery to each port.

**Full particulars will be obtainable at the Com**monwealth Railway's Offices, 84 William-street, **Melbourne, and also at the offices of the Com**monwealth Works Director, Customs House, Sydney; **Commonwealth Works Registrars, Brisbane,** Adelaide, Perth and Hobart.

Quotations are to be endorsed, "Quotations for Electric Staff Wire."

JOSEPH COOK,
Minister of State for Home Affairs.

---

## Government Notice (Q.).

Commissioner for Railways' Office,
**Brisbane, November 7, 1913.**

### FRESH TENDERS FOR SUPPLY OF CEMENT.

The notice inviting tenders for Supply of **Cement for 1914 has been cancelled, and fresh tenders are hereby invited for the Supply of** Cement, under an amended specification, to close **at this office at 2 p.m. on Tuesday, November 25,** 1913.

Tenders to be endorsed "Tender for Cement—1914," and accompanied by a preliminary deposit of £5.

Amended specification and further particulars may be obtained on application to the General Storekeeper, Brisbane, or District Storekeeper, Rockhampton.

The lowest or any tender will not necessarily be accepted.

By order of the Commissioner for Railways,

ARTHUR J. CROWTHER,
**Secretary.**

---

## Government Notices (V.).

### VICTORIAN RAILWAYS COMMISSIONERS.

### STATE COAL MINES.

### VENTILATING FAN.

Tenders (endorsed "Tender for Ventilating Fan"), to be addressed to the General Manager, **State Coal Mines, Wonthaggi, and delivered at his office at Wonthaggi, not later than 12 noon of** Wednesday, December 17, are invited for the Supply **of One Motor-driven Ventilating Fan.**

**Particulars at the Melbourne office of the State Coal Mines, Robb's Buildings, Collins-street, and at the office of the General Manager, Wonthaggi. P.D., £2.**

No tender will necessarily be accepted.

G. H. BROOME,
General Manager.

---

## Government Notices (N.S.W.).

N.S.W. Government Railways and Tramways,
Office of the Chief Commissioner,
Sydney, November 10, 1913.

**TENDERS will be received at this Office until 12 o'clock noon on the dates specified for the undermentioned supplies, works, etc., viz.:—**

WEDNESDAY, NOVEMBER 26, 1913.

The Supply of One 2000-lb. Storage Battery **Freight Truck, Specification No. 426 (price 2/6).**

**The Construction and Supply of Two Bogie Water** Sprinklers, to Specification No. 429 (price **5/-).**

WEDNESDAY, JANUARY 14, 1914.

The Supply of Two Electrically Driven Tur**bine Pumps, 50 gallons per minute, to Specifi**cation No. 432 (price 2/6).

**All specifications are obtainable at the Electrical Engineer's Office, 61 Hunter-street, Sydney.**

**Tenders to be endorsed, "Tenders for Storage Battery Freight Truck," or as the case may be.**

The Chief Commissioner does not bind himself to **accept the lowest or any tender.**

By order,
J. S. SPURWAY,
Secretary.

---

Department of Public Works,
Sydney, November 8, 1913.

### TENDERS FOR STEEL BRIDGES, ETC.

**Tenders, specified below, will be received at this** Department until 2 o'clock p.m., on the dates mentioned:—

MONDAY, DECEMBER 8, 1913.

**Manufacture, etc., of Steel Bridges for Coopera**bung and Piper's Creeks, on 5th Section, **North Coast Railway.**

MONDAY, DECEMBER 22, 1913.

**Supply, etc., of Twenty 20-ton Cart Weighbridges, Ten 20-cwt., and Forty 10-cwt. Weighing Ma**chines, for Railway Station Yards.

TUESDAY, JANUARY 27, 1914.

**Manufacture, etc., ~~of Steel~~ Bridges for Saltwater and Smith's Creeks; for Christmas, Warrel and Snaky Creeks, etc.; and for Bucca Creek, 5th, 6th and 8th Sections, respectively, North Coast Railway.**

**Further particulars may be obtained from N.S.W.** "Government Gazette."

(6a113) ARTHUR GRIFFITH.

---

### METROPOLITAN BOARD OF WATER SUPPLY AND SEWERAGE.

**Tenders for the works specified below will be** received up to 2 p.m. on the dates mentioned. For particulars, see "Government Gazette."

NOVEMBER 24, 1913.

**Contract 935.—Supply and Delivery of Centrifugal Pump Casings, with Spindles, Rings, etc., etc., for the Ryde Pumping Station.**

DECEMBER 15, 1913.

**Contract 930.—Manufacture and Delivery of One** Turbine Centrifugal Pumping Plant for Crown-**street Pumping Station.**

WILLIAM HOLMES,
Secretary.
341 Pitt-street,
**October 21, 1913.**
**(61-53)**

---

## Government Notices (S.A.).

Department of Mines,
Adelaide, South Australia,
October 14, 1913.

### PARAMATTA AND YELTA MINES—PLANT AND MACHINERY—SITUATED AT MOONTA, SOUTH AUSTRALIA.

TENDERS are invited, up to **Saturday, November 29, 1913, for the Purchase of the Mines, Plant** and Machinery, under either of the following heads:

1. The Mines, together with all the plant and **Machinery.**
2. All the Plant and Machinery.
3. Any Portion or Portions of the Plant and Machinery.

Further information is obtainable from the Secretary to the Minister of Mines, who will forward catalogues on application.

**Neither the highest nor any tender necessarily accepted.**

RICHARD BUTLER,
Minister of Mines.

---

## MUNICIPAL COUNCIL OF SYDNEY.

### TO CONTRACTORS.

Sealed and endorsed tenders will be received by the undersigned until 3 o'clock p.m. on Wednesday, November 26, 1913, for Alterations to Sir William Manning Markets, at Haymarket, in order **to convert it into a Hippodrome.**

It will be necessary for tenderers to lodge a **deposit of £5/5/- in the City Treasury to procure a Bill of Quantities.**

The lowest or any tender not necessarily accepted.

Full particulars may be had upon application to **the Office of the City Building Surveyor, Town Hall, Sydney.**

**Tenderers, please note that they must pay their** cash deposits direct into the City Treasury, and **not enclose same with their tenders, otherwise same will be rejected as informal.**

THOMAS H. NESBITT,
Town Hall, Sydney. Town Clerk.
November 4, 1913.

---

## SHIRE OF SWAN HILL.

### DUPLICATION OF POWER AND PLANT, ELECTRIC INSTALLATION, SWAN HILL.

**Tenders, returnable not later than Tuesday, De**cember 2, addressed to Councillor Thomas Standen, J.P., at the Shire Hall, Swan Hill, endorsed "Elec**tric," are invited for the Supply and Delivery on** the site, of all Machinery necessary, and for all **Labour, for the Duplication of Electric Energy** Power and Plant at Swan Hill, in accordance with **the plans and specifications provided.**

**On and after November 3, plans and specifica**tions can be seen at the Power House, Beveridge-street, Swan Hill, on application to the engineer in **charge (Mr. A. C. Bertoli, M.V.I., E.E.), and also at the offices of the Municipal Association, Collins-**street, Melbourne, and at the Town Hall, Bendigo.

**Preliminary deposit, £10, to be increased to 5** per cent. on the amount of the tender within seven **days of acceptance thereof.**

**No tender will necessarily be accepted.**

**Dated at the Shire Hall, October 20, 1913.**

**By order of the Council,**
WILLIAM BIRD, Shire Secretary.

---

## THE BRITISH BROKEN HILL PROPRIETARY Co. Ltd.

NOTICE is hereby given that an Extraordinary General Meeting of the above Company will be held at Salisbury House, London, on Wednesday, November 19, 1913, for the purposes of adopting the report and accounts to June 30, and declaring a final dividend for the past half-year.

F. H. CLARK, Secretary.

26 Steamship Buildings, Adelaide.

---

## THE BRITISH BROKEN HILL PROPRIETARY Co. Ltd.

### 20th DIVIDEND.

**The Transfer Books will close at 4 p.m. on** Wednesday, November 19, 1913, for the Twentieth Dividend. The Amount and Date of Payment will be advertised later.

**F. H. CLARK, Adelaide Secretary.**

**26 Steamship Buildings, Adelaide,**
**November 6, 1913.**

(Continued from page 455.)

porcelain, pattern "B," minimum insulation 10,000 megohms, 2.45d. each; 5000 insulators, porcelain, 1¼d. each; 2 tons salammoniac crystals, £34 17s. 6d. per ton—Theodore Zwicker and Co.

5000 sleeves, jointing, for use with 400 lb. galvanised iron line wire, maximum diameter, 175 mils., £25 16s. 7d.; 2000 sleeves, jointing, for use with 200 lb. galvanised iron line wire, £6 4s.—F. B. Cook, Chicago.

1000 insulators, porcelain, transposition, minimum insulation resistance 100,000 megohms, 1s. 3.18d. each; 40 miles wire, tinned, copper, No. 18 L.S.W.G., vulcanised, india rubber insulated, taped and braided, £8 10s. per mile—Noyes Bros. (Melbourne) Pty. Ltd.

Bridle rings (pattern "A"), size 1, 3500, 3¼d. each; size 2, 3500, 3½d. each; size 3, 3500, 3¾d. each; size 4, 3000, 4½d. each; bridle rings (pattern "C"), size 1, 2000, 2 7-8d. each; size 2, 1000, 3 1-8d. each; size 3, 1000, 3½d. each; size 4, 1000, 3 5-8d. each; 1000 plates, stay, wrought iron, 12in. x 12in. x 3-16in., with hole 7-8in. square in centre, 1s. 6d. each; 1000 bolts, "D," 4.98d. each; 4000 hold-fasts, 2.9d. each; 25,000 straps, cross-arm, 2000 at 2.7d. each, 23,000 at 2.55d. each—William Traylen.

90 lb. wire, enamelled—9 lb. 22 gauge, 5 lb. 28 gauge, 6 lb. 30 gauge, 6 lb. 32 gauge, 12 lb. 34 gauge, 10 lb. 36 gauge, 7 lb. 38 gauge, 10 lb. 40 gauge, 8 lb. 43 gauge, 17 lb. 45 gauge, £22 15s.—The Imperial Electric and Engineering Co.

2 tons wire, steel galvanised, 7-8th, £16 16s. 3d. per ton; 10 tons wire, steel galvanised, 7-12th, £16 16s. 3d. per ton; 4 tons wire, steel galvanised, 7-16th, £21 4s. 9d. per ton; 3 tons wire, galvanised iron stranded, 7-8th, £14 11s. per ton; 1 ton wire, galvanised iron stranded, 7-14th, £17 14s. per ton—Gilbert Lodge and Co.

1 ton wire, steel galvanised, 7-20th, £27 16s. per ton—R. Johnson, Clapham and Morris Ltd.

40 tons wire, hard-drawn copper, 70 lb. per mile, £84 per ton; 2 tons wire, hard-drawn copper, 100 lb. per mile, £84 per ton; 50 tons wire, hard-drawn copper, 200 lb. per mile, £84 per ton—Gibbs, Bright and Co.

5000 conduits, glazed earthenware, 4-duct, 4s. 4d. each; 1350 conduits, glazed earthenware, 6-duct, 6s. 2d.—Mills and Co.

75 wooden terminal blocks, fitted with terminals and rubber rings, alternative tender, £1 5s. 9d. each; 50 wooden terminal blocks, fitted with terminals and rubber rings, alternative tender, £2 7s. 9d. each—James and Co. Ltd.

75 boxes, cable distributing, 13 pairs, complete with brass tube and brass plug, alternative tender, £36 17s. 6d.; 50 boxes, cable distributing, 26 pairs, complete with brass tube and brass plug, alternative tender, £32 1s. 8d.—Cooper Bros.

10 cwt. bolts and nuts, 4in. x 5-8in., £1 4s. 6d. per cwt.; 10 cwt. bolts and nuts, 4½in. x 5-8in., £1 4s. 6d. per cwt.; 20 cwt. bolts and nuts, 8in. x 5-8in., £1 2s. 6d. per cwt.; 250 cwt. bolts and nuts, 9in. x 5-8in., £1 2s. 6d. per cwt.; 20 cwt. bolts and nuts, 10in. x 5-8in., £1 per cwt.; 20 cwt. bolts and nuts, 11in. x 5-8in., £1 per cwt.; 20 cwt. bolts and nuts, 12in. x 5-8in., £1 per cwt.; 10 cwt. bolts and nuts, 13in. x 5-8in., £1 per cwt.; 5 cwt. bolts and nuts, 14in. x 5-8in., £1 per cwt.; 10 cwt. bolts and nuts, 10in. x ¾in., 18s. per cwt.; 20 cwt. bolts and nuts, 13in. x ¾in., 18s. per cwt.—W. M. McPherson.

Automatic switchboard, with all associated apparatus for the Telephone Exchange, Perth, £42,612 10s.—Automatic Telephones (Australasia) Ltd.

## New South Wales.

PUBLIC WORKS DEPARTMENT.—M., S. and D. of four 8-ton Ruston Proctor steam crane navvies, £6740—Gibson, Battle and Co. Ltd., Sydney.

RAILWAY DEPARTMENT.—S. of forgings, tools and shafting for repair shops, Leichhardt—Gibson, Battle & Co., 3 fixed single smiths' hearths and one centrifugal fan; McPherson Pty. Ltd., one 20in. swing back geared upright drilling machine; R. L. Scrutton and Co., one 20in. x 2in. wet tool grinder and one Sterling hack saw; H. R. Gregory and Co., one band saw, 32in. wheel; Link Belt Co., 4 lengths shafting and 3 pairs couplings.

## Victoria.

VICTORIAN RAILWAYS.—C. and E. of steel decking, at Oakleigh, £262 12s. 6d.—Dorman, Long and Co.

P. of white metal, £11 4s.—Wilson "Waratah" Metal Co.

STATE RIVERS AND WATER SUPPLY COMMISSION.—S. of 3000 casks Portland cement, 10s. 10d. each—Austn. Portland Cement Co.

S. of 3000 casks Portland cement, 11s. 6d. cask—D. Mitchell.

## New Zealand.

TENDER BOARD.—500 cords for bell receivers, £18 15s.; 3300 ear pieces, £42 10s.—Lawrence and Hanson.

3000 plugs, £137 10s.—A. D. Riley and Co.

3000 rings, £52 10s.—Lawrence and Hanson.

3000 B.B. wall telephones, £7537 10s.—B. L. Donne.

## General.

MELB. AND MET. BOARD OF WORKS.—S. of 350 tons 9in. C.I. pipes, £3447 10s.—Monteath and Sons.

S. of 20 tons C.I. 3in. pipes, £177 10s.—Mephan Ferguson.

S. and D. of 1000 ¾-water meters, £2 11s. 9d. per meter—Davies, Shepherd and Co.

S. and D. of girders to carry 34in. pipe, £208 2s. 3d.—Johns and Waygood Ltd.

S. and D. of W.I. vent tubes, 9 and 12in. dia., £82 15s. 6d.—Mephan Ferguson Pty.

MUNICIPAL COUNCIL OF SYDNEY.—Arc lamp winches, £170—Warburton, Franki Ltd.

Stoneware bridges, £48 10s.—Aust. Tesselated Tile Co.

Metal filament lamps, £987 10s.—Aust. Metal Co.

Ladders, gangways, etc., new boiler house, £280 9s. 6d.—W. Elder and Co.

Coal trimming chutes, new boiler house, £75—Watt and Murdoch.

Black iron cable clips and liners, £131 18s. 4d.—F. Malby and Sons.

Fuse box replacements 1500 15-amp., 1000 25-amp., 300 50-amp., 300 100-amp., £87 10s.—British Insulated and Helsby Cables Ltd.

Arc lamp carbons, 50,000 pairs 8 m/m 24in., 25,000 pairs 8 m/m 22in., 25.000 8 m/m 20in., A.C. flame carbons, £1094 1s. 3d.—Siemens Bros. Dynomo Works Ltd.

MELBOURNE CITY COUNCIL.—S. and D. of 25 boiler tubes and 1650 stoker links, £107 10s.—Babcock and Wilcox.

P. of aluminium cable, £117 15s. 10d.—Lincolne and McDougall.

S. and D. of electric meters—£767 10s., Chamberlain and Hookman; £742 10s., Reason Manufacturing Co.; £497 15s., Allgemeine Co.; £74 12s., Reason Manufacturing Co.

S. and D. of three phase transformers, £432—Johnson and Phillips.

S. and D. of 7000 tons slack coal, 17s. for peas, 16s. 6d. for slack—Huddart, Parker Ltd.

S. and D. of pipes and bends, £800—Geo. W. Kelly and Lewis Pty. Ltd.

---

## DIVIDENDS.

The following dividends and bonuses of mining companies in Australia have been declared, and are payable on the dates noted:—

November.

14th.—Porepunkah Dredging Co., Bright (V.), 1s., £250.

14th.—Tongkah Compound Co., Siam, 1s., and bonus, 1s., £5000.

19th.—Broken Hill Proprietary S.M. Co., 1s., £75,000.

20th.—Ajax Central G.M. Co., Daylesford (V.), 2s., £3000.

20th.—Williams' United G.M. Co., Eaglehawk (V.), 6d., £875.

27th.—Cathcart Central G.M., Ararat (V.), 2s., £5000.

December.

1st.—Silverton Tramway Co., Broken Hill, (N.S.W.), 1s., and bonus, 2s., £37,500.

4th.—Talisman Consolidated Ltd., Karangahake (N.Z.), 1s. 9d., free of taxes, £30,187.

15th.—Mt. Lyell M. and R. Co. (T.), 1s. 3d., £80,424.

29th.—Zinc Corporation, Broken Hill (N.S.W.), 1s. 6d., less English income tax, all shares, £67,400.

---

## BANK CLEARINGS.

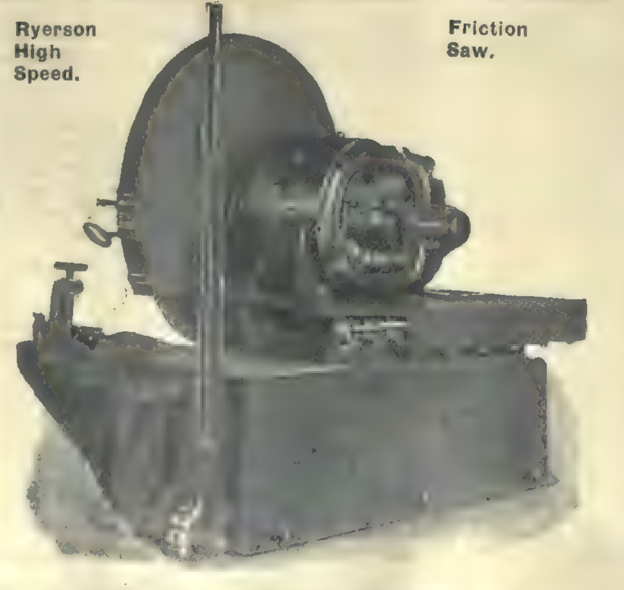
The report of the Melbourne Clearing House for the week ended 3rd November was:—

| | | |
|---|---|---|
| Total clearance | | £7,170,128 |
| Balances— | | |
| Settled by certificates | £717,000 | |
| Settled in coin | 151,225 | |
| | | 868,225 |
| Total clearance for the corresponding week, 1912 | | 7,695,157 |

The report for the week ended 10th November (five days) was.—

| | | |
|---|---|---|
| Total clearance | | £5,484,226 |
| Balances— | | |
| Settled by certificates | £310,500 | |
| Settled in coin | 260,424 | |
| | | 570,924 |
| Total clearance for the corresponding week, 1912 | | £5,454,652 |

CARL WERNER & CO., OPHTHALMIC OPTICIANS—
The Finest Illustrated Catalogue of Scientific Instruments in Australia mailed on request—comprising
THEODOLITES, LEVELS, LEVELLING STAVES, BRUNTON'S AND VERSCHOYLE TRANSITS, ETC., ETC.
All the Requirements for the Drawing Office in Stock.
336 COLLINS STREET - - MELBOURNE.



HIGH SPEED HEAVY DUTY
MACHINE TOOLS
For Bridge, Structural, Railway and Dockyard Work, and General Engineering Shops.
WE CARRY FULL STOCKS AND CAN GIVE YOU ADVICE ON LATEST IMPROVED MACHINES.
BENSON BROTHERS,
51-53 Druitt-st., Sydney. 60 Queen-st., Melbourne.

TITANIUM THERMIT

Purifies Iron and Steel

THE consistent use of it in your foundry work will enable you to increase the quality of your castings in a marked degree. It will increase the fluidity of your iron so as to permit of the pouring of thin and intricate castings. Titanium Thermit is supplied in cans ready for immediate use in the foundry ladle.

*Write for Pamphlet No. 3, which gives full information, and also describes the use of Heating Thermit Cans for reviving dull iron, keeping risers liquid and making semi-steel.*

THE
Australian Thermit Co. Ltd.,
387 Kent Street : : SYDNEY

O. GRANOWSKI, C.E.

387 KENT STREET, SYDNEY.

Manufacturer and Importer of

Light Tramway Material,

Well Assorted Stocks of—

Rails and Accessories, Points and Crossings, Turntables, Tipping Trucks, Steel Wheels, Axleboxes, Etc.

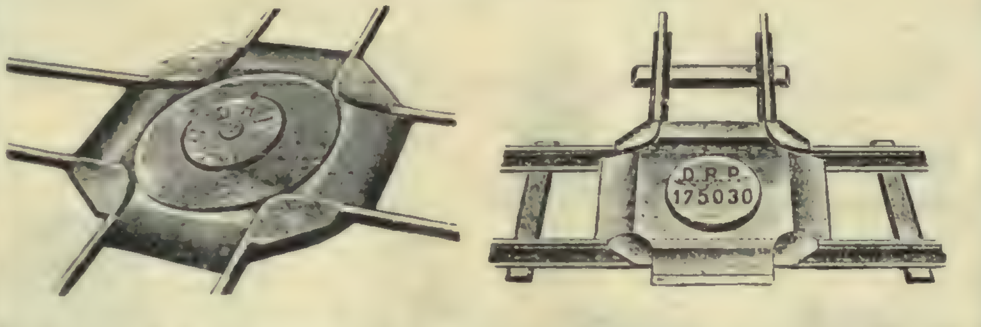
Internal Combustion Motor Locomotives

For Surface and Underground Haulage in Mines.

NEW SPECIALITY—

Removable Turntables & Turning Plates

of pressed steel to fit any gauge



## ALPHABETICAL LIST OF ADVERTISERS.

(—) *Indicates Fortnightly or Monthly Advertisements.*

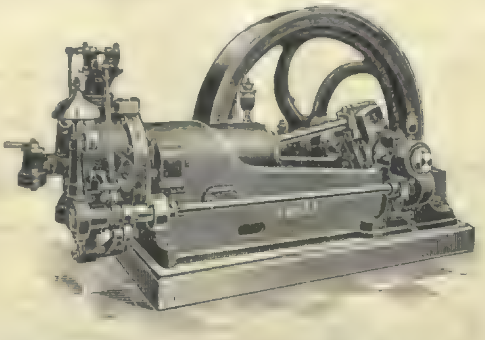
| | |
|---|---|
| **Acton Lamp Co., The** | — |
| Adams, Wm., and Co. Ltd. | IV., XXV. |
| [illegible], Gerard | XVII. |
| Ainsworth, W., and Sons | Cover III. |
| Allen, Edgar, and Co. Ltd. | — |
| Allen, W. H., and Co. Ltd. | XXIII. |
| Allgemeine Electric Co. | V. |
| Allis-Chalmers Co. | 460 |
| Armstrong, Sir W. G., Whitworth & Co. Ltd. | XVIII. |
| A.U.S.N. Co. | 454 |
| Austral Otis Engineering Co. | XXVI. |
| Australian Gas Retort and F.B. Co. | XVII. |
| Australian General Electric Co. | VII., 448 |
| Australian Metal Co. Ltd. (Elec. Dept.) | V. |
| Australian Patents Ltd. | XXI. |
| Australian Wood Pipe Co. Ltd. | XII. |
| Babcock and Wilcox Ltd. | Front Cover |
| Bannister, L. | — |
| Benson Bros. | 458 |
| Bessemer, Henry, and Co. Ltd. | — |
| Blakemore, G. H. | XVII. |
| British General Electric Co. Ltd. | V. |
| British Imperial Oil Co. Ltd. | XXIV. |
| British Aluminium Co. Ltd. | — |
| British Westinghouse Elec. Manuf. Co. Ltd. | VI. |
| Broken Hill Pty. Ltd. | XIV. |
| Brown, Bayley's Steel Works Ltd. | — |
| Bruce, Peebles and Co. Ltd. | — |
| Brisbane Charcoal Retort | XXI. |
| Bullivants' Wire Ropes | Front Cover. |
| [illegible] Matthew Co. | XVII. |
| Cole, E. W. | — |
| Colonial Mutual Fire Insurance Co. | 453 |
| Commonwealth Bank of Australia | — |
| Commonwealth Oxygen Co. | — |
| Commonwealth Portland Cement Co. | XXI. |
| [illegible] | VIII. |
| Crowley, Valentine J. | XVII. |
| Curtis's and Harvey Ltd. | XVI. |
| [illegible] & Co. Pty. Ltd. | 399 |
| Dalgety and Co. Ltd. | — |
| Denny Bros. Ltd. | XXVI. |
| [illegible] and Co. Pty. Ltd. | Cover IV. |
| Draeger (R. Jacobson) Rescue Apparatus | — |
| A. L. Campbell and Co. Pty. Ltd. | — |
| Dunlop Rubber Co. of Aust. Ltd. | 454 |
| Dudbridge Gas Plant | XV. |
| [illegible] and Co. | XXIV. |
| E. and A. Copper Co. Ltd. | IV. |
| Edwards Pyrites and Ore Reduction Co. | I. |
| Edison and Swan | — |
| Elder's Metal and Mercantile Pty. Ltd. | XVI. |
| Elliott Bros. Ltd. | XX. |
| Engineering Supply Co. | — |
| [illegible] Electric Co. | XV. |
| Ferguson, Mephan, Pty. Ltd. | Front Cover |
| Fetter and Dickinson | — |
| Ferranti Ltd. | IV. |
| Firth, Thomas, and Sons Ltd. | IX. |
| Fraser, Alex., Pty. Ltd. | XXIV. |
| Fyvie and Stewart | XXIII. |
| Gardner, Waern and Co. | XXIII. |
| Gen. Elec. Mfg. Co. of Sweden | XXIII. |
| **General Electric Co. Ltd.** | V. |
| Goldfields D.D. Co. | II. |
| Goodall, T. M., and Co. Ltd. | XI. |
| Geyler, Max | — |
| **Goyder and Hallet** | XVII. |
| Granowski, O., C.E. | 459 |
| Great Cobar Ltd. | XVIII. |
| Green, E., and Son | — |
| Greenway, T. J. | XVII. |
| Gutheridge, N., Ltd. | XXIII. |
| Hadfield's Steel Foundry | — |
| Hales Ltd. | — |
| Hardie, James, and Co. Ltd. | 464 |
| **Hart Accumulator Co. Ltd.** | XIII. |
| Harringtons Ltd. | 453 |
| Hargraves and Daggar | XVII. |
| Hassell, A. H. | — |
| Henley's Telegraph Works Co. Ltd. | — |
| Hirsch and Sohn, Aaron | XXIV. |
| Hornsby and Sons Ltd., R. | XVIII. |
| Hordern, Anthony, and Sons Ltd. | Cover III. |
| Horrocks, Roxburgh Pty. Ltd. | — |
| Hopkins Bros. and Odlum | — |
| Ingersoll Rand Co. | XII. |
| **I.R., G.P., and Telegraph Co. Ltd.** | X. |
| Kay, McNicol and Co. | XVII. |
| Klinger, Richard and Co. | XIX. |
| Knox, Schlapp and Co. | Cover III. |
| Krupp, Fried | — |
| **Kynoch Ltd.** | XXV. |
| Lasley, Wm., and Co. | XIX. |
| Lawrence and Hanson Elec. Co. Ltd. | — |
| Lempriere, W. and J. | Cover IV. |
| Lilcona Belting | — |
| Lodge, Gilbert, and Co. | XVIII. |
| Lohmann and Co. | — |
| Ludowici, J. C., and Sons, Ltd. | XXVI. |
| Laffit, E., and Co. | — |
| Mackensen, A. W. | — |
| **Malleable Fitting and Agency Co.** | XXV. |
| Mannesmann Tubes | — |
| Martin, Jas., and Co. | — |
| Melville and Mullen | — |
| Miller and Co. | — |
| Mines Department, Queensland | XIV. |
| Mines Department, Victoria | — |
| Mines Department, Western Australia | XIV. |
| Mines Department, South Australia | — |
| Minerals Separation and De Bavay's Ltd. | XIX. |
| **Morton, B. K.** | Cover II. |
| Mount Lyell M. and R. Co. Ltd. | 454 |
| Mt. Morgan G.M. Co. Ltd. | 453 |
| **McArthur Engineering Co. Ltd.** | IV. |
| McCarty, Underwood and Co. | XVII. |
| McDonald, A. H., and Co. | — |
| **McMicking and Co** | XVI. |
| Nobel's Explosive Co. Ltd. | Front Cover |
| Noyes Bros. (Sydney) Ltd. | — |
| Noyes Bros. (Melb.) Pty. Ltd. | XX. |
| P. and O. Company | 453 |
| Pacific Cable Board | 454 |
| Parrington, Lascelles | — |
| **Pearn, Frank, and Co.** | Cover II. |
| Peerless Rubber Co. | XXII. |
| Pels, Siegfried | XXIV. |
| Perrot, Frank R. | 460 |
| **Price, Martyn, and Co.** | III. |
| Robertson, Geo., and Co. Pty. Ltd. | — |
| **Roeblings, J. A., Sons and Co.** | XXIV. |
| S.A. School of Mines and Industries | — |
| **School of Mines, Ballarat** | XXIV. |
| **School of Mines, Kalgoorlie** | XIV. |
| School of Mines, Charters Towers | XIV. |
| Shaw, John, Ltd. | XVII. |
| **Siskol Drills** | — |
| **Siemens Bros. Dynamo Works Ltd.** | XI., XXII. |
| **Silberberg, H. B., and Co.** | XXIV. |
| Sirocco Fan | — |
| **Short and Mason** | XXII. |
| Smith, T. and W. | — |
| **Smith, Walter F.** | XVII. |
| Smith, J. D. Audley | XVII. |
| Snow, Francis H. | XXIV. |
| Stanley, W. F., and Co. Ltd. | — |
| Stawn, Ltd. | — |
| Steel Co. of Australia | — |
| Steanes, T. K. | Front Cover |
| **Sterling Telephones** | XV. |
| **Sulphide Corporation Co. Ltd.** | XXIV. |
| **Sullivan Machinery Co.** | II. |
| Summerhayes, A. A. | — |
| **Taylor, P. T., Ltd.** | — |
| Thompson and Co. (Castlemaine) Pty. Ltd. | II. |
| University of Sydney | — |
| **Union Electric Co. of Aus. Ltd.** | Front Cover |
| Walkers Ltd., Queensland | XVI. |
| Watson, W. G., and Co. Ltd. | XIX. |
| Weinberg, E. A. | XVII. |
| Werner, Carl and Co. | 458 |
| Western Elec. (Aust.) Ltd. | — |
| Westinghouse Brake Co. of A'sia Ltd. | Cover II. |
| Weymouth, George, Pty. Ltd. | XVII. |
| White, Franklin | XVII. |
| Willans and Robinson Ltd. | — |
| Worthington Pumps | Front Cover |

# *Immediate Delivery*

## *SYDNEY or PERTH.*

**British Built.**

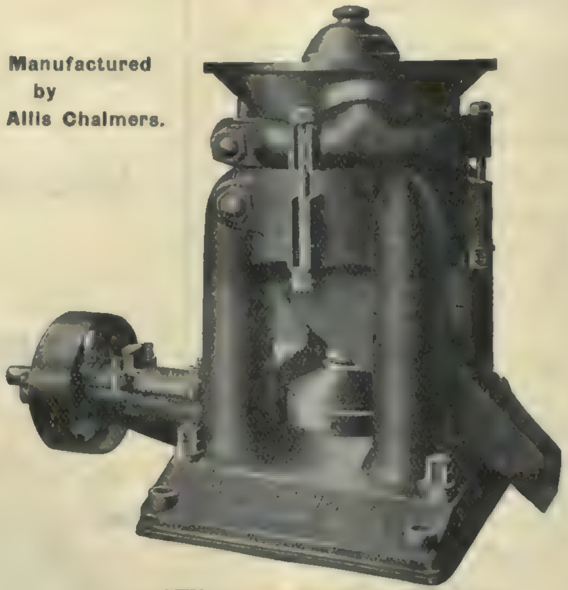
**Call and Inspect.**



## BATES ENGINES

**Gas and Oil.**

**Manufactured by Allis Chalmers.**



**A GOOD SAMPLE CRUSHER means RELIABLE SAMPLES and Saves Money.**

STYLE F—SAMPLE CRUSHER.

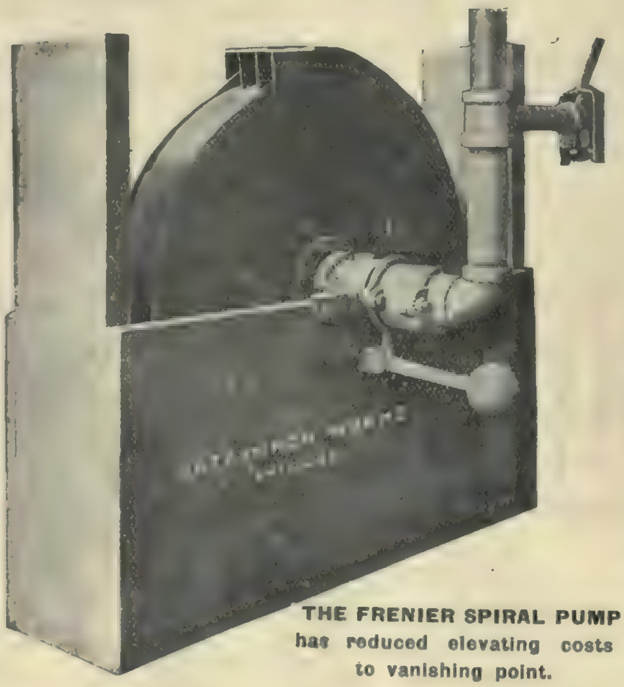
**We have a LARGE STOCK of Repair Parts for**

**Gates Breakers.**

**Manganese Mantles and Concaves in Stock.**

**The Surrey Boiler Works, after trial of most well-known makes, placed an initial order for 60 GARDNERS with us.**

## GARDNER STEAM PUMPS



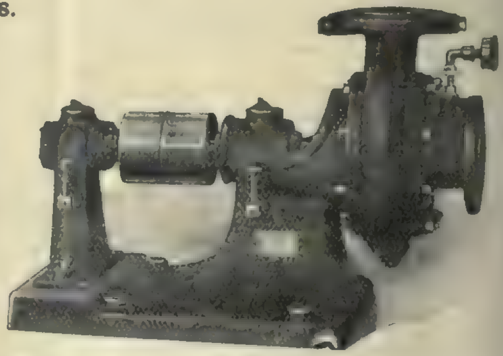
THE FRENIER SPIRAL PUMP has reduced elevating costs to vanishing point.

**YALE & TOWNE TRIPLEX BLOCKS.**

**hoist twice as fast as any other hand chain block.**

**are sent on FREE TRIAL.**

**Ask for Catalog.**



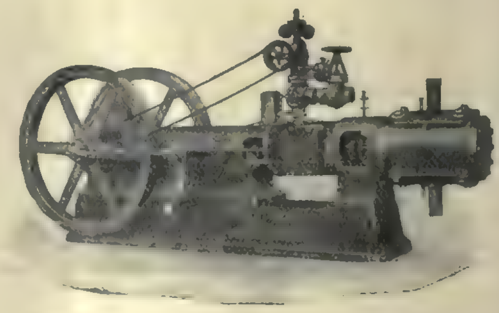
## CENTRIFUGAL PUMPS

**By Weise & Monski.**

**Suitable for Portable Outfit or Where Floor Space Limited.**

Gardner-Rix Duplex Cylinder Belt Driven Compressor.

## GARDNER AIR COMPRESSORS.



Gardner Horizontal Single Cylinder Steam Driven Air Compressor.

**WE WILL GLADLY SEND CATALOGS ON REQUEST.**

**FRANK R. PERROT, Sole Representative,**

204 Clarence St., Sydney.
883 Hay Street, Perth.

## CONTENTS

THURSDAY, NOVEMBER 20.

EDITORIAL—

N.S.W. Commission on Arbitration 461
Melbourne Public Library . . . . . . 462
Leaderettes . . . . . . . . . . . . . . . . . 462
Personal . . . . . . . . . . . . . . . . . 463
Investor's Column—
New Langi Logan (V.) . . . . . . . . 464
Edna May (W.A.) . . . . . . . . . . . 464
Metal Quotations . . . . . . . . . . . . 464
Sydney Stocks . . . . . . . . . . . . . . 465
Brief Comment . . . . . . . . . . . . . 465
Our Big Mines . . . . . . . . . . . . . . 465
Queensland's "Biggest Mining Proposition" . . . . . . . . . . . . . . . . 466
Iron Phosphate at Whitfield (V.) . . 466
New Mariner's Mine, Steiglitz (V.) . . 466
The Coal Mining Industry . . . . . . . 467
Mining in New South Wales . . . . . . 467
Victorian Mining Activities . . . . . . 468
The North Mt. Farrell Co. (T.) . . . . 469
Tasmanian Mining . . . . . . . . . . . 469
Western Australian Mining . . . . . . 470
Queensland Mining . . . . . . . . . . . 470
Auckland Tramways . . . . . . . . . . . 471
The Position of the Small Arms Factory . . . . . . . . . . . . . . . . . . . 471
Railway Electrification (V.) . . . . . . 471
Melbourne Suburban Tramways . . . . 471
Port Melbourne Electric Supply . . . . 472
British and European Developments . . 472
Flourishing Victorian Industry . . . . 474
Industrial . . . . . . . . . . . . . . . . . 475
Miscellaneous . . . . . . . . . . . . . . 475
New Electric Lamps . . . . . . . . . . . 475
Canadian Engineering Feat . . . . . . . 476
News and Notes . . . . . . . . . . . . . 480
Safety of Electric Railways . . . . . . . IX.
Liquid Air for Blasting . . . . . . . . . XVI.

---

**BACK NUMBERS OF THE "MINING STANDARD."**

The following is the rate for back copies more than a month old. Applications by post must be accompanied with cash and postage added. In no case can we guarantee to supply copies, as our storage accommodation is limited.

A postcard will be sent if the number required is out of print.

For copies three months old, ninepence; six months, one shilling, and beyond that period, one penny per month per copy.

As there is a regular demand for back copies of the "Mining Standard" newsagents are requested to send back all returns uncut and in good condition, otherwise they will not be accepted.

All Returns from Newsagents must reach us by the end of each month (the whole paper must be sent). No credit will be allowed beyond this term.

Postage—British, 1d; Foreign, 1½d; Australasia, ½d per copy.

Stamps will be accepted as pre-payment.

Address communications: Publishing Department "Mining Standard."

---

HENLEY'S
Electric Wires and Cables
AND INSULATING TAPES
ARE THE BEST.
W. T. HENLEY'S Telegraph Works Co. Ltd.
546 COLLINS ST., MELBOURNE.
61 YORK ST., SYDNEY.

BELTING!
Largest stock of all kinds of Machine Belting in the Commonwealth.
Conveyor and Elevator Belting for all purposes.
HOPKINS BROS. & ODLUM PY. LTD.
LEICESTER ST., CARLTON, MELBOURNE.
'Phone, Central 754 and 5202. Box 377 G.P.O.

---

**MINING STANDARD.**
PUBLISHED EVERY THURSDAY.
Forwarded Post Free to any Address.

| | Per annum. |
|---|---|
| Australasia | 26/- |
| British Possessions | 32/6 |
| Foreign | 34/8 |

Payable half-yearly or yearly, in advance.
All amounts should be made payable to order of "CRITCHLEY PARKER, Bank of Australasia."

12 O'Connell-street,
Sydney.
Tel. City 8103
P.O. Box 331.

376 Flinders-lane,
Melbourne.
Central 7931 & 1838
P.O. Box 253.

**CASUAL ADVERTISEMENTS.**

The rate for this class of advertisement is governed by the position it occupies.

If it appears on leader page or amongst or next to reading matter, the rate is 15s. per inch (nonpareil) per insertion.

Towards end of reading section—
Brevier, 16 ems width, 6s. per inch per insertion.
Nonpareil, 8s. per inch per insertion.

For the convenuience of advertisers, we might state that—Brevier has approximately 7 words to a line, and 8 lines to the inch—6s. Nonpareil has approximately 8 words to the line, and 11 lines to the inch—8s.

**ALTERATION TO ADVERTISEMENTS.**

As our publishing arrangements necessitate the "Mining Standard" being issued simultaneously in Sydney, Melbourne and Adelaide on the same day each week, advertisers wishing to change their advertising matter must supply same ten days in advance of publication.

**ADVERTISEMENT PROOFS.**

Proofs are submitted to advertisers in order to give them an opportunity of going over the advertisements before printing.

Advertising Copy must be typed and so arranged as to clearly indicate the display required for the more important features of the advertisement.

Any departure from the original copy will be charged for. Advertisers are specially requested to instruct their publicity departments to give us clear and definite instructions respecting changes of matter or new copy in order to avoid incurring unnecessary charges.

---

AUSTRALIAN
MINING STANDARD.
PUBLISHED EVERY THURSDAY.
ESTABLISHED 1888.

It is requested that all business communications be Addressed to Critchley Parker.

THURSDAY, NOVEMBER 20, 1913.

## N.S.W. COMMISSION ON ARBITRATION.

The report of Mr. A. B. Piddington, K.C., who was appointed by the N.S.W. Government a Royal Commissioner to inquire into the operation of the industrial laws of the State, furnishes the last (official) word on a vexed subject. There is every reason to believe that the enquiry has been patient, and the conclusions arrived at honest. Whether, if acted upon, they would bring the senior State any nearer to the wished-for goal of industrial peace is not so clear. It must never be forgotten that any attempt on the part of one of the States of the Commonwealth to solve this crucial problem for its own people is seriously, if not fatally, discounted at the outset by the fact that the Federal Arbitration Court has a paramount jurisdiction, and is more highly favoured by the unions which seek legal redress than are the State tribunals. That, of course, is no reason why the latter should not be made as efficient as possible, but it is an important factor of the position which cannot be overlooked. Coming to the report itself, we find that the Commissioner did not deem it within the scope of his duty to inquire whether or not the whole system of industrial arbitration should be abolished. He devoted himself to examining the machinery which it provides, and suggesting improvements. One of the outstanding features to which he calls attention is the fact that the issues decided by the industrial tribunals, stated in terms of money, are often immensely more important than the majority of cases which come before the Supreme Court. The inference, to the legal mind, is inescapable. These issues should be decided, the Commissioner considers, by men of great acumen and of trained minds. He therefore suggests that the wages boards should be superseded by a Court composed of three Supreme Court judges. Practical men will see little to hope for in such an innovation. The redeeming feature of the wages boards is that, despite the manner in which they are prone to prolong their investigations, they do provide that the decision shall be very largely in the hands of men who are thoroughly acquainted with the practical details of the business which is the subject of inquiry. Judges and barristers, with the best intentions in the world, can never attain such an intimate knowledge. Therefore, even if they be able to arrive at decisions satisfactory to themselves—a point which is often in doubt—their findings are seldom recognised by both parties, if by either, as "filling the bill." Mr. Piddington doubts the utility of this practical experience, and therein, we take leave to think, he underrates the importance of a very essential factor of the problem. More to the purpose is his suggestion that the voluminous evidence which is now so frequently taken on that most elusive of subjects—the living wage—shall be decided periodically by a Court whose findings will command respect. Another suggestion is of practical value—namely, that (with the exception of travelling expenses) payment of lay members for serving on boards shall be discontinued. Thus one potent influence for "stringing out" the proceedings would be abolished. The members affected, however, will be apt to regard the notion as one more instance of the lawyers taking "the oyster," and leaving their clients only "the shells." On the vexed question of awards by craft, as against awards by industry or employ, the Commissioner is non-committal. This is a point with which the interests of mining companies are very intimately concerned. They employ men of numerous industries—miners, labourers, blacksmiths, machinists, engineers, etc.—and when the awards are given in respect of each "craft" separately, the number and complexity of them become intolerable. Awards by industry, however, permit of one award for each class of such concerns, and it would specify, of course, every one employed. Mr. Piddington thinks that, in each case, the decision "craft or industry" should be left in the hands of the Court. Many other improvements, more or less pertinent, have been suggested in the course of the inquiry, and the report contains recommendations accordingly. But the bedrock fact that, after 12 years of trial, it is found that "the strike" is still tenaciously clung to by the unions as the last resort, will cause many to ask, "If the strike has to come sooner or later, why not let it come at once, and get it over, instead of wasting so much time and money in legal proceedings?" The object is to abolish strikes and lock-outs. The latter are now seldom heard of, but the threat of "strike" is more of a commonplace than ever it was. Mr. Piddington recognises this aspect of the matter, for he boldly declares that striking cannot be made a crime in the same manner as assault and robbery are crimes, and he counsels the abolition of penalties on strikers. It seems pretty clear, to come down to bedrock, that industrial disputes have their origin in desire of gain on one hand and the ingrained contentiousness of human nature on the other. Can they, then, be abolished by any legal or statutory device whatever? The community can, and must, take steps to provide against the paralysis of its most vital industrial activities. But the assumption that, by legal process, it can so satisfactorily settle every dispute between employer and employed that no resort will ever be had to the "ultima ratio" seems wildly improbable. We cannot honestly say that the consummation of industrial peace by means of litigation, which is deemed so eminently desirable, has been brought appreciably nearer by Mr. Piddington's report.

## MELBOURNE PUBLIC LIBRARY.

The Melbourne public is to be congratulated on the magnificent new building in which the Public Library of Victoria is now housed. The State indeed has done something that it may be pardoned for bragging about. The Library, begun in a very small way some 60 years ago, is now perhaps the finest in the Southern Hemisphere—certainly the finest in Australia. Its books total some 300,000; and this magnificent collection has now been removed from the old building to a building entirely worthy of it. The trustees deserve no small amount of credit for what they have done; and still more credit should be given to the State Ministry, for it is they who have authorised the necessary expenditure. Amongst individuals there are two deserving of special praise, the one being the librarian, Mr. E. La Touche Armstrong, whose idea it is that has been enshrined in this glorious building (unquestionably one of the finest of its sort in the world), and the other the architect, Mr. N. G. Peebles, who embodied the idea presented to him in a way which showed that the race of great architects is not extinct. The design is both grand and beautiful, and there is nothing about the whole building that is out of place or out of tune with the general harmony of the design. Whether, with its multiplicity of doors, the reading room will not be somewhat draughty, remains to be seen, and it may perhaps be worth while to draw attention to two minor details in which the scheme seems to us to fall short of perfection. The first is that no book-lifts have been provided. These, connecting the enquiry desk (on the floor of the reading room) with the various galleries, would, with the addition of a speaking tube similarly connecting the various floors, have enabled books to be obtained for readers much more expeditiously than is now the case, when either the large passenger lifts will have to be waited for, or the time of the attendants will have to be taken up by the use of the stairways. Secondly, the number of air-shafts is so great, and the size of them is so considerable, that they very materially subtract from the book space accessible to the public. The fact that the number of books so available would, in any case, have been very much less than it has hitherto been, rendered it advisable that every possible inch of space should have been made use of; and, as the books in this portion of the library are already pretty closely packed, it follows that room can only be made on the shelves for new volumes by the transference of some of these older ones to galleries where they will be available for the public only through the medium of attendants. We feel sure, therefore, that sooner or later some of this air-space will have to be curtailed for the provision of extra shelving. This, fortunately, can be done without making the air in the reading room impure, or without, in any way, detracting from the glory of the building.

When it was proposed by the Postmaster-General's department a couple of months ago to secure the services, in England, of men competent to act as mechanics in the electrical branch of that department, there was immediately a hue-and-cry against such a proceeding while there were plenty of men out of employment in Australia. The matter was brought up in Parliament, but all the assurances of the Public Service Commissioner and of everybody else who was likely to know anything of the trouble which had been experienced in securing suitable men in the Commonwealth, were treated contemptuously. It was, however, decided to give young Australia another chance, although the delay necessarily caused the arrears of work in the shops to increase. Applications were therefore again advertised for, in every State, with the result that ninety-eight were received. The majority of the applicants, however, gave immediate proof of their inefficiency for the work requiring to be done, but for the others the Public Service Commissioner, Mr. D. C. McLachlan, arranged that practical examinations should be held at the department's workshops, with the result that not a single candidate passed the tests. It was found that many of the applicants had a fair elementary knowledge of electricity, but were deficient in experience of telegraphic and telephonic work, and as a result of this and previous experiences, the authorities have formed the opinion that previous employment in the department, or elsewhere where similar work has had to be done, is essential before the qualifications necessary to secure appointment as postal mechanics can be attained. It is probable, therefore, that, after all, it will be found necessary to import a number of trained men, the same wages being offered as before.

* * *

A railway proposal which has for a very long time exercised the imaginations of southern Queenslanders, is one which, apparently for no other reason than the inadequacy of the English language to convey a proper impression of the importance of the scheme, has become known as the "via recta." How the term originated is not of great consequence; it has become thoroughly acclimatised, and is the name in common as well as parliamentary use, yet its status is so uncertain that the newspapers print it sometimes as a proper name, Via Recta, sometimes as a common name, via recta, and only the other day it became "via Recta." But, what's in a name? Via recta was to be only a short line, but it was to do a lot of climbing, to double back on itself, in one part making a complete semi-circle, to twist and turn first in one direction, then in another, so as to cross the Main Range and connect existing railways at Mt. Edwards and Maryvale. At least that was the route finally recommended in a "plan, section and book of reference" which the Legislative Assembly was asked, on the 12th inst., to approve of, and send on to the Legislative Council. The length of the line was to be 27 miles 78 chains, the ruling grade was 1 in 33, and the cost was estimated at £424,384, including rolling stock, land purchase, allowance for depreciation, etc.; the construction cost alone was to be £389,384, or, for 28 miles, about £13,906 per mile. The Railway Commissioner reported very unfavourably on the proposition; in fact, he was strongly opposed to it. Although it would shorten the journey to Sydney to some extent, he said, the grades necessary to surmount the Main Range in Queensland and the New England Range in New South Wales had to be considered, and heavier trains could be run at greater speeds on coastal lines, besides which, the latter would allow of the provision of dining cars on mail trains, which could not be done on the proposed routes. Mr. Paget confessed that when the Commissioner made his report no man was more astonished than he (Mr. Paget). The Minister assured the House that sundry other lines which had cost £1,458,405 would be greatly helped by carrying out this project, the cost of haulage from Brisbane to Dirranbandi being reduced by 13.41 per cent., and from Brisbane to Warwick by 33.74 per cent. In support of the scheme, Mr. G. P. Barnes said it would serve 29,000 square miles of country, or 18,660,000 acres, and that it would preserve to Queensland the vast trade along the south-western border, which otherwise would be drawn to New South Wales. The district which would be served produced approximately two-thirds of the wheat of Queensland, for which heavy freights had now to be paid. The debate was a long one, but in the end an amendment to postpone the question, and look for a better route over the range, was carried by 39 votes to 23. The Premier must have been greatly disappointed at this summary rejection of the proposal, for in replying to an innuendo passed after the division, Mr. Denham declared that there was never a motion brought before the House with more sincerity behind it. His impression was that the motion had been defeated largely because it stood alone as the one railway proposal of the session. Via recta, however, is only postponed, not finally disposed of.

* * *

Between 80 and 90 men, members of the United Labourers' Union, who have of late been employed by the South Australian Public Works Department in excavating for deep drainage at Malvern and Glenelg, struck work last week because they objected to piecework. As the secretary put it, the men had had enough of it, and would have no more at any price, as a large proportion of them were not making more than 8s. a day, and some as little as 3s., while men doing the same work on day wages were paid 9s. a day. It appears not to have occurred to Mr. Secretary Murphy, that it was most unreasonable for a man who confessed that he could not earn more than 3s. by fair work to claim to be paid 9s. for it, nor even that the man who can actually give 8s. worth of work for 8s. should not be paid more than the incompetent who is only worth 3s. Of course, the matter was mentioned in Parliament. Sir Richard Butler, Commissioner of Public Works, admitted that on the waterworks the men were paid 8s. a day, while those on sewerage works had previously been paid 9s. for the same work; but he said it was an arrangement which had no justification, though he agreed that for working in wet places the pay should be higher. The differences between the earnings of the men on piecework were due, in part, to the fact that many of them were inexperienced at that work; they were not unwilling, but they were unable. He also complained that some of the men who could do even better for themselves than they had were not allowed to. Good men were watched, and told they would not please the ordinary men if they did their best. Sir Richard put the matter in a light which should have showed to the heaviest brain in the House the absurdity of the demand made. Taking the money to be paid for day work, he said, and working it out at piecework, they would have to pay per yard 1s. 5d. for the work of the best men and 4s. 6d. per yard for the work of the worst. It was a monstrous injustice to the good man to compel him to knuckle down to the man whose work cost 4s. 6d. a yard against his 1s. 5d. If the Government abandoned the piecework system, and put the wages up to 9s. a day, they would have to weed out the weak men, whose only fault in many cases was that they were no longer young and lusty. If these men could not now earn as much as their sons, that was no reason why they should not be allowed to earn as much as they could. The Government, however, recognises its duty to get proper value for the expenditure of public money, and has determined not to depart from its piecework policy, which was adopted last July. It is matter for regret that amongst the men now on strike, with or against their own will, are many who have worked for a long time for the department, and are not only throwing away steady work and a wage commensurate with their work, but also their accumulating privileges as Government employees. Sir Richard Butler has made it quite clear that the pay will be for work actually done, and that if the men don't like to do it, either it and they will stand still, or other men will be put on.

* * *

There is a common impression that a bully is almost always a coward, and a large number of the really big strikes which have marred the industrial progress of Australasia have afforded illustrations of its truth. Like the rough of the streets, he is bold as a lion so long, and so long only, as he sees no police about; let the unfriendly helmet appear round the corner, and he is as meek as a lamb. True, the agitator in the midst of a wild harangue cannot eat his words because the police come upon the scene, for that would brand him at once in the esteem of his hearers and his occupation would be gone. Appearances must be kept up as long as possible. But it is within the memory of all that at the beginning of a big strike there are invariably protests against any increase of the police force in the affected district, and it will be remembered with equal clearness that the arrival of reinforcements almost always has a marked effect upon the behaviour of the strikers. It is not surprising, therefore, that the strikers on the Geelong (V.) sewerage works should have protested against the police being employed to maintain order and to prosecute for breaches of the law. Nor is it surprising that at the recent Inter-state Congress of Trades and Labour Councils a motion should have been carried condemning the employment of the defence forces in similar circumstances to preserve order, and, if necessary, to disperse a mob by force. There appears to be an idea that one portion of the community has a perfect right to array itself against all the rest, and that the attacked portion has to sit quietly by, see its own welfare endangered, yet raise no hand to protect itself, nor even look for protection to those to whom the safety of the public is entrusted. Someone has said that a strike is "an invention for making crowds think," and the epigram is a true one. If the present strike in New Zealand collapses, as it promises to do, that result will have been brought about not merely, perhaps not mainly, by the arrest of the ringleaders, but because it made the crowd of farmers think, and the crowd of citizens think, and led to the enrolment of a large body of special constables and an army of workers, who rose to the occasion, and undertook, to the best of their ability, the work which the strikers had thrown out of gear. And the same effect will assuredly be produced some day amongst the workers themselves. Some day they will begin to think what asses they have been to allow themselves to be dictated to, very frequently, indeed, quite contrary to their own interests and opinions, by men who have previously been hounded away from other districts by the workers themselves for having misled them into false positions. At the present moment we have in New Zealand the remarkable position that men who had refused to belong to the Federation, or "strike-all-the-time" party, and had joined the United Labour, or "arbitration" party, going on strike at the dictation of those with whom they had refused to ally themselves. When things have resumed their normal once more, these men will realize that a strike has the merit of making crowds think, sooner or later.

* * *

There is every prospect that within a comparatively short time the copper-producing States of Australia will have to count upon further serious competition from the mines of Peru, South America. As yet copper mining is there only in its infancy, but many mines have been so far developed that it only requires a continuance of high prices for them to be able to increase their output enormously, and, judging by reports, each year's operations are likely to open up sources of supply which will enable production to be maintained, even when the market comes down to what is now an unprofitable level. Hitherto mining operations in Peru, like other industries, have been hampered by difficulties of transportation and consequent high rates, but in one way and another these are being overcome, and the high copper prices of last year encouraged a large expenditure on plant enlargement, while mines which during the currency of low rates were doing little work were given the opportunity for which they were looking and joined the list of producers. The result was that in 1912 the output of copper from Peru amounted to 27,600 metric tons in blister, matte and ore, as compared with 28,300 in the previous year, and 27,400 in 1910. That country is now, therefore, treading close upon the heels of Chili, and in 1911 was only 1600 tons behind her. The Cerro de Pasco put out no less than 20,321 metric tons of copper bars last year, which contained gold and silver, and during the year this company commenced the installation of a hydro-electric plant which is to develop 10,000 horse-power, as well as laying a 15-mile railway between the works and the company's coal mines, which will make it independent of imported coke, and lower the cost of production. Nine years ago (1904) Peru produced only 6900 metric tons, and Australia produced 34,700 metric tons; last year Australia reached her record output of 47,800 metric tons, showing an increase of about 37.77 per cent., but Peru's output of 27,600 tons shows an increase for the same period of exactly 300 per cent.

* * *

Perhaps the recent advance in the price of osmiridium is to be accounted for by the following somewhat vague information from a London paper:—A new high-speed tool steel is about to be placed on the market by one of the largest firms in the industry, which steel is stated to be capable of taking heavier cuts at higher speeds than any other yet produced. No definite particulars can be given as to its exact composition, but it may be stated that it contains a proportion of both cobalt and iridium. To give an instance of what the steel can do, it has been mentioned that it is capable of removing a chip 1in. wide by a quarter of an inch thick at a cutting speed of 39ft. per minute. In some recent tests it was found that whilst a tool made from ordinary English steel would only remove from 44 to 86 cubic inches of cast-iron at a cutting speed of 98.4ft. per minute before the tool wore so much as to tear, rather than cut, the metal, a similar tool made from iridium steel would remove 927.6in. of similar cast-iron before it failed. One of the iridium steels which is similar to the new steel mentioned has been found, by analysis, to consist of total carbon 0.76, silicon 0.28, manganese 0.10, phosphorus 0.01, sulphur 0.032, copper 0.006, cobalt 5.03, chromium 4.38, tungsten 16.40, vanadium 0.62, molybdenum 0.3, and the remainder iron. Under a recent shop test a tool of this steel, at a cutting speed of 103ft. per minute, with a feed of one-twenty-fifth of an inch per revolution and a depth of cut of five-sixteenths of an inch, removed 712 cubic inches of metal from a steel axle of the quality known as 0.45 carbon before it required grinding.

## PERSONAL.

Mr. W. A. T. Davies, F.G.S., of 48 Queen-st., Melbourne, is at present reporting on several copper mines in the Cloncurry district, North Queensland.

By the end of last week, Dr. Gilruth, the Administrator of the Northern Territory, in prosecuting his motor-car trip from the Queensland border through the Territory, eventually to reach Port Darwin, had reached Alice Springs, whence he will journey to Hermansburg, the Lutheran mission to aborigines, and thence to the Arltunga goldfields.

Mr. Arthur C. Steele, who had resided at Zeehan (T.) for the past 19 years, died on the 4th inst., from pneumonia. Previous to going to Zeehan, Mr. Steele had spent 15 years on the East Coast at tin mining. During his time in Zeehan he had spent 14 years with Mr. Vincent, manager of the British-Zeehan and Zeehan-Dundas Blocks mines. The late Mr. Steele was a man of quiet and retiring disposition, but his sterling worth was very generally recognised.

Mr. E. F. Pittman, Under-Secretary for Mines, New South Wales, has of late been visiting Tasmania in connection with his task of compiling a handbook on Australian mining, for the convenience and information of visitors to the British Association Congress next year. In company with Mr. Hartwell Conder, the Tasmanian Government Mining Engineer, he is making a round of the principal mining fields and metallurgical works of the island State.

After being in the employ of the Richmond (V.) City Council for 26 years, having entered it as a boy in knickerbockers, Mr. R. T. Kelly has resigned his position as the city engineer and surveyor, to take a similar dual position under the St. Kilda Council. The maximum salary for the position at Richmond, which boasts of being a working man's suburb, is £400 a year, but that sum is the minimum at St. Kilda.

Mr. Frank B. Smith, of the Victorian Railways Commissioners' office, who has been abroad on twelve months' leave, returned by the R.M.S. "Orama," on Monday.

Mr. W. B. Griffin, the architect who has been retained by the Federal Government to supervise plans for, and operations at, the proposed Federal Capital, returned to the United States by the "Ventura" last Saturday, to arrange for carrying on his private business in Chicago during his three years' residence in Australia. He expects to be back in the Commonwealth in about six months' time.

Mr. Alexander Dick, who is well known in commercial and mining circles in Melbourne, met with a serious accident in the city last Sunday evening, which resulted in his death about 24 hours later. At about half-past eight on Sunday, at the intersection of Swanston and Flinders-streets, he was knocked down by a pony which had been frightened by a tramcar. One of the wheels of the phaeton to which the pony was harnessed passed over him. Mr. Dick was taken to the Melbourne Hospital in a passing motor car, and there it was found that he had sustained a small depressed fracture of the skull and probably a fracture to the base of the skull. He did not regain consciousness, and after his injuries had been attended to, he was conveyed to a ward. He never regained consciousness, however, and died on Monday night. Mr. Dick was born in Dumbartonshire, Scotland, in 1835, and came to Australia in 1853, going first to the Ballarat diggings, but later, when the rush to Smythesdale set in, he betook himself to storekeeping there, being one of the partners in McGee, Dick and Co. A few years later he came to Melbourne, and was one of the original partners in Bell, Bruce and Co., wholesale grocers, of Queen-street. About 15 years ago he retired from business, but was associated with the financial world to the end through being on the directorate of a number of companies, including the Great Southern Consols mine, Rutherglen. Deceased was 78 years of age.

# THE INVESTOR'S COLUMN.

## Some Companies Attracting Attention To-day.

(By Our Exchange Reporter.)

### New Langi Logan (V.).

A recent forecast in these columns of increased activity in Ararat stocks has been fulfilled, and it must be admitted, a little beyond the expectations of the writer, and this statement applies more especially to the leading mine on the main trunk lead.

Only a week or ten days ago New Langi Logan shares were freely obtainable at about 19s. 6d., the prevailing impression among the dealers being that a forward sale at the proper opportunity would result in the seller making the amount of the call. This belief, no doubt, helped to bring about the rise in price, for it served to create an oversold market, so that when a genuine enquiry set in, the "Bears" got alarmed, and started to cover up, and once the impetus was given the movement set in with considerable strength, so that sales have taken place up to 25s., which is equal to an increased valuation of over £25,000 for the stock.

The main reason that so far has been given for the better support is that the water pressure above the gutter, which had increased during the cessation of pumping operations, caused by the accident to the plant, had been quickly reduced again, and is now standing at 30 lbs. to the square inch., the lowest point to which it had previously been lowered. It may therefore be assumed that steady progress will now be made with the unwatering of the mine—the rate being apparently 1 lb. per fortnight, but although this is satisfactory, it must not be assumed that the end of the dead work is yet in sight. Some misconception still exists even among old shareholders in alluvial mines with regard to the water above the gutter—the general impression being that it is contained in an underground river or channel, V shaped, so that the reduction in the pressure is cumulative—in other words that it goes down relatively much quicker in the later stages of the operations.

This latter theory is perhaps correct, though not to so great an extent as is generally believed, but the main point for recognition is that the alluvial matter overlying the old river bed is packed so tightly by heavy pressure that the water does not come down so freely, nor is the surrounding country as widely drained as is supposed. The mines up or down the same lead have, notwithstanding the pumping operations of their neighbours, their own individual water troubles to overcome. This will be the case with the adjoining mines to the New Langi Logan, both north and south, and with regard to the parent mine itself, the period before the wash is entered will probably be somewhat longer than the market anticipates. If this be so, then the recent substantial rise in price is a little premature, nevertheless the higher range of market value has probably come to stay (even if its present limit be not maintained), and for the reason that the potentialities of the mine are very great. The length of the holding on the line of the mine lead is about 3½ miles, and the width 800ft., in all 37 bores have been put up into it, and from all of these, with one exception, good payable prospects have been obtained—the exception being a bore which was put up outside of the gutter.

The holding is large enough for three more substantial companies, and once the value of the wash is established it is likely that their formation will be undertaken.

In the meantime there will be a good many more calls to be made, and for that reason 25s. may seem a better price to accept than to pay. There is, however, one other important factor, not yet dealt with, which has to be remembered. It is the manner in which the Cathcart Central gutter is opening up and establishing a record as a gold producer. The portion of this lead, which the New Langi Logan will have to work, in addition to the main trunk lead, is to some extent still in doubt, but it will probably be about half a mile. Good progress is being made with the erection of the plant at the No. 2 shaft, which is on the Cathcart Central lead and it is not unlikely that this fact has helped to influence the market operations.

### Edna May (W.A.).

Amidst the general dulness of the market, the sharp fluctuations in the prices of this stock have been very noticeable — the limits being within 40s. and 45s. The usual differences of opinion with regard to a mine which is coming on the dividend list have not perhaps been so evident in the case of this company, for the Stock Exchange verdict is generally favourable. Still, they do exist, and the unfavourable side finds expression first of all in a doubt as to whether the ore reserves are as large and of as high a grade as has been stated. Some reason for this doubt is to be found in the fact that the experts who have gone into figures have not been altogether in accord, and the latest summing up has shown a reduction on previous totals.

Such differences of opinion are, however, very common in connection with the ore reserves of all mines, more especially gold mines, and as far as the Edna May is concerned the ore body is of a character which renders it more than usually difficult to form an opinion, both as to quantity and value, as it varies very considerably from time to time, in both of these respects—that is as far as it has been opened up above the 71ft. level. The estimate of the present manager should, however, be substantially correct, and it is evidently expressed on reasonable and conservative lines. Mr. Williams put the quantity of ore in sight at the date of the last meeting of the company at 20,000 tons, and of a value of 82s. 6d. per ton. This has, perhaps, been increased to some extent since then, although the efforts of the company have been very largely confined to sinking the main shaft rather than to development work.

Allowance would have to be made also for the amount of ore extracted since the estimate was made. At the date in question the stone in sight was worth approximately £82,500, and as the working expenses are not expected to exceed 20s. per ton, this meant a profit of a little under 30s. per share.

As the present market price at the lowest point of current fluctuation is 40s., it would appear that the prices are marked up high enough; it must be remembered, however, that a winze has been sunk from the 71ft. level on the ore body for a depth of 55ft., and the value has been found to be well maintained, a crushing of 114 tons from the bottom of the winze giving a return of 285 oz. of gold—the width of the reef here being 10 feet. Although it would be unwise to regard anything in mining as assured until it has actually been proved by shot and stamper, it seems a reasonable assumption enough that there is from 30s. to 40s. per share in sight, or practically so, as the result of the work that has been done. Further confirmation of this assumption should soon be forthcoming, as a crosscut is now being put in at a depth of 150ft., which should cut the lode at a distance of 140ft. from the shaft. As this crosscut is now out 137ft., an important development may occur at any moment. There is little doubt that if the size and quality of the reef, when intersected, correspond substantially with that in the bottom of the winze, than which it will be about 40ft. deeper, a sharp improvement in the price of the shares will ensue, and already such an anticipation has lifted them to 44s., although the rise was not maintained.

Perhaps 50s. is not an unlikely high-water mark —it will depend largely on the nature of the development—but it ought to be something pretty good to justify such an advance, for, until this downward continuation and extension of the lode are established, the shares at 40s. are well valued.

It is by no means an unusual occurrence for the market to be ahead of a mine, especially when the latter is a more than unsually attractive proposition, but there is another reason in this instance why too high a prospective value should not be put upon the shares, and why prices should rather follow developments than anticipate them, and it is, that the lease is situated in a granitic belt of country, and the ore occurrence is of a somewhat unusual character. There is thus always a possibility of the lode being affected by an intrusion of the primary rock, and although the possibility may not be very great, still it has to be taken into account. It was the appearance of a bar of granite in the present crosscut which recently brought the shares back sharply from their highest price, and although it was quickly passed through, and, apparently, of no importance, its presence in the workings has probably to some extent affected the confidence of the supporters of the stock, for a subsequent recovery in the price of the shares was followed by some free selling, which brought them back again to a little over 40s., which is about the closing quotation.

Another peculiarity of the country is that in the lode channel the filling or material between the quartz veins is of a very soft nature, evidently holding a considerable amount of water, so that sinking through it is accompanied by some of the difficulties usually associated with alluvial mining. The sinking of the first main shaft had to be discontinued, on account of this cause, but, luckily, it was quite sound to a depth of 71ft., so that when connection had been made with the drive from the underlie shaft, it was available for the purpose of hauling the ore. This was a fortunate circumstance, as it enabled gold production to be maintained, while in the meantime a second shaft has been sunk at a point 75ft. to the west and 36ft. north of the first. This new shaft has been successfully taken down to the required depth of 150ft., and as stated, the crosscut has been put out, the distance now attained being 137ft., and from the appearance of the face, and the fact that the water in the winze has been reduced, it looks as if the lode will soon be cut. The milling plant consists of 10 head of stampers (1250lbs.), driven by suction gas plant, concentrating tables, etc. An unusual feature of the mine is that the ore, which is a free milling one, and suitable for amalgamation, carries a percentage of wolfram. It will be gathered from this brief summary that the Edna May property is not only an attractive proposition from a mining point of view, but possesses also some interesting geological features. The best evidence of its value in the former respect is to be found in a statement of the gold returns. Since the half-yearly meeting in April, 6161 tons have been crushed for a gold return of 5598 oz. This does not include the gold in the sands, which is estimated to be worth about £5000.

These figures give a good idea of the gold-bearing character of the ore, and form a basis for an estimate of the value of the shares, but after making reasonable allowance for the uncertainty of mining, 40s., as already stated, seems a very fair price for them—that is until the downward continuation of the lode is proved.

---

# METAL QUOTATIONS.

(From Our Correspondent.)

## By Cable.

### London, Tuesday.

A very bad opening was experienced in the markets for both copper and tin, the former commencing the week at £2 7s. 6d. per ton lower than the previous Friday's rate, and the latter as much as £3 5s. per ton lower, for metal on the spot and for deferred delivery. Lead also participated in the depression, though to a less degree at first, but later in the week, as the two metals first mentioned began to recover, lead went persistently down. Last Friday's rates for copper was 27s. 6d., for tin 25s., and for lead 25s., below the closing rates of the previous week.

COPPER.—Monday's spot quotation was £67 7s. 6d., followed successively by £68 12s. 6d., £67 17s. 6d., £68 2s. 6d., and £68 7s. 6d.

The daily rates for three months' delivery were £67 2s. 6d., £68 2s. 6d., £67 8s. 9d., £67 10s., and £67 12s. 6d.

Electrolytic, which opened the week at £73 10s., rose to £74, then fell to £73 10s. and £72 10s. Yesterday began the new week at £71.

TIN.—The price for spot lines on Monday was £179 5s., on Wednesday it had improved to £180 5s., after which it went to £181 10s. and back to £181 5s.

The quotations for three months were £180 10s., £180 15s., £181 15s., £183, and £182 7s. 6d.

LEAD.—Monday's quotation was £20 7s. 6d., showing a fall of 2s. 6d., and subsequent quotes were £19 15s., £19 6s. 3d., and £19 5s.

SPELTER did not move from £20 15s., the price which has ruled now for some weeks.

SILVER began with a rise of ⅛d. to 27$\frac{11}{16}$d., but depreciated each day afterwards, the prices being 27⅝d., 27½d., and 27$\frac{7}{16}$d.

ANTIMONY.—"Star" brand went back another £1 per ton, changing hands at £28, but 50 per cent. ore was still quoted at £6 5s.

WOLFRAM (70 per cent. ore) was firm at 34s. per unit, or £119 per ton.

MOLYBDENITE had a further rise to 3s. per lb., equal to £336 per ton.

MANGANESE (50 per cent. ore) fell back to 9d. per unit, equal to 37s. 6d. per ton.

---

The secretary of the British Chamber of Commerce, 9 Rue des Pyramides, Paris, official representative of the Commonwealth in France, reports, under date October 11th, the following latest prices per ton quoted for minerals on the French markets:—Copper (Havre), £79 10s.; tin (Havre), £202 12s.; lead (Havre or Rouen) £23 4s., (Paris) £23 8s.; zinc (Paris), £23 16s.; nickel (Paris), £165 to £175.

---

The miner, John Friday, who was injured at the Nuggety Ajax mine, Daylesford (V.), on October 17th, through the accidental explosion of unfired plug of gelignite which was penetrated by a drill, is still too seriously ill in the hospital for a statement to be obtained from him. In consequence, the inquest into the cause of the death of his mate, Edmund Thomas, has been further adjourned until the 27th inst.

## SYDNEY STOCKS.

Doings in the mining section of the Sydney Stock Exchange during the week have been flat, stale, and most distinctly unprofitable, from a broker's point of view. The downward course of industrial metals, as indicated by press and private cables, has played into the hands of the bears, both in London and Sydney. Those holders of copper and silver-lead shares who saw their margins of profit rapidly disappearing became nervous, and unloaded in a number of cases where they were able. But there have been more sellers than buyers. In fact, speculators for the time being have withdrawn from the field of active operations. The fall in copper has been very material, and in view of the trouble which has arisen in Mexico, a large source of supply, somewhat unaccountable. But the slump in the red metal has occurred for all that. Six weeks ago copper was worth £75 per ton. Last Tuesday's cable gave the spot "middle" prices down to £65 12s. 6d., a fall of £9 7s. 6d. per ton. Latest cable messages show some improvement, the price in London having recovered to £67 17s. 6d. per ton. Still, even that figure represents a great curtailment in the value of the output of our mines. The price of lead, likewise, has received a sharp set back, the latest quotation, £19 6s. 3d. per ton, being over £1 lower than it was a week ago. Spelter and silver have kept fairly steady, but tin has shown retrogression. Small wonder that the mining market has been troubled.

Towards the latter end of the week the London market offered more encouragement to dealers in copper shares. Holders of Mount Elliott scrip had the satisfaction of seeing values on that side recover to 88s. 1½d. That movement was attributed to some substantial buying orders on Australian account being cabled home. But usually after a sharp slump values experience some recovery. At any rate, there has come a lull in the bearing of the market in Sydney. Great Cobar shares have not been at all popular with buyers, but, despite the rumoured debenture difficulty, and the said retirement of the manager at the mine, quotations for those shares have gained a few points on the week. Whispers have been heard of certain Cloncurry amalgamation, but it is most probably a mirage emanating from the minds of would-be "bulls" of Mt. Oxide and Hampden Cloncurry interests, which are the two companies that would most benefit. Anyhow, Mt. Oxide has failed to respond in the market to the suggested combination of interests, for sellers have come back to £32. Mammoth Copper shares have been in more request of late, buyers operating at 40s. for three months' delivery. For the week ended the 5th inst. the furnace of that company was in blast 128 hours, and produced 24½ tons of copper, 1173 oz. silver, and 10 oz. gold. A spurt occurred in the demand for Oxide Creek shares on Thursday. No actual reason was assigned, and the effect on prices was immaterial. Ardlethan ventures have been left more or less alone. A fair number of transactions have been recorded in Carpentaria contributing shares, but the market has continued a weak one, values favouring the buyer. Big Bygoo Ltd. has about shot its bolt. The property has opened up so badly that the directors have decided not to purchase the property on the terms of their option. In their opinion the funds in hand should be conserved until the shareholders have had a chance of expressing their views. That they will be able to do at the extraordinary meeting to be held on the 21st. It would have been a good thing if the directors of some other Ardlethan ventures had shown a disposition to conserve shareholders' money when they realised their holdings were impossible. Comparing current quotations for Broken Hill shares with those ruling a week ago, movements disclosed are trifling. Two or three days back, however, the market was distinctly weaker, but has picked up subsequently in sympathy with improved London prices. The Sydney market has provided nothing out of the common in share transactions. The turnover in gold shares has also been exceedingly quiet. The shareholders of the Harden gold mine have anything but a cheerful document in their directors' report to be presented at the coming meeting. Matters for the company looked pretty blue at the close of the preceding half-year. As a last resort diamond drilling was undertaken in No. 6 level to test the possibilities of the reef. The reef was pierced at three points along its course, but the ore was found unpayable, and all work was stopped.

If the statements of an expert who has recently spent a week or so prospecting and assaying the Red Rock mine, situated about 29 miles from Tenterfield, turn out correct, this State will have a proposition equal to Mt. Morgan, so it is said. The mine is on the top of the mountain, and has a fall of 800ft. The whole area is said to be a mass of metal. The nature of the formation appears similar to the Mt. Morgan. The mine was first worked for gold, and then given up, after large quantities of the yellow metal had been taken out. It then remained idle for some time, but recently was taken over by a syndicate. Over 1000 tons of rich ore are in sight, and some hundred of tons at grass. The stone averages 5 dwt. to 7 dwt. gold, and ore can be quarried anywhere down the 800ft. of the cliff. The investment stock market has displayed considerable activity during the week. Values for all leading securities have been very firmly sustained. In most cases holders have wanted higher rates to be tempted to sell their shares. Bank shares have continued in brisk demand.

## BRIEF COMMENT.

According to the report of an expert who has recently been examining the property, the Red Rock mine, near Tenterfield (N.S.W.), is a second Mt. Morgan. This is a somewhat sweeping assertion to make. Unfortunately, there have been many properties found in Australia which gave the same promise and fulfilled it—by remaining second. The Red Rock mine, however, certainly possesses some unusual features. It is neither a gold, silver, copper, lead, nor zinc mine; it is all of them, and in such proportions as would make each one quite a valuable proposition on its own. If this be a fact, the expert who made the foregoing assertion was afflicted with a too-keen sense of modesty, otherwise he would have flatly stated that the Mt. Morgan is not in it. While it goes without saying that Australia is a great mineral country, it also suffers the painful disadvantage of possessing, in the main, only an average percentage of mineral in proportion to mother rock, which is a matter for extreme regret.

It is regrettable that the option holder (Mr. Weinberg) of the Hercules and Primrose mines (T.), has failed to raise in London the necessary capital to effect the desired amalgamation of the above companies with the Tasmanian Smelting Co. It was hoped, after various tests, that, with the amalgamation effected, a suitable process could be installed for the recovery from the Hercules and Primrose ore of the zinc, which is actually its most valuable constituent. It is the intention of the directors to frame a fresh proposal for the approval of shareholders, whereby an effort will be made to raise the capital required at this end. It is quite evident that some comprehensive scheme for combining the work of these three companies is necessary to make any one or all of them profitable, and just for the moment the outlook for the amalgamation is not too hopeful, on account of the complicated nature of the proposition and the difficulty already experienced in raising capital elsewhere.

The intention of the Federal Government to erect a battery for the benefit of prospectors on the Maranboy tin field, in the Northern Territory, is a commendable one, and one which, at this juncture, is likely to be of more value than a million spent on batteries where they are not wanted. It is intended to invite tenders immediately for a five-head battery, with power sufficient to propel ten. The terms of contract will probably be for the delivery and erection of the plant on the spot. The boon such a plant will confer upon prospectors who delve in parts of a wilderness as remote as is the interior of the Territory, cannot be lightly estimated. It will help them to realise the wherewithal to carry on if the wealth is there to realise. If not, the experiment will not be a very expensive one, and the Territory is with us and must be developed somehow. A word in time: in a community of prospectors such as that of Maranboy, no Government supervision is necessary for the welfare of the battery. A committee of local miners to appoint a supervisor would be more effective and less expensive than a Government figurehead.

The Vegetable Creek Tin Mining Co. (N.S.W.) is in possession of an apparently promising property. As the result of development work it is estimated that reserves containing £20,000 worth of tin have been blocked out ready for extraction. According to the last official report, all development ends are in excellent values, varying from 40 to 200 lbs., the width of the wash being from about 12 to 42 inches. A satisfactory feature is that a regular output is now anticipated, the yield for the past fortnight being 9.25 tons tin oxide, won at a cost of about £500, and realising £1128.

There can be very little doubt that the transfer of the Mt. Oxide Mines Ltd. (Q.) to the London Co. of that name has been unnecessarily protracted. For this, the old company is responsible, as it has had possession of the necessary documents long enough to have enabled the transfer to be effected weeks ago. This is only one of the innumerable delays which shareholders may look forward to. It is understood that the railway from Cloncurry to Mt. Cuthbert is being carried on with all possible speed, but that the Mt. Oxide Co. will construct the balance of the line to connect the property with Mt. Cuthbert, a distance of about 50 miles, is by no means assured at this juncture. The delay which is bound to occur in connection with this matter must not be overlooked, and, combined with the time which will be involved in equipping and preparing the mine for active operations, shareholders will be fortunate if the mine commences a permanent output inside of two years.

Some interesting experiments in concentration have recently been completed on bismuth and molybdenite ores from the Whipstick mine, near Pambula (N.S.W.), as the result of which the oil flotation process will most likely be adopted for its treatment. It would seem that, owing to the light flakey nature of the mineral characteristic of it, molybdenum ore lends itself readily to this form of treatment. In the tests it was found that the mineral quickly disengaged itself from the pulp and floated to the surface, whence it was readily recovered with oil, a concentrate of over 90 per cent. being secured. At the present time molybdenite is worth over £300 per ton, it being extensively used in the hardening of steel. Peculiarly enough, as in the case of osmiridium, Australia furnishes the major portion of the world's supply of molybdenum.

Judging by the results so far obtained from development, the Ruby Well field, beyond Meekatharra (W.A.), gives no evidence of being out of the ordinary. Indeed, the values are such as to inspire the belief that it will need to show greater widths of ore to even produce any attractive low grade propositions. According to Mr. F. B. Trude, who has just returned from the field, no find for years in W.A. had given better surface indications, which doesn't amount to much, anyway. It is very doubtful if anything under 10 dwt. will be profitable in this locality, and there is no evidence that any of the ore-bodies so far disclosed are likely to average much more than half this value.

## OUR BIG MINES.

### Examinations of Their Yearly and Half-Yearly Reports.

(By a Mining Accountant.)

### The Chillagoe Company Limited (In Liquidation).

### Report for the Year Ended March 31, 1913.

The report prepared and issued by the liquidator is a melancholy affair, well in keeping with previous reports issued by this unhappy company. It is also a dilatory affair, delay in issue being largely caused by the settlement of accounts between the new and old company. The history of the twelve months may be summed up in the deficit of £18,783, after the payment of £30,089 debenture interest, and after writing off £29,821. Of this latter sum, £28,510 was in connection with shares in other companies in liquidation. The details may be sorrowfully brought to light thus:—

Railway Department.—An effective train service was maintained, there being an unusual freedom from serious accidents throughout the year. Contrary to anticipation, cattle traffic was not augmented by the Biboohra Meat Works, as these, from various causes, did not commence operations until the month following the close of the financial year. The expenditure for the year was heavy, but, considering that wages increased at least 12 per cent. all round, that coal for the second six months increased 30 per cent., and all other supplies at least 10 per cent., the general railway manager regards the figures as satisfactory. The satisfaction to shareholders must indeed be of a decidedly negative sort. The manager considers that the operations for the year were in many respects the most successful for a number of years, for though the revenue was less than in some former years, the tonnage hauled was greater. This was not due to any adventitious circumstances, such as the carriage of heavy machinery and other such goods, and would appear to show that more ore was won, and that the industry in general was steadily progressing. The outlook for the railway for the current year is considered more promising and encouraging than it has been for many years. A revenue of £95,000 is expected. But anticipations of this nature have a habit of meeting with disappointment. The following comparative table illustrates the actual achievement of the last three years:—

| | Year ended March, | | |
|---|---|---|---|
| | 1911. | 1912. | 1913. |
| Receipts . . . . . . | £87,843 | £73,499 | £84,441 |
| Expenditure . . | £25,084 | £28,176 | £32,013 |
| Net revenue . . | £62,759 | £45,323 | £52,428 |
| Train miles . . | 108,321 | 106,946 | 116,520 |

Mines Department.—Mining operations on the Chillagoe field were almost entirely confined to the Muldiva mines, Mount Lucy ironstone quarry and the Chillagoe limestone and silica quarries. And there is nothing very encouraging to report concerning these. The Muldiva mines produced 3625 tons of ore, containing 28,997 ounces of silver, 88 tons of copper, and 629 tons of lead. On the

Etheridge field the Einasleigh and Union mines were worked. The main shaft at the Einasleigh was sunk to 498ft., and No. 5 plat cut. A crosscut east was started. At 95ft. below No. 4 level the shaft entered low-grade ore, and continued in same. A new body of ore was opened up in the footwall on No. 2 level, and some sweetening-ore was won. But, as in all the mines of this company, the ore-bodies are not sufficiently large for a concern of this magnitude. The Einasleigh mine provided the smelter with 27,439 tons of ore, containing 494 ounces of gold, 26,571 ounces of silver, and 1491 tons of copper. At the Union mine the main underlie was sunk from 293ft. a further distance of 100ft. The shaft exposed a vein at 393ft. in the footwall. A level was put in at 393ft., and extended east 115ft., west 70ft. The vein was proved to be separate from the ore formerly worked. The Union mine produced 150 tons of ore, containing 1006 oz. of gold, 2016 oz. of silver, and 31 tons of copper. A five-head battery and wet-dressing plant has been authorised to treat the low-grade siliceous ore developed in this mine. The Etheridge Branch continued to purchase ores outright at Forsayth, and the sampling mill put through 1089 tons of ore, in small parcels, containing gold, silver, lead, and copper.

Reduction Works.—How familiar is the following:—"Two blast furnaces were used, one lead and one copper; but the running was not continuous, due to shortages of ore, then to vexatious shortage in delivery of coke, and, later in the year, to the exceptionally heavy wet season, which prevented the lead-sulphide ores from being crushed fast enough for the requirements of the roasting processes." The history of the works is one continued battle against such odds. The technical work, nevertheless, deserves a word of praise. The total ore and metal-bearing fluxes received amounted to 58,990 tons, the supplies coming from the mineral fields as below. The previous year is given in comparison:—

| | Year ended March, 1912. tons | 1913. tons |
|---|---|---|
| Chillagoe Mineral Field .. .. | 20,057 | 26,161 |
| Herberton " " .. .. | 1,453 | 2,231 |
| Etheridge " " .. .. | 18,396 | 30,511 |
| Cloncurry " " .. .. | — | 87 |
| | 39,906 | 58,990 |

Included in the Chillagoe field is 12,848 tons from the Mungana company; the lead-ore from which was lower in copper content than formerly. The roasting works crushed 15,176 tons of ore, through rock breaker and rolls, the final crushing being done with the help of ball and Chilian mills. Edward's furnaces are used to partly roast some of the material high in sulphur, e.g., gold concentrates, preliminary to mixing it with the crudes ores for the Huntingdon-Heberlein and Dwight-Lloyd processes. Regarding lead smelting, the furnace did satisfactory work, clean slags resulting, and mattes being produced with a lower lead content compared with copper. The matte production from this furnace was much lower in copper than formerly, due to the lower copper grade of the lead ore from the Mungana mines. Copper smelting operations were concerned with siliceous ore, and considerable additions of limestone and ironstone were required. The copper converting plant was worked in conjunction with the copper furnace. In the following table will be found a comparison of the input of ore and output of metals for the last three years:—

| | Year ended March. 1911. | 1912. | 1913. |
|---|---|---|---|
| Ore and metal-bearing fluxes .. .. .. tons | 61,094 | 39,978 | 59,042* |
| Metals produced— | | | |
| Copper .. .. tons | 3,272 | 1,845 | 2,177† |
| Lead .. .. .. tons | 2,396 | 1,410 | 2,842‡ |
| Gold .. .. .. oz. | 11,648 | 2,286 | 9,827 |
| Silver .. .. .. oz. | 512,625 | 197,886 | 272,670 |

*Does not include 1284 tons of flue dust accumulated from previous periods.

†Blister copper, 2200 tons.

‡Lead bullion, 2906 tons.

Accounts.—These are gloomy. The brightest spot reveals the following:—

Working Account.

| | |
|---|---|
| To Railway and Wharf Expenditure .. | £47,248 |
| " Mining Expenditure .. .. .. .. .. | 51,774 |
| " Ore Purchase .. .. .. .. .. .. .. | 280,127 |
| " Charges on Bullion .. .. .. .. .. | 17,589 |
| " Charges on Copper .. .. .. .. .. | 25,335 |
| " Reduction Works Expenditure .. .. | 115,507 |
| " Balance carried to P. and L. Account .. .. .. .. .. .. .. .. | 53,792 |
| | £591,372 |
| By Railway and Wharf Receipts .. .. | £101,138 |
| " Copper and Bullion Account .. .. | 433,720 |
| " Proceeds of Ore .. .. .. .. .. .. | 56,514 |
| | £591,372 |

The working profit here, however, is undoubtedly a mirage of finance. The surplus of £53,792 is converted into a heavy dead loss when the P. and L. account charges are taken into consideration. These latter include over £11,000 for administration and head office, and a killing £33,000 odd for interest. The writing off charges also are heavy, but they do not make any allowance for depreciation of plant. So from a credit balance of £2271, the company has proceeded to a deficit of £16,512. This result, during a year of high metal prices, etc., with a fairly-well sustained output of ore, cannot be considered as anything but most lamentable. The balance-sheet gives one the shivers. In preference to dilating upon the unhappy facts disclosed therein, the following summary must tell the tale:—

| | Year ended March. 1911. | 1912. | 1913. |
|---|---|---|---|
| Revenue .. .. .. | £629,183 | £343,859 | £593,332 |
| Expenditure .. .. | 562,997 | 363,082 | 582,294 |
| Written-off .. .. | 55,373 | 13,368 | 29,821* |
| Net profit .. .. | 10,833 | — | — |
| Net deficit .. .. | — | 32,591 | 18,783 |
| Paid capital .. | 452,857 | 552,818 | 587,500 |
| Debentures and deficiency coupons .. .. .. | 828,198 | 853,198 | 848,062 |
| Other liabilities | 56,636 | 112,089 | 96,201 |
| Liquid assets, not including stores, etc. .. .. .. .. | 60,613 | 77,678† | 42,313‡ |
| Debit .. .. .. .. | 771,562 | 887,609 | 902,950 |

*No charge for depreciation of plant.

†£14,745 premium on new issue of shares.

‡General stores, coke, etc., amount to £30,694.

## QUEENSLAND'S "BIGGEST MINING PROPOSITION."

In the Queensland Legislative Assembly, the Mines Department estimates being under discussion, on the item, "In aid of Mining £27,000" (the same figure as last year), the proposal for a deep exploring shaft at Charters Towers, as put forward by Mr. T. Mills, was reviewed. Regret was expressed by some members that the Government had turned the scheme, and the Premier was reminded that, on his visit to Charters Towers, he had admitted that "something must be done for the place." The claims of the district were strongly urged, and in comparison with them, it was said, the "via recta" railway scheme was simply throwing money away. If relief was not given the Towers was going to fade away, and the State was going to lose an immense amount of revenue. Mr. Mark's report, on which the Government had acted, was severely criticised, but, on the other hand, that of the subsequent board of experts was disagreed with, because it seemed to favour some such scheme as Mr. Mills'. There was a general desire, however, that some assistance should be given to "the Towers"; if it became known that the Government had lost confidence in the field it would not be well, and people would cease to invest their money. If the scheme had been approved, it would have given the field a further four years' lease of life. Certainly, if anybody was prepared to put up £60,000, then the Government should subsidise it by a like amount. At any rate, let some modification of the Mills scheme be submitted. The hope was expressed that the last word had not been said on the matter. Although members were not at one on this particular proposal there was practical unanimity as to the need for a more vigorous mining policy than the Government had been following in recent years. The Government could at least assist the field by the loan of diamond drills.

In reply, Mr. Appel said that the question which the department had to decide was whether, in granting that particular subsidy, they were carrying out the policy of the department—not to help the individual, but to assist the industry generally. The scheme, if approved of, would require an amending Act to enable it to be carried out. He then traversed the history of the movement, and said that the personnel of the board was undoubted. After careful consideration of that report in conjunction with the whole of the inquiries already made, the Cabinet came to a conclusion unfavourable to the project. It was held that it would not achieve the object which it was claimed it would do; further, that it would not be conclusive as to whether the country at the lower level of the field was auriferous or not. In addition, it was held that it would not have the effect of ventilating the greater portion of the mines of Charters Towers. Really it resolved itself into a private project, and undoubtedly as such it was a good one. One of the matters urged, and one of the reasons for the fresh inquiry, was on account of the ventilation which it was said would be provided for the other big mines of the field. Yet the board had conclusively said, on the strength of the evidence of mine managers, that it would not have that effect. On the question of capital, the board was unfavourable to the proposition. If the company, as a company, made application to the department for assistance, it would be considered in the usual way, and, all things being equal, the assistance, as with other cases, would be granted.

The item was agreed to.

## IRON PHOSPHATE AT WHITFIELD (V.).

In 1905, Mr. A. M. Howitt, of the Victorian Geological Survey, made an inspection of the Whitfield district, and brought back with him a ferruginous specimen which was submitted to the laboratory for analysis, with the result that it was found to contain 10 per cent. of phosphoric anhydride. Subsequently the ridge from which the specimen came was prospected, and the lode discovered, the situation of the ridge being between Stony Creek and the King River. As the result of a recent inspection of the lode and surroundings, Mr. A. M. Howitt reports that "the occurrence is of value, as it proves that rich phosphate of iron in lode form may occur in other localities in Victoria amongst the extensive areas of upper ordovician rocks, which are in many districts so far little known from a mineral aspect. The ore is itself of interest, having been determined by complete analysis as indicating dufrenite (basic phosphate of iron), new to the list of Victorian minerals.

"As at present exposed, the lode varies from a few inches up to 1ft. in width, and some of the richer portions yield up to 31.54 per cent. of phosphoric anhydride. The top or southerly prospecting cut is 4ft. across the strata, and here the rich ore is only narrow and pinching out going south. The middle cut, 26ft. further north-west, is 5ft. across the strata and 3ft. deep, proving 2in. of rich ore and 6in. of poor, bounded by slate and sandstone, showing traces of phosphates. The main cut and 6ft. shaft are 120ft. further north-west, and here up to 1ft. of ore has been proved.

"At present, the amount of rich ore is too small to be of commercial value as a phosphate, but further prospecting may prove other adjacent veins. The ore might be of value as a pigment, as when ground it produces a dark green colour with a moderate covering power."

## NEW MARINER'S MINE, STEIGLITZ (V.).

According to Mr. W. H. Ferguson, the New Mariner and the Clifton reefs, near Steiglitz (V.), are not identical. As a matter of fact, it is evident that the country, which carries a number of reefs and veins, is much disturbed. Apparently some excellent yields have been obtained from the New Mariner's property, as in his report Mr. Ferguson states that about 18 years ago it was actively worked for 20 months, during which time it is said to have yielded 28,000 oz. of gold, the best return for one run of a fortnight being 1012 oz., and some pyrites which were treated contained gold, and were worth £29 per ton. At that time two reefs were worked, and some good ore yielding about 1 oz. per ton was won from the 200ft. level, where it was from 2 to 6ft. thick.

In disagreeing with the opinion locally expressed, that the Mariner and Clifton reefs are the same, Mr. Ferguson says:—"If the Cutting and the Clifton reefs are members of the same series of parallel northerly-southerly fissures, it is possible that they may have faulted the New Mariner's reef for as far as it extended northwards towards the Clifton reef, and it may rest against the south-eastern side of the fissure as far north as the Clifton reef; but, if that be so, the New Mariner's reef would be located at a depth below the limits of practical mining. It has been mentioned that at the northern end of the open cut the New Mariner's reef has been cut off by a fault containing some quartz, which is known as the Cutting lode. A couple of feet north is another fault lode, and 22ft. north of the Cutting lode some work has been done on a reef which is known as Mulhan's. North of these fissure lodes the New Mariner's reef has not been found. In all probability, portion of it yet exists below the surface, but the portion near the open cut may have been faulted upwards, and, if so, will have been worn away as the level of the country has been lowered by denudation."

Mr. Ferguson further considers that what Mr. Martin has traced is a series of reefs across Mariner's Gully, and up the opposite hillside, and that further prospecting north of Mariner's Gully is advisable, as there the series may be found to be auriferous, in which case they could all be worked from one shaft.

# THE COAL MINING INDUSTRY.

## New South Wales.

### Northern District.

(From Our Correspondent.)

Newcastle, November 15.

A one-day strike took place at Seaham No. 1 colliery on Wednesday. On Saturday last four men were told that they had filled too much dirt in the coal sent out by them, and that they would have to see the manager before they started again. They say that they went to the colliery on Monday and Tuesday to see the manager, Mr. Lawson, but he was not there. On Wednesday morning they placed their case before the officials of the lodge, and the latter communicated with Mr. Lawson on the telephone. The manager said that the men could not start work again until they had seen him. The whole of the men then refused to go in, and returned home. The officers of the lodge interviewed the manager during the day, and arrangements were made for the men to return to work on Thursday morning, and the men were at work again on that day. The men contended, before the manager, that the agreement made it unnecessary for men who had filled too much dirt to see the manager personally—that the matter was to be stated before the board at the pit top, and there determined. However, the manager gave the officers to understand that he would not depart from the present method of determining the amount of dirt in a skip.

The Northern Coalminers' Wages Board was to have visited Seaham No. 1 colliery on Wednesday, but owing to the strike the visit was postponed until the following day. It was a visit of inspection in connection with the Stockton-Borehole inquiry, in respect of which a lot of evidence has been given by both sides. The board now wished to see work carried out under some of the conditions which prevail in Stockton-Borehole. When the board went down the Seaham pit on Thursday, they were escorted through the mine by the manager, Mr. Lawson, and the working of the bord and pillar system was explained. The board heard further evidence yesterday, and on Monday the Stockton-Borehole mine will be inspected.

In connection with the inquiry into the condition at Stockton Borehole colliery, evidence was given on Tuesday by Nicol Peacock, secretary of the Sydney Colliery Limited, to the effect that there was an appreciable decrease on certain days in the number of men who presented themselves for work. This was most noticeable on Wednesdays and back Saturdays. On back Saturdays the shortage was from 20 to 25 per cent., and the reduction in output was approximately two thirds. The difference was not so great on Wednesdays, but it was appreciable. His inquiries had shown that the absentees were racing men, and their staying away meant a considerable loss to the company, and to the men themselves in wages. In the Northern district the mine owners have made like complaints for a long time past, and they say that on a day when races are being held there is always a large number of men absent. The men also object to working on back Saturday, and many of them stay away even if there are no races or other sports to entice them. In the case of at least one colliery, employing between 300 and 400 hands, the number of absentees is so great at times, on back Saturday, that the manager has to send the other men home, as it would not pay to work the pit.

The Pelaw Main award was mentioned before the Wages Board again on Monday, when Mr. A. Lewis, the men's advocate, asked whether the clause referring to the provision of spare places was intended for the benefit of the men working in the places adjoining. The Chairman (Judge Edmunds): "Yes; that is so. They are for the benefit of the men in the adjoining bords, who cavilled them. They are not for the shooters and fillers." Mr Kelynack, council for the proprietors, said he would not like that limitation placed upon the award, as it would put them in a difficulty in providing spare places for a number of the men. His Honor: "Well, I put that limitation on it. The places must be kept cut up, but they are not for the shooters and fillers." The board decided to add to the clause—"To be cut, if necessary, by other machine men, but to be filled only by the shooters and fillers who cavil the adjoining bord."

In the Stockton Borehole dispute the proprietors have put in their counter claims, and they ask therein that the rate for winning coal on the longwall system shall be 1s. 9d. per ton (the coal to be filled in the gross), as against the claim of 3s. 1d. made by the men. The evidence in this matter is practically completed, and it will not be long before an award is given by the board.

The coal trade of the port of Newcastle continues good, although time has been lost during the last fortnight by several collieries through the lack of berths for shipping. The output of coal for the week ending to-day was over 150,000 tons, and of this quantity 120,000 tons was exported, being about 2000 tons in excess of the quantity for the corresponding week of last year.

The annual election of officials of the Northern District Colliery Employees' Federation will take place early next month. Nominations are now being received. There is not likely to be any opposition to the secretary, Mr. W. Brennan, or to the treasurer, Mr. A. Lewis, but already there are four nominations for the position of president. Considerable interest will be taken in the election, for the opponents of Mr. D. Watson, the president, are Messrs. E. Peters, A. Teece, and C. Thomson, the first two of whom are well known throughout the district, and are prominent workers in the federation.

In respect to the testing of explosives for use in collieries, Mr. M. Charlton, one of the members of the House of Representatives for this district, has been informed by the Prime Minister that the whole question is being inquired into. Mr. Cook says that if the cost is moderate, a testing station will be established.

The Abermain Colliery Company Limited has declared an interim dividend, in respect of the half-year ended 31st October, at the rate of 10 per cent. per annum.

### Western District.

(From Our Correspondent.)

Lithgow, November 15.

The past fortnight has been a very satisfactory one so far as the collieries of the Lithgow Valley and adjoining district are concerned. The orders dealt with have been good ones, and the railway truck supply quite up to requirements. Full time was worked at both the Lithgow and Hermitage pits—which both belong to the Lithgow Valley Ltd.—while ten days were put in at the Vale of Clwydd mine. Oakey Park colliery worked 10½ days, while the full number of shifts was worked at the Invincible mine, Cullen Bullen, on the Mudgee line. At the Boldon colliery, also on the Mudgee line, the truck supply was exceptionally good, and satisfactory time was recorded by the men. At the Great Zig Zag colliery the full 11 days were worked, and a good quantity of coal was sent away from the sidings.

### Southern District.

(From Our Correspondent.)

Wollongong, November 15.

The Bulli Colliery has obtained a further suspension of labour conditions on its extension leaseholds, that is, the new parts of the property which are being opened out and which will make a new colliery. The period applied for was six months. These leaseholds have been under labour suspension for some years now. It was stated by the manager, Mr. Broadhead, in making the application, that £80,000 had so far been expended in the development of the leaseholds, and that much machinery had been erected.

The hearing of the claims of the Employees' Association by the Wages Board, actually the making of a new award, has been the event of the week. The old award expired in August last, but an extension for three months to November 10 was granted. The employees' representatives feared that such an extension would be unnecessarily long; however, it in turn had expired before the Wages Board had got to business, and so a further three months had to be allowed. The claims on almost every item are for advances. The miners' minimum wage at present is 11s.; the claim would raise it to 13s. 7d.; that is, a miner, whether he earned it or no, would be entitled to that amount for a day's work. Claims for payment for several items of a miner's work are made, which the employers contend the hewing rate was originally fixed to cover. Among these claims is for extra tonnage for the use of safety lamps. These are in use throughout the district now, and so an allowance for them would mean a general increase of the hewing rate; they also claim for afternoon shift and for night shift; the former shift, it was stated, makes it between 10 and 11 p.m. before the workman gets home. The miners aim at discouraging these two shifts, and are asking as much as 6d. per ton for the night one. One of the principal battle-grounds will be the claim for eight hours bank to bank for all not now on that time—namely, shiftmen, wheelers, etc. On the occasion of the last award making this claim was made, the chairman conceded to wheelers half of it, reducing their day of nine hours to eight and a half. The employers have opposed it with all their strength, contending that the reduction would mean either a considerable increase of expense in working or reduction of output. No doubt the chairman will be very much influenced by the evidence given as to the experience of a half-hour concession. Nothing but the emphatic assurances he received from the employers' side stopped the last chairman from granting the eight hours, as, in the abstract, he favoured the principle for underground workers.

Payment is also asked for travelling into a place over a mile. The argument is that the miners' time is cut into by these long walks; for instance, it was stated that two miles in means an hour and a half of walking. Corrimal carries the men in by rail, and will shortly extend this facility 30 chains further in; each trolly seats four men. It is said the board will endeavour to finish the hearing of evidence by the Christmas adjournment.

On this occasion there are no legal advocates. The making of the award will virtually devolve upon the chairman; a preliminary discussion between the representative members of the board, with the view of finding points of agreement, and thus reducing the case for hearing, proved fruitless.

## Victoria.

### Powlett River District.

(From Our Wonthaggi Correspondent.)

A special district meeting of the members of the Victorian Coal Miners' Association was held in Wonthaggi on Sunday; Mr. T. Mathieson, district president, in the chair. The general secretary, Mr. F. J. Murphy, reported on the conference held in Sydney recently, at which it was decided to form a Labour Federation of Australasia. He stated that the Sydney Trades Hall was not represented at the conference, but that twelve of the principal industrial unions of New South Wales were. It was agreed to hold another conference in Sydney early next year, to which delegates from all unions throughout Australasia will be invited. The report was discussed, all the speakers favouring the formation of a Labour Federation in preference to the present system of sectional and craft unions. Some, however, were of opinion that the organising work in Victoria should be done through the Trades Hall, and not by the V.C.M.A., which was the only Victorian union represented at the conference. After a good deal of discussion a motion was carried that the V.C.M.A. join the Labour Federation of Australasia, and the amount of the entrance fee was passed for payment. The financial affairs of the union were discussed at great length, and Mr. H. McCulloch, who acted as general secretary during the first four months of the year, came in for a good deal of adverse criticism owing to the unsatisfactory manner in which he carried out his duties, and not having kept any books showing his receipts and expenditure. Mr. J. Hasson, president of the Powlett branch, spoke with a good deal of warmth. He moved—"That the meeting express its censure and dissent from McCulloch's statements." The motion was carried. A further motion was carried, "That an independent auditor be engaged to go into the financial affairs of the union during the time Mr. McCulloch was acting as general secretary." A motion of sympathy with the strikers in New Zealand, and expressing indignation against the Government of New Zealand for the methods it was adopting towards the strikers, was carried.

---

# MINING IN NEW SOUTH WALES.

## Broken Hill.

(From Our Correspondent.)

Broken Hill, November 14.

Two things pleased Broken Hillites this week, the 3s. dividend from the British and the 4s. from Block 10; on the other side two things troubled and annoyed folk, slight disputes on the South Blocks (Zinc Corporation) and on Block 10. Trivial matters both the latter were, but they dislocated work and also showed that the men (or the unions behind them) are determined to create a disturbance if possible. In the case of the South Blocks, during a stormy day, the atmospheric conditions were such that the smoke and air had no free egress from certain of the workings. The men, or some of them, did not like the stuffiness of underground, and went to the surface. The result was that work on one level was suspended for a couple of shifts. None of the officials of mine found the air specially bad, neither did the mining inspector, but the men had the master hand.

The trouble on Block 10 was in realation to gates on cages and the changing of platmen. One of the platmen was suspended for disobedience of orders, some men left work, others followed their example, and the result was a complete closing down of mine and mill. A conference was held to-day, at the first possible moment. After a long talk matters were amicably settled between manager and men. At first work was to be started this afternoon, but the management finally decided not to resume productive work until Monday morning.

Neither dispute was of importance, but the men (or their unions) seem anxious to show their power and let the manager know that an agreement can be broken. If the companies committed a breach—well, really, it seems as if the unions are trying to goad them to do so.

The Proprietary's directors are in Broken Hill to-day having their half-yearly look at the mine. The visit is more formal than otherwise.

No new developments are reported—three good things in one week exceed the average. The Central body at the 1300ft. improves—at latest the crosscut was in nearly 30ft. in ore of better grade than at the 1200ft. level. Not only is the ore of higher grade, it is also freer and looser and easier of treatment.

The British, too, is showing up excellently at the 1200ft. level, where the grade seems to improve as the crosscut advances. The South is good everywhere, the North continues "No. 1 topside," the Junction North is not doing too badly, and and the South Blocks still shapes well at depth.

The North mill put up a record for a recent week, when it treated 6300 tons of ore for 1100 tons of leady concentrates. A recovery of 76 per cent. lead and 52.4 per cent. silver is shown on recent labours.

The Central mine development carries ore going over 20 per cent. for lead.

Lead appears to be falling in value, but despite that the margin is still profitable. Even the forward price of £18 15s. will leave a profit. "I ran my mine for five years," said one manager to-day, "and made profits with lead at an average of £12 10s. per ton.'' Recently, however, wages and expenses have been higher, and extra depth of working means extra cost.

Recent development should give a fillip to the mines at the north and south ends of the line of lode. More activity could easily be displayed in the working of some of these young properties—a matter of £10,000 could with wisdom be expended in testing deep down the southern end of the line of lode.

### Bathurst District.

(From Our Correspondent.)

Bathurst, November 14.

A mine that will be heard more of at an early date is the Iron Duke copper mine, near Dandaloo. They have two shafts, one being over 200ft., and the other, which is 1000ft. further along the line of lode, 100ft. Below the oxide zone the lode is composed of siliceous sulphides, and is 20ft. wide. The owners are now in the position to produce on a fairly large scale, having some 800 tons at grass of various grades, and are at present carting 400 tons of Tullamore railway station for despatch to the smelting works. They have no concentrating plant at the mine, the whole of the capital so far expended going in the direction of underground development, for which sensible course the management is to be commended.

Considerable prospecting has gone on at the Yellow Mountain, 12 miles out from the Mineral Hill silver-lead mine, near Condobolin, but, as depth was attained, values became disappointing, and from present indications the work may be suspended if more encouragement is not met with.

The Mountain Run copper mine is improving as depth is attained. The lode is now 10ft wide, and will bulk about 7 per cent. Another 25-ton lot is going forward to the reduction works, and, it is estimated, will yield 10 per cent.

Latest news from Amalgamated Hill End is eminently satisfactory, and it would appear that the fringe only has been touched of the rich gold now in course of opening up. The decision of the board to offer the balance of shares to shareholders only is to be commended. This will give ample capital to fully equip the mine and develop it at a far deeper level than the present workings. Hill End may yet make a second Bendigo.

### Lithgow and District.

(From Our Correspondent.)

Lithgow, November 14.

The Belmore Copper Mine, near Cow Flat, at present being worked by Mr. H. Wilson and party, of Sydney, is making a very fine show of good ore, and it is hoped that the mine will be reopened on an extensive scale. The Sugar Loaf, in the same locality, is still working and getting out some splendid stuff. The roads being in a very bad condition, teamsters do not care to travel the road to the mine, and some difficulty is experienced in getting the stone to the railway station, some twelve miles distant.

The Newbold Silica Fire Brick Company Limited have taken up some 80 acres of country suitable for the manufacture of this class of brick at Lidsdale. The firm have already their new works (which are connected by a railway siding with the Great Western line) equipped and in full working order. The silica brick is very much in demand by smelting and furnace companies generally, and the market is rapidly increasing.

### South Coast.

(From Our Correspondent.)

Wollongong, November 15.

In the far South Coast the recent find of a gold-bearing reef at Coolagolite, near Cobargo, attracts some attention. A number of applications to enter and mine on Mr. John Gillespie's property have been granted. Wilson and Chambers, who have a holding adjoining G. William's prospecting claim, in trenching struck the reef the same day as they started. It is in settled granite country, and some think it has on that account a better prospect of permanency than had the find thereabouts of some years ago.

The Yambulla field, some years ago a busy and interesting centre on the far South coast, is now practically dead. The battery and other plant of the Yambulla Mines Co. was sold by auction the other day, and there is only one working party now on the field.

---

## VICTORIAN MINING ACTIVITIES.

### Bendigo and District.

(From Our Correspondent.)

The gold production for the week ending November 15, 1913, amounted to 4317 oz. 17 dwt., including 1205 oz. 17 dwt. from the Lansell Proprietary mines for the month of October. The principal producers were Lansell's Little No. 180, 706 oz. 7 dwt.; Central R., W. and Blue, 305 oz. 14 dwt.; Ironbark, 280 oz. 17 dwt.; Lansell's North R., W. and Blue, 274 oz. 14 dwt.; Johnson's Reef, 200 oz. 10 dwt.; Virginia, 193 oz. 19 dwt.; Great Northern, 187 oz.; Clarence United, 134 oz. 15 dwt.; Lansell's Sandhurst, 123 oz. 3 dwt.; North Bendigo, 121 oz. 14 dwt.; New Chum Goldfields, 117 oz. 5 dwt.; Great Extd. Hustlers, 112 oz. 10 dwt.; Victoria Proprietary, 95 oz. 1 dwt. Three dividends aggregating £2589 13s. were announced, viz.:—Ironbark, 1s., £1239 13s.—total to date, £123,195 11s.; Great Northern, 6d., £750—total to date, £171,700; North Bendigo, 6d.. £600—total to date, £7800.

Ironbark made a much better showing from the 480ft. formation on the Sheepshead line, the average of the yield being highly profitable. The increased return is due to the higher grade quality of the upper portions of the reef in the south stopes. Operating at about 70ft. from the Victoria Consols boundary very fair prospects are visible across the saddle, in a width of 10ft. of crushing material between the hanging walls. At 80ft. further north more gold, and of a coarser character, is showing in the cap stone. Above this stope there is a lengthy neck of quartz, from which the richest yields were obtained in the initial stopes of the opening up work in the No. 1 winze. This portion, however, has not maintained its quality very far north or south of the winze, most of the gold for the past 12 months having been won from closer to the turnovers. In rising through the neck stone at a short distance from the stope on the cap, quartz of low-grade has recently been traversed. The east leg has lately proved more remunerative in this direction, and the lava has evidently played an important part in the deposition of the gold—conditions that prevailed in the early history of the reef. The north level has been stopped temporarily to permit of the extension of the north stopes in the cap and neck of the reef beyond the small tribute block. A little gold is seen in these stopes, with similar prospects visible in the neck where the level has been suspended at 100ft. further north. Below the main level a crosscut has been driven east to centre from the winze on the west leg, disclosing a number of mineralised spurs. With the new machinery on the eastern shaft work is now being conducted more economically. Shaft-sinking is in progress below 551ft. with the object of following the north pitch of the reef to the Hercules and Energetic boundary, the cap having pitched under the main level some weeks ago. There is a length of 380ft. of the formation yet to work north of the eastern shaft. Very little is being done on the New Chum line, where the water has risen to between the 800ft. and 900ft. levels.

Central R., W. and Blue had a couple of firings in the stope north of the No. 5 winze below 318ft., dislodging some rich stone of a highly mineralised character. The gold is of excellent sample and showing more freely at 5ft. from the eastern hanging wall. There is about 200ft. of the reef to extract from the winze to the end of the lease, which is estimated to be of profitable quality, though much inferior to that portion close to the No. 5 winze. Where the richest stope is located is 18ft. under the 318ft. workings. The 400ft. north level having reached the boundary, the reef is being back stoped from the end, a little gold showing in 8ft. of stone. The width of the formation here does not coincide with the conditions prevailing at almost the same level in Lansell's Little No. 180. At 539ft. in the level the crosscut west is being extended to ascertain the value of the irregular quartz, which is very freely deposited about the middle and western lavas in the adjoining property. Above 318ft. the stopes disclose a little gold. A good deal of interest is centred in the extension of the 800ft. and 880ft. crosscuts and levels. At the former depth the east and west back of the reef showing in the 720ft. plat will be first intersected. The west crosscut will probably be extended to the west leg and lava of the 650ft. formation. Both reefs have shown gold, and the management is hopeful of the 720ft. formation proving a fair asset. There is nearly £1700 in hand, and a 2s. dividend should again be available at an early date.

Great Extended Hustler's crosscutted to what is known as the east back of the new 1053ft. reef some time ago, at 465ft. north of the shaft, and found the bedded quartz associated with fault stone, where a slide intersected the back. In stoping the latter good prospects were revealed for a time, but towards the end of last month this stone contracted greatly overhead, and leaving the outlook anything but promising. Last week the quartz was found widening out again higher on the back and carrying gold more freely than hitherto. Over the crosscut there is a rise to 40ft. on the bedded quartz, in which gold was traced at intervals throughout. A level has since been driven 60ft. north on the same deposit, and towards the end of the term fair gold was exposed in 2ft. of stone. The indications are now more favourable than at any stage at this depth. At 1226ft. a crosscut is going out to test the value of the reef, which is intact from the bottom of a winze at 50ft. below the 1053ft. level. The work at 1226ft. is important, as any payable discovery there would mean clinching the future of the reef for some time. In driving and stoping in the 1053ft. winze there is 2ft. to 3ft. of payable material. Further east the company are driving north on the Little reef in order to get under the 777ft. winze before rising to connect. The reef is larger in the winze and profitable. As the level advances better prospects are anticipated in the next 40ft. At 717ft. the northern extension of the Little reef is also being sought for north of a fault, and should be picked up shortly. Beyond this break profitable results were got in the level above some years since.

Broken Hill Gold and Copper Co. purpose commencing operations next month. The venture is in the southern portion of the Broken Hill field and owes its origin largely to Bendigo capital. Fair results are stated to have been obtained under ordinary methods of treatment, but were greatly exceeded by the Federal Ore Co.'s process subsequently. Indeed, it is on the strength of the assay results under the latter method of treatment of the selenide ores that the company was floated. The discoverer of the process (Mr. J. H. Niemann) is accompanying the mine manager (Mr. D. Mann) to Broken Hill, with a view to a general assay of the lodes and supervising the treatment of about 1000 tons of ore as a practical test.

Johnson's Reef owed last week's success mostly to the Collmann Reef, on the Paddy's Gully line, at 1730ft., in the No. 2 shaft; the higher average of over 13 dwt. per ton being obtained. The reef has so far been of erratic quality, but gives some promise of proving payable over the length of several hundred feet still remaining toward the Princess Dagmar boundary. At the No. 3 shaft on the Derby line, the best prospects are still disclosed in the east leg of the 1150ft. reef, in driving toward the shaft from the crosscut off the main south level, 1ft. of stone being available. Northward operations have been resumed on the west leg of the outer reef. At 300ft. north of the shaft a crosscut has been started east to reach the 1225ft. reef, which has shown fair gold in the rise over the 1225ft. crosscut. The north crosscut is well located for rapidly ascertaining the resources of the formation, as the west leg should be reached about the end of the month. There is every likelihood of a 1s. dividend in December.

New Argus, driving on the west back of the Clarence Reef, above 2280ft., from the centre winze at the company's shaft, have revealed a few colours of gold in 18in. to 2ft. of stone. The improvement was noticed after the lava crossed to the west back. There is 400ft. of solid ground from here to where the company are drivnig on the same reef from the Clarence United 2280ft. level. A little gold is seen in the latter end, but the first milling was of no value.

Collmann and Tacchi had an interesting development, a few colours of gold being found in the west leg of the Sandhurst reef below 800ft. The leg is being exploited at 385ft. south of the shaft, and close on 100ft. from the boundary of Lansell's Sandhurst mine. In the latter mine the caps average over 14 dwt. per ton at over 400ft. from the end of the lease, and is intact over the intervening section. The Collmann and Tacchi worked the eastern limits of the reef extensively many years ago southward from the crosscourse, the stone being exceedingly rich about the fault. The work does not appear to have included the west leg, and about 150ft. of the cap stone was also abandoned. The reef pitches very rapidly below the level at 330ft. from the plat, and is being tested from a winze on the east back, where a crosscut was put through the cap, and nothing of value was found in the cap, but the west leg promises to be more productive. Back to the crosscourse this leg is likely to be found intact, and may be reached with a few firings in a crosscut at 100ft. nearer the shaft. Nothing is known of the formation north of the fault, general opinion in the early reefing days being that bedded deposits were not continuous through the fault. It has, however, been demonstrated in recent years that the crosscourse is younger than saddle reefs, and the Sandhurst backs are to be prospected opposite the shaft by crosscutting at 710ft. and 610ft., and connecting these levels with a centre winze. The reef channel proper has apparently been left unprospected upward from the 1000ft. level, with the exception of the west crosscuts at 500ft. and 200ft. In the 200ft. crosscut there is a small saddle formation. Below 2588ft. the company are sinking a centre winze, and anticipate reaching a new reef shortly.

North Bendigo sixpenny dividends are coming along at very frequent intervals for a 5s. stock. This week's disbursement is the thirteenth from the present saddle reef and slidy neck above 1000ft., yet values have never exceeded 8s. since the company started paying dividends. There is a fair quantity of crushing material still available both at 1000ft. and 913ft., and payable averages seem assured for some time, though the improved standard of the past few weeks is not likely to be long maintained.

## Castlemaine and District.

(From Our Correspondent.)

The discovery reported a few weeks ago of gold in a horse yard, near the gasworks, is giving good prospects. The discoverer is Mr Geo. Lane, and the site is where Vivian and Ford's foundry was in Forest-street many years ago. Down 30ft. in the prospecting shaft, nice-looking stone 8ft. wide has been found. Working with a windlass, they got 8ft. under the reef, when heavy water was tapped. A crushing is being taken out. The applications of two Maldon parties for a road claim to the north and south respectively, which were made to the council some weeks ago, and referred to committee, have not been again heard of. The reef is said to be the old Caledonian line, which was very rich in its shallows.

Spring Gully's last week's operations were more profitable than those of the two previous terms, and over the payable margin. From 170 tons 49 oz. 11 dwt. was obtained. The 240ft. level south is in 165ft., with a few colours of fine gold showing in the bottom spur, which is 6in. thick. An additional shift of men has been put on to extend the level. At 150ft. in, the east crosscut is out 10ft. and shows two spurs overhead, and they are slightly gold-bearing. In extending the north intermediate to 154ft. from the rise another fault has come in underfoot, and it carries up to 5ft. of crushed dirt. The upper slide is still showing gold in spurs and broken dirt. Gold is likewise seen both whilst stoping over the fault to the east of the level and in the bottom spur of the 200ft. south stopes.

Spring Gully No. 1 tried a parcel of 23 tons, but it was only worth 1 oz. 9 dwt. Operations have been chiefly confined to driving and stoping north on the slide above 300ft., opening up a thin vein of quartz revealing a little fine gold. Low-grade spurs have been seen both there and to the southward. As stoping extends to the east better results are expected.

South Spring Gully reports that the machinery should be ready this week, and if so, an inspection of the underground workings will be made.

McCann's Reef Co., at Yapeen, is beginning to look distinctly hopeful. They have cut into the western lode for over 4ft., and have not reached its limit. It is well mineralised. The main west crosscut at 150ft. is in 40ft., and at 38ft. the western reef was touched. This, too, extends beyond the limits of the drive. Both reefs are underlying east, and look well.

South Wattle Gully continues to look well at the various points being prospected. The stone generally is of good appearance, and even better prospects are expected in the near future, judging by the improving appearances. This applies more especially to the west leg at 300ft.

Oswald's gold mine, at Maldon, for last month crushed 403 tons for 199 oz. 9 dwt., and 20 tons were treated by the chlorination plant for 375 oz. 16 dwt. Stone worth 1½ oz. per ton is showing above the floor at 500ft., where stoping is in progress; and at 600ft. the reef in the stopes is from 3ft. to 8ft. wide, and worth from 10 to 15 dwt.

Campbell's Creek bucket dredge is getting payable returns from the No. 1 plant, and the result is doubly valuable because the second plant is still lying disabled through a breakage. From 133 hours 68 oz. 5 dwt. was netted.

The two Newstead mines, Blow Reef and Uncle Sam, have put trial crushings through. The latter sent 14 tons to the South German battery, and got a neat 7 oz. back. Blow Reef treated 18 tons for a battery return of 6 oz. 8 dwt., exclusive of concentrates.

## Malmsbury.

(From Our Correspondent.)

Further driving of an encouraging nature has taken place at the Malmsbury Alluvial mine. Boring operations have been continued from the main east level, and the No. 15 bore has disclosed coarse wash carrying gold at a height of 22ft. This bore and the one which was reported a week ago to have touched wash at 30ft. from the drive are 30ft. apart, and are from an extension of the main reef drive east. From these and other explorations, the management suspect that two distinct runs of wash exist over the main drive owing to the channel having been divided by a high bar of reef. While the present wash workings have given encouraging prospects, it has been thought that there was not sufficient water in the wash for it to be the main lead. Hence the decision to continue the reef drive to the eastward. The last two bores have shown a variation in the wash, it being much coarser, and carries more water. This feature suggests the main channel. Taking the whole of the bores together, gold-bearing wash has been proved for a width of fully 180ft.

A highly interesting case came before Mr. Warden Barlow, at Kyneton last week. For a considerable time past Mr. B. Beer has been working the Rainbow mine, at Tylden, and getting good gold from a narrow reef. It has at times been sought by Melbourne syndicates, and just lately Mr. F. Walker, of 361 Collins-street, Melbourne, has been successful in inducing the lessee to part with the mine. However, before this deal could be consummated, an application for forfeiture was lodged by Joseph Trickey. The grounds, as stated by Colonel McCay, who appeared for the applicant, were:—The conditions specified that 11 men should be employed, and there were never at any time more than 8 men working. About the end of last August, a tribute was let to Trickey for six weeks from 1st September. The mine was 180ft. deep, and from the bottom level a drive had been put in northward a distance of about 70ft. From the end the tributers put a crosscut westward to intersect the hanging wall reef. That contained little gold, and the drive was continued. Five feet further on a new reef was cut. Where it was so cut a break occurred. To the southward the stone is said by the tributers to be worth from 15 to 20 oz. per ton. When this was found, three weeks had expired. The tributers began to drive south on the rich stone, but when they had only gone 3ft. Beer told them they could not go south. Trickey, of course, held that he had a perfect right to do that, but Beer threatened to suspend operations on the ground that the mine was not being worked properly, and to emphasise his objections he walked off with the valve of the winch. They had then taken out 2 tons of good stone, and mixed with 25 tons taken from the stopes near the shaft, it returned 96 oz. If Trickey got the lease, he was prepared to comply with the covenants, and P. J. O'Connor, of Oxford Chambers, Melbourne, had promised to finance him up to £5000. After an adjournment for lunch, Colonel McCay announced that a settlement had been arrived at. The tributers were to be allowed to work the mine for five weeks from the date of the mine being unwatered by the lessee. Only the party of six were to work it; operations had to be done to the satisfaction of the inspector. This agreement was signed by the parties, and the warden said he would recommend the Minister to approve of same, and issue a lease to Francis Walker.

---

# THE NORTH MT. FARRELL CO. (T.).

(From an Occasional Correspondent.)

The directors of this company have declared another dividend of 6d. per share. For some years this company was struggling against adverse circumstances. Owing to low metal prices and increased charges all round, dividends became an impossibility. During the past two years the company has retrieved its position, and it has now a reasonable prospect in view of a profitable output. Some years ago shares were changing hands as high as 25s. At that time several works were undertaken, including the building of railway to connect with the Emu Bay line, involving a large expenditure of capital, but when the price of metals fell, with heavy liabilities to meet, the company had to make calls, which caused the inevitable fall of shares. The company has paid off all liabilities, is now in a sound financial position, and is providing a strong reserve fund to be expended in proving the mine at depth. A good output of payable ore is now being maintained, so that the present position, with shares under 10s., is a very different one to what it was six years ago, and even if a heavy fall in metals should take place, there is every reason to believe that moderate dividends could be paid, as there are no works ahead which will require a large capital expenditure, and the output of ore will probably be increased in the near future. The mine manager, Mr. L. C. H. Woodroffe, was formerly general manager of the Derby United claim, at Maldon (V.), and his Victorian friends will be glad to learn of his success in bringing his mine to the front.

---

# TASMANIAN MINING.

## Mount Lyell District.

(From Our Correspondent.)

Queenstown, November 14.

At the North Lyell mine ore breaking is in regular progress at all the levels from the 400ft. to the 1100ft. inclusive, with the exception of the 600ft. level, where a limited amount of exploratory work is going on. The bulk of the output continues to come from the 850, 1000 and 1100ft. levels, but the 400ft., 700ft., 925ft. and 1050ft. levels are each contributing a small tonnage. The mine is now outputting an average of approximately 10,000 tons of ore every four weeks, and it is in a fit condition, with ordinary luck, to ensure an output of this tonnage being permanently maintained. The important work of mullocking the stopes is being closely attended to, and a large number of men are regularly employed in the open cut breaking the overburden required for this purpose. The fireproof pump chamber at the 1100ft. level is just about completed, and both this and the chamber at the 700ft. level have been constructed on lines which provide practically absolute immunity from fire

Altogether the North Lyell mine is looking "real good" right from its nearest point to heaven down to its nearest point to the other place, and as far as its productive capacity is concerned, it is pretty certain that it has never, at any previous time in its history, been in a healthier position than it is to-day.

At the Mount Lyell mine the regular output of pyrites is now 800 tons a day, and of this about 700 tons is being won from underground, and the remainder from the benches of the open cut. The material from underground is coming from three levels, which between them are supplying pyrites from 15 different stopes. At the South Lyell mine, which may now be regarded as a patron of the Mount Lyell mine, fair progress is being made with the cutting of the main and cross galleries through the ore body, and a small tonnage of pyrites is being won during the course of this work. In addition to the supply of pyrites required for the reduction works, they are shifting about 1000 tons a month to the fertiliser works in Melbourne, and now that the company's pyrite mine at Chester has shut down, it looks as if future requirements in this connection will have to be drawn from the Mount Lyell mine.

Operations at the Lyell Constock mine at the northern end are proceeding on a limited scale, between 30 and 40 men being employed, chiefly in exploratory or prospecting work. In carrying out this a little ore is being won, and occasional parcels of 50 or 60 tons are being sent to the smelters. Some of this ore is worth up to 5 per cent., but there does not appear to be enough of this value to make any appreciable addition to the average value of the monthly tonnage treated.

At the reduction works three furnaces have been in constant operation during the whole of the current four weekly campaign, which closes on November 26. The ore supply is sufficient to ensure the three furnaces being kept in blast until the end of the term, so that the month's smelting run should be a good one. Assuming, therefore, that they will furnace 10,000 tons of North Lyell ore for the four weeks, and that the usual proportionate tonnage of pyrites of Mount Lyell pyrites will be treated, along with a small quantity of fair-grade material from the Lyell Comstock mine, the output of copper for the month under review may reasonably be anticipated to reach at least 600 tons.

Fair progress continues to be made with the Lake Margaret power scheme, and a big effort will be made to complete the principal portion of the work during the coming summer. Whether they will be able to do this depends largely on the two factors of sufficient skilled labour and the weather conditions. The latter during the last three days have been worse than anything experienced during the winter, when they were reckoned to have reached the limit. During the 24 hours ending 9 o'clock this morning five inches of rain have fallen, and at time of writing it is still raining in torrents, with gales strong enough to blow a man's hair off. All surface work at the mines has been practically suspended for two days, and considering it is nearly the middle of November, this is a bit over the limit, especially for those men who have to work in the open. Under ordinary conditions the work in connection with the Lake Margaret scheme has to be carried out in the face of great difficulties, but with weather such as prevails at present these are increased to an extent which can only be realised by those who are directly connected with operations.

At Lyell Blocks the main shaft has been sunk a little over 1200ft. from the surface, and sinking at present is through country consisting largely of conglomerate. This does not promise very favourably in regard to striking ore in or about the shaft, and the presence of this rock suggests that the shaft has entered portion of the main conglomerate mass of Mount Lyell. Should this prove to be the case, it will be "good-bye" to any hope of ever meeting with the North Lyell (or any other) ore bodies in the Lyell Blocks ground.

## WESTERN AUSTRALIAN MINING.

(From Our Correspondent.)

Kalgoorlie, Nov. 10.

The south crosscut at the No. 6 level of the Victorious, at Ora Banda, has cut the lode at a distance of 22ft. from the shaft, where it assays 120s. per ton over a width of 5ft. At No. 5 level the lode was cut at 50ft. in from the shaft, and assayed 110s. per ton for a width of 6ft., which shows that the lode will be cut in the shaft before reaching No. 7 level. In the east drive, at No. 5 level, at a point 252ft. in the drive, where the lode assayed 130s. per ton over a width of 6ft., another 13ft. in a crosscut gave values of 57s., indicating that the lode will be highly payable for a total width of 19ft. The No. 5 level alternated between high and low values for a distance of 295ft., the low values always being found where the oxidised ore alternated with the richer sulphide. The result of driving at the No. 6 level will be awaited with interest, as, should the high values prove continuous, the future of the mine and the district will be assured. All the mines in the Ora Banda district, including the Victorious itself, have proved so poor in the oxidised zone that they are quite unpayable for prospectors, but may be highly payable propositions at depth when backed by capital.

The management of Ziegler's Find, adjoining the Government reservoir, on Mt. Charlotte, at Kalgoorlie, who bought the head gear from the Creswick lease, situated about a mile south, have dismantled it during the week, and will be reerecting it immediately. Ziegler's does not appear to be a very promising property, and is held by the Adelaide Enterprise Syndicate, capitalised in 5000 shares of 20s. each, of which 1600 are held in reserve.

Mr. N. S. Stuckey, manager of the Greenfinch Pty. Co., formerly of Bullfinch, and for the last two years of Westons, has been having a look at mines in the Randalls district, 50 miles east of Kalgoorlie, and 8 miles south of the Transcontinental railway. This district has long been under a cloud, as it was condemned by Government experts, including Mr. Montgomery, Chief Engineer, a dozen years ago, on the grounds that the ore was too refractory to treat, except after roasting. This has been proved to be a fallacy, as the tailings, which have lain at the Government battery for years, have been treated by cyanide by Messrs. Truman and Peart for a recovery of 10s. per ton, from an assay value of 12s.. Mr. Collier, Minister of Mines, after a visit to the field, has decided to subsidise Truman and party to run the Santa Claus, where there is a lode 20ft. wide, which has given good returns under most disadvantages circumstances. This district, if backed by capital, will give a good account of itself in the near future.

Mr. R. Hamilton, of the Great Boulder Pty. Co., has abandoned his option on the Big Bell, at Paton's Find, 18 miles west of Cue, and also on the Rothesay, at Yalgoo, as the prospects in both cases did not seem to warrant further expenditure. The Big Bell appeared to be a rather promising proposition, as the first 83 tons treated gave a return of £230, or 56s. per ton, exclusive of gold in residues. However, 48 tons broken from the 52ft. level gave a return of £60, or 25s. per ton, and sampling also proving unsatisfactory, induced Mr. Hamilton to abandon the option. Regarding the Rothesay, it was abandoned a dozen years ago by the old company, after treating 9000 tons for a return of £14,000, or 31s. per ton, and present tests have, apparently, proved unsatisfactory, hence the rejection of the property. The 20-head mill from the Rothesay has been lying on the Royal Standard, belonging to the Bullrush Estates, for the last year, and the management appears in no hurry to start it.

The Ruby Well Development Syndicate, and the Ruby Well Syndicate, which both secured options on saltbush flats at Holden's Find, 55 miles north of Meekatharra, and 16 miles from Ruby Well, are already satisfied that the district is no good, although nothing has been done to prove this. This is the worst feature of Adelaide syndicates. Their experts take options on mine applications, which have neither been granted, surveyed, nor proved, and immediately start a wild gamble in the scrip, and, when the gamble collapses, retire without ever having put a pick in the ground. This sort of thing should be discountenanced by the Government and the Stock Exchanges, instead of being tacitly encouraged, as it appears to be at present.

The recent activity in Lake View and Star shares, due to the high values discovered at the 2100ft. level of the Lake View mine, has, apparently, died out, and prices are already sagging. The mine, in spite of this setback, is one of the soundest propositions in this State, and is earning and paying 16 per cent. per annum on the par value of the shares of 4s. Even if the Lake View is no good, the Star portion of the property is good enough to last for years, and to maintain the present rate of dividends. The manager, Mr. H. E. Vail, is the most practical and energetic mine manager on the fields, and has to consult no one as to how a mine should be worked or developed underground.

## QUEENSLAND MINING.

### North Queensland Fields.

(From Our Correspondent.)

Mareeba, November 8.

After a short cessation of operations the Chillagoe smelters blew in again on Sunday last, one copper furnace and one converter being called into requisition. There is a distinct shortage of labour, but a number of men arrived from the South during the week, so the company intend, in a day or two, putting a lead furnace into commission. There are ample supplies of fuel and ore on hand, and barring labour troubles, smelting operations will go on unceasingly till the Christmas holidays.

Latest reports from the New Minnie Moxham mine state that the western drive in the bottom level is in over 62ft. The reef has carried high gold values for the full distance, and the reef is showing strong in face of drive from top to bottom, and is going down strong underfoot, the stone showing gold freely. The constructing of the dam is being pushed ahead with all speed. The engineer in charge states that he will have same completed in about four weeks. Development work in the New Minnie Moxham East is being rapidly pushed ahead, and the reef, which is over 4ft. wide, is estimated to go half an ounce to the ton.

At Fossilbrook, a wolfram and tin mining camp off the Etheridge Railway, mining is fairly brisk, and good parcels of metal are going forward for shipment.

Reports are to hand regarding the finding of a new lense of copper ore in the Chillagoe Co.'s Einasleigh Copper Mine. In sinking the shaft below the No. 5 level a body of ore 41ft. in width, and bulking about 2½ per cent., was located. This lense of ore is about 300ft. west of the main lense, which has produced all the ore to date. The sinking of the shaft was continued, and now another body of higher grade ore has been struck, rumour stating that it will go as high as 10 per cent. So far no authentic information regarding the size or value of the ore body is to hand, but it is to be sincerely hoped that the find is a valuable one.

Mr. E. Leisner, manager of Leisner's Wolfram Block Mine, Wolfram Camp, is at present in Charters Towers conferring with his directors regarding future operations. Since he commenced sinking in front of Murphy and Geaney's and Larkin and Wade's claims to try and get their rich wolfram and molybdenite bearing lodes, in the deeper ground, a three-chambered shaft has been sunk to a depth of 354ft. A good winding engine and necessary overhead gear has also been installed. However, the company, with its rather limited capital, has failed so far to reach its objective, and it seems a pity that it is necessary to call a halt, especially as indications in the bottom of the shaft are very favourable. The company is in 25,000 shares of 6s. each, of which 12,500 were issued as fully-paid up to the vendors. In addition to the above capital the company also got a grant of £500 from the Government, and this is also expended. If the directors make an appeal to the shareholders for further capital, I feel sure that it will be forthcoming. The company is doing valuable prospecting work for the whole field, as the lodes have never been tried in the deeper ground. Notwithstanding the enormous quantity of molybdenite produced from this field, Leisner's shaft is the deepest on the ground. Mr. Leisner is one of the old prospectors of the field, and he is very sanguine regarding the future success of his efforts. His optimism is shared by geologists and the mining men on the Wolfram field (it is all a matter of sinking another hundred or so feet). The French Rare Metals Co.'s mill is still idle, the principals being away in France conferring with their directors. Murphy and Geaney's claim is looking very well indeed, and is producing large quantities of molybdenite or "lig," as it is commonly called here. Leisner's shaft is sunk on the boundary of this claim, about 90ft. from Murphy's main shaft. The Larkin and Wade claim is also producing large quantities of molybdenite and wolfram. A man named D. Robson has a molybdenite mine on the Barron River at Tinaroo, a few miles away from Tolga railway station, on the Herberton line. The owner states it is a big low-grade proposition, and he is anxious to get capital into it and would like to hear from any person interested. From samples of stone submitted to me, it appears to be a most likely proposition considering the prices obtaining for wolfram and molybdenite. The mine is easily accessible, only being about one hour's journey from the railway line.

There has been a better demand lately for Tommy Burns and Prince Alfred shares, particularly the former. The Tommy Burns battery is now in operation again, and as there is a large quantity of low-grade stone available the battery should be kept going full time, and it should not be long before the Burns makes up its financial leeway, but the one vital question bearing on the profitable working of the mine is transport. If the directors were to instal an aerial ropeway from the mine to the battery, substantial profits would be realised. The present method of carting is not in the best interests of the shareholders. There is nothing startling to report from the Prince Alfred mine. The lost shoot of tin has not been located, but the management are raising payable stone from the upper levels.

Shares in the Vulcan tin mine are in a very strong demand, and as there are never many shares floating around, they are difficult to obtain. The public have evidently at last realised the importance of the mine developments. For a long time the Vulcan has never showed more promise than she does to-day. The connections between the 550ft. stope, in which there is a face of ore eight feet in width and worth 30 per cent. black tin, and the level above, have now been made, and this rich stone is available for the battery. In the 360ft. level drive, at the 840ft. stope and in the 965ft. stope large quantities of payable stone have been broken. The company has a substantial cash balance and has paid seventy per cent. of the cost of the aerial ropeway installation. In connection with the latter, Mr. Mackie, of the Aerial Ropeways Ltd., London, who has been to Cairns to take delivery of the ironwork and rope, which arrived from London last week, states that he hopes to have the whole installation completed in a few weeks time. What this installation means to the Vulcan tin mine has not yet been fully grasped by the shareholders. Transport charges will be reduced to a minimum, and regular dividends should be forthcoming during the coming year, and it is most probable that shareholders will get a Christmas box this year.

The Gilmore tin mine bids fair to rank amongst the top notch tin producers. Since operations were resumed by the management, independent of the tributers, excellent results have been obtained, and the first parcel of 80 tons of stone has just been crushed at the Gurrumbah battery, and the returns should be available any day now. In a few weeks' time the manager is sending a parcel of 100 tons of higher grade ore for treatment, and judging by the present appearance of the mine regular shipments should go forward in future.

Mr. Krebs, manager for the Malvern Tin Mining Co. N.L., has arrived to start work on the old Village Blacksmith lease, Gurrumbah. Before leaving Melbourne he purchased a pumping plant, which should now be on the way up, and he hopes to have it ready for work before Christmas. The company has a capital of £9600 in 24,000 shares of 8s. each. The intention of the company is to sluice away the surface which carries payable tin and expose any formation under the surface alluvial. If this venture is successful others will follow, and the Gurrumbah district will recover its lost punch.

# ENGINEERING AND ELECTRICAL SECTION

W. T. GLOVER
and Co. Ltd., Manchester
Specialists in the Manufacture of
All Classes of
WIRES and CABLES
for
MINING WORK.
Large Stocks kept by the
Sole Agents—
THE
LAWRENCE & HANSON
Electrical Co. Ltd.
33 YORK ST., SYDNEY.
105 LONSDALE ST., MELBOURNE.
and at WELLINGTON, N.Z.

## AUCKLAND TRAMWAYS.

### Annual Meeting.

(From Our Correspondent.)

London, October 10.

Yesterday the Auckland Electric Tramways Ltd. held its annual meeting, and also passed the proposals to raise new capital. Mr. C. G. Tegetmeier, the chairman, in the course of a lengthy speech, said that the time was approaching when they would have to meet a considerable expenditure for the reconstruction of their permanent way. Last year extensive renewals and reconstruction were carried out, and the expenditure amounted to £34,844. This had been charged to the renewals account. For the next few years the expenditure would continue heavy, although not perhaps to the same extent as last year. They were fortunate in having provided out of past revenue for expenditure of that nature, but the necessity of continuing the provision still existed, and out of last year's revenue they had allocated £25,000, or £5000 more than in the preceding year, to the renewals account. That account would then stand at £61,162. In addition to the renewals account they had a general reserve account which was not earmarked for any specific purpose. They proposed to place to that account out of the year's profits £17,500, and this would bring the account up to £102,500. At the beginning of the year they had 126 cars in stock, and that number had been increased during the year to 156, and they had five more approaching completion at the end of the year. One reason they had made that very liberal addition to their cars was that during the current twelve months an exhibition on a considerable scale was to be held in Auckland. It would commence in December, and would remain open for some months. There was no doubt that while this exhibition was open there would be a very large increase in traffic requirements. They had at last received the approval of the Public Works Department to run coupled cars. This would enable them to make a much more effective use of the smaller cars that were sent out in the earlier stages of the undertaking. A request had been made by the exhibition authorities that they should run a service of motor omnibuses in connection with the tram lines, and this the company had agreed to do. The 'buses had been introduced entirely with a view to further the success of the exhibition, and to facilitate access to it, and although they did not think there was scope for the profitable operation of omnibuses, yet, if there should be an opportunity in the future of running motor vehicles to advantage, the company was not likely to leave it to others.

They had now 4500 kilowatts of generating plant installed; but in view of the progressive expansion of their business they had to anticipate increased power requirements in the future. Since the close of the year they had placed an order for an additional 1000 kilowatt set, which they expected to have installed during the ensuing twelve months. The development of the traffic had also necessitated considerable capital expenditure in doubling the track in several places, and with comparatively slight exceptions the whole of their track was now doubled throughout the system. They had also spent a good deal of money in connection with the new repairing works. From the nature of the capital expenditure to which he had referred it would be seen that only to a slight extent could it have been directly productive of profit during the year in which it had been spent, but they could look for material benefit from it in the future, not only in increased receipts, but in the greater efficiency of the service and the greater economy in working expenses. In view of future capital requirements they proposed to make an issue of £100,000 ordinary shares. The upward movement in regard to traffic was still continuing. During the first three months of the present year they had carried more than half-a-million more passengers and taken over £3000 more in traffic receipts than in the corresponding three months of last year.

---

## THE POSITION OF THE SMALL ARMS FACTORY.

Our Lithgow correspondent writes that the "Mining Standard's" leaderette on Small Arms Factory matters, which appeared on the 6th inst., was read with much interest in that centre. The idea of Senator Pearce or any other person apologising for the unsatisfactory number of rifles turned out at the factory up to date, at the expense of the town of Lithgow, is altogether too absurd for words. The factory is practically surrounded by building allotments, ranging from 10s. or 15s. up to £3 or £4 per foot, according to position. Mr. E. Burns, the municipal council's accredited valuer, states that, though there are no empty houses in the town, rents at Lithgow are not higher than in any other town in Australia. A three-roomed house could be got for 6s. and 7s. per week; and a newly-built brick house of four rooms is rented for 13s. 6d. The same style of cottage would be 20s. or 22s. in Sydney. Mr. Burns says that Senator Pearce is altogether wrong when he says there is a land monopoly at Lithgow, as splendid land can be bought on all sides at £1 per foot.

---

## RAILWAY ELECTRIFICATION (V.)

Work has at last been commenced towards the erection of the Newport electric power-house for the Melbourne suburban railways. The area secured is about 47 acres, and the excavations for foundations cover about 5 acres, the maximum depth being 7ft. 3in. There is a good deal of rock in and on the ground, and this is being blasted, to be broken up later for ballasting the loop line which will connect the station with the main Williamstown railway. Construction of the loop line is being carried on from both ends.

Messrs. E. C. Blazey and F. M. Calcutt, the Departmental officers who some months ago set out on a visit to Europe for the purpose of studying various systems for increasing the safety of railway travelling, and have recently returned, have presented their report on safe-working devices, in which full particulars are given of those which commended themselves most strongly to their judgment. Particular attention is directed to automatic signalling and automatic stopping appliances. As Mr. Fitzpatrick, the Chief Commissioner, will not return to Australia until Christmas, nothing will be done with the report until after the New Year holidays.

In order that the principal officers of the department may become practically acquainted with their own special phases of management of electric railways, so that they may be prepared to undertake the direction of the electrified suburban railways when the scheme is inaugurated, three of them have already been sent on visits to England and foreign countries to inform themselves in their own branches. These three were the chief electrical engineer, Mr. Stone, the engineer for signalling, Mr. F. M. Calcutt, and the superintendent of goods traffic, Mr. E. C. Blazey. It is highly probable that at an early date an official announcement will be made that two other heads of branches of the service are to be sent away on similar instructional tours, namely, Mr. T. B. Molomby, superintendent of passenger traffic, and Mr. E. B. Jones, the acting-secretary.

---

## MELBOURNE SUBURBAN TRAMWAYS.

Last Thursday was a gala day in the eastern suburbs of Melbourne, the occasion being the opening of three new tramways, about 5½ miles in length, connecting with lines already being operated by the Prahran-Malvern Tramways Trust, and one of which will give complete communication between Kew and Elsternwick. About 4½ miles of the new lines are within the boundaries of Caulfield and the other mile in Malvern. The cost was £33,000. In spite of very inclement weather, about 800 invited guests assembled. The official car was driven by Mrs. E. C. Murphy, mayoress of Caulfield. At the social gathering which followed the formal opening of the lines, Mr. A. Cameron, chairman of the Prahran and Malvern Tramways Trust, said that Caulfield had done a courageous thing in embarking on the Glenhuntly line. The trust now embraced seven municipalities, including the City of Melbourne, and it would shortly be decided whether Hawthorn and Kew were also to be taken in. In the first year of the trust's existence, in 1910, the receipts for the four months the trams were running amounted to £7000. In the following year the amount received was £26,000. This grew to £37,000 last year, and the receipts for 1913 should be about £60,000. Three and a half million passengers were carried during the first twelve months. This year 9,000,000 would be conveyed, and in 1914 he hoped to see 15,000,000 passengers return a revenue of £100,000. When the profits for the current year were distributed, £12,000 would have been returned to the municipalities. A reserve fund of £14,000 had been established.

In addition to the lines mentioned above, the Prahran-Malvern Trust has undertaken to continue the Glenhuntly tramway to Point Ormond, as well as another along Commercial-road and Malvern-road to connect St. Kilda-road with Burke-road, Malvern; it has also agreed to electrify the existing horse-tram service from Victoria Bridge along Barker's-road and Church-street to the Boroondara Cemetery, at Kew, which was lately purchased by the Kew municipal council. All these will be begun in the early months of next year. To carry out these and future undertakings, the Trust is asking for an increase in its borrowing powers from its present limit of £500,000 to £700,000. Another projected east and west line will run from Camberwell, along Camberwell-road, Riversdale-road, Hawthorn, and Swan-street, Richmond, to Princes' Bridge. Further to the east than all the above-mentioned lines will be that proposed to be laid along Burke-road, from Cotham-road, Kew, directly southwards to Waverley-road, Caulfield. There is no doubt about the earnestness and the activity of the various municipal councils in the eastern and south-eastern districts, in the direction of providing the public with travelling facilities.

The question of motor-'bus traffic is still agitating many, and the interest in the new conveyances is undoubtedly increasing. Two companies now have them running into the city, though only one restricts its business to operating them. This is the Melbourne Motor-'Bus Co., which employs 18 vehicles on the road between East Brunswick and St. Kilda, but it is planning new routes, for which extra cars will be required. The other company is the Globe Motor Co., which began with, and still continues to run, taxi-cabs; its motor-'buses are at present confined to traffic between the city and North Melbourne. Several municipalities contemplate arrangements for similar services, either by subsidizing a private company or by instituting a system of their own. But when it was suggested that the Premier should be asked to so amend the Local Government Act as to permit the application of municipal funds to that purpose, Mr. Watt replied that no legislation of that nature would be introduced; such powers would be given to his proposed Greater Melbourne Council, but not to existing councils.

At the instance of Mr. Beckett, M.L.C., a return is to be prepared showing the names of all firms registered under the Firms Act, and all companies registered under the Companies Acts during the last two years to carry on the business of motor-

'bus proprietors and carriers of passengers, together with a statement of the capital of each of such registered companies. Judging from his remarks when presenting his motion, Mr. Beckett is not at all sure that the Melbourne Tramway and Omnibus Co. is not corporately interested in one of the existing motor-'bus companies, but a most positive denial has been given to this suspicion.

The Railways Commissioners state that the capital expenditure on the St. Kilda-Brighton electric tramway to 30th June, 1913, amounted to £88,133, of which only £79,645 is interest bearing, inasmuch as £8000 was provided out of surplus revenue, and £488 has been debited to the construction branch votes. The results of the working of the line from the date of its opening up till 30th June, 1913, are:—Revenue, £88,932; ordinary working expenses, £74,179; interest charges, £15,688; loss after meeting ordinary expenditure, £935; expenditure other than ordinary expenditure, £16,408; loss after meeting all expenditure, £17,433. It is explained, however, that a fire which destroyed the car-sheds and rolling stock in March, 1907, necessitated the expenditure of £13,252 in that and the following year in restoring the service, that £1400 expended in the year ended 30th June, 1912, represents the cost of renewing the storage battery, whilst the expenditure of £1846 was incurred in the year ended 30th June, 1913, by renewals of the track, in conjunction with the work of duplicating the line from St. Kilda to the power house, and would not otherwise have been incurred until a subsequent period. Referring to the proposal that the Railways Commissioners should either sell or lease the line to the two municipalities concerned, the report says that the Commissioners are averse to surrendering control of it until the formation of the Greater Melbourne Council, though in the meantime they offer no objection to the municipal councils obtaining an expert estimate of the value of the line and rolling stock; but in any case they are strongly of opinion that no proposition for taking over the line should be accepted on any basis other than the liability actually incurred by the department in connection with the line.

## PORT MELBOURNE ELECTRIC SUPPLY.

In further reference to the resolution adopted by the Port Melbourne Council recently that other Councils be invited to join in to approach the Melbourne C.C. for a reduction in the price of electric energy, a report has been prepared for the Port Melbourne Council, which shows that the cost of current, before it is transformed at the Council's sub-station, is 2.33d. per unit. This is based on the Melbourne City Council's charge of ¾d. per unit, and 10s. 10d. per maximum kilowatt. It is, however, stated that the loss in distribution after transformation equals 25 per cent., which is undoubtedly high and is a serious matter for the Port Melbourne Council. It will readily be seen why the Port Council is incurring a heavy loss in its electric supply venture when it has to pay 2.33d. per unit, bear the cost and loss involved in transformation, together with the high loss of 25 per cent. in distribution. On the basis of actual working conditions during the past two or three months, an estimate has been prepared showing the loss which the Council will incur during the coming year, which is as follows:—

Receipts.—From private consumers, including municipal offices, £583; light, 28,000 units at 5d., and power, 19,000 units at 2d., £158; street lighting, £660; meter rents, £5; total, £1406.

Expenditure.—Bulk supply, £1205; wages, one at £3 17s. per week and two at £3 3s. per week, £528; office salaries, £75; office expenses, £25; advertising, printing and insurance, £20; renewals, £50; interest and sinking fund, £500; total, £2403.

It will thus be seen that the estimated loss is about £997. On the statement of Mr. Harper (City Electrical Engineer), in which it is shown that the M.C.C. is making handsome profits out of at least one of the purchasing Councils, a reduction in the price appears to be justified. But the Port Council ought to take steps to stem the loss in distribution and in other directions.

---

The following Newport Workshop facts are given in the "Victorian Railways Institute Review":—Area of grounds, 130 acres; buildings cover 17 acres; men employed, 4143; total yearly wages, £600,000; material used, 1912-13, £500,000; 46 locomotives, 156 cars and 907 trucks manufactured during year 1912-13.

The six turbines which have been constructed for the mammoth steamer "Aquitania," now being fitted at Clydebank for the Cunard S.S. Co., have a combined weight of 1400 tons, while the engine to be employed in starting the turbines is sufficiently powerful to propel a small steamer. The boilers will hold sufficient water to fill 8250 barrels, i.e., between 41,000 and 42,000 cub. feet. The steamer has four funnels, each large enough to allow a vessel of the size of the "Comet," one of the first steamships, to pass through it.

## BRITISH AND EUROPEAN DEVELOPMENTS.

(From Our Correspondent.)

London, Oct. 10.

The various engineering and scientific societies in London and the provincial centres are just now issuing their programmes for the winter session. Indeed, some of them have already held their opening meetings. The Society of Engineers started off on October 6th with a paper on a subject of increasing importance to the motor-using public and indeed to all users of the public roadways. Taking "Highways" for his title, Mr. C. H. Cooper, M. Inst. C.E., accused the local authorities of the United Kingdom of having failed to realise the necessity of providing highways sufficient for present-day traffic. Central control was a necessity, for there were 1883 highway authorities, as well as three Government departments, which had a voice either in granting loans or regulating traffic. Road crusts had as a rule been carefully constructed, but the indifferent manner in which excavations for mains, etc., were filled in had a destructive effect. Mr. Cooper advocated the local authority filling in the trenches at the undertaker's expense. He referred to the benefits following the use of flexible tyres, from the road engineer's point of view. When first introduced the motor car was a luxury for the rich, but the motor-'bus, traversing the metropolis and its suburbs by 89 routes, was a democratic vehicle, and the author expressed surprise at the outcry for increased taxation on these vehicles. Referring to the forming of road crusts he said that the economic difficulty was the uncertainty as regards the traffic to be carried. A crust that could be formed at a total cost of, say, 7s. per yard super. was quite incapable of carrying rapid heavy traffic such as motor omnibuses; in fact, wood-paving laid on 6in. concrete, which was an expensive paving, could no longer be considered reliable for such a class of traffic, the concrete having to be increased to at least 9in. in thickness.

The Junior Institution of Engineers started the session with a paper by Mr. W. A. Tookey, one of its vice-presidents and a well-known authority on "Gas Engine Testing." He referred to the usual objects in view when tests were conducted upon internal combustion engines, and then proceeded to deal in a practical manner with the use and limitations of various kinds of apparatus for determining the power transmitted, such as rope and Prony brakes, water dynamometers, fan dynamometers, direct coupled and belt-driven dynamos generating current absorbed in water resistances or wire resistances, electrical torque measuring devices, etc. Mr. Tookey said that when engines were being tested on behalf of purchasers it was chiefly desired to determine whether the specified power could be maintained throughout a stipulated period; to measure the fuel consumption in b.h.p. per hour; to note the speed variations at different loads; to judge from the position of the governor sleeve if a margin of power existed when the engine was running under full load; also to observe the momentary and permanent speed variations when full load was suddenly thrown on and off. Engineers were mainly concerned with tuning-up tests, an interesting process yielding very valuable information. The question of determining the mixture strength with which the engine was supplied and the misleading nature of the usual method—stating it as so many parts of air to one of gas—was discussed by the author, who gave particulars of a method adopted by him for obtaining a standard of comparison of mixture strength, taking into account the whole of the working fluid, gas, air, and residuals. This standard was based upon the information obtainable from the measurement of volumetric efficiency and of compression pressure from both power and light spring indicator diagrams. Mr. Tookey explained how it was possible to express the mean pressure obtained as a factor of the mixture strength. This factor showed whether the calorific value of the mixture admitted per cycle was suitable or not, and he said that it was of the utmost use in indicating whether better results could or not be attained by regulation of the quantity of gas admitted or by proper correlation of the timing of the ignition device to suit the strength of the mixture. In the course of other remarks in a very valuable paper the author said that the whole subject of tuning up lay in the acceptance by the tester of the fact that the mixture strength, cylinder wall temperature, and timing of ignition, should be so correlated that combustion while proceeding swiftly and completely was not violent.

The annual meeting of the Association of Mining Electrical Engineers has been held at Birmingham. The president, Mr. Alexander Anderson, spoke very optimistically concerning the prospects of electrical applications in collieries in the future. Collieries completely equipped with electricity throughout were increasing, and electrically driven coal cutters were sure to increase in number as it became more and more impossible for coal to be profitably worked by hand. Criticism has often been levelled at the want of electro-technical training and knowledge on the part of those responsible for running colliery plants. Greater reliability both of the equipment and of those responsible for it would be secured if young men embarking upon this department of work as a profession were to have a thorough technical ground work.

Not only are the institutions resuming, but the excellent societies which cater for the social and musical tastes of electrical men are also about to hold their opening concerts—I refer to the Electro Harmonic Societies of London and Manchester. Both of these will hold smoking concerts on Friday next, October 17th. Visitors home from Australia ought to make a note of these societies, for they afford opportunities for coming to close quarters with hundreds of men in the electrical profession and industry. The session will last until March or April next. The new Engineers' Club at Manchester, to which I referred here some months ago when the excellent movement for it began, is just about ready to open its premises. Indeed, I believe that there is to be something in the nature of a housewarming in a few days. Colonials visiting this important British engneering and textile centre will have facilities at their disposal for fraternising with representatives of civil, electrical, mechanical and other engineering men who abound in Manchester and neighbourhood.

The speech of Mr. Godfrey Isaacs, managing director of Marconi's Wireless Telegraph Co., at the special meeting last Friday, when it was resolved to increase the capital by a further 500,000 ordinary shares, is chiefly of electrical interest on account of the references made to the Goldschmidt patents. He said that they were acquiring a large number of shares in the Cie. Universelle de Telegraphie et Telephonie sans Fil, which company owned the rights throughout the world, with the exception of the interior of Germany, of Dr. Goldschmidt's high frequency alternator, and his other wireless patents. The Cie. Universelle was a French company with a subscribed capital of ten million francs in 100,000 shares of 100f. each, and 100,000 Parts Beneficiares or Founder Shares, which participated in the profits to the extent of 45 per cent., thus making the capital equal to nearly twenty million francs, or £800,000. This capital was subscribed by a few important and very influential persons, who wielded considerable power in certain countries abroad. Their board was composed of men of eminence and ability in France, Germany and England, and their support of the Goldschmidt system, no matter what might be its merits, represented a serious menace to the programme of the Marconi Co. in certain countries. "We did not fear their competition, but we were anxious that they should not prevent or delay our obtaining certain concessions to which we attached importance. The company is in possession of some 7½ million francs, or £300,000, in liquid capital, and therefore in this respect also carried no small weight in the foreign countries mentioned. "We are satisfied with the conditions we have obtained, and believe we have entered into transactions which will prove beneficial to the company. All the shares in the Cie. Universelle et Telegraphie et Telephonie sans Fils, which were previously held in Germany, pass into our hands, and all the German directors retire from the board—a consideration of no small importance in France, and one which we hope will enable the Cie. Universelle, who will also probably hold the Marconi long-distance licence for France and the French Colonies, to secure the whole of the important business in wireless telegraphy which is comprised in the programme of the French Government."

"It is probable that the Goldschmidt patents for the rest of the world will become the property of the Marconi Co. Now, with regard to the Goldschmidt high frequency alternator, this is an extremely clever machine for the generation of continuous waves; it has been erected in a station near Hanover, which Mr. Marconi, one of his ablest engineers, and I visited a few weeks back. There is great merit in the invention, and Professor Goldschmidt is no doubt a very able engineer. But it should be understood that he has not invented, and does not claim to have invented, a system of wireless telegraphy, but a machine for the generation and utilisation of continuous waves. The station in Hanover is well designed and of great promise; it has succeeded in sending across the Atlantic signals, and even messages—but, as we have told you on frequent occasions, there is a great difference between sending signals and messages and conducting a continuous telegraphic commercial service—and the Hanoverian station, in our opinion, without the assistance, experience and patents of the Marconi Co., is still a long way from being able to conduct such a service. In saying this, I do not want to be understood to be taking from Professor Goldschmidt one whit of the merit to which he is entitled; on the contrary, his is the only method, other than those of the Marconi Co., of which we have any knowledge, which, in our opinion, has any prospect of success, but it is natural that a long period of tests, experiments and further inventions would be necessary with

Professor Goldschmidt, as they were with Commendatore Marconi."

Mr. Godfrey Isaacs later in his speech referred to the fact that the British Government Advisory Committee, composed of scientific men, reported that the Marconi Co. alone was able to carry out the Government work at the present moment, "but it nevertheless spoke of Prof. Goldschmidt's machine in words which would have served the Cie. Universelle as a certificate with any foreign Government and consequently provide the means of seriously impeding, if not damaging, this company's programme." "Further," said Mr. Isaacs, "it would have been little, if any, satisfaction to us (the Marconi Co.) to see the Cie. Universelle obtain a contract or a concession abroad and fail two or three years later to fulfil it; for, even though it fell subsequently to us to carry it out, it would not have compensated us for the delay or the prejudice we should have suffered meantime. These are considerations of importance which obtain to-day, but in a very short time, we hope, they will no longer exist; the important foundations of our business will have been securely laid and no interference with our programme can then arise. It has been stated that one of the reasons which induced us to enter into this transaction was that the station at Hanover had succeeded in transmitting wireless messages to Tuckerton, U.S.A., at a regular rate of 100 words per minute for hours at a stretch. There is not an atom of foundation for that statement, for no better reason than that the Hanoverian station has not done anything of the kind, nor anything approaching it."

London, Oct. 17.

I made brief mention last week of the address delivered by Mr. Alexander Anderson, the new president of the Association of Mining Electrical Engineers. The address merits fuller attention than it was then possible to devote to it. In the first place, the membership returns, which showed so excellent a rate of progress in 1910, 1911, and 1912, fell off from 1125 to 1081 between January and June last, the cause of this being a deliberately adopted weeding-out policy. In some sections officials had joined who wanted to secure the advantages of membership, but not to bear a share of the responsibilities; in the early days of the Association unsuitable members may have been taken on, due to the desire to make an impressive start. Some might have thought that the Association was to fill the place of a trade union, but that was a mistake, and those who so thought had resigned. The Association had, however, added a large number of members of a very desirable class—200 during the year. Mr. Anderson set out a number of reasons for hopefulness regarding their future. One of these was the indispensability of electricity in most mines, another, the continuous efforts to improve electrical machinery, causing those responsible for its management and control to desire to be abreast of the times in regard to knowledge of methods. The mining electrical engineer must fit himself to meet the constant advances in the science of coal mining and the new conditions following upon such advances. Speaking generally, it was by interchange of experience that they would ensure steady progress. The day when a little elementary knowledge of electrical machinery was sufficient for the colliery engineer had passed. The sooner he realised it the better for himself and everybody else. The president said that the need for study was advancing most rapidly, and he promised to do all in his power to further "an organisation which has for its object the promotion of the study of electrical engineering in its relation to mining." By means of lectures in colliery centres, good had been done, and Mr. Anderson thought latent ambition could be aroused in this way. The Association's system of examinations had not met with the measure of success that he believed it to merit. The mere fact of a man entering for an examination meant that he would sit through a course of instruction which would make his success more certain than if he relied on knowledge of an everyday kind picked up in the course of his work. The president went on to show how even a little knowledge of theory made work more interesting, and that, owing to the increasing complication of electrical plant, a complete knowledge of its construction and characteristics was indispensable. He also referred to a scarcity of what he called first-class men, owing to the younger men neglecting theory at the beginning of their education and trusting to practical experience. It was the lack of knowledge, too, which meant unreliability of plant, owing to inefficient attention. One of His Majesty's Inspectors of Mines, in referring to the fact that in 1912 there was only one person killed by electric shock in the mines of Scotland, where the mine plant using electricity aggregated 90,000 h.p., paid a tribute to the Association which had, as a result of its work, produced an altogether better class of colliery electrician than formerly obtained. The men take a more intelligent interest in their installations, and, therefore, give a more careful supervision than they used to do. The president, in the course of further very interesting review on the technical side of colliery electrification work, ventured the opinion that the colliery electrician of the future would have to be capable both mechanically and electrically. Such men were scarce to-day. In referring to the operation of coal-cutters, which, he said, would become more numerous in the future, Mr. Anderson laid stress upon the necessity for training motor attendants regarding the handling of such apparatus. It was absurd to leave valuable machinery in untrained hands, and a little more attention to this point would mean reduced maintenance charges. It would well pay to engage instructors for such a purpose.

To-morrow, October 18, there is to be a joint meeting at Dover of the London Branch of the Association of Mining Electrical Engineers and of the Kent Branch of the National Association of Colliery Managers. Mr. E. K. Scott is to read a paper on "Large Prime Movers and Boilers for Power Houses."

The Newcastle Local Section leads off on Monday next with the first I.E.E. meeting of the season. The chairman, Mr. C. Vernier, will deliver his inaugural address.

Dr. E. Hopkinson opened the new session at the Manchester Association of Engineers last Saturday evening with an address bearing upon some aspects of the influence of electrical engineering on mechanical engineering, an influence which had been profound and far-reaching. He said that the subject was one of singular interest, repaying examination not only in throwing light on the course of some of the great developments of the past, but also in affording guidance for the future. Dr. Hopkinson began by considering the earliest designs of dynamo and the factors which had progressively influenced design. Later he said that a satisfactory form of continuously changeable speed-gear would give a great impetus to the application of electric drives. In electric traction the difficulties of the problem had been halved, as it were, by mere chance. The accident that vehicles had in general two axles, had brought about the use of two motors, and being two, their coupling could be changed from "in parallel" into "in series," thus reducing the speed to one half, and in like proportion increasing the driving couple for a given current, but the shunt and series resistance were still necessary to provide the complete speed range. Dr. Hopkinson dwelt for some time on this particular problem, as he wished to emphasise how very imperfect were the solutions hitherto adopted, and how much the electrical engineer would welcome purely mechanical improvements in gear, or the mechanical engineer electrical or hydraulic devices which would enable him to circumvent the mechanical problem which he could not yet solve by purely mechanical means. Dr. Hopkinson proceeded to refer to one broad distinction between electrical and other branches of engineering which had had a determining influence in their relative developments:—

"We can magnetise the iron bar and thereby completely change its properties in a manner and to an extent which we can accurately measure and precisely express, but we have no knowledge, nor can form any conception, what are the actual changes in the constitution of the iron. Still less can we suggest any explanation of that most extraordinary natural fact that iron alone, and iron only in particular states, is magnetic to any material extent. We can grasp in our hand a conductor conveying an electric stream of thousands of horse-power, but are unconscious of the flow. We can measure its electro-motive force, we can measure its intensity, we can determine the resistance it is meeting in its passage, all with the greatest accuracy. We can observe the manifestation of its energy in hundreds of different ways, but of the thing itself, of the location of the stresses and trains which in some medium or another must accompany the transmission, we know nothing. The philosopher may speculate, but has not proved. In this, electrical science at present differs fundamentally from others, and this difference has had great influence on its development. The electrical engineer, having no material conception of the electrical quantities he is dealing with, and dependent entirely on being able to express them and measure them in terms of the fundamental units of mass, length and time, must necessarily treat his subject from a more purely mathematical point of view." This led the president on to the remark that no electrical engineer could acquire a competent knowledge of his subject without a knowledge of mathematics. This absolute dependence of electrical engineering on mathematics had had an altogether salutary effect on its development, which had extended in some instances to other branches of engineering. It had attracted many of the most powerful scientific minds of the latter part of the last century to devote themselves to the elucidation of its problems and to the determination of its fundamental constants to a far greater degree than in other branches of engineering. Dr. Hopkinson closed an extremely interesting address by saying that if he were restricted to one word of advice to engineering students, and indeed to all who followed the profession of engineering, he would say, "strive and study above all things to be accurate in measurement, precise in thought and knowledge, and exact in expression."

Mr. Dickinson, who went from Leeds to Liverpool to take charge of the city electric light and power undertaking, is in full command there, and Mr. Clough has now entirely relinquished office. The reconstruction of some of the power stations is in progress. The Lister Drive No. 1 Station and the Pumpfields Station are both undergoing change. Two 6000 kw. turbo-alternators for the former are on order, and at the latter three rotary converters are to be installed in a month or two. The demand for light and power supply is increasing very satisfactorily, for there are now about 9700 consumers, as compared with 8938 a year ago, and there has been an increase of 12 per cent. in the energy supplied to these during the past eight months; the actual increase for the eight months has been 3,000,000 units, as compared with 2,200,000 for the previous twelve months. In regard to power demand, 3500 h.p. has been ordered this year; in some cases a.c. three-phase supply is to be given through sub-stations on consumers' premises. For the six months ended at June last the revenue was better by £10,000. In connection with the business development part of the system, motors are supplied on the hire system, and so is apparatus for heating and cooking.

The Chancery Court in London has this week had before it a difference between two electrical instrument manufacturers respecting the use of the words "Megger" and "Omega" as a trade description for certain electrical instruments. In 1903 Mr. Vignoles (Evershed and Vignolds), as counsel said, invented a horrible word, but one which, like many other horrible words, became popular, for an electrical instrument for detecting leakage. The word was "Megger," and it was soon widely accepted as realting to their instruments. In 1911 Mr. R. W. Paul, another well-known instrument maker, began to manufacture such instruments, and adopted the name "Omega." Counsel said that though those connected with the electrical industry might not confuse the two names, the outside public who purchased such things (drapery, cement, timber, salt, and other trades, were indicated there), might find the words so similar as to confuse them. After Mr. Vignoles had given evidence and there had been conversation between counsel and the judge, counsel for the plaintiffs consented to the action being dismissed, saying, among other things, that the plaintiffs were not aware that the "Omega" had been applied to test instruments as long ago as 1901, or they would not have brought the matter to court. Ultimately, the parties announced that they had agreed upon the terms of the Court's order in the matter.

With reference to the electric railway scheme of the General Post Office, it is stated that there is being brought before the authorities a system of electric carriers which has been developed by the Electric Carrier Co., of New York, and was recently demonstrated at Paterson, N.J. The cars run on rails through a 36 inch steel or concrete tube which may be either on the surface or underground. Three-phase alternating current is fed to the car by two overhead trolley tracks, and the car is operated by magnetic push or pull.

Water-power electrical installations of any size are so few in the United Kingdom that it is but natural that considerable interest is being taken just now in the hydro-electric plant, which has been put down at Chester in connection with the municipal supply system. The public inauguration takes place early next week. The waters of the river Dee are utilised, a weir being constructed across the river and the water led to a turbine house equipped with three Francis turbines of vertical shaft type, two to develop 415 b.h.p. each, and one 305 b.h.p., the former at 50 revs. per min., and the latter at 55 revs. To these turbines are coupled by gearing, and flexible couplings, Lancashire Dynamo Co.'s shunt wound interpole machines, two of 225 kw. and one of 185 kw., generating at 440 to 500 volts pressure. The speed of the larger machines ranges from 140 to 285 revs. per minute, and that of the smaller from 167 to 300 revs. The plant is controlled from a Crompton switchboard. Mr. Britton, as borough electrical engineer, has been responsible for the work. Chester has, of course, had a steam-driven plant running for some years.

---

Delay has resulted in the Provincial (V.) Electric Development Co. Ltd. losing a franchise which it had previously secured. At its meeting last week, the Dandenong Shire Council unanimously agreed to the following resolution:—"That inasmuch as no application has been made by the Provincial Electric Development Company Limited for an Order-in-Council under the Electric Light and Power Acts authorising the said company to supply electricity in the South Riding of the Shire of Dandenong, the consent of this Council to such application,' given by resolution passed on September 30, 1912, be now withdrawn, and the said resolution be and is hereby rescinded."

# FLOURISHING VICTORIAN INDUSTRY.

## Thompson and Co. (Castlemaine) Pty. Ltd.

### Remarkable List of Contracts.

The growth during the last few years of the firm of Thompson and Co. Pty. Ltd. has been little short of phenomenal. The rapid increase in the number of adult skilled employees has caused a famine in houses, and there is a building boom going on, which is likely to extend. From Chewton all the available houses have been bought and shifted in bodily, while Maldon has lost (literally) dozens of houses. The shifting of houses by team or traction engine has become quite an art. It is impossible to rent a house, and to get board, or a furnished room, is quite a feat on the part of a newcomer. In order to gain some idea as to what lay behind all this activity, our Castlemaine representative was shown over the works by the works manager, Mr. "Rex" Thompson. As most people connected with the engineering trade know, vast strides have been made by this firm in the last few years. They have secured numbers of important contracts that have ensured them steady work for some considerable time ahead, and to cope with which it has been necessary to extend their already large establishment.

Entering the works by way of the office, the opportunity is afforded the visitor of inspecting their very complete system of dealing with all matters pertaining to the business. The technical department employs probably more than any other engineering works in Victoria, and a number of experts are employed dealing with various branches of engineering designs. Considerable care has been spent in elaborating the system of orders from the office to the works, and the firm pride themselves upon the very complete order system and upon the splendid detail drawings that are issued to the works.

Leaving the office, the first part of the works to enter is the rail shop. This shop has been running continuously night and day for several years past without a break, the larger portion of the work, of course, being for the Victorian Railways; but, in addition to the important contracts that they hold for them, they have recently secured two important contracts for the South Australian Government Railways. This, in spite of the very serious cost of transport, which acts as a handicap against them.

The present smith shop is at the left hand of the rail shop, but the intention is to do away with this, and shift this department, and make it in one with the new smith shop that is being erected in the locomotive works.

The power plant is situated at the end of the rail shop, between the rail shop and the general works. It has been increased recently by the addition of one of the firm's own underfired multitubular boilers fitted with Watkinson shunt type superheater. A quick revolution engine, 250h.p., direct coupled to a generator, transmits power to the various portions of the works, and also supplies light at night time. This power set is being duplicated at the present time to supply power and light for the new locomotive works that are at present in process of erection. This quick revolution engine has been built by the firm, and is of the design that has been evolved by them in competition with English makers, and which has won its way in spite of the very serious disadvantages against which the firm has to work. Unfortunately, effective protection has not been granted to Victorian manufacturers in this particular line, with the consequence that these engines are admitted duty free to the Commonwealth when the engine is direct coupled to either a high speed engine or a pump, and it would be safe to say that in 90 per cent. of the cases in which a high-speed engine is used, it is used for one of these two purposes.

Messrs. Thompson and Co. have perfected the design of their high-speed engines until they are willing to guarantee them against any imported engine of any of the standard makes, but this portion of their business cannot be fully developed until such time as an effective protection is granted to enable Victorian manufacturers to compete against their overseas competitors working under more advantageous conditions of wages and raw material.

The next shop entered was the general erecting shop. This consists of one bay 45ft. span by 230ft. long by 36ft. high in the clear, and is served by an electric crane with a lifting capacity of 15 tons. The new locomotive erection shop in course of erection has been built in line with the general works erecting shop, and it is also served by a 15-ton crane running as a continuation with the general erecting shop, so that these cranes can be worked in conjunction with a maximum combined effective lift of 30 tons. The total length of these shops is 450ft.

The general erecting shop at the time of the visit was filled with a number of massive castings of very handsome appearance. These were parts of the large sewerage pumping engines which the firm have in hand for the Brisbane Water Supply and Sewerage Board. This contract runs into about £124,000, and Messrs. Thompson and Co. were the only tenderers for the work, although it had been advertised broadcast throughout the world. The plant itself will weigh about 1300 tons, and will consist of three vertical inverted cylinder triple expansion pumping engines, each capable of developing about 800h.p. with steam at 180 lbs. per sq. inch. The large castings in process of machining throughout the works enables one to gain a good grasp of the magnitude of this contract, and it is satisfaction to the engineering profession to know that there is a Victorian firm capable of carrying out a contract of such magnitude.

Although this particular contract, to a certain extent, dwarfs others that are in course of manufacture, there are yet a number of other very important contracts going through the works at the present time. The outstanding impression gained by the visitor is the variety of work in hand calling for every class of engineering skill. Three marine propelling sets for the Public Works Department are nearing completion, and, besides this, the firm have also in hand all the auxiliary machinery in connection with the vessels for which these are intended. The vessels themselves are being constructed at the Victorian Government Dockyard, Williamstown. Three quick revolution engines for direct connecting to three 75kw. generators (which are being supplied by Messrs. G. Weymouth Pty. Ltd), are being constructed for the Naval College at Jervis Bay. Messrs. Thompson and Co. are also supplying the condenser, air pump and circulating pump for the same plant. A number of gravel pumps are in course of construction for the Malay State tinfields, with which Messrs. Thompson and Co. have a very large trade, and for which fields they send away heavy shipments of machinery every month.

A large pumping plant is being constructed for the Australian Farms Ltd., at Lake Boga. This plant will consist of two units, each capable of delivering 1500 cubic feet of water per minute, and each unit consists of a turbine pump direct connected to an engine of the firm's own standard design and manufacture of the enclosed quick revolution forced lubricating two crank compound type. Steam for these engines will be supplied by an underfired multitubular boiler with shunt type superheater attached. Increased economy will be gained by passing the exhaust steam through an ejector condenser.

A number of special suction gas plants are in course of construction for the Cambridge Gas Power Co., the firm having the sole right of manufacture. These plants have proved their economic possibilities, many thousand horse-power having already been installed. An order for a 20in. gravel pump has recently been received from the Greymouth Harbour Board, New Zealand, where a pair of their special gravel pumps have already been installed and are giving excellent results. A quick revolution engine for direct coupling to an electric light generating set is in process of manufacture for the Commonwealth Quarantine Station, and is of similar design to the engines already mentioned for the Naval College.

The main machine shop runs parallel with the erecting shop, 27ft. 7in. span, by 230ft. long, and is equipped with an 8-ton electrically driven travelling crane. The machine shop is equipped throughout with machines of the very latest design by the leading machine tool makers of the world. Here can be seen a number of high speed lathes of varying sizes by Dean, Smith and Grace, universal boring, milling and facing machines by Richards; a large boring and facing machine by the same people is fitted with a specially designed attachment for gear cutting, and is capable of cutting gear wheels up to 20ft. in diameter. Another machine that calls for special notice is a horizontal drilling and milling machine, built by Beaman and Smith, and capable of dealing with work of very large dimensions. A machine recently installed, and one that has only lately come into prominence in Great Britain, is a 72in. vertical boring and turning mill, fitted with two heads. There are a number of other very fine machines that call for consideration, but space forbids entering into a description of them.

Situated between the erecting shop and the main machine shop is an intervening bay, 15ft. 3½in. span, and fitted with light machines, tools and cranes.

The general store is situated at one side of the machine shop, and here are kept all various stores called for throughout the works.

The iron foundry is next in order of inspection. The main bay in which all heavy work is poured is 230ft. long by 45ft. span, and is served with electric cranes. The light foundry runs parallel with the main foundry and is 25ft. span, and all the light work is moulded and poured here. The foundry cupolas are situated at one side in the centre of the length of the shop. Charging platform from cupolas is continued out to form a gallery on which coke is stacked in bulk and bags. On the other side of the cupolas are situated the sand sheds, in which moulding sands are stored and whence they gravitate down into the mixing and grinding room. Here all the sand is treated before passing out on to the moulding floor.

Scrap and pig iron yards are at the back of the foundry, and material is unloaded direct from railway trucks and stacked until required.

The casting dressing shop is situated at one end of the foundry, and castings after being cleaned pass from here into the machine shop.

The pattern shop is a well lighted shop, situated adjacent to the foundry, and equipped with all the latest labour saving devices applied to the pattern-making trade. The patterns are stored above this shop, and also in adjoining buildings, and these patterns represent thousands of pounds in value, and cover every conceivable branch in engineering design.

From the pattern shop on to the boiler shop and steel structural department. The main building is 280ft. long by 45ft. span, and like the other main buildings, is equipped with a 15-ton electrically-driven crane. At one end of the boiler shop is situated a large riveting tower, equipped with a 20-ton electrically-driven geared hoist of the firm's own design and manufacture. The riveting tower and hoist enables boilers of any length and size to be put together and riveted up in the one length. A fine set of flattening and straightening rolls has just been installed, and the shop is further equipped with radial drilling machines, angle iron bending rolls, and a large punching, shearing and cropping machine by Henry Pels and Co. This machine is independently driven by its own motor, and is capable of cutting or cropping almost any section of material in angles, flats and round bars. The locomotive boilers are in every process of construction, and 28 have already been delivered. The firm also have in hand, beside the locomotive work, underfired multitubular boilers, marine boilers for the Public Works Department, return tube marine type boilers for dredges, and the ordinary Cornish flue type boilers. A large bucket dredge ladder for Townsville is just nearing completion, and as this is 90ft. long, and weighs 30 tons, it requires to be shipped in three sections.

At the side of the main boiler shop is a large yard with a powerful jib crane in the centre, so that material can be swung from railway trucks and stacked until required. Facing the boiler shop is a large gantry equipped with travelling crane with 50ft. span and 130ft. run. This was installed for the purpose of erecting large pontoons and fitting up complete machinery before dismantling for shipment. Further machinery is on the way out from England in order to deal with the large amount of general work the firm has in hand, in addition to locomotive boilers and tenders.

From the boiler shop down to the locomotive works, which have only recently been constructed, and are now being equipped with machinery. The locomotive machine shop is 220ft. long by 35ft. span, and is fitted with an 8-ton electric travelling crane. This shop is being equipped with the most modern types of machines capable of rapidly and economically machining all locomotive parts. No expense has been spared in the equipment of these shops, and when completed, they will be a model for their size. Most of the machine tool makers that have obtained world-time fame are represented here by one or more of their specialities. The equipment of these shops generally has been selected with the end in view of being able to turn out one complete locomotive per week.

The locomotive fitting shop is also 220ft. long, by 27ft. 7in. span, and is built in a continuous line with the general machine shop, and the crane runways for the two shops are continuous, so that either crane can be used as an auxiliary lift to the other.

Between the locomotive fitting shop and the locomotive erecting shop is a bay 15ft. 3½in. span, in which are situated the brass foundry, coppersmiths' shop, tool room, and tool store. The brass foundry is intended to not only furnish all the castings for the loco. work, but also for the requirements of the general work. The tool room for the general works was originally situated in the centre of the general machine shop, but the opportunity has been taken in fitting up the loco. works for re-designing and re-equipping the tool room, and it is available not only for producing all necessary tools and jigs for the loco. works, but also for supplying all the requirements of the general machine shop as well. The tool room department is divided into two divisions. One portion is reserved for the machining and fitting up of various jigs and gauges required, and also for the production of any special tools. The other portion is reserved as a tool store, and here are stored all the various tools required throughout the works.

The locomotive erecting shop is 220ft. long by 45ft. span, and equipped with a 15-ton electrically-driven crane, and, as mentioned previously, this shop runs a continuation of the general erecting shop. Three lines from the Government Railways run into the loco. erecting shop, and two pits for the erection of locomotives have been put down, and on each pit is capable of erection at the one time three locomotives, so that it is possible to have six locomotives in course of erection on the pits at the one time. When the locomotives have been completed, they will be run back out of the erecting shop into the paint shop.

The new smith shop, now in course of erection and equipment, will have, in addition to the steam hammers already in use in the present smith shop, a 25-cwt. steam hammer by Thwaites Bros., and a 500 ton high speed forging press of the steam hydraulic intensifier type, built by Davy Bros., Ltd., Sheffield. Before ordering this press, Messrs. Thompson and Co. investigated the matter thoroughly, and finally Mr. David Thompson, the managing director, in the course of a recent visit to England, had the opportunity of thoroughly comparing the merits of the press in working against steam hammers, and his final decision was all in favour of the press. Two forge furnaces are being installed to serve the press, and a 7-ton electric forge crane will handle the material from both these furnaces.

## INDUSTRIAL.

The Cyanide Plant Supply Co. (London) have forwarded a number of recently published booklets dealing with Brown agitators and tube mills, which bring together a lot of information not published hitherto, but of great interest to the mining community; also describing the Komata liner for tube mills, employed at many of the New Zealand mines and in various parts of North America, Cooper roller bearings, and Neal's pebble-retaining discharge for tube mills.

* * *

From the Lawrence and Hanson Electrical Co. Ltd., Melbourne, we have received one of Messrs. W. T. Glover and Co.'s desk calendars for the second half of the current year and the first of next year. Its distinguishing feature is that each day's leaflet bears an extract from recognised and authentic publications on some question of interest to engineers and electricians. A memorandum accompanying the calendar mentions that it has just arrived, but that does not alter the fact that most of the first half is already out of date, as a calendar.

* * *

The Allmaenna Svenska Elektriska Aktiebolaget (General Electric Co. of Sweden) have just entered into a contract with a Norwegian firm for six generators, each 18,000kw., or over 150,000 h.p. for the six machines. Two years ago the company supplied the same firm with five alternators, each 16,000kw., and the fact that the large repeat order has been placed is in itself a guarantee of the satisfactory performance of that contract. The current is three phase, 50 periods, 10,000 volts, and speed 250 r.p.m. Accompanying is an illustration of one half of a 23,000 e.h.p. double 3 phase generator at Rjukanfos, Norway.

* * *

Messrs. B. K. Morton Pty. Ltd., Melbourne, have forwarded a pattern book of the new floor-covering, "Congoleum," advertised elsewhere, for which they have the Australian agency. Congoleum is manufactured by the Barrett Manufacturing Co., Philadelphia, the foundation being a tough, hard-surface fabric specially prepared with a water-proofing compound which renders it impervious to dampness and moisture, besides which it is claimed that the material will not dry out, rot or crack. It is made in a large variety of carpet patterns, as well as plain tiles and parquetry.

* * *

In consequence of the great extension of their business, the Sterling Telephone and Electric Co. Ltd., hitherto of St. Bride-street, London, E.C., have removed to more commodious premises at Telephone House, 210-12 Tottenham Court-road, London, W.

## NEW ELECTRIC LAMPS.

Some discussion has been taking place in England recently as to the effect the probable early introduction of highly efficient lamps will have on stations which depend largely on lighting for their revenue. The tungsten lamp consumes about 1.25 watt. per candle power, and, on the one hand, it is argued that molybdenum lamps made by similar methods to those used for tungsten filaments cannot be made to give a higher efficiency than 1.10 watt. per candle power. It is understood that a tungsten lamp will shortly make its appearance which will have an efficiency of 0.5 watt. per hefuer candle, and it is this lamp which is evoking the discussion referred to. The general impression, however, is that at the outset these lamps will only be obtainable in large sizes of from 300 to 1600 candle power, and will, therefore, come into competition chiefly with enclosed and flame arc lamps for street lighting purposes. It is anticipated that small lamps will be made in time which will reduce the cost of electric light to the ordinary consumer by fully 60 per cent.

In the new "half-watt." lamp, which has recently made its appearance, the filament is a pure drawn tungsten wire coiled into a very fine spiral and hung between two stout molybdenum wires, which are of sufficiently large cross-sectional area to remain comparatively cool whilst the lamp is in use. These lamps have large spherical bulbs, which are not in vacuo, but are charged to a pressure of one atmosphere with some inert gas, which is probably nitrogen. One result of this is that the heat from the filament is transmitted to the glass of the bulb, so that the ordinary methods of capping could not be used. The brilliancy of these lamps is said to be extraordinary, and tests have shown it to have an average efficiency of about 0.53 watt. per candle power, and it is believed that if it were possible to make molybdenum filaments in the same manner the efficiency of the lamp would then be as nearly as possible 0.5 watt. per candle. In the event of this consummation being reached it is believed that conditions will be altered so materially as to seriously affect the revenue of electric light stations unless some steps are taken to meet it.

## MISCELLANEOUS.

Some time ago two excavators were ordered by the South Australian Public Works Department. Last week Sir Richard Butler (Commissioner) announced that these would arrive about Dec 25. They are only required for shallow work, excavating channels about 3ft. deep. Judging by the work so far done with the two excavators already in use, Sir R. Butler considers that, except where rock exists, the work of excavation by machinery is done at one-third of the cost of manual labour.

* * *

In order to expedite the transport of water and material along the route of the Trans-Australian railway, from Port Augusta (S. Aus.) westwards, and to reduce the cost, the Assistant Minister for Home Affairs (Mr. Kelly), has agreed to the purchase from Messrs. A. H. McDonald and Co., Burnley (V.), of an Imperial oil tractor and trailer, at a cost of £1530, that price including spares. The machine is made locally, and should be delivered at Port Augusta within a month. In about a month's time the first section of this great undertaking will be opened for goods traffic namely, that between Port Augusta and Euro Bluff, a distance of 35 miles, and the first freight rate, namely, for wool, has been fixed at 2s. 3d. per bale for that distance. It is stated that two internal combustion engines for use on the permanent line have been ordered in Great Britain. With respect to passenger cars, a design has been approved by the Assistant Minister, and timber for their construction is being obtained for seasoning. This will comprise 105,000 super feet of teak, 38,000 feet oregon, 63,000 feet Queensland maple, 144,000 feet hoop pine, 20,000 feet cedar, 230,000 feet celery-top pine, 200,000 feet jarrah, and 200,000 feet of tallow wood, spotted gum, iron bark and blackwood.

* * *

It was announced by cable last week that Mr. C. E. H. Hobhouse, who represents Bristol East in the House of Commons, and who was recently appointed Chancellor of the Duchy of Lancaster, is to be the chairman of the departmental committee appointed by the Postmaster-General, Mr. Herbert Samuel, to consider the advisability of making provision for research in wireless telegraphy, and possibly also in telegraphy and telephony.

* * *

Two officers of the Postmaster-General's Department—Mr. A. R. Jones (Melbourne), and Mr. W. Morgan (Sydney)—will, after Christmas, be despatched to England and America to look into all matters relating to telephones. While in the United States they will visit all the largest cities, particularly Chicago, in order to become familiar with the latest ideas, the American standard being in advance of that in other parts of the world.

* * *

The revenue of the Victorian railways from July 1 to October 31 amounted to £1,690,134, or £76,818 in excess of that for the same term of last year. The principal increases were £44,952 from goods traffic, £22,410 from live stock traffic, £8560 from passenger traffic, and £2616 from parcels traffic.

* * *

The receipts of the Brisbane Tramway Co. for October amounted to £27,250 16s. 4d., as compared with £23,017 4s. 11d. for the same month last year, the increase being £4233 11s. 5d.

* * *

The Queensland railway estimates, which were last week passed by the Legislative Assembly, provide for increases in officers' salaries totalling £213,047.

* * *

Before the agreement between the Melbourne Harbour Trust and the Victorian Public Works Department for the construction of the Trust's new dredge and steam tug at the Government ship-building yards at Williamstown was formally entered into, certain alterations were made in the design of each, and the cost of the dredge was reduced from £96,000 to £93,000. Instead of being fitted with hopper doors at the bottom so as to discharge the material in other parts of the Bay, heavy pumps are to be fitted for discharging silt into hopper barges, which alteration will enable the capacity of the vessel to be increased from 2000 to 2500 tons. In the case of the tugboat, the cost of which will be £26,842, she is to be fitted with the most up-to-date fire fighting apparatus, so that she may be put to service in case of fire breaking out on a ship lying at the wharves, or in the stream, or even in the Bay. The steam pumps are to be capable of throwing 2000 gallons of water per minute, and a Harker fire extinguisher will also be put in to deal with small outbreaks without damaging a ship's cargo.

* * *

The Brunswick (V.) City Council decided last week to seek the permission of the Governor-in-Council to borrow £7000 to extend its electric lighting scheme, and £1000 for the purchase of land for a technical school, besides other sums for public works.

* * *

Being asked in the Queensland Legislative Assembly last week whether the Government would itself take over the Brisbane tramways at the expiry of the concession lately made, acting under the compulsory purchase clauses of the new agreement, Mr. Denham said: "There is not the least chance: that would make too great a demand on loan funds. Brisbane does not keep the country; the country keeps Brisbane, and when we have money to spend it will be better spent in building railways than in buying tramways in Brisbane."

* * *

The electric "rapid transit" railway to the Grunewald settlement, near Berlin which is the outcome of negotiations between the municipal authorities of Grunewald, Wilmersdorf and Charlottenburg, is to be built as an underground railway. It will go by way of the Kurfuerstendamm, Henrietta Square, Halensee and Grunewald to Hundekehle.

* * *

The revenue of the Postal Department from telegraphs and telephones for the first quarter of the financial year, July to September, was as follows.—Telegraphs £51,974 (against £46,329 for the same term last year), telephones £255,761 (against £209,138 last year).

* * *

Mr. Appel, the Queensland Minister of Railways, has recommended a pension of £50 a year to Mrs. Nash, widow of the discoverer of the Gympie goldfield.

* * *

The railway receipts of the Chillagoe Ltd. (Q.) for October amounted to £10,182, as against £9935 in October, 1912, while those for the seven expired months of the company's financial year were £63,550, as compared with £61,801 for the same period last year.

* * *

The members and delegates to the Australian Congress of the British Association for the Advancement of Science next August will number 395.

* * *

The Emu Bay Railway Co.'s receipts for October amounted to £5505, as compared with £5814 for October, 1912, making the total receipts for the ten months of 1913 £26,082, as against £54,795 for the same period last year.

**P. & O.** COMPANY'S ROYAL MAIL STEAMERS

FOR MARSEILLES, PLYMOUTH AND LONDON.

Leave Sydney on the subjoined dates, calling at usual ports.

FIRST AND SECOND SALOON ONLY.

| Steamer. | Tons. | Commander. | Noon. | Melb., 3 p.m. |
|---|---|---|---|---|
| MONGOLIA | 10,000 | Lewellin | Nov. 29 | Dec. 2 |
| MACEDONIA | 10,500 | Bennett | Dec. 13 | Dec. 16 |
| MALWA | 11,000 | Thompson | Dec. 27 | Dec. 30 |

PASSAGE MONEY TO LONDON—
Single, £41 16s. to £82 10s.
Return, £69 6s. and £123 4s.

Return Tickets between Inter-State Ports are available for return by Orient, Messageries Maritimes, and N.D.L. steamers having room.

SPECIAL HOLIDAY RETURN TICKETS to COLOMBO are now issued, available for two months. Fares from Sydney, £45 2s. first saloon, and £31 18s. second saloon.

A. GORDON WESCHE, Superintendent IN AUSTRALIA, 63 Pitt-street, Sydney.

**The COLONIAL MUTUAL FIRE Insurance Company Limited.**

Principal Office: 60 MARKET-ST., MELBOURNE.

Branches in all the States.
Transacts Fire, Guarantee, Employers' Liability, Marine, Burglary, and Plate Glass, Accident, Workers' Compensation and Live Stock Insurances.
Send for Prospectus.
W. TUCKER, General Manager.

**Harringtons LTD**

**ANALYTICAL & METALLURGICAL DEPT.**

Highest prices given for all gold, silver or platinum residues, etc.
Lowest fees for all kinds of Assay, Analytical, and Metallurgical work.
Expert Advice on Ore Treatment, Bullion Refining, Smelting, etc., etc., Directed by a qualified Analyst from Messrs. Johnson and Sons, London: Assayers and Refiners to Bank of England, H.M. Mint, The Council of India, etc.

**HARRINGTONS LTD.**
**386 George Street, Sydney.**

## CANADIAN ENGINEERING FEAT.

### A £3,000,000 Bridge.

A fine new steel cantilever bridge is being erected by the Canadian Government over the St. Lawrence River, about nine miles above the city of Quebec. It will replace one which collapsed during its construction about six years ago, when 15,000 tons of steel fell, together with the workmen upon it, into the river below, sacrificing 80 lives. The new bridge has been under construction four years, and when completed in another four years' time will be one of the finest bridges in the world, and a triumph of engineering skill, and its cost about £3,000,000. The bridge was designed, and is being constructed under the direction of a board of engineers appointed by the Government, and when completed will be used by the Grand Trunk Transcontinental Railway, now being constructed in sections from Halifax on the east coast, to Prince Rupert, B.C., on the west coast, 550 miles north of Vancouver, a total distance of 3550 miles. The main span of the bridge will be 1800ft., the longest in the world by 90ft., the Forth bridge having the next longest span of 1710ft. Nickel steel is being used in the principal members of the cantilevers, with the object of increasing the tensile strength and reducing the dead weight of the superstructure. The total length of the structure will be 3239ft. and the clear height above high water 150ft., for 640ft. of its central length. At the time of my visit the piers were completed, and one approach span erected.

When Mr. A. B. Brady, the Queensland Under-Secretary for Public Works, was recently in Canada, by the courtesy of the chief engineer of construction he was allowed to inspect the working plans and details of the bridge, and a large model of the cantilevers of the principal span. Mr. Brady, who was greatly impressed by what he saw, made the above statement to a "Daily Mail" interviewer on his return to Brisbane.

---

At the last meeting of members of the Victorian Legal Managers and Secretaries of Mining Companies Association, Messrs. B. Bradley, G. E. Dickenson, H. S. Dickson, G. B. Gordon, A. Pearson, and D. G. Stobie were re-elected members of the committee; Mr. W. T. Thompson was elected to represent Ballarat members, and Mr. W. O. Strangward was re-elected hon. auditor.

# Invited and Accepted Tenders

It is particularly requested that the information regarding contracts open, and the successful tenderers, be forwarded to The Editor not later than Monday of each week.

The following contractions are used throughout:—S—supply; D—delivery; M—manufacture; C—construction; E—erection; P—purchase; I—installation; R—removal. Where no contractions appear, supply and delivery is understood. The date at the beginning of each paragraph refers to the closing of tenders.

## INVITED.

### Commonwealth.

Specifications, tender-forms, etc., for tenders invited for the Postmaster-General's Department of the various States under this heading may be had as follows:—Victoria—Various State G.P.O.'s. New South Wales—Departmental Stores, Sydney, and various G.P.O.'s in other States. South Australia—Adelaide, Melbourne, Sydney and Brisbane G.P.O.'s. Western Australia—Departmental Stores, Perth, and various G.P.O.'s in other States. Queensland—Various State G.P.O.'s. All States—Various G.P.O.'s. If the specifications, etc., may be had elsewhere, in addition, the places will be given in parentheses.

POSTMASTER-GENERAL'S DEPARTMENT, Melbourne.—2nd December.—S. and D. of 2000 pairs of brass lightning guard brackets, as per schedule No. 978. (See advertising columns.)

9th December.—S. and D. of 1000 reinforced concrete poles, as per schedule No. 959.

11th December (extended from 11th November). — D. and E. of eight automatic telephone switchboards at the Ascot, Canterbury, Malvern, Cheltenham, Footscray, Oakleigh, Sandringham, and Williamstown Telephone Exchanges, as per schedule No. 953. (See advertising columns.)

16th December.—S. and D. of one common battery multiple switchboard at the Telephone Exchange, Wills-street, Melbourne, as per schedule No. 968.

30th December.—S. and D. of telephone material, as per schedule No. 976.

27th January, 1914.—S. and D. of switchboards, telephone, etc., as per schedule No. 990.

17th February.—S. and D. of cable boxes, as per schedule No. 986. (See advertising columns.)

POSTMASTER-GENERAL'S DEPARTMENT, Sydney.—3rd December.—S. and D. of 8000 jointing sleeves, for use with galvanised iron wire.

3rd December.—S. and D. of 181 tons wire, galvanised iron, 400, 200, and 60 lbs. per mile, as per stores schedule No. 346.

3rd December.—S. and D. of 3 miles wire, copper, No. 18 L.S.W.G., and I.R. insulated, as per stores schedule No. 347.

3rd December.—S. and D. of 48,500 insulators, porcelain (brown and white), as per stores schedule No. 348.

3rd December.—S. and D. of 42,000 spindles, steel, galvanised.

3rd December.—S. and D. of 1500 stay rods, as per stores schedule No. 349.

3rd December.—S. and E. of about 104 wooden poles and erection 4 miles wires.

3rd December.—S. and E. of 324 wooden poles and 14¾ miles wires.

18th March, 1914.—S., D. and E. at the Telephone Exchanges, Epping, Ryde, Hunter's Hill, Drummoyne, Wahroonga, Paddington and Waverley, Sydney, of seven (7) automatic switchboards, with associated equipment, as per schedule No. 179.

POSTMASTER-GENERAL'S DEPARTMENT, Brisbane.—26th November.—S. of all material specified and labour for erection about 170 miles H.D. copper wire from Inglewood to Mungindi.

1st December.—S. of all material specified, and erection about 107½ miles H.D. copper wire to Roma and Pickanjinnie.

9th December.—S. and D. of all material specified, and workmanship necessary erection 63 miles 200-lb. H.D. copper wires between Blackwall and Tambo.

17th December.—S. and D. of insulators, as per stores schedule No. 280.

31st December.—S. and D. of insulators, as per stores schedule No. 282.

7th January, 1914.—S. and D. of switchboards, as per schedule No. 274.

7th January, 1914.—S. and D. of telephone instruments, as per stores schedules Nos. 275, 276 and 277.

7th January, 1914.—S. and D. of protectors, parts, etc., as per schedule No. 278.

POSTMASTER-GENERAL'S DEPARTMENT, Perth.—3rd December.—S. and D. of H.D. copper wire.

10th December.—S. and D. of 60 tons galvanised iron wire.

21st January, 1914.—S. and D. of switches, telegraph line with plugs.

POSTMASTER-GENERAL'S DEPARTMENT, Adelaide.—26th November.—S., fitting and erection of 229 wooden poles.

17th December.—S. and D. of 5000 protectors, as per schedule No. 309.

11th February.—S. and D. of 50 cable terminals, 26 pair, as per schedule No. 308.

POSTMASTER-GENERAL'S DEPARTMENT, Hobart.—1st December.—S. and D. of dry cells, as per schedule No. T. 84.

DEPARTMENT OF HOME AFFAIRS.—Kalgoorlie-Port Augusta Railway.—28th November (extended from 5th November).—M., S., D. and E. of 4 locomotive engines and tenders (N.S.W. "P" type); tender capacity, 4500 gallons of water, and approx. 7½ tons of coal.

1st December.—S. and D. of 22 tons G.I. wire, 200 lb. per mile, 2 cwt. 60 lb. per mile, at Fremantle and Port Augusta respectively.

2nd December.—600 pairs of wheels and axles (9in. x 4½in. journals).

2nd December.—S. and D. of 15 bogie cattle waggons and 30 bogie sheep waggons. (See advertising columns.)

FEDERAL TERRITORY.—26th November.—S. of pumping plant for Canberra.

DEPARTMENT OF HOME AFFAIRS.—Quarantine Station, Sydney.—24th November.—S. of boiler plant for Quarantine Station.

1st December.—S. and D. of one overhead travelling crane.

DEPARTMENT OF DEFENCE.—St. Kilda-road, Melbourne.—8th December.—S. and D. of typewriters.

DEPARTMENT OF DEFENCE—Small Arms Factory, Lithgow, N.S.W.—29th December.—P. of scrap steel, brass, jute bags, whale oil, etc.

12th January.—S. of iron and steel for manufacture of rifles.

### States Invited.

### Victoria.

RAILWAY DEPARTMENT.—20th November.—S. and D. of high speed tool steel.

21st November.—S. and D. of G.I. rubbish bins.

21st November.—S. and D. of india-rubber bumpers.

21st November.—S. and D. of mantles for Bland burners.

24th November.—S. and D. of copper sheet.

25th November.—M., S. and D. of one mild steel kerb.

26th November.—S. and D. of best Yorkshire iron angles.

26th November.—S. and E. street verandah, Spencer-street.

26th November.—C. and E. of steel decking for subway at Castlemaine.

26th November.—M., S. and D. of steel spring washers, ½in. deep, for ⅞ guard rail stay bolts for 60 lb. rails.

26th November.—M., S. and D. of steel spring washers, 1in. deep for 1in. guard rail stay bolts for 80 and 100 lb. rails.

26th November.—S. and E. of verandah over platforms, 9, 10 and 11 Spencer-street.

26th November.—M., S. and D. of 200 sets M.S. tinned footwarmer parts.

26th November.—S. and D. of 1000 cast steel blooms for axles for electric motor bogies.

30th November.—Resilvering mirrors.

3rd December.—Steel blooms, for piston rods.

3rd December.—S. and D. of vulcanised rubber electric light wire.

10th December.—M., S. and D. of one 15-ton electric crane for Ballarat.

31st December.—S. and D. of planished mild steel sheets (lead coated or galvanised).

7th January.—S. and D. of 10,000 porous pots for batteries.

7th January.—S. and D. of best steel boiler plates.

7th January.—S. and D. copper rod.

7th January.—S. and D. copper plates.

7th January.—S. and D. of cast steel wheel centres.

7th January.—S. and D. of steel blooms for crank pins.

7th Jan.—S. and D. of locomotive brass boiler tubes.

7th January.—S. and D. of best Yorkshire iron angles.

7th January.—S. and D. of locomotive seamless copper tubes.

7th January.—S. and D. of steel channel bars.

14th January.—S. and D. of five feed lubricators.

14th January.—S. and D. of 100,000 lineal yards tarpaulin canvas.

14th January.—S. and D. of high speed twist drills.

14th January.—S. and D. of one concrete mixer.

21st January.—S. and D. of one high axle speed lathe.

21st January.—S. of hydraulic jacks.

28th January.—S. and D. of 200 forges and rolled steel disc wheels.

28th January.—M., S., D. and E. of one three-phase alternator, complete, at Newport.

4th February.—S. and D. of 1500 felt body blocks.

4th February.—S. and D. of 25 five-feed lubricators.

11th February.—S. and D. 10 tons commercial sodium acetate.

18th February.—S. and D. of pig iron.

VICTORIAN RAILWAYS COMMISSIONERS STATE COAL MINE.—24th November.—S. and D. of Silverlight kerosene oil, or approved brand.

24th November.—S. and D. of drop forged copper controller, fingers and screws, angle steel.

17th December.—S. of one motor driven ventilating fan. (See advertising columns.)

STATE RIVERS AND WATER SUPPLY COMMISSION.—6th December.—M. and S. of one centrifugal pump and quick revolution steam engine about 800h.p.

## New South Wales.

PUBLIC WORKS DEPARTMENT.—8th December.—M., S. and D. of steel bridges for Cooperbung and Piper's Creeks, on fifth section, North Coast Railway, viz., Wauchope to Kempsey.

22nd December.—M., S. and D. of twenty 20 ton cart weighbridges, ten 20 cwt., and forty 10 cwt. weighing machines for railway station yards.

27th January.—M., S. and D. of steel bridges for Saltwater and Smith's Creeks; for Christmas, Warrel, and Snaky Creeks, and Lagoon, at 216 miles 60 chains; and for [illegible] Creek, on the 5th, 6th and 8th Sections, respectively, North Coast Railway, viz., Wauchope to Kempsey, Kempsey to Macksville, and Coff's Harbour to Glenreagh.

RAILWAY DEPARTMENT.—26th November.—C. and S. of two bogie water sprinklers. (See advertising columns.)

26th November.—S. of one 2000 lb. storage battery freight truck. (See advertising columns.)

14th January, 1914.—S. of 2 electrically driven turbine pumps, 50 gallons per minute. (See advertising columns.)

METROPOLITAN BOARD OF WATER SUPPLY AND SEWERAGE.—24th November.—S. and D. of centrifugal pump casings with spindles, rings, etc., for Ryde Pumping Station.

15th December.—M. and D. of one turbine centrifugal pumping plant for Crown-street Pumping Station.

## Queensland.

TREASURY DEPARTMENT (Babinda Central Sugar Mill).—24th November.—S. D. and E. of small electric generating plant, motive power, and all accessories. Shafting, brackets, and travelling crane for 30 cwt. Tools for fitting shop. Bar iron and piping. One locomotive, about 12 tons loaded. 2ft. gauge.

6th January, 1914.—S. and D. of 23 miles of steel rails, 28 lb. per lineal yard, with all fastenings, to be delivered at Cairns Wharf in July, 1914.

HOME SECRETARY'S DEPARTMENT.—25th November.—S. and D. of drugs and chemicals.

RAILWAY DEPARTMENT.—25th November (extended from 11th November).—S. of cement.

WATER SUPPLY DEPARTMENT.—Tambo Water Works.—12th December.—C. and E. of steel tower surmounted by steel tank.

5th January.—S. and D. of 85 tons cast-iron water pipes, special castings and valves.

## Western Australia

GOVERNMENT TENDER BOARD.—20th November.—S. of copper firebox, tube plates for Railway Department.

20th November.—1000 yards roofing canvas.

20th November.—200,000 yards tarpaulin canvas.

20th November.—S. of sewerage fittings.

4th December.—S. of 16,000 gallons oil.

18th December.—S. and D. of copper plates, pipes, bars and sheets, for Railway Department.

18th December.—Mill rolled plate glass for Railway Department.

18th December.—S. and D. of telephone material for P.W. Department.

## South Australia.

SUPPLY AND TENDER BOARD.—25th November.—S., D. and stacking 200 miles galv. wire netting (100 miles 42 x 1½ x 18g. and 100 miles 36 x 1½ x 18g.).

9th December.—S. and D. of 200 rubber washers, 4in. dia. x 1⅛in. thick x 1⅞in. dia. hole in centre.

9th December.—S. and D. of 300 india-rubber buffing springs for No. 202 cylinders, 1⅞in. hole; 200 india-rubber draw springs for No. 180 cylinders, 1¾in. hole to suit 1⅝in. dia. draw bars.

6th January.—S. and D. of 1500 bars chain iron, various sizes.

6th January.—S. and D. of 1559 tons steel rails, 41 lbs., and 18 tons steel fishplates for same.

13th January.—C. of 12 bogie goods break vans, with passenger compartments, 3ft. 6in. gauge.

PUBLIC WORKS DEPARTMENT.—16th December.—S. and E. at Renmark of complete pumping plant.

MINES DEPARTMENT.—29th November.—P. of Parramatta and Yelta mines plant and machinery. (See advertising columns.)

## General.

MUNICIPAL COUNCIL OF SYDNEY.—26th November.—Alteration to Sir Wm. Manning Markets, at Haymarket, in order to convert into a hippodrome.

BALLARAT WATER COMMISSIONERS (V.) (Alex. Fraser, Secretary).—11th December.—C. of reservoir embankment, on the Moorabool River. (See advertising columns.)

SHIRE OF SWAN HILL.—2nd December.—S. and D. on site of all machinery and labour for duplication of electric power plant at Swan Hill.

BRISBANE METROPOLITAN WATER AND SEWERAGE BOARD.—13th January.—S. and D. of material for aerial ropeway.

10th February.—S. and D. of steam crane excavator. (See advertising columns.)

CITY OF LAUNCESTON (T.) (C. W. Rocher, Town Clerk).—24th November (extended from 13th October).—Section i., S. and D. of transformers, etc.; section ii., S. and D. of feeder cable, etc.; section iii., S., D. and E. of high tension switchboard, etc.

CHRISTCHURCH CITY COUNCIL (H. R. Smith, town clerk).—5th January, 1914.—S. and D. of series street lighting plant and accessories. Specifications may be seen Town Clerk's office, Melbourne.

ELECTROLYTIC REFINING AND SMELTING CO. LTD., Port Kembla (N.S.W.).—22nd November.—Engineering, electrical, chemical and general stores, for years 1914 and 1915.

BURNT CREEK G.M. Co. (S. J. Warnock, Collins-street).—1st December.—P. of heap of slimes and sand, near Dunolly (V.). (See advt. columns.)

MARINE BOARD, Hobart (J. Adams, Secretary).—2nd December.—S. and D. of 6000 imp. gallons mineral colza oil for light house purposes. (300 deg.)

SHIRE OF SWAN HILL (Wm. Bird, Shire Secretary).—2nd December.—S. and D. of necessary machinery for duplication of electric power plant.

THE SULPHIDE CORPORATION LTD., Central Mine.—6th December.—S. of stores for year 1914.

CYANIDING.—P. of 200,000 tons (about) of sands and slime.—James Paton, Main-street, Stawell (V.). (See advertising columns.)

CHRISTENSEN'S AJAX G.M. CO., Daylesford (Norman G. McLeod, 31 Queen-street).—21st November.—P. of whole mining plant standing on above leases.

## States Accepted.

### Victoria.

M., S. and D. of "C" class jibs, valves, and brackets for combined tanks and cranes, at £23 7s. 6d. per set.—J. T. Trevorrow.

C. and E. of steel decking and lanterns over subway at Caulfield station, £1342 5s. 6d.—Johns and Waygood Ltd.

C. and R. of mild steel girders, etc., for use in the renewal of the Moorabool Viaduct, Geelong, £9406 4s. 11d.—Dorman, Long, and Co. Ltd.

S. and D. of air drills for Newport Workshops—Item No. 1, air drill (Boyer drills No. 3), at £24 each; item No. 2, air drill (Little Giant drills No. 3), at £19 each.—William Adams and Co. Ltd.

S. and D. of pig iron for 15 "A2" engines—Item No. 1, "Frodair" No. 3, at £7 4s. 6d. per ton; item No. 2, "Bearcliffe," at £7 16s. 6d. per ton; item No. 3, "C. B. Kittel," at £11 4s. 6d. per ton.—McPherson's Pty. Ltd.

S. and D. of red oxide (dry), at £3 19s. 6d. per ton.—W. and G. Dean.

### New South Wales.

RAILWAY DEPARTMENT.—S. of 45in. special induced draught fan, with 24in. square discharge for Newcastle Power House.—Ferrier and Dickenson, Sydney.

**A.U.S.N. Co. Ltd.**

*Fast, Regular, and Comfortable Passenger Steamers*
(also carrying cargo) from and to
MELBOURNE, SYDNEY, ADELAIDE, FREMANTLE, BRISBANE, and all QUEENSLAND PORTS.

Passage Tickets interchangeable, with other Inter State Companies, on certain conditions.

Full Particulars at
**COMPANY'S OFFICES**
at all principal Australian Ports.

**The Mount Lyell Mining & Railway**
CO. LIMITED.

Purchasers of Ores containing Copper, Gold and Silver. Rates obtainable on application to the Secretary.

Manufacturers of Coke for Smelting and Foundry Purposes, Acids, Etc.

HEAD OFFICE—
39 QUEEN-STREET, MELBOURNE.

D. G. LUMSDEN,
Secretary.

**The "Atlas" Diesel is the right Engine for Mining Work!**

Proof of its efficiency is its popularity. Many managers have adopted the "Atlas" Diesel Oil Engine after experimenting with every other make. Let their experience be your profit and prompt you to get particulars.

We can tell you here that the "Atlas" Engine is unique as regards

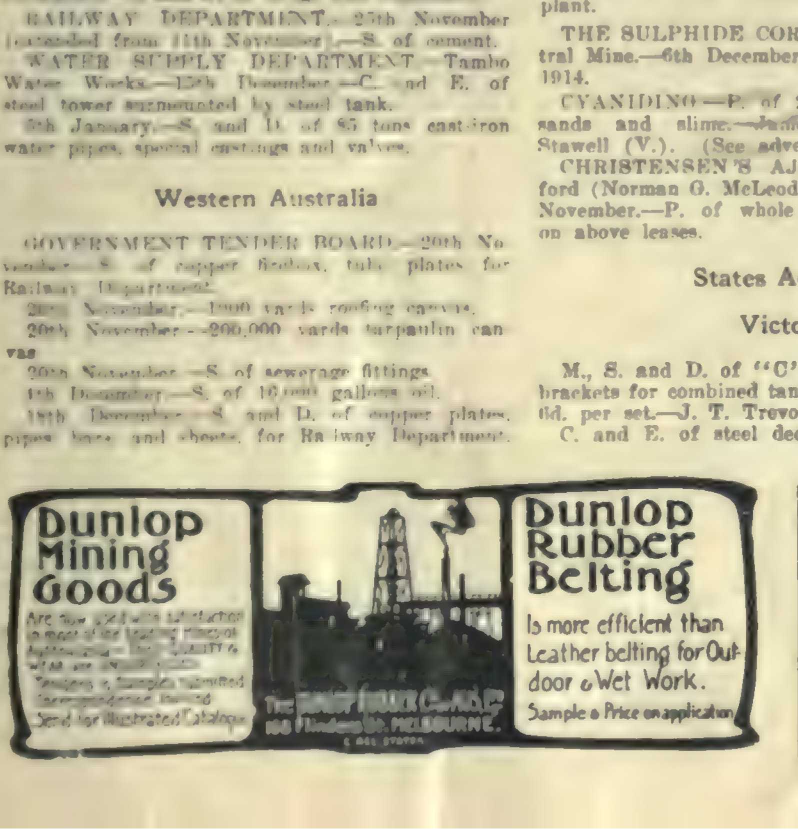
POWER — RELIABILITY — LOW COST OF RUNNING.

Being a true internal combustion engine, it requires no ignition device. It runs on the very crudest fuel, such as Petroleum residue, etc.—starts easily and surely, and requires but little looking after—in fact, it runs itself.

It will pay you handsomely to get particulars of this famous engine. Call and see it running if you can—to-day.

We are Mining Machinery Specialists.

**STAWN LIMITED,**
Engineers, 343 Kent Street, Sydney.



Dunlop Mining Goods

The Dunlop Rubber Co. A'sia Ltd.
108 Flinders St. MELBOURNE.

Dunlop Rubber Belting
Is more efficient than Leather belting for Outdoor & Wet Work.
Sample & Price on application

**"FIBRO-CEMENT" Fireproofing**

Everyone about to build should obtain full particulars of this cool, acid-proof, ant-proof and fire-resisting material. The slates for roofs and the sheets for walls and ceilings are specially suited for the Australian climate. Used by the Federal and State Governments and by all the leading Architects and Builders.

ECONOMICAL AND EVERLASTING.

Full particulars, etc., from Sole Agents and Importers—
**JAMES HARDIE & CO.** Melbourne & Sydney

## DIVIDENDS.

The following dividends and bonuses of mining companies in Australia have been declared, and are payable on the dates noted.

November.

20th.—Ajax Central G.M. Co., Daylesford (V.), 2s., £3000.

20th.—Williams' United G.M. Co., Eaglehawk (V.), 6d., £875.

20th.—North Bendigo G.M. Co. (V.), 6d., £600.

20th.—Great Northern Co., Eaglehawk (V.), 6d., £750.

20th.—Ironbark Co., Bendigo (V.), 1s., £1500.

26th.—Wandiligong G.D. Co., Wandiligong (V.), 1s., £300.

27th.—Elsmore Tin S. Co., Elsmore (N.S.W.), 6d., £600.

27th.—Cathcart Central G.M., Ararat (V.), 2s., £5000.

December.

1st.—Silverton Tramway Co., Broken Hill, (N.S.W.), 1s., and bonus, 2s. £37,500.

4th.—Talisman Consolidated Ltd., Karanga hake (N.Z.), 1s. 9d., free of taxes. £30,187.

5th.—Edna May G.M. Co., Westons (W.A.), 1s., and bonus 1s., £4285.

6th.—Vulcan Tin M. Co., Irvinebank (Q.), 3d., £500.

8th.—British Broken Hill Propty. Co. (N.S.W.), 3s., £56,250.

15th.—Mt. Lyell M. and R. Co. (T.), 1s. 3d., £80,424.

17th.—Broken Hill Propty. Block 10 (N.S.W.), 1s. and bonus 3s., £20,000.

19th.—Tongkah Compound, Siam, 1s. and bonus 1s., £5000.

20th.—Sons of Gwalia Ltd., Mt. Leonore (W.A.), 1s., less income tax, £17,500.

29th.—Zinc Corporation, Broken Hill (N.S.W.), 1s. 6d., less English income tax, all shares, £67,400.

## BANK CLEARINGS.

The report of the Melbourne Clearing House for the week ended 17th November was:—

| | | |
|---|---|---|
| Total clearance .. .. .. .. .. .. | | £6,597,257 |
| Balances— | | |
| Settled by certificates .. | £385,500 | |
| Settled in coin .. .. .. .. | £397,030 | |
| | | £782,530 |
| Total clearance for the corresponding week, 1912 .. .. .. .. .. .. | | £6,221,324 |

The Sydney police have arrested an Assyrian, named Joseph Shalala, on a charge of having in his custody at Sydney on 10th November 17 oz. 12 dwt. 12 gr. of gold, supposed to have been stolen. The value of the gold was £28 18s. 6d. He was further charged with stealing a quantity of retorted gold, valued at £10 5s. 5d., the property of some person or persons unknown, at Sydney, on or about 7th April, 1913. On accused being brought before the Central Court last Monday week, and remanded, Sergeant Mankey asked for heavy bail. He said the circumstances of the case were that accused was a storekeeper at Canbelago. There was a gold mine near the township, and for a considerable time there had been a series of thefts of gold from the mine. Accused came to Sydney, and endeavoured to sell a piece of gold, which was believed to be portion of the stolen metal. Accused was arrested by Detective Moore while he was negotiating for the sale of a nugget. Accused was remanded until 17th November, bail being fixed at £500 in one surety, or two of £250.

The amount of gold purchased by the banks of Bendigo and Eaglehawk (V.) during October was 13,179 oz. 4 dwt. 3 gr., as compared with 14,197 oz. in September, and with 13,068 oz. in October, 1912. In the same month of 1908 the amount was 18,203 oz., and in 1909 it was 19,285. Only in one month this year, namely in August, has the return reached as high as 15,000 oz., the total for that month being 15,122 oz. The total for ten months has been 136,725 oz., the lowest for many years.

Writing of the future work of the Geological Survey of South Australia, the Government Geologist, Mr. L. Keith Ward, in his latest annual report, says that foremost among the future undertakings in connection with the work of the Geological Survey on economic problems is the systematic and critical survey of the deposits of rock phosphates of the State. That the mining of the phosphatic deposits will assume a greater degree of importance than hitherto is considered beyond doubt. It is therefore regarded as specially desirable that the known occurrences should be mapped, and that the work of prospecting for other deposits should receive scientific direction. Of equal importance is the necessity for a complete geological survey of the district embracing Wallaroo and Moonta, wherein the principal mines of the State are situated. There has never been made any detailed investigation of this field, he adds; but since Mr. Ward's report was penned (though apparently before it was printed, as it reached us later) the half-yearly report of the Minister of Mines has been issued, which states that the Assistant Government Geologist, Mr. R. Lockhart Jack, has beun the survey.

Certificates of competency have been issued by the Victorian Municipal Surveyors' Board, as a result of last month's examinations, to Messrs. M. K. N. Johansen, R. N. McKay, and C. M. B. Neylon. Certificates of qualification are also to be issued to Messrs. C. A. Mickle and L. M. Ord.

---

### Government Notice (V.).

VICTORIAN RAILWAYS COMMISSIONERS.

STATE COAL MINES.

VENTILATING FAN.

TENDERS (endorsed "Tender for Ventilating Fan"), to be addressed to the General Manager, State Coal Mines, Wonthaggi, and delivered at his office, at Wonthaggi, not later than 12 noon of Wednesday, December 17, are invited for the Supply of One Motor-driven Ventilating Fan. Particulars at the Melbourne office of the State Coal Mines, Robb's Buildings, Collins-street, and at the office of the General Manager, Wonthaggi. P.D., £2.

No tender will necessarily be accepted.

G. H. BROOME,
General Manager.

---

### BALLARAT WATER COMMISSIONERS.

TENDERS are invited for the CONSTRUCTION of a RESERVOIR EMBANKMENT (together with Bye-wash, Tower, and Outlet Works) on the Moorabool River, about 4 miles north-east of the Township of Wallace.

The embankment is to contain about 157,870 cubic yards of materials, including selected earth, clay, stone and concrete.

Copies of the contract drawings and printed copies of the specification, conditions of contract, and schedule of quantities, etc. (price, £1/10/- per set), may be obtained at the Water Commissioners' Office, Ballarat.

Each tender is to be accompanied by a preliminary deposit of £100. The final deposit will be 5 per cent. of the contract sum.

The Commissioners will not necessarily accept the lowest or any tender.

Tenders, addressed to the Chairman, Ballarat Water Commissioners, endorsed "Tender for the Construction of Reservoir Embankment." are to be deposited in the tender box at the Water Office, Ballarat, before 12 noon Thursday, December 11, 1913.

FREDERICK BRAWN,
Ballarat, Oct. 31, 1913. Chairman.

---

### Government Notices (N.S.W.).

Public Service Board,
4 O'Connell-street, Sydney,
November 14, 1913.

APPLICATIONS are invited for the position of Engineer-in-Chief (temporary) for Tramway Construction, Newcastle. Salary, £350 per annum. Applicants must have had experience in tramway construction work.

Application should reach the undersigned not later than December 8, 1913.

By order of the Board,
R. A. GILFILLAN,
(9A73) Secretary.

---

New South Wales Government Railways,
Office of the Chief Commissioner,
Sydney, November 10, 1913.

TENDERS will be received at this Office until 12 o'clock noon on the dates specified for the undermentioned works, etc., viz.:—

WEDNESDAY, NOVEMBER 26, 1913.

The Supply of One 2000 lb. Storage Freight Truck, Specification No. 426 (price 2/6).

The Construction and Supply of Two Bogie Water Sprinklers, to Specification No. 429 (price 5/-, with complete drawings 20/-).

WEDNESDAY, JANUARY 14, 1914.

The Supply of Two Electrically Driven Turbine Pumps, 50 gallons per minute, to Specification No. 432 (price 2/6).

All specifications are obtainable at the Electrical Engineer's Office, 61 Hunter-street, Sydney.

Tenders are to be endorsed, "Tender Storage Freight Truck," or as the case may be.

The Chief Commissioner does not bind himself to accept the lowest or any tender.

By order,
J. S. SPURWAY,
Secretary.

---

### Commonwealth of Australia.

Postmaster-General's Department,
Melbourne, November 14, 1913.

TENDERS will be received at the office of the Deputy Postmaster-General, Melbourne, until 3 p.m., on the undermentioned dates:—

December 2.—Brass Lightning Guard Brackets. (Sch. 978.) See Commonwealth Gazette, November 15.

December 11 (extended date).—Eight Automatic Telephone Switchboards. (Sch. 953.) See Commonwealth Gazette, November 8.

February 17, 1914.—Cable Boxes. (Sch. 986.) See Commonwealth Gazette, November 15.

AGAR WYNNE,
(1274) Postmaster-General.

---

Department of Home Affairs,
Melbourne, November 10, 1913.

KALGOORLIE-PORT AUGUSTA RAILWAY.

GALVANISED IRON WIRE.

Quotations, addressed to the Engineer-in-Chief for Commonwealth Railways, 84 William-street, Melbourne, will be received up to 11 a.m. on December 1 for the Supply and Delivery of the following:—

Galvanised Iron Wire to Fremantle and Port Augusta, respectively:—

200 lbs. per mile, as per postal specification No. 301, 22 tons.

60 lbs. per mile, as per postal specification No. 5, 2 cwt.

Half the above quantity for delivery to each port.

Full particulars will be obtainable at the Commonwealth Railway's Offices, 84 William-street, Melbourne, and also at the offices of the Commonwealth Works Director, Customs House, Sydney; Commonwealth Works Registrars, Brisbane, Adelaide, Perth and Hobart.

Quotations are to be endorsed, "Quotations for Electric Staff Wire."

JOSEPH COOK,
Minister of State for Home Affairs.

---

Department of External Affairs,
Melbourne, November 17, 1913.

TENDERS are invited by the undersigned, returnable on December 15, for the Supply of a Complete Tin-Dressing Plant for the Northern Territory, to include following items:—

60 B.H.P. Suction Gas Plant, or I.H.P. Steam Engine and Boiler.
1 Rock-breaker.
10 Head 1200 lb. Stamps, with boxes.
3 Wilfley or Krupp Concentrating Tables.
3 Wilfley or Card Slime Tables.
4 Luhrig Vanners (2 pairs).
4 Wheeler Grinding Pans.
3 Classifiers.
4 Cone-shaped Settlers, 6ft. deep, 6ft. diameter, large end.
2 Cone-shaped Settlers, 5ft. deep, 5ft. diameter, large end.
2 Cone-shaped Settlers, 4ft. deep, 4ft. diameter, large end.
2 Sand Pumps.
1 Tin Drier.
Necessary Shafting, Belting, Supply Pumps, and Feed Pumps, and all Sundries essential for working above plant.

Tenderers should submit constructional plans with their tenders, and the successful tenderer should be prepared to send a capable man to the Territory to supervise erection of plant.

Tenderers should quote c.i.f. Darwin, and state time when delivery can be effected.

The lowest or any other tender not necessarily accepted.

ATLEE HUNT,
Secretary Department of External Affairs.

---

NOTICE is hereby given that the Patentees, Messrs. Wood and Carson, of Australian Letters Patent No. 10101, dated October 29, 1907, for "Improvements in and relating to Axle Boxes," are prepared to satisfy any demands and all requirements of the public respecting the said invention. Further information obtainable from P. M. NEWTON, Patent Attorney, Fink's Buildings, Melbourne.

### BROKEN HILL PROPRIETARY BLOCK 10 CO LTD.

NOTICE is hereby given that a Dividend (102nd) of One Shilling per share, and Bonus of Three Shillings per share, has been declared, payable on December 17, 1913. Transfer books close on Wednesday, December 3, 1913, at 5 p.m. By order of the Board, JOHN BRANDON, Secretary.

**31 Queen-st., Melb., Nov. 12, 1913.**

---

FURTHER NOTICE is hereby given that the Patentee of Australian Letters Patent No. 9226/07, dated July 17, 1907, for "Improvements in Apparatus for Charging Furnaces," is prepared to satisfy any demands and all requirements of the public respecting said invention. Fuller information and particulars obtainable from EDWARD WATERS & SONS, Patent Attorneys, of 414-418 Collins-st., Melbourne, and 7 Moore-st., Sydney.

---

**TENDERS are invited for the Purchase or Working on Royalty of Moore Electrical Co.'s "Improvements in and Connected with Vacuum** Tubes or the Like," covered by Commonwealth Letters Patent No. 6228 of June 20, 1906, in the name of E. Phillips. The Company will dispose of the whole or part interest in the patent or will **grant licenses to work the same to fulfil the full requirements of the public. Address: C/o Phillips,** Ormonde & Co., Patent Attorneys and Consulting Engineers, Lombard Bldgs., 17 Queen-st., Melb.

---

TENDERS are invited for the Purchase or Working on Royalty of K. [illegible]'s "Improvements in Jigging Sieves," covered by Commonwealth Letters Patent No. 3934, of February 13, 1912. The inventor will dispose of the whole or part interest in the patent, or will grant licenses to work the same to fulfil the full requirements of the public. Address: C/o Phillips, Ormonde & Co., Patent Attorneys and Consulting Engineers, Lombard Buildings, 17 Queen-street, Melbourne.

---

### BURNT CREEK G.M. CO. NO LIABILITY.

TENDERS are invited, returnable at the Company's office, 375 Collins-st., Melbourne, on or before Monday, December 1, for the Purchase of a Large Heap of Stones and Sand, situated at the Company's No. 2 shaft, near Dunolly. Specifications may be seen at the mine or the Company's office. Terms, 10 per cent. deposit, and the balance payable either in cash or by monthly payments **of 10 per cent. on the purchase money. Highest or** any tender not necessarily accepted.

S. J. WARNOCK, Manager.

---

### BRITISH BROKEN HILL PROPRIETARY CO. LTD.

TWENTIETH DIVIDEND.

The Twentieth Dividend, 3/- per share, will be payable on December 8. This is 2/- for the half-**year ending June 30 and 1/- for the current half-**year, so that new issue (1912) shares paid up this year will take 20 per cent. per annum on capital payments for last half year, and 10 per cent. per **annum for this half-year. After this dividend** all shares will rank alike for future dividends. The transfer books close November 19, at 4 p.m.

**F. H. CLARK, Secretary.**

26 Steamship Buildings, Adelaide.

---

### NEW LANGI LOGAN GOLD MINES N.L.

**NOTICE is hereby given that the half-yearly general meeting of shareholders will be held in the Board Room, National Trustees Building, 125 Queen-street, Melbourne, on Tuesday, November 25, 1913, at 10.15 a.m. Business: (1) To receive and adopt balance-sheet, statements of accounts and reports; (2) to transact any other general business that may be lawfully brought forward. By order of the Board,** JAMES MACKAY, Manager.

---

### ONE HUNDRED MACHINE MINERS WANTED.

PERMANENT JOB.

**Contract Miners last year averaged 17/4 per Shift.**

Wages Miners, 11/- per Shift.

Apply on Job—

MOUNT MORGAN GOLD MINE,

QUEENSLAND.

---

### NOTICE TO CYANIDERS.

TAILINGS HEAP FOR SALE.

**For Sale, by Tender, Tailings Heap, in Stawell,** containing about 200,000 tons of Sand and Slime. **Good water supply.**

**For further particulars, apply to—**

JAMES PATON, Main St., STAWELL.

---

### METROPOLITAN WATER AND SEWERAGE BOARD.

TO ENGINEERS, MERCHANTS AND OTHERS.

SEALED TENDERS will be received until 12 o'clock noon on Tuesday, February 10, 1914, for the Supply and Delivery of a Steam Crane Excavator.

Conditions of tendering, forms of tender, specifications and general conditions of contract will be supplied free of charge to bona fide tenderers, on written application to the Chief Clerk.

Tenders to be endorsed on front of envelope containing same, "Tender for Steam Crane Excavator."

The lowest or any tender not necessarily accepted. **By order,**

GEO. JOHNSTON,
Office of the Board, Albert St., Secretary.
**Brisbane, October 31, 1913.**

---

TENDERS are invited for the Purchase or Working on Royalty of C. A. Bettington's "Improvements in and relating to Apparatus for Pulverising Coal and Other Materials," covered by **Commonwealth Letters Patent No. 16,599, of** December 14, 1909, and "Improvements Relating to Steam Generators," covered by Commonwealth Letters Patent No. 16600, of December 14, 1909. The inventor will dispose of the whole or part interest **in the patents, or will grant licenses to work the same to fulfil the full requirements of the** public. Address: C/o Phillips, Ormonde & Co., Patent Attorneys and Consulting Engineers, Lombard Buildings, 17 Queen-street, Melbourne.

---

### MOUNT CUTHBERT NO LIABILITY.

(Incorporated 1909.)

**NOTICE is hereby given that the Annual Meeting of Shareholders in the above Company will be held at the registered office of the Company, 39 Queen-street, Melbourne, on Thursday, December 4, 1913, at 2.15 p.m.**

Business.—1, To receive and adopt the reports **and statements of account. 2, To appoint auditors. The retiring auditors, Messrs. C. H. Rogers and H. H. Sherlock, offer themselves for re-election. 3, To consider a proposal to remunerate the chairman for special services rendered to the Company. 4, To transact any other general business which may legally be brought forward.**

By order of the board,

W. B. ARNOLD, Secretary.

39 Queen-st., Melb., Nov. 18, 1913.

---

## THE ONE HUNDRED AND FORTY-FOURTH HALF-YEARLY REPORT OF THE DIRECTORS OF

# THE WESTERN AUSTRALIAN BANK.

1. The Directors have much pleasure in submitting the accompanying Balance Sheet and Statement of Profit and Loss for the Half-year ended 29th September, 1913.

2. The net profit after providing for Bad and Doubtful Debts, for Rebate on Discounted Bills Current, for Interest on Deposits, and for all expenses of Management is

| | | |
|---|---|---|
| The net profit, as above | | £33,652 4 2 |
| Balance from previous half-year | | 15,876 6 6 |
| | | £49,528 10 8 |
| From this the Directors have resolved to pay a Dividend of [illegible] per share free of Dividend Tax | £25,000 0 0 | |
| To carry forward | 24,528 10 8 | |
| | | £49,528 10 8 |
| The Reserve Fund is now | | £660,000 0 0 |
| Reserved Profits | | 24,528 10 8 |
| | | £684,528 10 8 |

3. During the half-year a Branch has been opened at [illegible] and a Sub-Branch at Kanowna.

4. The retiring Directors are W. T. Loton, Esq., and S. F. Moore, Esq., who are eligible and offer themselves for re-election. The Auditors, Messrs. O. L. Haines and Co., also retire and offer themselves for re-election.

5. The Dividend free of Dividend Tax will be payable at the Head Office on the 6th November next.

Head Office, St. George's Terrace, Perth, 21st October, 1913.

By order of the Board. H. D. HOLMES, General Manager.

### BALANCE-SHEET of THE WESTERN AUSTRALIAN BANK.

For the Half-year ending 29th September, 1913.

| Dr. Liabilities. | | |
|---|---|---|
| Notes in Circulation | | £[illegible] |
| Bills in Circulation | | 37,117 10 6 |
| Balances due to other Banks | | 120,722 4 8 |
| Deposits not bearing Interest | £1,240,[illegible] 4 4 | |
| Deposits bearing Interest | 1,215,[illegible] 14 6 | |
| | | 2,456,567 18 10 |
| Interest accrued on Fixed Deposits and Rebate on Bills Discounted | | 16,761 18 10 |
| | | £2,644,909 12 10 |
| Capital paid up | £250,000 0 0 | |
| Reserve Fund | 660,000 0 0 | |
| Profit and Loss | 49,528 10 8 | |
| | | 959,528 10 8 |
| | | £3,604,438 3 6 |

| Assets. | Cr. |
|---|---|
| Specie on Hand | £512,250 1 10 |
| Bullion | 187,103 13 4 |
| Australian Notes | 174,408 0 0 |
| Public Securities | 124,585 0 0 |
| Bank Premises | 78,030 0 0 |
| Balances due from other Banks | 71,950 14 11 |
| Notes and cheques on other Banks | 2,619 8 8 |
| Stamp Account | 2,906 0 10 |
| Bills Receivable and all other Advances | 2,416,476 11 10 |
| Remittances in transitu | 34,108 12 1 |
| | £3,604,438 3 6 |

### PROFIT AND LOSS.

| Dr. | |
|---|---|
| To 14[illegible] Dividend paid 8th May, 1913 | £25,000 0 0 |
| Dividend Tax | 1,250 0 0 |
| Duty on Note Circulation | 151 5 3 |
| Transfer to Reserve Fund | 20,000 0 0 |
| Expenses at Head Office and 63 Branches | 38,794 6 7 |
| Balance forward | 49,528 10 8 |
| | £134,724 2 6 |

| | Cr. |
|---|---|
| By Balance from last Half-year | £50,876 6 6 |
| Gross profits after providing for Bad and Doubtful Debts, for Interest paid and accrued on Deposits, and for Rebate on Discounted Bills Current | 73,847 16 0 |
| | £134,724 2 6 |

### RESERVE FUND.

| Dr. | |
|---|---|
| Balance to next Half-year | £660,000 0 0 |
| | £660,000 0 0 |

| | Cr. |
|---|---|
| By Balance from last Half-year | £640,000 0 0 |
| Transferred from Profit and Loss | 20,000 0 0 |
| | £660,000 0 0 |

F. A. KENDALL, Accountant. H. D. HOLMES, General Manager.

We have examined the above Balance Sheet and beg to report that we find the several items therein stated agree with the balances at Head Office and with the returns furnished by the various Branches, the latter being certified to by the respective Managers and Accountants. We have counted the cash, verified the investments and checked all bills held by the Bank at Head Office, and hereby certify that we found them correct. We further certify that in our opinion the Balance Sheet is a full and fair Balance Sheet, properly drawn up, and exhibits a true and correct view of the state of the affairs of the Bank, as shown by the books on the 29th September, 1913.

Perth, 21st October, 1913.

O. L. HAINES & CO., Auditors.

## NEWS AND NOTES.

The output of the Adelong Gold Estates (N.S.W.) for the 4 weeks ended with Oct. 30, during which two dredges worked a total of 715½ hours, was 301 oz. from 81,120 cubic yards of wash, as against 237¾ oz. from 83,800 cubic yards, dealt with in 876¾ hours in the previous four weeks.

A dividend of 1s. and a bonus of 3s. will be payable on shares in Broken Hill Propty. Block 10 Company (N.S.W.), on December 17th. This is the 102nd distribution of profits by the company, and will amount to £20,000, making the total distribution to date £1,330,000.

Police Superintendent Davidson, in conducting a series of prosecutions for gold-stealing at the Jamieson (V.) Police Court last week, asked that each of the six accused should be committed for trial. The evidence to be adduced, he said, suggested that a conspiracy existed at Gaffney's Creek to systematically rob the mines. The accused, Michael Miller, Alexander Giles, John Hampton, Joseph Bernard, S. Murphy, and William John Beaver, all of Gaffney's Creek, were charged with having stolen gold from the Rose of Denmark and New Dempsey's mines, Gaffney's Creek, and the Champion mine at Ten Mile. The mine managers, Smith (Rose of Denmark), Burns (New Dempsey), and Macpherson (Champion) gave evidence as to the identification of the gold and quartz stolen and recovered, and the absence of any system of searching. Accused, who pleaded guilty, were committed for trial at the next General Sessions at Mansfield. Mr. R. Knight, P.M., highly commended the police, and recommended the superintendent to notify the Commissioner.

The Elsmore Tin Sluicing Co., Elsmore (N.S.W.), will pay its first dividend, 6d. per share, on the 27th inst., the total distribution being £600.

The latest results announced by the manager of the Cathcart Central mine, Ararat (V.), show five fathoms washed for 7 oz. 15 dwt., five fathoms for 6 oz. 3 dwt., and four fathoms for 19 oz. 17 dwt., making a total of 14 fathoms for 33¾ oz., equal to an average of 2 oz. 8 dwt. per fathom. The material dealt with came from two drives, one crossing the gutter at the furthest point reached going down the lead and the other going up the lead.

In the Queensland Legislative Assembly last week the Minister of Mines, Mr. Appel, said that during the past 23 years £182,792 had been granted for the assistance of the mining industry. Of that amount £151,886 had been expended, and only £5388 had been refunded.

The directors of the Edna May G.M. Co., Westons (W.A.), announce a first dividend of 1s. and a bonus of 1s. per share, payable on December 5th, the whole amounting to £4285. Approximately 5700 tons of stone have been crushed to date, the yield being 6200 oz. gross, or 5862 oz. fine, valued at £24,900.

The report of the general manager of the Briseis Tin and General Mining Co. (T.), for October is as follows, the corresponding figures for September being added in parentheses:—Total output black tin, 40 (40) tons; Briseis drift and overburden removed, 20,000 (21,000) cubic yards; Ringarooma drifts, 38,000 (40,000) cubic yards; Ringarooma overburden, 9000 (13,000) cubic yards. Mutual Hill yield, 53 (89, for quarter) cwt. black tin. Wallace properties, 549 (530) oz. gold from 138,700 (131,600) cubic yards, including 98 (68) oz. from 29,100 (27,100) cubic yards from the Argo property.

Replying to a question by Mr. Smith, M.L.A., the Victorian Premier stated last week that he was informed that the Victorian Manganese Iron and Steel Company had not yet completed its financial arrangements in London so as to take advantage of the Act passed in 1911, empowering the company to build a railway to its mine, near Buchan, but that such arrangements were expected to reach a satisfactory conclusion before long.

It was announced last Friday by Mr. W. J. Roberts, chairman of the Melbourne Stock Exchange, that it had been decided that on and after November 13th, 1913, no official quotation shall be granted to shares in any trading or investment company issued to vendors or promoters in terms of the contract or contracts registered by the Registrar-General in any State of the Commonwealth after the 12th day of November, 1913, either until six months after such company has been registered on the official list of any of the Stock Exchanges of Adelaide, Brisbane, Melbourne, and Sydney, or until after the publication of the first balance-sheet of the company. Hitherto the tying-up of vendors' shares has related only to mining companies, for which a period of six months has been fixed, irrespective of whether a balance-sheet is issued or not.

The amount of ore carried from Broken Hill to South Australian ports fell off considerably during the early portion of this year, owing to labour disturbances. The deficiency was wiped off soon after the trouble was overcome, and lately there has been record traffic. The mines are turning out immense quantities of ore and rushing it to the seaboard. The quantity lifted from Broken Hill for the week ended November 1st totalled 22,622 tons. This was an absolute record, but it was lowered the following week, when 23,700 tons were sent to Port Pirie. The previous highest aggregate was in June of this year, when 21,240 tons was taken from the mines to the sea. The total shipments from Broken Hill for the first 10 months of the year reached 486,000 tons.

Dalgety and Co. Ltd. will pay a dividend of 8 per cent. per annum on the 26th inst., after which date the transfer books will be re-opened. £50,000 has been added to the reserve fund, bringing it up to £550,000.

Mr. E. L. Grundy, general manager of State batteries and cyanide works to the South Australian Government, telegraphed to the Minister of Mines, Sir Richard Butler, last week, reporting that the State battery at Tarcoola had treated 50 tons of stone from the Day Dawn mine, owned by Messrs. Trewartha and Cray, which yielded 347 oz. of gold, worth £1289 (equal, therefore, to 303 oz. 9 dwt. fine). During the first half of this year the battery treated 110½ tons from this mine, which gave 98 oz. 15 dwt., worth £330 (equal to about 77 oz. 14 dwt. fine); but the bulk of the stone—i.e., 75 tons of it, was worth £3 18s. per ton. The present crushing, of course, works out at about £25 17s. 6d. per ton.

The quarterly dividend of the Sons of Gwalia Ltd. (W.A.), of 1s. per share, less income tax, will be payable on December 20th.

Messrs. E. L. and C. Baillieu, Melbourne, have forwarded the Monthly Official List of Quotations and Prices Current of the Melbourne Stock Exchange for November.

Seventeen summonses have been issued, as a result of police inquiries, into the disgraceful happenings a few weeks ago at the Beaufort Deep Leads mine, near Ballarat (V.).

The underwriters of the West Australian new 4 per cent. loan of £1,000,000, issued at £97, are left to carry 78 per cent. of the stock. Within a day of the announcement the stock was quoted at ⅜ discount.

Very fine conduct characterised the action of one George Ferguson, engine-driver, in drawing the fire of a boiler on the Lyell Blocks mine (T.). When going on shift one day last week he noticed that there was no water in the gauge-glass of the engine, which was almost red-hot, the fire having been banked up during the night. Warning the people in the vicinity of the danger of an explosion, Ferguson took the risk of drawing the fires, but was overcome by the gas and heat of the coal which he raked into the stokehole. Assistance reached Ferguson when he was in a fainting condition, in which he remained for five hours, and for some time afterwards he suffered severely from the effects of inhaling the fumes of gas.

It is intended by the Director of Geological Survey in Victoria to have a survey made of an area in the Casterton district, with the view of having detailed plans of the district prepared by the officers of the Department. Last week, in the company of Professor Skeats, of the Melbourne University, the Director, Mr. H. Herman, visited Casterton, and the area to be surveyed was fixed upon.

The P. and O. S.N. Co. has declared a dividend of 6½ per cent., and a bonus of 5 per cent. on the deferred stock, making a total of 15 per cent. for the year.

The gold received at the Melbourne branch of the Royal Mint during the week ended on the 15th inst. amounted to 9014.2 oz.

The names of the three members of the London Stock Exchange who have been suspended for five years on account of their part in introducing American Marconi shares to the London market, are Percy Heybourn, Alexander Croft and William Sagster, jun. The punishment, however, is entirely personal, and does not affect any partners they may have. The first two named belong to the firm of Heybourn and Croft, of Theadneedle-street, city. The point of their offence was a breach of faith with the brokers. The evidence showed that Mr. Heybourn purchased 250,000 American Marconi shares from Mr. Godfrey Isaacs (managing director of the British Marconi Company) at 25s., and sold 128,650 for about 30s. Brokers' orders increased from 57,900 to 668,000 during the boom on April 18th. At that time Mr. Heybourn, including his extra purchases, owned 221,350 shares. Instead of filling 40 per cent. of the orders, he only sold 82,680 at 65s., and sold 63,000 elsewhere on April 19th. The "Daily Express" estimates that Mr. Heybourn's profit by the end of April 19th was £125,810, besides which he retained 75,670 shares.

It has been decided by the directors of the Tongkah Compound, Siam, to pay a dividend of 1s. and a bonus of 1s. per share on December 19th. Together these will require £5000, and will bring the return to shareholders to date up to £97,500, or 39s. per share.

In the West Australian Legislative Assembly last week the Minister of Mines, Mr. Collier, congratulated the State on the gold output for the first time for nine years showing an increase. If this should prove to be the case the State may honestly congratulate itself, and there is every likelihood of the Minister's statement proving literally correct (except that he should have said ten years), while at the same time being apt to mislead. Official returns show that up to the end of October the gold produced this year amounted to 1,084,011 oz. fine, therefore, allowing the same rate of output for the present month and December, the total for the year should be about 1,300,000 oz. It so happens that last year's total was the lowest by far that has been recorded for Western Australia since 1898, and was upwards of 88,000 oz. lower than that for 1911, which was 1,370,867 oz. So that this year's output, although it promises to exceed the leanest year since 1898, thereby confirming Mr. Collier's forecast of an increase, will probably stop short of equalling the second lowest total. The output for 1912 was 1,282,658 oz., leaving 198,647 oz. to be won in the last two months of the year, which in 1912 produced 223,156 oz.

The secretary of the British Broken Hill Proprietary Co. (N.S.W.) has received a cable message from the head office in London announcing that the half-yearly reports and accounts to June 30, 1913, are being issued, showing a net profit of £50,968 for the half-year, and making the total credit of profit and loss account £68,284. The twentieth dividend is to be 3s. per share, made up of 2s. for the half-year to 30th June, and 1s. on account of the current half-year; thus, the new issue (1912) shares, on which payments have been made this year, will take at the rate of 20 per cent. per annum on capital payments for last half-year, and 10 per cent. per annum for the current half-year. All the other shares will take the full 3s., and, after this payment, all shares in the company will rank alike for future dividends. The books close at 4 p.m. on November 19, and the dividend will be payable on December 8.

Some exceptionally fine gold specimens were obtained just recently by an old prospector, Mr. James Montgomery, a resident of Moliagul (V.). The old man has for some time been working near the Golden Goose lease, from which splendid yields were obtained years ago, the ground being along the indicator line of reef. It was on the 10th inst. that Mr. Montgomery arrived at Dunolly with his specimens, the gross weight of which was 144½ oz., estimated to carry over 100 oz. of gold; he also had another parcel containing 14 oz. or 15 oz. of gold, which he had washed from prospects. The find was made at a depth of 8 or 10ft., on what is supposed to be Weymouth's line of reef. The locality is about half a mile northwards from Snow and Liddle's indicator, which yielded a patch of £2,600 worth of gold. The world-famed "Welcome Stranger" nugget was found about one mile to the south of the Golden Goose lease and on the same belt of indicator country. The Moliagul, and also the McIntyres' goldfield, three miles to the north-east, have yielded some rich patches on indicators, and many very large nuggets have been obtained from the shallow alluvial.

At a special meeting of the Gippsland Copper, Platinum and Gold Mining Co. (V.) the chairman, Mr. H. B. Black, was authorised last Friday to endeavour to raise funds for continuing operations by any means which commended themselves to him.

It was announced at Daylesford (V.) last Friday that the English directors of the Victorian Cornish Gold Mines, Ltd., which property is there situated, had accepted the tender of a Victorian syndicate for its purchase. It is intended to float a company, probably at not more than 2s. a share, all the cash to go to the credit of the company. It is now over 50 years since the mine was started, and a very large amount of gold had been produced from it when the last owners gave up working it. Operations were suspended below a few weeks ago, but the water has been kept under, and so practically everything is ready for the resumption of operations.

The half-yearly balance-sheet of the Western Australian Bank for the term ended on September 30 (which appears elsewhere) shows a net profit of £33,652, and by adding a balance brought forward of £15,876, the total available for distribution is £49,528. From this the directors propose to pay a dividend at the rate of 20 per cent. per annum, amounting to £25,000, and to carry forward £24,528. The profit of the previous half-year was £37,404, and that for the April-September term, 1912, £36,487; there has been a succession of shrinkages of deposits for some time past, the amount at the close of the term here reviewed being £2,456,508, as compared with £2,953,885 in September, 1911, and advances have fallen to £2,416,476. The total liability of the Bank amounts to £3,604,438. Assets include specie, bullion, and Australian notes, £873,762, against £771,709 six months ago; public securities, £124,585; bills receivable and all other advances, £2,416,476.

At a recent conversazione of the Otago (N.Z.) University School of Mines, Professor Park stated that the number of new students taking up the School of Mines course this year was greater than for any year during the last twenty.

## PROFESSIONAL CARDS.

**GERALD AHERN, A.O.S.M.,**
MANAGER COMET MINE,
DUNDAS, TASMANIA.
Mines Sampled and Reported On.

Tele. Address—Gerald Ahern, Zeehan, Tasmania.

---

**G. H. BLAKEMORE,**
CONSULTING METALLURGIST
For Copper and Lead.
MINING ENGINEER.
CASTLEREAGH CHAMBERS, 10 CASTLEREAGH ST
Telegraph Codes Bedford McNeill 1908 Edition.
Moreing & Neal
A.B.C. 5th Edition.
Cable Address Radgarn. Telephone 7124 City

---

**MATTHEW C. COATES, A.M.I.E.E.**
CONSULTING MECHANICAL and ELECTRICAL ENGINEER Expert Reports given for Power Generating Plants, Factory Installations, Steam, Gas and Electric.
99 QUEEN STREET, MELBOURNE.

---

**VALENTINE J. CROWLEY,**
CONSULTING ELECTRICAL ENGINEER.
Hydro-Electric Plants and Transmission Lines
Designed and Supervised
Austral Chambers, Telephone 7738
97-99 QUEEN STREET, MELBOURNE.

---

**GOYDER & HALLETT,**
ASSAYERS AND ANALYSTS.
110 Gawler Place, Adelaide.
Telephone 169
Metallurgical and Chemical Processes
Investigated
Ores Sampled and Assayed

---

**T. J. GREENWAY, M.I.M.M., F.I.C.**
MINING AND METALLURGICAL ENGINEER
60 QUEEN STREET, MELBOURNE

---

**HARGRAVES & DAGGAR,**
CONSULTING ENGINEERS & METALLURGISTS.
Broken Hill Chambers, 31 Queen Street, Melbourne,
and at Bendigo, Vic., and Sydney, N.S.W.
Consultations, Examinations,
Reports for Investors, Machinery Erection
and Supervision.
Tel. Central 6064. Process Devisors, &c.

---

**KAY, MACNICOL & CO.,**
Mechanical, Mining &
Electrical Engineers
BROKEN HILL CHAMBERS
31 QUEEN STREET, MELBOURNE
Cable Address "Engineer," Melbourne
Telephone, No. 4885

---

**McCARTY, UNDERWOOD & CO.,**

CONSULTING ELECTRICAL AND MECHANICAL ENGINEERS.

31 QUEEN STREET, MELBOURNE

Telephone, 7096

---

**J. D. AUDLEY SMITH,**
MINING ENGINEER.
9 Bridge-street, Sydney
Telegraphic Address—
Audley Smith,
Mining Engineer,
Sydney
Telephone No.—
City 2677

---

**WALTER F. SMITH,**
MANAGER FLOATER G.M.
Ravensthorpe, W.A.
Mines Sampled, Valued, and Reported on.
ASSAYS MADE
Code Bedford McNeill.
Reliable Information Furnished on the Phillips River
Gold and Copper Field

---

**E. A. WEINBERG,**
MINING AND METALLURGICAL ENGINEER.
19 QUEEN STREET, MELBOURNE

---

## PUBLISHERS' ANNOUNCEMENTS.

**Cole's Book Arcade**
Melbourne
Sydney
Adelaide

—BOOKS Advertised—
—by Everybody are—
—SOLD AT COLE'S—

Send for **COLE'S BOOK BUYERS' GUIDE** or Catalogues on your Special Subject.

**MINE MANAGER'S** Book-keeping Manual and Office Companion, by Edwin R. Field. 3/6, postage 1d.

**ROUTLEDGE'S EVERYMAN'S CYCLOPAEDIA,** 50,000 items of literary, historical and useful knowledge. Cole's Price: 2/6, postage 4d.

**HEALTH, STRENGTH and HAPPINESS,** a Book of Practical Advice for Men and Women, by Dr. Saleeby. Cloth 3/6, paper 2/-, postage 3d.

**LIFE AND EVOLUTION,** by F. W. Headley, with 100 illustrations. Now 5/-, postage 4d.

**THE MAN FARTHEST DOWN,** a record of Observation and Study in Europe, by Booker Washington. Cole's Price: 3/6, postage 3d.

**BACKBLOCK BALLADS** and Other Verses, by Den (C. J. Dennis) from the "Bulletin" and other live papers. Paper 1/6, cloth 2/6.

**E. W. COLE, Book Arcade, Melbourne, Etc.**

---

## SIAM OFFERS

A splendid new field for Australian Business Enterprise.

## SIAM WANTS

Mining and Agricultural Machinery, Seeds, Hides, Tallow, Meats, Jams, Butter, Cheese, Potatoes, General Manufactures, also Horses, Cattle and Sheep.

**The Siam Observer (Daily),**
**The Siam Maitri**
**The Siam Weekly Mail** | **(Weeklies.)**

Siam's Leading Newspapers, which, with

**The Siam Directory**

are published at the Siam Observer Offices, Bangkok, will put you in touch with this market.
Rates and Particulars from
***GORDON & GOTCH.***

---

During the last four-weekly period the mill of the Edna May G.M. Co., Westons (W.A.), ran 591 hours and treated 1355 tons of stone for a return of 1210 oz. gross, equal to 1153¾ oz. fine, valued at £4901. The residues assayed 4 dwt. 13 gr. per ton. Working costs amounted to £749, mine development £160, shaft sinking £387, capital expenditure £738, making total expenditure £2034. In the previous term the mill ran 551 hours and treated 1168 tons for 1025¼ oz. gross, or 982 oz. fine, valued at £4171. Concentrates produced, 4 tons; assay value, 18 1-5th oz. per ton; residues, assay value, 5 dwt. 5 gr. per ton. Working costs, £705, or 12s. 1d. per ton; mine development, £138, or 2s. 4d. per ton; do., shaft, £383, or 6s. 6.7. per ton; capital expenditure, £676; total expenditure, £1902.

---

**FRANKLIN WHITE,**
MINING ENGINEER.
CITY MUTUAL CHAMBERS,
62 HUNTER ST., SYDNEY
G.P.O. Box 1498
Code: Broomhall Imperial Combination

---

**Critchley C.P. Parker**

## Publications

**Past and Present Metal Markets.** W. E. Figgis. Book and 2 Charts, 15/-. Posted, 16/3; foreign, 16/5.

**Coalfields and Collieries of Australia.** F. Danvers Power. 440 pages, 229 illustrations, demy octavo. 25/- nett. Posted, 25/3; foreign, 26/8. (Size, 9 x 6.)

**High Explosives.** W. R. Quinan. 224 pages, royal octavo, 21/-. Posted, 21/3; foreign, 22/4. (Size, 10 x 7.)

**Power.**
(*Issued under authority Sydney Municipal Council.*)
2/6 nett; post free.

**Australian Mining and Metallurgy.** Donald Clark. 600 pages, royal octavo. 21/- nett. Posted, 21/4; foreign, 22/9. (Size 10 x 7.)

**Gold Refining.** Donald Clark. 134 pages (plates), demy octavo. 12/6 nett. Posted, 12/7; foreign, 13/1. (Size, 9 x 6.)

**West Australian Mining Industry.**
(*By authority W.A. Government.*)
250 pages, crown folio. 10/- nett. Posted, 10/2; foreign, 10/8. (Size, 14½ x 10.)

**New South Wales Mines and Minerals.** 250 pages, crown quarto. 5/- nett. Posted, 5/1; foreign, 5/7. (Size, 10 x 7½.)

**Victoria, and its Mining Resources.**
(*By authority Victorian Government.*)
84 pages, crown quarto. 3/- nett; post free.

**Mining and Railway Map of Australia.** (In preparation.) Cloth, 21/-.

**Ventilation of Mines.** Johann Sarvaas. 60 pages. 2/7 post free.

**Australasian Joint Stock Coy's Year Book.** R. L. Nash (Financial Editor, "Daily Telegraph," Sydney). 600 pages, demy octavo, 10/6 nett. Posted, 10/8; foreign, 11/9. (Size, 9 x 6.)

**Australian Mining Standard.** Issued every Thursday 26/- per annum. British possessions, 32/6; foreign, 34/8; post free.

Size stated in inches.
Order through your Bookseller, or

***AUSTRALIAN MINING STANDARD,***
**Sydney: 12-14 O'Connell-street.**
**Melbourne: 376 Flinders Lane.**
**London:** Hill Publishing Co., 6 Bouverie St., Fleet St.

*Also published by us, but now out of print.*

**Tasmania and its Mineral Wealth.**
(*By authority Tasmanian Government.*)

**Metallurgy of Tin.** P. J. Thibault. Demy octavo. 12/6.

**Resourceful Queensland.**
(*By authority Queensland Government.*)

**Electrical Progress of Australasia.**

---

ESTABLISHED 1860.

## BONDHOLDERS' REGISTER

Publishes the Actual Numbers of all Drawn Bonds Throughout the World.

PUBLISHED FORTNIGHTLY.

**10s. PER ANNUM.**

73 FARRINGTON ST., LONDON, E.C.

Australian Offices,
376 FLINDERS LANE, MELBOURNE.

"Allen's"

IMPERIAL

Manganese Steel

FOR

Dredging Pins and Bushes, and all Wearing Parts of Rock-Crushing Machinery, Points, Crossings, Etc.

SOLE MAKERS OF

THE "STAG" TUBE MILL

For Grinding Grit, or Tailings, and Granular Materials, to any degree of Fineness.

THE OCTAGON MINING DRILL STEEL

"STAG" BRAND

EDGAR ALLEN & CO., LTD.,
Imperial Steel Works, SHEFFIELD.

Stocks on Hand
of
Mining and High Class Tool Steels.

AUSTRALIAN REPRESENTATIVES:
P. T. Taylor Ltd., 141 York Street, Sydney.

## LIQUID AIR FOR BLASTING.

Experiments made at the Rudersdorf works, under the auspices of the German Society of the Oxygen and Nitrogen Industries, are officially stated to have given highly saisfactory results. The main advantages of the method are that no danger whatever is incurred in manufacture, storage and transport of the explosive, or in replacing cartridges which have missed fire. Furthermore, the working safety underground is considerably increased, and owing to the presence in the mines of considerable quantities of oxygen in the shape of liquid air, rescue work, if necessary, is greatly facilitated. Lastly, owing to the advantage that the component parts of the new explosive can easily be produced at the mines themselves, the mining industry is made independent of the explosive factories. The only drawback connected with the new method is the at-present comparatively high price of liquid air, but, as the main item in the cost of production is the power required for working the plant, it appears probable, in view of the cheapness of fuel for power generation in coal mines, that processes will soon be elaborated enabling liquid air to compete successfully with the explosives at present in use. The manner of operating with liquid air is very simple. The cartridge with the dry carbon carrier is placed in the borehole without the liquid air. Only at the last moment, when all the preparatory work has been completed, the liquid air is added and at once ignited. Cardboard is used for the cartridge case. A tube of finely meshed wire work placed through its longitudinal axis distributes the liquid air through the whole cartridge mass. The liquid air is kept in cans constructed after the Dewar system and pressed into the cartridge by a hand pump with .4 atm. pressure. The cartridge is placed in the borehole with a mixture of kieselguhr and petroleum. The simultaneous filling of three blasting holes does not take more than 1 min. The shots proved to be at least as effective as those with ammonium cahucite, the explosive which had formerly been in use. The cost of one shot with the latter would have been about sixpence, while the quantity of liquid air consumed amounted to about one quart.

---

Owing to the favourable character of the reports received relative to the prospects of the new tin field recently discovered at Maranboy, in the Northern Territory, the Minister of External Affairs, Mr. Glynn, has arranged for a Government battery to be erected in the vicinity. The battery will be worked by employees of the department, and miners will be charged as low a rate as possible for the treatment of their ore. Already 50 men are working on the new field, and others are on the way, though the difficulty of transport presents an effective obstacle to anything like an immediate rush.

Mica is employed in large quantities in the form of scrap mica, small sheets and the waste from the manufacture of sheet mica, being ground for different uses. Among these are the decoration of wallpaper, and the manufacture of lubricants, fancy paints, and moulded mica for electrical insulation, according to the United States Geological Survey. Ground mica applied to wallpaper gives a silvery lustre. When mixed with grease or oils, finely-ground mica forms an excellent lubricant for axles and other bearings. Mixed with shellac or special compositions, ground mica is moulded into desired forms and is used in insulators for trolley wires. Ground mica for electrical insulation must be free from metallic matter, minerals, and mica used for lubrication should be free from gritty matter. For wallpaper and brocade paints, a ground mica with a high lustre is required, and such lustre is best obtained by using a clean, light-coloured mica, and grinding it under water.

GREAT COBAR LIMITED,
COBAR, N.S.W.

MINE OWNERS, SMELTERS, COLLIERY PROPRIETORS, PURCHASERS OF COPPER ORES AND MATTES.

VACANCIES FOR COMPETENT MACHINE MINERS.

SYDNEY: Australasia Chambers, Martin Place, And at Lithgow and Singleton. LONDON: 65 New Broad Street, E.C.

## CONTENTS

### THURSDAY, NOVEMBER 27.

EDITORIAL—

New Zealand Mining, 1912 . . . . . . 481
Leaderettes . . . . . . . . . . . . . . 481-482
News and Notes . . . . . . . . . . . . . 482
Personal . . . . . . . . . . . . . . . . 483
The Investor's Column—
Edna May Central (W.A.) . . . . 484
Ajax Central (V.) . . . . . . . . . . . 484
Metal Quotations . . . . . . . . . . . . 484
Sydney Stocks . . . . . . . . . . . . . 485
Brief Comment . . . . . . . . . . . . . 485
The Coal Mining Industry . . . . . . . 486
Victorian Mining Activities . . . . . 487
Queensland Mining . . . . . . . . . . . 488
New South Wales Mining . . . . . . . 489
Western Australian Mining . . . . . 489
Publications Received . . . . . . . . . 489
Victorian Railways . . . . . . . . . . . 490
Municipal Council of Sydney . . . . . 490
Australian Wireless . . . . . . . . . . . 490
Melbourne Tramways . . . . . . . . . . 490
Dredges and Steel . . . . . . . . . . . 491
British and European Developments . . 492
Panama and Australian Transport . . 493
Miscellaneous . . . . . . . . . . . . . 493
Invited and Accepted Tenders . . . . . 494
Castlemaine Strike . . . . . . . . . . . 496
The Great Lake Scheme (T.) . . . . . . 496
Report of Companies, etc. . . . . . . . 498
Mixed Mems. . . . . . . . . . . . . . . 498
From Foreign Sources . . . . . . . . . XIII.

---

**BACK NUMBERS OF THE "MINING STANDARD."**

The following is the rate for back copies more than a month old. Applications by post must be accompanied with cash and postage added. In no case can we guarantee to supply copies, as our storage accommodation is limited.

A postcard will be sent if the number required is out of print.

For copies three months old, ninepence; six months, one shilling; and beyond that period, one penny per month per copy.

As there is a regular demand for back copies of the "Mining Standard," newsagents are requested to send back all returns uncut and in good condition, otherwise they will not be accepted.

All Returns from Newsagents must reach us by the end of each month (the whole paper must be sent). No credit will be allowed beyond this term.

Postage—British, 1d.; Foreign, 1½d.; Australasia, ½d. per copy.

Stamps will be accepted as pre-payment.

Address communications: Publishing Department "Mining Standard."

---

**FIRE. . BRICK**

**Our Products have proved their superiority.**

**FIRE CLAY GOODS For Every Purpose.**

Darley Fire Bricks will withstand the most intense heat, and will not shrink. Our bricks are made near Bacchus Marsh, Victoria, and we supply all the States.

Specialities

**High-Grade Firebricks & Retorts.**

*Prompt Delivery.* *For Prices, etc., write to—*

**DARLEY F. B. Co.,**
**Oliver's Lane, Flinders St. Melbourne**

---

**MINING STANDARD.**
PUBLISHED EVERY THURSDAY.
Forwarded Post Free to any Address.

| | Per annum |
|---|---|
| Australasia | 26/- |
| British Possessions | 32/6 |
| Foreign | 34/8 |

Payable half-yearly or yearly, in advance.
All amounts should be made payable to order of "CRITCHLEY PARKER, Bank of Australasia."

12 O'Connell-street,
Sydney.
Tel. City 8103
P.O. Box 331.

376 Flinders-lane,
Melbourne.
Central 7931 & 1838
P.O. Box 253.

**CASUAL ADVERTISEMENTS.**

The rate for this class of advertisement is governed by the position it occupies.

If it appears on leader page or amongst or next to reading matter, the rate is 15s. per inch (nonpareil) per insertion.

Towards end of reading section—
Brevier, 16 ems width, 6s. per inch per insertion.
Nonpareil, 8s. per inch per insertion.

For the convenience of advertisers, we might state that—Brevier has approximately 7 words to a line, and 8 lines to the inch—6s. Nonpareil has approximately 8 words to the line, and 11 lines to the inch—8s.

**ALTERATION TO ADVERTISEMENTS.**

As our publishing arrangements necessitate the "Mining Standard" being issued simultaneously in Sydney, Melbourne and Adelaide on the same day each week, advertisers wishing to change their advertising matter must supply same ten days in advance of publication.

**ADVERTISEMENT PROOFS.**

Proofs are submitted to advertisers in order to give them an opportunity of going over the advertisements before printing.

Advertising Copy must be typed and so arranged as to clearly indicate the display required for the more important features of the advertisement.

Any departure from the original copy will be charged for. Advertisers are specially requested to instruct their publicity departments to give us clear and definite instructions respecting changes of matter or new copy in order to avoid incurring unnecessary charges.

AUSTRALIAN
**MINING STANDARD.**
PUBLISHED EVERY THURSDAY.
ESTABLISHED 1888

It is requested that all business communications be Addressed to Critchley Parker

THURSDAY, NOVEMBER 27, 1913.

## NEW ZEALAND MINING, 1912.

The New Zealand Mines Statement for the year 1912 is a very belated publication, but it is none the less interesting. It serves to show that up to the end of last year the value of so much of the Dominion's mineral output as was exported amounted to £102,175,751, of which no less than £80,599,044, or just about 80 per cent., came from gold. Last year's total was £2,067,923, of which £1,345,131, or over 67 per cent., is credited to gold. This shows that, though the yellow metal is still predominant in New Zealand mining, its dominance is on the decline. Since 1909 the output has fallen year by year; and last year the decline was very heavy, amounting to no less than £471,651, a drop of 26 per cent. on the 1911 total. In 1906 the value of the gold output was £2,270,904, so that in six years there has been a decline of £925,771, equal to 41 per cent. New Zealand's greatest gold yield was away back in 1866, when a total of £2,844,517 was achieved; but that day is not likely to return. The year 1906 was, however, New Zealand's best, if the whole of the mineral industry be taken into consideration, the value of its total exported output that year being £3,078,043. Last year's figures then mean a decline in six years of £1,010,140, equal to 33 per cent., a figure that is quite sufficient to show that New Zealand is, from a mining point of view, moving in the same direction as Australia. Since 1909 the decline has been unbroken, and in those three years alone the drop has amounted to £868,429, equal to 30 per cent.

Outside of gold, the values are, of course, not an entirely satisfactory means of estimation, inasmuch as they are variable, while that of gold is invariable. Looked at, however, from that point of view, the figures are still anything but pleasing. The silver output totals 801,165 oz., as compared with 1,813,830 oz. in the record year, 1909, a decline of 56 per cent. in three years. There is no other metal that counts for anything in New Zealand outside of gold, the only two other minerals that have a serious effect upon the mineral statistics being coal and kauri gum. Kauri gum has provided more than it did in 1911; but its tonnage of 7,908 does not compare favourably with that of 8,693 in 1910, and is very far behind the record figure of 11,116 in 1899. Coal, also, has improved slightly upon its figures for last year, but its tonnage (2,177,615) is 20,347 below the total of 1910, which, however, constituted a record for the Dominion.

This consideration of the figures for coal brings us to the point of directing attention to a great deficiency in the Statement. The statistics it gives on pages xii. to xv. deal only with exports. In the case of all the minerals except coal, the export and the production are identical; but in the case of coal they are by no means identical. Thus the tonnage of the coal exported last year was only 229,012, whereas the total production was 2,117,615. Hence, in the figures given above, New Zealand's mineral output has not had full justice done to it. We were careful to say, it may have been noted, that those figures were export figures, but we would undoubtedly have given, in preference, figures of full production, had such been comparable with the totals for previous years. All, however, that is done in the direction of making this possible is to give on page xvi. a statement of the annual tonnage of coal produced subsequent to the year 1877. In any case, to have had to subtract the value of the exported coal from the value of the total coal in order to add the difference to the figures of the total mineral export, given on pages xiv. and xv., in order to ascertain the value of the total production, would be a very great labour, which the Mines Department ought hardly to expect any journalistic critic to have to perform; but, in point of fact, the figures given in the coal production table contain no values, so that the investigator of this statement is left in absolute ignorance as to what was the value of the actual production of New Zealand in any one year, saving only the one under review and its immediate predecessor. A table given on page ii. shows that the value of so much of the coal output for 1912 as was not exported adds no less than £974,301 to the total mentioned above, as being that of the total mineral export. This makes the total value of production for 1912 £3,042,224, which is a decline of £450,179, equal to 13 per cent., on the figures for the previous year.

---

A cruelly fierce light was thrown upon the question of day labour versus piece-work by a communication made last week by Senator Oakes to the Sydney Master Builders' Association, with respect to works carried out by day labour by the New South Wales Government. Senator Oakes gives, for example, half-a-dozen works for which tenders were called, for which the combined prices amounted to £140,631, but it was decided to carry them out by day labour, the consequence being that the actual cost was £225,141. One of these was the Newcastle post-office, for which the tender was £19,395, but the actual cost was £33,000. Another was the Moree-Garah railway; tender £97,776, work to be completed in 52 weeks; actual cost (including, however, cost of survey and supervision) £158,500, work still uncompleted at the end of August, after 106 weeks' work. Another tender was £157,000 for making the South Grafton—Glenreagh railway, the work to be completed in 18 months; the work was commenced three years ago by day labour, and was not completed on September 24th, 1913, up to which date it had cost £151,000. Another group of works for which estimated costs are given, revealed a similar excess when actual costs by day labour were ascertained. The total amount of nine works was estimated at £49,491; the actual cost (one still incomplete) was £103,366. One was car sheds at Fort Macquarie, estimated to cost £17,000, but which actually cost no less than £37,000. Still more outrageous was the waste on the Rookwood-Bankstown railway, 3¾ miles long, which was expected to run into £14,000, but really cost £38,000. The new offices in Phillip-street, Sydney, for the Colonial Architect's branch, was expected to cost £3300, but when a question was asked in Parliament on September 18th last £5878 had already been spent on it, and the building was still incomplete. Other works are included in Senator Oakes's list which tell the same story of squandering public funds in order to pay men, not for what they do, but for the time they choose to occupy in doing it. To make way for new buildings for the Education Department it was necessary to remove two Moreton Bay fig trees, and this Herculean task took 18 men twelve days to accomplish, and as their wage was 9s. a day, the cost of the job was £98 14s. In another case a tree had to be grubbed on the North Coast railway, and three men took three days, at 8s. a day, to do it. The fifteen works mentioned in the earlier part of this summary could, and therefore should, have been carried out at a cost of £190,122, but as it was public money which had to pay for it, and the public purse was in the hands of a Labour Government, the cost was £328,507, showing a voluntary gift of £138,385. Anyone who is not convinced by this recital of the iniquity of the day-labour system will never be convinced, and mainly so because he wishes not to be.

* * *

It was in more respects than one an "extraordinary" meeting of Elder, Smith and Co. Ltd., which was held in Adelaide on the 14th inst., for the sole purpose of calling shareholders together was to ask them to vote £30,000 from undivided profits, to create a provident fund for the company's employees. It should be mentioned that the idea had been under consideration for some months, having been practically and effectively originated early in the year by the splendid gift of £10,000 from the chairman of directors, Mr. Peter Waite. The annual meeting was held at the end of August, and then the suggestion was made that the shareholders should consider a proposal to vote a sum of £30,000 to the same purpose, and that a special meeting should be called at a later date to deal finally with the matter, and this was held on the 14th inst. Mr. Waite was in the chair, and he warmly commended the scheme to those present, his words carrying the more weight in that he had given the best of all proofs of his sincerity of purpose. It was in the best interests of the company, he said, to attract good men to the service and to keep them, also to show that when a young man joined their staff he had a career before him for the rest of his working life, and after that a pension for his closing years. Also it was proposed to provide other benefits for those who might not reach the retiring age in the service of the company. The carrying of the resolution which he was about to propose would materially strengthen the very fine sense of loyalty which already existed amongst the staff, and would thereby work greatly in the interests of shareholders. It may be said that this was an appeal to self-interest on the part of shareholders; and so it was. But self-interest is in no sense an unworthy motive in the average investor, who has to place his money where he can get the best interest on its use. In the case of Mr. Waite's own generous contribution, however, that sentiment was conspicuously absent; he is a wealthy man, and he recently showed in another matter that he not only recognises that wealth imposes responsibility and obligations to the community, but also that he has the interests of South Australia at heart. He was able to announce that the actuarial work in connection with the fund was nearly completed, and that if the shareholders voted the money, the scheme could come into operation with the New Year. The motion having been put and carried unanimously, a further surprise was sprung upon the meeting, Mr. Alex. Martin announcing that another director, Mr. R. Barr Smith, had decided to follow the lead of Mr. Waite, and add another £10,000 to the fund, which, therefore, would start with £50,000, which surely is a remarkably good foundation. In these days of industrial strife, when each day renews the impression that there is a great gulf separating Capital and Labour, which neither seems very strongly disposed to cross, and which it seems almost impossible to bridge, it is refreshing indeed to learn of some attempt in that direction. It is not forgotten that a number of other institutions, several of the banks, for example, also have provident funds, which are being gradually built up by half-yearly or annual contributions from profits; none the less, the example of Elder, Smith and Co. Ltd. is well worthy of commendation to still other wealthy citizens and companies.

* * *

Those who had anticipated from Dr. Anton Breinl's lectures in Melbourne on Tropical Australia a confirmation of their individual views for or against the possibility of the permanent settlement of a white population in the Northern Territory, have been disappointed, for the lecturer stated last Monday night that it would be precarious at the present stage to express an opinion on the subject, because statements either way could not be substantiated by fact. In this we have another illustration of the reticence of science on questions which are settled off-hand every day by the man in the street. It would be almost difficult, for example, to find a professional politician who is not fully prepared to convince an audience one way or the other on the subject, on any day of the week, and the question has been decided again and again in debating societies. Dr. Breinl is one of the small army of investigators in the domain of Tropical Medicine, of which this question forms a part; he sees how much has been done, and how much remains to do, to enable a satisfactory answer to be given, and his declaration is that it is too early to announce a decision. Investigations into the effects produced on the blood by continued high temperatures point to the conclusion that they are very slight, and of little significance; the influence of parasitic disease on white people appears to be of much greater moment, and has been more thoroughly investigated, the result being that many conditions previously attributed to climate are really due to parasitic causes, and must be dealt with by suitable preventive measures. Tropical Australia, says Dr. Breinl, enjoys a unique position in tropical lands, the diversity of its climate ranging from the bracing atmosphere of a high table-land to the hot and humid conditions of coastal districts, while the sparseness of its black population makes dealing with disease a comparatively easy affair. In this way, and for these reasons, tropical Australia offers far more favourable conditions for white settlement than any other tropical country. Yet the problem is recognised as one of the farthest-reaching of those which are occupying the attention of scientists, and one which fully justifies unlimited effort to solve it. Dr. Breinl thus summed up his conclusions:—"I am only expressing an individual opinion in remarking that, as a rule, the conditions of life in the tropics are much easier, competition is less, living areas are larger, and numerous servants can be obtained for small pay. At the same time there is an undoubted tendency for the individual to become afraid of work, unable to concentrate, and generally a weakling. This is not, however, the universal tendency, and the European will always find himself able to do a certain amount of work. The white woman will be much more affected than the white man. Very soon she will begin to feel homesick, and the lack of out-door exercise will accomplish the rest. Her only subjects of concentration will be the behaviour or misbehaviour of her servants. A young woman of robust physique and common sense will not drift so far, but very often she, too, will suffer from homesickness and ennui."

* * *

After all, it would seem that working conditions in Australian mines are not absolutely the worst in the world, though no doubt they are still capable of improvement. An explanation of what contract work on the Rand field means was recently given by a writer in the London "Daily News." "Superficially," he says, "this contract work should not be wrong. But in actual working it is absolutely and utterly bad; for it simply enables the mineowner to shift his responsibility on to the miners' shoulders, while the solidarity of the mine companies has lowered the price of contract to the very lowest level of the miners' endurance. For, if you refuse to work in one mine on the plea of it being too low a figure, you may look in vain in any other Rand mine for employment. The owners have no use for a man with such notions. With a full knowledge of this, what can a man with a wife and family do but knuckle under? Let it be understood that the grievances lie with the underground men; but, of course, without them any work is impossible. The 'big' money that a miner makes has to be heavily discounted. It is what the economist calls a 'nominal' wage; his 'real' wage is quite another story. A miner who contracts to get out a certain bit of reef has working under him, say, a couple of white assistants and a gang of native labourers. He has to pay the white men and the company for his native 'boys;' he has to pay the company, too, for the use of mine machinery, buy his light, his dynamite, and, in fact, all the necessities of his trade, from the company, or he gets into trouble—or rather gets sacked on any pretext but the real one. If he has taken the contract at a 'cut' price, his balance at the end of the month looks foolish when the company's contract account is entered up against him. And if he should have made such a bad bargain, and it has happened that he is left with a balance on the wrong side of the ledger, the company can follow him to his next contract and claim payment before he touches the money he has earned."

## NEWS AND NOTES.

At Trunkey Creek (N.S.W.), McKellar and party obtained 59½ oz. of gold from a crushing of 35 tons.

The Hampden-Cloncurry copper mines (Q.) will pay a dividend of 2s. per share on December 22, amounting to £35,000, making the total repaid to date £140,000.

A matter bearing on the probable existence of petroleum in Australia is the recovery of actual crude oil from Eyre's Peninsula. A hole was dug through the fossiliferous limestone crust into lig-site. When water made into the hole, it was found to have an oily scum, which was removed, and bottled, by Mr. Burns, of the Telegraph Department (S.A.), and Mr. Russell, of the "Advertiser," of Adelaide, in the presence of five other gentlemen.

At the Victorian State coal-mine there is again a movement to dispense with one of the secretaries, or to give him part pay only, in order to reduce the expenses of that branch of the V.C.M.A. Such action on the part of an employer would be called "sweating," and there would be a prompt outcry. Certainly they seem to be in trouble over their book-keeping; nevertheless, they have sufficient funds on hand to be able to forward £50 to assist the waterside strike in New Zealand.

The five young miners who were recently arrested at Mansfield (V.), and subsequently charged with stealing gold from various mines at Gaffney's Creek, to which they pleaded guilty, were sentenced last week by Mr. Justice Hood. The thefts were committed at the Rose of Denmark and New Dempsey's mines, Gaffney's Creek, and the Champion Amalgamated, Ten Mile. There were three charges against two of the men, and one against each of the others. His Honour said he could not deal leniently with the prisoners, as their offence was premeditated, and had been long continued. Theirs was a form of crime easy to commit, difficult to detect, and which cast suspicion on honest miners. He sentenced Hampton and Murphy to six months' imprisonment, with hard labour, on each charge, the sentences to be concurrent; Beaver and Miller to six months' imprisonment, with hard labour, and Giles to three months' imprisonment, with hard labour.

In connection with the work of the Victorian State batteries, the Minister for Mines, replying to Mr. Langdon, in the Legislative Assembly last week, to the effect that, when a battery was available, the claims of the Inglewood district would be considered, said that there was no provision for new plants, which cost about £1100 each. Already there were 25 in existence, and last year the total tonnage crushed was 2887, at a cost of £2417, or nearly £100 per battery. Only 10 out of the 25 batteries crushed more than 100 tons, while four treated no quartz whatever.

The North Australian Exploration Ltd. has taken from the Guinea Gold Co. an option over the dredging areas recently pegged by Messrs. Clark and Hungerford, on the Morat River, Woodlark Island (P.), on the terms of one-fifth fully paid interest, in shares, in any company formed to work such leases, together with the sum of £3000 cash from the first profits on the gold won. It purposes making arrangements for testing the property by means of boring and shaft-sinking. A separate company has also been formed to test 12 miles of dredging areas on Tamata Creek, over which the Guinea Gold holds an option. The latter company is to receive one-half of the interest, in cash and shares, received by the subsidiary company, in any company promoted to work such areas. The Yodda Valley property is to be shortly launched into a company of £50,000, in 80,000 shares of 10s. each. The prospectus will be available in a few days. This property has been favourably reported on by Messrs. Clark and Hungerford, who actually tested, by means of shaft-sinking, 500 out of the 700 acres embraced in the property, for an actual gold value of 1s. 4½d. per yard (wherever bottom was obtained). The working costs are expected not to exceed 4d. per yard. In addition a subsidiary company, to be called the Papuan Timber Industries Ltd., has been formed, to acquire 75,000 acres of timber lands, and 5000 acres of agricultural lands, situated in the vicinity of Buna Bay.

The report of the Kampong Kamunting Tin Dredging, Ltd., to 31st October, shows that to that date the total number of shares issued was 130,000, of £1 each, of which 50,000 were contributing. Upon each of the contributing shares 7s. 6d. was paid up. The total amount received in cash to October 31 was £18,750. Of that sum, £9000 was required for the cash portion of the purchase price, and £[illegible] for deposit and expenditure on dredges. After deducting other expenses, the balance at bankers was £[illegible]. The arrangements made for the construction of two dredges have been detailed. The first plant is to be shipped not later than June 22, 1914. The purchase of the leases was duly completed, and possession obtained, all the titles being in order. The directors' report concludes with the remark that, so far as can be seen, there is no reason to suppose that the statements in the prospectus will not be fully borne out in the practical working of the mine.

A find of alluvial tin has been made on the True Blue lease at Ardlethan (N.S.W.). The material merely requires washing, but one of the difficulties confronting the lease owners is the present lack of water, only a very small quantity being available from some soaks.

During the fortnight ended 12th November, the ore raised in the Occidental Gold Mine (N.S.W.), and despatched to the battery for treatment, amounted to 1191 tons, of an average value of nine samples of 1 oz. 12 grs. per ton.

The directors of the Etheridge Gold Mines, Ltd. (Q.), have issued a circular stating that the date of applications for shares has been extended until the 2nd December. The circular further states that it has been discovered that the width of the reef just below No. 3 level, in the Queenslander shaft, is not 90 inches, as reported in the telegram dated 2nd September, from the manager, but 19 inches, the figures having been mutilated in transit. On this account any applications already made may be withdrawn before the 2nd December if desired.

The first half-yearly report of the Mt. Bonnie Mining Co. (N.T.) states that the first work undertaken was to drive a tunnel near the foot of the hill, to cut at depth the lodes exposed in the shaft on the hillside. From June 14 to September 30 the tunnel was driven 270ft., and about 100ft. of driving, crosscutting, and underlie shaft-sinking was also done. In the tunnel a lode known as No. 2 was cut, at 265ft., the width being given as 20ft., and the assay value at 15 per cent. lead, 11 oz. 2 dwt. silver, and 6 dwt. of gold. Parcels of ore aggregating about 5¾ tons were sold during the period. The assays of the material vary from 15¾ dwt. to 1½ oz. gold per ton, and 30 to 34 per cent. lead; while the net return, after paying carriage and smelting charges, was £33 10s. At the close of the term, the company had a cash balance of £962.

During the four weeks ended with the 15th inst. the Sulphide Corporation (N.S.W.) milled 17,521 tons of crude ore, at the Central mine, Broken Hill, producing 2684 tons of leady concentrates, and 5308 tons of zinc concentrates. At the Cockle Creek works 6163 tons of leady concentrates, purchased ores, etc., were smelted, yielding 2576 tons of lead, containing 3410 oz. gold and 196,245 oz. silver. During four weeks, ended October 18, 13,972 tons crude ore were milled at the Central mine, producing 2338 tons leady concentrates, 4433 tons of zinc concentrates, and at Cockle Creek works 5926 tons leady concentrates, purchased ores, etc., were smelted, yielding 2402 tons lead, containing 3305 oz. gold, 184,704 oz. silver.

For five years Professor Rudolf Sommer has been experimenting on carnotite ore, with the object of ascertaining its value as a source of radium, and it has been announced that he has succeeded in separating three-quarters of a gramme of radium, worth about £20,000. In 1906 a large formation of carnotite was discovered about twenty miles E.S.E. of the Olary railway station (S.A.), and subsequently a 30-ton lot was sent to Europe for assay. It will be seen that, taking the dates as approximate only, it is at least possible that it may have been Olary carnotite which gave this return.

In order to provide further capital, a scheme of reconstruction has been prepared by the directors of the Broken Hill South Extended, Ltd., under which a new company is to be formed, with a capital of £180,000, in 100,000 preference shares of £1 each, and 800,000 ordinary shares of 2s. each. The former will be entitled to nine-tenths of the profits, and nine-tenths of the assets in a winding up, the ordinary shares taking the balance in each case. The affairs of the old company will be taken over in exchange for 672,872 of the 2s. shares fully paid, to be allotted to present shareholders in exchange, one for one, of their present holdings. The new company is also to redeem the debenture stock of £25,000. Present shareholders, especially those who have been instrumental in keeping things going during the company's bad times, may have something to say in criticism of this scheme, when it is formally submitted to them!

Mr. James Montgomery, who, as stated in our last issue, recently found a number of rich gold specimens near Moliagul (V.), has not been deserted by his good fortune, for last week it was reported that he had made further finds on the indicator, which are expected to yield about 80 oz.

The Black Range Mining Co., Sandstone (W.A.), will pay its 83rd dividend, 1s. per share, on December 12, amounting to £3625, making the total distribution to date £240,093.

The 82nd dividend of the Great Boulder Proprietary G.M. Ltd., Kalgoorlie (W.A.), will be payable on December 19, the amount being 9d. per share, absorbing £65,625. This will bring the total dividends from the mine to £4,389,300.

A return of 464 oz. of gold for four weeks' work is reported by the secretary of the Philippine Dredges, Ltd. The No. 1 (old dredge) only worked the first eight days of the month, owing to boiler troubles. This dredge has been stopped, in order that it may be remodelled. The No. 2 (large dredge) stopped, owing to a broken shaft. The time lost owing to the stoppage is not stated in the cable. It was expected it would resume dredging on Monday. No. 3 dredge: Construction work is going along well. The frames are all up, and the chimes bolted in. Planking is in full swing. The manager reports that this plant will be working before the end of March.

The Broken Hill South S.M. Co. (N.S.W.) will pay its 58th dividend, at the increased rate of 8s. per share, on December 19, the total payment amounting to £80,000. This will bring the year's repayment to members up to 30s. per share, or a total of £300,000, the first quarter's dividend having been 10s., and the second and third 6s. each. Altogether, when this December payment has been made, the company will have distributed £1,495,000, equal to £7 9s. 6d. per share.

The Mount Bischoff Tin Mining Co. (T.) will pay a dividend of 10s. per share on the 29th inst., amounting to £6000, and making a total distribution to date £2,428,500.

The directors of the Briseis T. and G. Mining Co. (T.) have decided not to exercise the option of purchase recently acquired over a property at Mount Tiverton, near Germanton (N.S.W.).

Mr. Daniel Grove lectured before the members of the Sydney section of the Society of Chemical Industry, at the Royal Society Hall, Sydney, on the evening of the 19th inst, giving the results of an investigation of the diamond fields of Australia. His conclusions are that two parallel zones of eruptive diamond-bearing dolerites, running from north to south, have been discovered, the one intersecting the New England Plateau of the main divide, and the other situate along the contact between the rocks of the central and eastern division of the State.

## PERSONAL.

Mr. E. G. Foster, of Auckland (N.Z.), has been apponted tramways manager and electrical engineer by the Invercargill Town Council.

The New Zealand Minister of Railways, Mr. W. H. Herries, presided, early in the month, at a social gathering at Wellington, the purpose of which was to say farewell to the ex-general manager of the Dominion Railways, Mr. T. Ronayne. All branches of the Railway Department were represented, and Mr. E. H. Hiley, the new general manager, was also present. Mr. Ronayne had been general manager since 1895, and was previously railway commissioner, but he had been connected with the service from its early days.

Mr. H. A. Jackson and Mr. P. J. A. Ridgeway have been appointed by the Federal Executive Council as district engineers in the lighthouse branch of the Customs Department, at £432 each per annum.

Professor David, of the Sydney University, left Melbourne yesterday by the R.M.S. "Osterley," on a business and pleasure visit to England. The business to be undertaken is arranging for the publication of the geological memoirs of the Shackleton Antarctic expedition of 1908-9, of which the professor was a member. Professor David hopes to return to Australia about the middle of March, in time to meet Dr. Mawson and his party on their return in the "Aurora" from Adelie Land.

The death is reported of Mr. J. McMahon, of Gympie (Q.), at the age of 83 years. Mr. McMahon was one of the first on the field, and he has been ever since closely identified with its development and progress.

Mr. Allan S. Cambridge, the inventor of the Cambridge suction gas plant, is returning from England by the "Nestor." He has been away for twelve months, placing his invention on the foreign markets.

Mr. Edgar H. Cambridge, late chief engineer of the Cambridge Gas Power Co., is severing his connection with it, and intends starting in manufacturing gas plants with a large engineering company.

Lord Pirrie, chairman of directors of Harland and Wolf Proprietary Ltd., shipbuilders and engineers, Belfast, has denied the truth of the announcement made in London, and cabled to Australia last week, that he was retiring from that position, and would be succeeded by the Rt. Hon. A. M. Carlisle, formerly general manager, and at present consulting engineer, of the company.

With regret we record the death last Tuesday of Mr. C. E. Frazer, M.H.R., who has represented Kalgoorlie (W.A.) in the House of Representatives since 1903. Mr. Frazer was in his place in the House last week, and apparently in his usual health. When Mr. Fisher formed his second Ministry in April, 1910, Mr. Frazer was one of the three honorary members of it, and remained so until, in October, 1911, he replaced Mr. Josiah Thomas as Postmaster-General; meantime, however, he had officiated as Acting Treasurer for the last three months of 1910. Mr. Frazer was an able speaker and a capable administrator, and in losing him the Labour Party has lost considerably more than a reliable Parliamentary vote. It is not too much to say that Australian politics have lost a man who promised to take a very prominent place at no distant date, for the deceased was, politically, a strong man, and that he would have reached the foremost rank in the country's service, had he lived, was inevitable. Mr. Frazer was born at Yarrawonga (V.) in 1880, but about 15 years ago he went to Western Australia, which has since been his home, except when the Federal Parliament was sitting. The cause of death was pneumonia, which necessitated his removal to a private hospital last Sunday, and he died there two days later.

# THE INVESTOR'S COLUMN.

## Some Companies Attracting Attention To-day.

(By Our Exchange Reporter.)

### Edna May Central (W.A.).

There was quite an old-time atmosphere about the mining market on Friday afternoon, the business in the vestibule towards the close of the day being on an unusually large scale, while a number of spectators, outside of the area reserved for the members and jobbers, followed with interest the fluctuations in prices. This welcome change had been brought about mainly by the favourable development just reported as having taken place in the Edna May mine, stone worth two ounces to the ton, and evidently part of a large formation, having been encountered in the crosscut at the bottom level. Such developments have been rare in recent years, and it is to be hoped that now the spell is broken that others will follow.

The price of Edna Mays improved from 40s. to 54s. 6d., and closed firm, while at the same time a substantial advance was also recorded in Edna May Central—an adjoining stock. Not more than a week ago shares in the latter company could have been obtained in the vicinity of 9s., but the mine has been opening up favourably, and apart from the sympathetic advance just referred to, there had been an increasing enquiry for the stock on its own merits. The property adjoins the Edna May on the east, and is made up of three leases containing an area of 54 acres, and which are so situated that the company must have a substantial holding both in length and depth on the line of the reef. A fair amount of development work has already been carried on, and with decidedly promising results, as will be gathered from the following brief summary. An underlay shaft has been sunk to a depth of 70ft. at a point 37ft. from the Edna May boundary, and a level has been driven on the reef a distance of about 420ft., connecting with the Edna May workings on the western boundary and being out nearly 400ft. east in the other direction. This drive goes out very straight, which is a good indication of permanency, and the reef runs nearly due east and west, with a strong northerly underlie. At a point 250ft. from the western boundary a winze was sunk 56ft. and the lode found to be 9ft. wide and worth 30 dwt. A second winze has been sunk to a depth of 26ft., showing the reef at this point to be 10ft. wide and the value 12 dwt. A rise has been put up from the level to the surface, and the stone for a height of 70ft., that is to the conglomerate capping, is estimated as worth half an ounce. It should be mentioned that the stone in the end of the eastern drive is of good quality and size. These particulars are derived from the report dated September 18th of Mr. R. M. Boyd, one of the promoters, the information with regard to the value of the stone in the winzes having been obtained from the manager for the previous owners, as the winzes were then full of water. Up to date 750 tons of stone have been crushed on a return of 265 oz., which is equal to 6.8 dwts. per ton, the tailings, however, are estimated to contain another 4 dwt., which brings the average value up to nearly 11 dwt. The ore in sight is assessed at 20,000 tons, worth at least 40s. per ton. Mr. A. P. Morgans, one of the vendors, gives a report on very similar lines, his concluding sentence being as follows: "Although the adjoining Edna May mine is a property of great value, and much attraction, I think it may be safely said that the prospective value of the Myrtle Central mine is greater than that of the Edna May." As the Edna May has had an excellent development since the above opinion was expressed, it is obvious that the "Central" has been set a somewhat difficult task, but setting aside the comparison, and taking into consideration the close proximity of a rich and well opening up mine like the Edna May, the prospects of its neighbour, the Edna May Central, must be regarded as of a decidedly prepossessing character. The length of the chute already proved in the company's ground is now over 400ft., and although an east and west course is not regarded with favour by Victorian mining men, still, the reef has spoken for itself in such an unmistakable manner, as far as its quality and permanency are concerned, that it may safely be regarded as an exception to general rule —that a good reef should run fairly closely north and south. The work done by the present owners since taking over the property about six weeks ago has been of a satisfactory character, and confirmatory of the expert reports, inasmuch as a winze which has been put down from the 70ft. level at a point 316ft. from the western boundary was reported, on the 15th inst., to be down 26 feet, the reef being six feet wide, and the value 16 dwt. Since then another six feet or more has been sunk, and on the 20th inst. the vein was reported to be 5 feet wide, and the value 30 dwt. per ton.

The capital of the company is £30,000, in 60,000 shares of 10s. each, of which 10,000 are held in reserve; 24,000 shares, fully paid up, went to the vendors, and 2000, also fully paid, to the promoters. The remaining 24,000 were sold to the public, 5s. per share being payable on application, and 2s. 6d. per share on allotment. The balance of 2s. 6d. per share to be called up within one year at the discretion of the directors. Out of the £9000 realised by the sale of the shares, £1450 was paid in order to acquire lease 2585, known as the Myrtle Blocks, over which an option had been secured prior to flotation.

This purchase and consolidation of holdings were of great importance to the company, as the underlie of the lode is such that, at a depth of 400ft., it is expected to pass into the block just referred to, and which is north of the Myrtle Central lease, on which all the work above described has been carried on. From the balance of the subscribed capital, £5000 will be utilised in equipping the mine with pumping, winding and crushing plant, and £2000 will be available for development. The market takes a favourable view of the prospects of this company.

### Ajax Central (V.).

The greatly increased activity in deep lead alluvial and Southern Cross ventures has, to some extent, diverted attention from the decline in value of this company's shares; nevertheless, it must have caused the supporters of the stock a considerable amount of anxiety. It cannot be said that the prospects appear quite as promising as they were two or three months ago, and for the following reason: At that time there was a strong probability that one or other, if not both, of the crosscuts, which were being put out east and west at the No. 8 level, would prove the downward continuation of the payable stone, which was being worked in the two vertical reefs at the upper levels. This anticipation was, perhaps, not so strong, as far as the Ajax or Eastern reef was concerned, for it was known that the country was not of so favourable a nature at this level as it was above. No great disappointment was, therefore, expressed when this reef, at the point of intersection, was found to be of not much value, although gold-bearing, and of good appearance. Much more confidence was expressed with regard to the western reef, but, although it was duly encountered, and of a promising character, it did not seem likely to greatly increase the gold returns of the mine. It was, apparently, just about payable, which would probably mean seven or eight pennyweights.

There have, therefore, been two rather disappointing developments, and it is not surprising if they have, to some extent, affected the confidence of the shareholders, for, although the possibilities of fresh discoveries of payable stone are by no means exhausted, yet they do not appear so good as they did when the shares were worth well over 40s. Under these circumstances it would be safer to base an opinion of the value of the shares mainly upon the amount of payable stone already opened up in the mine. Here, again, the outlook is somewhat different to what it was in September and October. The company had then come into full bearing as a gold producer and dividend payer, and the returns were sufficient, not only to provide for disbursements of 2s. per share, but also to enable the building up of a reserve. As for the reserves, they were estimated at varying amounts, but it may be regarded as fairly well assured that they are somewhere about 40,000 tons. And the quality! Well, this is always a very difficult matter to determine, even by experts, and would require exhaustive sampling. Assuming, however, that the results of the crushings to date afford a good basis for an opinion, and that the material has been taken generally from the different workings, then an estimate of 12 dwt. per ton would certainly be a conservative one, and this should give a profit of nearly £2 per share. Such an estimate may prove not very wide of the actual result—the battery alone can decide; but it is still more probable that the monthly yields will not be maintained at the previous high rate of about 17 dwt. per ton. This seems too much to expect, and it may be said that, if the average value of the ore now opened up in the mine is as good as that crushed to date, the shares should be worth between 50s. and 60s. There is room, therefore, for some falling off in the value of the stone without the shares being unduly high at recent prices, and as the reef in some of the drives runs up to eight or nine feet wide, which it pays well to take for the full width, it is not unlikely that such a reduction will take place.

It is not unreasonable to assume that such large bodies of stone would require to be sweetened up with richer material from other parts of the mine if the recent high returns were to be maintained. Such a policy is not likely to be adopted—that is, to an undue extent—and it is likely that the yields will come down to an average which will just enable the payment of the 2s. dividend. This would probably be about 1050 or 1100 oz. per month.

Strange things happen, no doubt, in mining, and Daylesford ventures are far from being an exception to the rule. It will be surprising, however, if the property of this company, which has been under the searchlight of expert examination for the last twelve months, should fail to be a substantial dividend payer for a long while to come. So far the shareholders have received 17s. per share, and another disbursement will be announced after the monthly clean up, on Thursday. Next year the record should be as good, if not better.

On Monday afternoon a telegram was received from the mine, stating that there is four feet of payable stone in the south drive, on the western vertical. The shares improved to 33s. 6d.

# METAL QUOTATIONS.

(From Our Correspondent.)

## By Cable.

### London, Tuesday.

The demand for all the industrial metals was poor at the beginning of the week, though in some instances good advances were made after Monday, but a retrograde movement soon set in again, and the week closed with low rates, and a falling market. On Tuesday copper rose to £69 7s. 6d. for spot, and £67 5s. for deferred, but those rates ruled for one day only. Similarly, tin rose to £181 15s. on Wednesday, but this was immediately followed by a fall of £1. Spelter was stationary at the late rate. Silver also was weak, and wolfram went slightly backwards.

COPPER.—Monday's price for spot was £67 17s. 6d., or 10s. below the previous Friday's; next day there was a rise to £69 7s. 6d., followed by £69 7s. 6d., £68 10s., £67 12s. 6d., and £66 12s. 6d.

For three months' delivery the quotations were £66 17s. 6d. (a fall of 15s.), £67 5s., £67, £66 7s. 6d., and £65 12s. 6d.

Electrolytic opened at £71, and closed the week at £70 10s. Yesterday's quotation was £69 5s.

TIN.—Spot lines brought £180 2s. 6d. on Monday, showing a fall of £1 2s. 6d., next day brought back £181 5s., which was followed by £181 15s.; then came £180 15s., and £180 10s.

The opening price for three months parcels also showed a fall of £1 2s. 6d.—viz., £181 7s. 6d., followed on Tuesday by £182 10s., and on Wednesday by £183 5s.; then came a sudden drop to £181 15s., and £181 10s.

LEAD.—Monday's price was £19, or 5s. less than on the previous Friday; on Tuesday £19 2s. 6d. was obtained, but by Friday the rate was £18 17s. 6d.

SPELTER was still unmoved at £20 15s.

SILVER commenced with a fall of 3-16, to 27¼d., later rates being 27 3-8d., 27½d., 27d., 26 15-16d., and 26¾d.

ANTIMONY.—"Star" recovered to £28 10s., but 50 per cent. ore remained at £6 5s. per ton.

WOLFRAM (70 per cent. ore), fell back to 33s. 6d. per unit, equal to £117 5s. per ton.

MOLYBDENITE was firm at 3s. per lb., equal to £336 per ton.

MANGANESE (50 per cent. ore) had the good rise from 9d. to 11¼d. per unit—that is, from £1 17s. 6d. to £2 6s. 10½d. per ton.

---

The British Chamber of Commerce, 9 Rue des Pyramides, Paris, the official representative of the Commonwealth in France, reports, under date October 21, the following quotations for minerals on French markets:—Copper (Havre), £77; tin (Havre), £198 8s.; lead (Rouen or Havre), £23 10s., (Paris), £23 14s.; zinc (Paris), £23 18s.; nickel (Paris), £165 to £175.

Messrs. Henry R. Merton and Co. (London), in their circular of October 10, write as follows of the prospects of copper:—"We cannot detect any material falling off in the actual consumption of copper. Some branches of the industry are indeed slowing down, but others, especially the electrical and engineering branches, are extremely active and supplied with work for some considerable time to come. Whatever therefore the ultimate future may have in store for the copper market, there can be no doubt that during the next few months, when the accidental restriction of output will be most effective, the requirements of consumers, with small stocks on hand, will remain on a large scale, and those in control of the market will have a serious task before them in adjusting prices. In the meantime the market continues in a very sensitive mood."

---

The proceeds from the sale of products of the Great Cobar Mine (N.S.W.), during the September quarter, amounted, roundly, to £164,000, and the expenditure to £146,000, leaving a balance of £18,000. For the June quarter the figures were:—Receipts, £114,177; expenditure, £98,356; the surplus being £15,821.

## SYDNEY STOCKS.

Mining matters on the Sydney Stock Exchange have gone from bad to worse. The speculator has vanished, and the stockbroker has been busy doing nothing. The week has about put up a record for dulness. The depreciation in industrial metals, the tightness of money, the increasing of capital by so many of our old-established firms, and the backwardation still to be paid on certain Ardlethan stocks, have all contributed towards the general stagnation which has prevailed. And the outlook for the near future does not promise much better conditions. Brokers themselves do not look forward to any activity until the new year. Although there has been such a famine in business, and London quotations have displayed weakness and irregularity most days, the variation in Sydney quotations for copper, tin, and silver-lead shares on the week have been very trifling. The official list showed some slight appreciation in values of Mt. Elliott's Lloyd shares, as compared with the previous Friday's closing list, but Mt. Morgan, Hampden Cloncurry and Grafton were all a shade easier. London cables showed also a distinct weakening in Gt. Cobar shares. The Sydney market for Broken Hill stocks has been generally weaker, with the exception of Broken Hill South shares. Naturally, the announcement of an 8s. dividend, payable on December 19, has had a stimulating effect upon those shares. The dividend distributions of that company for the year will represent 30s. per share. The entire dividends paid by the Broken Hill South have aggregated £1,495,000, or equal to £7 9s. 6d. per share. Junction Norths have received some spasmodic attention from buyers during the week. Sydney shareholders appreciated the holding of the meeting in Sydney during the week.

In the tin section Carpathias have been again the mainstay of business, and as per usual, all the attention has been given to the contributing shares, which have advanced; but the paid-up shares are actually lower on the week. It is, therefore, quite evident that the "bears" have had to cover some of their time sales. The failure of one of the members of the Exchange, who had several thousands Carpathia contribs. to deliver, placed into the hands of the "bulls." Backwardation paid for extension of scrip delivery continues to stimulate the gamble in those shares. Just how long the squeeze can be maintained remains to be seen, but the "cute ones" whisper that the covering has nearly been completed, and then it will be a case of stand off. However, the company is to pay another dividend next month, so it is said. As far as can be made out, from the accounts of the company, there was £9000 in hand at the end of June. Since, £6000 worth of tin has been sold, making £15,000. The previous dividend, and the one next to be paid, will, together, absorb £12,000. It does not leave over much for working expenses, depreciation or reserve. On the present position the shares are too high. Of the other Ardlethan stocks, Wild Cherries have had a little attention, and inquiries have been made for Southern Cross shares. It has been rumoured that sooner or later the last named shares may be pushed upwards.

The Rowley's Reef Gold Mining Co. N.L. has been added to the official list at the Sydney Stock Exchange. The nominal capital is £10,000, in shares of 2s. The subscribed capital is 54,000 fully paid shares issued to vendors and 16,000 fully paid shares publicly subscribed.

The market for investments has been pretty brisk during the week, with leading securities very firmly held. In fact, there have been more buyers than sellers of late. Smaller stocks have been somewhat irregular, but that is the natural outcome of so many increases of capital. For instance, the following increases will take place in the near future:—Hy. Jones, Co-operative, 55,000 shares at par, in the proportion of one new to every ten old shares, Feb. 1; East Greta Coal, 50,000 shares, pro rata to shareholders, 31,250, payable 5s. on application and balance when required, subject to at least 22,500 shares being taken up, the remaining 18,750 shares as fully paid by the capitalisation of £18,750 of the reserves; Port Jackson and Manly S.S. Co., new issue of shares at par in the proportion of one new for every three old shares held.

The Australian General Re-insurance Co. Ltd. is to be floated by the Mercantile Mutual: 1,000,000 shares of £1 each to be called up to 2s. Shareholders of the latter company are offered one share in the new company for every two in the Mercantile Mutual Co. And so the list keeps on expanding. The older companies continue to attract more of investors' money, and to the detriment of the newer and smaller concerns.

It has been whispered abroad in certain directions that the "Sun" newspaper was likely to declare a substantial dividend in the near future. It is about time that company made good to its shareholders. The accounts at the last meeting showed up satisfactorily, although some of the shareholders were inclined to regard the expenses as somewhat too high.

## BRIEF COMMENT.

When speaking at Leonora (W.A.) early in the month, Mr. A. Gibb Maitland, Government Geologist, stated that the work of mapping out the geological features of W.A. had now been completed. Mr. Maitland pointed out that the difficulty most prospectors in W.A. encountered was the overburden of cement which so effectually conceals the indications necessary to enable work being commenced at the right point. This feature also frequently deterred the prospector from trying what might be likely country, and it was the object of the department to assist in prospecting the resources of the State by instituting boring operations. It was essential that in the first place a reasonable prospect of success should be held out, and that, secondly, small local companies or syndicates be formed as a guarantee. These local bodies would be asked to supply one-third of the estimated cost of the work, and the Government would supply the balance, in addition to the boring plant. A board of control would be formed, consisting of the Government and of nominees of the local company. It is intended to commence boring operations in the vicinity of Leonora immediately.

For six months ended the 30th September the Mt. Bischoff Extended Tin Mining Co., Waratah (T.) milled 9221 tons for a yield of 97 tons of tin oxide. The total receipts for the period were £11,900, which amount was practically balanced by the expenditure to within £20, this amount being the net profit after all expenses, including the sum of £1352 in connection with the Mt. Bischoff action, were paid. Now that the company is clear of that liability better results should be shown for the ensuing term. The amount of £1421 brought into the term was augmented by the £20 surplus, and £1441 has been carried forward. The company has also £4000 on fixed deposit, constituting a reserve. Actual ore reserves amount to 30,483 long tons, worth 1 per cent., and probable 8567 long tons, worth 0.9 per cent. At the Nos. 5 and 6 levels the developments have been satisfactory, with the exception that after being exposed for some length the lode entered the main porphyry dyke, about which the management are not apprehensive, anticipating that values will improve as soon as the dyke has been passed through.

At Carngham (V.) the Russell's Freehold Gold Estates commenced boring operations about a month ago, with the result that eight of the ten bores sunk have indicated the existence of a wash system, and three of them the existence of gold. Neither fact is extraordinary. The last bore in which gold was obtained penetrated 15ft. of gravelly wash which bottomed at 26ft. on a layer of pipeclay. It is said that the company's operations have evoked considerable local interest, hundreds of acres having been pegged as the result. Unfortunately, the company is doing the work of prospecting with hand bores, the results from which are not likely to be conclusive or satisfactory. In short, hand-boring is simply fooling with the proposition, as there is evidence on the property of a more comprehensive method of prospecting being justified.

The manager of the Golden Springs mine, near Blayney (N.S.W.), reports that as the result of cleaning up the 200ft. level 160 tons of ore have been won which should yield 10 dwt. per ton. Also that 20,000 tons of highly payable material have been revealed. It is evident that work in the property was either badly directed or the value of the ore was not good enough, as it was generally supposed that this level had been worked out. The manager, however, states that there is no evidence of any stoping having been done in this direction. This mine affords interesting evidence that the mining industry is governed by circumstances and conditions as much as anything else. The manager does not offer any further information regarding the 20,000 tons of ore left standing than that it is highly payable. The answer to the question, "Why was it left standing?" may be found in the fact that it by no means follows that what may be highly payable now was profitable when the mine was worked before. Still, some facts regarding the value of the 20,000 tons would be welcome.

A company, the sails of which flap in the breeze of circumstance, is named the Tarcoola Blocks (S.A.). According to the half-yearly account to 30th September last, odds and ends of crews have worked the ship on tribute, a course the directors considered it advisable to follow, in order to reduce expenditure and have the leases adequately manned. As the result of 55½ tons sent to the Government battery for treatment the company recovered £164. It also did some development work on the Warrigal and Enterprise and No. 1014 leases, the importance of which may be gauged by the distinctions applied in the description of values. The reefs, unfortunately, are small, varying from 1 to 2ft. wide, and only in two instances are the values worthy of note, one about 1 oz. and the other 10 dwt. The company spent £779 during the period, and at the end had assets in cash and bullion in transit amounting to £619. It is now awaiting the arrival of the East-West railway, which the directors hope will improve the outlook, and enable them to float off the Warrigal and Enterprise leases into subsidiary companies.

The Bill to assist the Tasmanian Smelting, Primrose and Hercules companies, brought forward in the Tasmanian House of Assembly, will not be submitted to the Legislative Council until the amalgamation of those three companies has been effected. Evidently, the arrangement is based on the same principle as that on which Providence moves, and the companies concerned will be helped when they help themselves. In speaking to the measure, the Premier said the Government would not proceed with the Bill unless the amalgamation was arranged and a time definitely fixed for the reopening of the works. The chief concern, of course, is the idleness of the Tasmanian Smelting Co., the closing of which is a serious matter for all and sundry on the West Coast who have ore to smelt. The items in the Bill are subsidies of £3500 to the Tasmanian Smelting Co., and £500 to the Primrose Co., and a rebate of £2500 to the Hercules Co. These were agreed to, and the Bill shelved for the reason stated.

In connection with the power which has been vested by the shareholders of the Gippsland Copper Co. (V.) in their chairman to place the property to the best advantage, it is understood that it has been submitted in both London and Paris, with what result is not yet known. A point in regard to the prospects of the property which is not generally known, and which is not even shown on the company's assay plan, is that the last (No. 10) bore put down from a crosscut in the adit level was from 18 to 35ft. in excellent gold, silver and platinum values, in addition to copper assays up to 9 per cent., and was stopped at 58ft. with the end still in values. Apart from the copper content for a distance of 17ft. in this bore the assays were 6 dwt. gold, 1 oz. silver, and 6 dwt. platinum per ton. Not one of the other nine bores put out from the same point disclosed as high values in gold, and in view of the fact that the bore was still in values at 58ft. it is most extraordinary that it was stopped.

In connection with the circular addressed to shareholders of the Ivanhoe Gold Corporation Ltd. (W.A.) by Mr. F. A. Govett (chairman), it might be said that the directors of many other mining companies, particularly in Victoria, would do well to cut by the same pattern. The position is concisely put in the statement that £10,000 per month is a safe profit, taking the ore reserves at 39s. and the total costs per ton (including dividend duty and London expenses) at 24s. 2d. and loss in residues at 4s. 10d., making 29s. per ton, or a total profit of 10s. per ton on more than 1,000,000 tons in reserve. On this basis, the position is perfectly clear. At the present moment the Ivanhoe has in prospect an actual life of some four years, with about £500,000 profit in sight. Of course, this is the hard, bedrock outlook. It is quite probable that the life of the mine will be materially improved once the porphyry dyke is passed through, Dr. Maclaren being quite confident that the reef will suffer very little in its passage through the porphyry. He points out, however, that owing to the greater hardness of the rock which will practically from now on be encountered, the cost of mining operations will be materially increased at least from 10 to 15 per cent. This is only to be expected; but, on account of the conservative nature of the estimates given, in addition to the probability of further reserves being blocked out in the present workings and payable ore being found beyond the influence of the porphyry dyke, there is every hope that the Ivanhoe will maintain its reputation as a great producer for considerably more than four years.

In another column we publish a correction of the figures given by the directors of the Etheridge Gold Mines Ltd. (Q.) in connection with the width of the reef just below No. 3 level in the Queenslander shaft. Upon receipt of the circular quoting the width of the reef as 90 inches at the point named, we were, of course, unable to appreciate the optimism of the manager regarding the prospects of the mine when, in the same report, the width of the reef 50ft. deeper is quoted at 36 inches. It now transpires that the figures were mutilated in transit, the width of the reef at No. 3 level being actually 19 inches, which completely alters the outlook, as, instead of the reef narrowing, it widened appreciably in the 50ft. sunk. With these facts before us, it is easy to understand the optimism of the manager. The mistake is an unfortunate one, as the directors are now in the position of having to give those who applied for shares prior to the correction the opportunity of withdrawing if they desire, notwithstanding the prospects of the mine now being better.

The half-yearly report of the Radium Extraction Co. of South Australia Ltd. to 31st October last indicates that the outlook for the immediate future is promising. The rich shoot encountered above the 50ft. level was thoroughly exploited, and yielded over 40 tons of ore containing from 2 to 5 per cent. of urano-uranic oxide, and 270 tons of lower-grade material, the value of which is not stated. In addition, the work at this point exposed a large quantity of similar second grade ore on the hanging-wall side of the deposit. Length, apparently, is not characteristic of these shoots, as the one referred to is stated to be 20ft. long, the width varying from 1½ to 12ft. The company has now between 600 and 700ft. of what is described as good concentrating ore at grass, with a probable quantity of 300 tons still available above the 50ft. level. The result of work done on the ironstone outcrop was not as encouraging as indications in the east tunnel led the management to anticipate; but it is believed that ore-shoots will occur frequently along the zones of secondary enrichment (as they are styled) and be ultimately found to extend beyond the limits of the ironstone. This belief is confirmed by the experience so far gained in development work. A new shoot has recently been exposed in a trench south-east of the shaft. This shoot contains good patches of radio-active mineral, and varies in width from 6 to 24 inches. Seven and a half tons of ore shipped to London realised £100 19s. 1d., or about £13 10s. per ton. Shipping crude ore is not exactly economical at the best of times, but there are two parcels of 12 tons each now on the way to London, while another 20 tons are bagged awaiting shipment, so that the company may expect to realise some revenue from time to time. Meantime ore is being subjected to tests to determine the best method of concentration. At the present juncture it would seem that some simple form of concentration, if such can be devised, would enable the company to keep pegging indefinitely and give the property the chance of being extensively developed without the possibility of shareholders' aid being further invoked.

A distinction which time cannot wither nor custom stale! Later on, when it has fattened shareholders with a gorge of dividends, the Oxide Creek mine (Q.) will become famous. Meantime it is merely notorious. Mr. Arthur Williams, the manager of that Eldorado, has spoken. Warmed and expansive in the glow of Sydney's hospitable charms he has made definite statements concerning a property which has been the subject of much speculation—mental and monetary. Being definite statements, they must be taken more or less seriously. Briefly, the Oxide Creek mine has one ore-body (it has others, but one of the kind mentioned is ample just now) which from wall to wall for a width of 17ft. and a depth of 100ft. assays 30 per cent. copper, with a 4ft. seam of glance, persistent and regular over the entire depth, assaying 63 per cent. In short neither the width of the ore-body and the seam of glance, nor the values in the entire sink, varied by so much as a hair's breadth. This has been proved by crosscuts from the winze to both walls as sinking proceded. At 100ft. below the adit level, or 260ft. beneath the outcrop on the crown of the hill, driving has been commenced on the ore-body, and it is to be hoped that when further crosscuts are run out a little variation will be found in the width and value of ore-body, if only for the sake of variation.

# THE COAL MINING INDUSTRY.

## New South Wales.

### Northern District.

(From Our Correspondent.)

Newcastle, Nov. 22.

The Miners' Wages Board (His Honor Judge Edmunds, chairman) is still dealing with the Stockton-Borehole case, but an award will probably be given next week. Early this week the matter of the men going back to work and agreeing to accept the wages and conditions fixed by the award, as from the day they started, was again mentioned by the colliery proprietors' representative. His Honor suggested that the men might go back to work—they have been idle for several months—on these terms, and the miners' lodge considered the suggestion, but it was decided not to go back until the award is given.

The colliery proprietors have not at any time since the Wages Board first sat expressed their feelings as to the amount of work that has been thrown upon it. However, it is known that some of them do not regard with pleasant feelings the prospect of the Board sitting for perhaps twelve months, with the constant expense of counsel, witnesses, etc., and then to find that they will have to pay much more in the way of wages for the winning of coal. Speaking this week, one of their number said that at least three companies were "having a rough passage," and if any further increases came in the matter of payments to the men, there would be only one way out of the difficulty, and that would be to increase the price of coal. Even that would give very little relief to the owners of the mines, for, according to present usage, the wages of the men would be increased proportionately. On top of all this, they had good reason to believe that in some of the mines in the Newcastle district, where payment was made for filling the coal "all away together," the men were taking matters very easily, so that shortly they might come before the Wages Board and be able to say that they were entitled to some increase for the quantity of small coal contained in their daily output. The owners would be glad to know, if it were possible, where their liabilities would end; then some of them would be able to say whether or not they could continue to work their pits. So far as many of the men were concerned, they seemed to think they had only to make demands and that the owners had unlimited means for satisfying those demands. Far from that being so, many of the owners were at their wits' end to know what to do to secure trade and pay their way.

Messrs. J. and A. Brown are spending an enormous sum of money in the development and further equipment of the mines and works owned by them in Newcastle and Maitland districts, and in this way they are doing much to forward the industrial interests of the place. In addition, it is known that they have had a lot of clearing done on their Stockrington estate, not far from Minmi, and it is understood that steps will be taken before long to open out and develop the fine seams of coal underlying that property.

Complaints have been loud and frequent of late concerning the delay in the bringing of coal down to the port from the mines, and in its shipment. However, during the last week the Railway Department outdid itself, and landed a very large quantity of coal on the water front, so that no less than 123,700 tons were shipped by the cranes and the McMyler hoist. This is a record for the port, the previous best week's work being in April, 1910, when a little over 118,000 tons were shipped. This week, colliery proprietors are again calling out about the delay in the lifting of coal. They say they cannot get sufficient trucks from the Department, and in the case of trucks owned by the collieries, there is not sufficient engine power to move the trains expeditiously. The trouble is becoming more acute every month, for several of the mines in the Maitland district are increasing their output rapidly. The Department's answer to these complaints is that they will be able to do much better when the railway between Newcastle and Maitland is duplicated.

### Western District.

(From Our Correspondent.)

Lithgow, Nov. 22.

The past fortnight has been rather a satisfactory one, so far as the local coal trade is concerned, the orders to hand being good ones, and the truck supply about equal to demands. Full time was worked at the Lithgow and Hermitage collieries (owned by the Lithgow Valley Coal Co.), while ten days were put in at the Vale of Clwydd mine. The Oakey Park pit worked 10½ days, while the full number of shifts were got in at the Invincible colliery, Cullen Bullen. At the Boldon colliery the truck supply was also good, and satisfactory time was worked. At the Great Zigzag colliery 11 days were worked.

### Southern District.

(From Our Correspondent.)

Wollongong, Nov. 22.

At the Wages Board sitting this week, two claims were prominently in evidence; abolition of night work as far as practicable, and of miners working singly. The claim respecting night work, that is, the afternoon and night shifts, is 6d. per ton extra. Witnesses said that the intention was that such extra cost of the coal should be an inducement to managements to do away with night work. It was stated by the witnesses that a household was much inconvenienced by the workers not getting home before ten o'clock or thereabouts when on the afternoon shift. The question of miners working singly is one which has caused trouble, because the practice has been applied in deficient place cases by taking one of the pair out and placing him elsewhere; the trouble comes in in computing the earnings. The management want the earnings of the pair thus separated put together, so that the one who has been in a good place will contribute towards the deficiency of the other; the union wants the earning in the good place for the one who made it, and the management to make up the deficiency in the other. Of course, if the claim is conceded, it will do away with that. It was admitted by an employee witness that there were places in which one miner might earn good wages, and a pair be unable to earn the minimum. Regarding safety lamps, for the use of which there is a claim for extra pay per ton, it was asked if there was not a good electric lamp. Mr. Sellers (Bellambi Co.) said the owners would be glad to get a reliable electric lamp. Of the C.E.A.G. electric lamp, recently tried in the northern district, Mr. Sellers said he found that the cell was soon destroyed by the attack of the sulphuric acid used. A claim is made by the employees for the provision of washing houses or baths at the mines, at which a miner could wash when he came out, and get into his ordinary clothes. The employers say the expense of this would be considerable, and that it is doubtful if many would avail themselves of it. Another new claim is for travelling in to work. The face in most of the mines is now a very appreciable distance in, "and," said the employees' representative, Mr. Willis, "we're willing to walk a mile for nothing, but we want sixpence for every half-mile beyond that." It was explained that the real object of such an award would be to induce the proprietors to instal a system of conveyance to the face.

## Victoria.

### Powlett River District.

(From Our Wonthaggi Correspondent.)

Since the coming into operation of the new agreement between the management and the employees of the State mine accidents of a serious nature have increased to such an extent as to cause those in charge considerable uneasiness. It was thought that the men, in order to make as much money as possible, might be taking unnecessary risks and neglecting to put in timber where required. Steps were taken by the mine manager, Mr. McLeish, to see if this was so, and instructions were given to deputies to report any breaches of the rules. As the outcome of this proceedings are being taken in the police court by Mr. Wallace, Inspector of Mines for the district, against 10 miners for breaches of rules 72 and 73 of the special rules under the Coal Mines Regulation Act 1909, pertaining to the State coal mines, Victoria. These rules refer to the spragging or upholding of the coal before starting to hole it and the safe timbering of the workings. It is a singular thing that after proceedings against the miners had been launched Mr. F. J. Murphy, general secretary of the V.C.M.A., saw fit to refer to the matter at the fortnightly meeting of the local branch. He said he thought the attention of Mr. Broome, general manager, should be drawn to the frequency of accidents in the mine. He understood that a lot of members of the branch were to be prosecuted for breaches of the Mines Act. He was informed that one of the injured men had complained that his place was dangerous, and was told that if that was his opinion he had better go on top. Many accidents occurred for which the miners were in no way responsible. The meeting decided that the officers should bring the matter before Mr. Broome, which is a rather peculiar position to take up, seeing that effective attention had been given before the V.C.M.A. took the matter into consideration at all.

The financial affairs of the local branch of the V.C.M.A. continue to absorb the attention of members to the exclusion of almost everything else. Recently the branch auditors went into the matter and discovered that the accounts and books were in a muddled condition. They went through all the books and vouchers available, and as the outcome of their investigations they found that Mr. H. McCulloch, the secretary for the first portion of the term, had a deficiency of about £20, and the present secretary, Mr. A. Chapman, about £17. Both these amounts have since been paid in. The committee suspended Mr. Chapman, but his explanation as to his shortage was accepted by a special meeting, and he was reinstated. It was agreed that as an independent auditor should go through the books, and this has been done. A special meeting was held on Saturday to deal with this auditor's report, and it turned out to be the most disorderly meeting yet held by the union. The auditor (Mr. Shackleton) had not completed the audit up to date, but he reported that he had increased the shortage of McCulloch to about £30 and reduced that of Chapman to about £14. Mr. Burley, one of the local auditors, offered to bet Mr. Shackleton £5 that he would take six items in which they differed and prove that he was right. One thing led to another, and Mr. Chapman accused Messrs. Mathieson, district president, and D. Simpson, ex-president of the branch, with taking union money to which they were not entitled. Mr. Mathieson said Mr. Chapman was a liar and had brought this out to injure him in his election, because he was responsible for having him (Chapman) suspended when he had not the courage to resign on the auditor's report being received. Mr. Simpson characterised Mr. Chapman's assertion as a "dirty lie," and denied having received more than the president's allowance of £10 10s. After a long wrangle the whole question was adjourned until the audit was finished and the balance-sheet produced. It appears that before it is all over there will be a lot more mud slinging, and reputations will not count for much.

## New Zealand.

The directors of the Westport Coal Company have issued a circular to their shareholders proposing to increase the capital of the company to £500,000 by issuing a further 100,000 shares of

£1 each, of which 50,000, it is suggested, shall be offered at par to shareholders who are on the register on December 1, in the proportion of one new share to each eight old shares held, fractions of shares being omitted. The terms are, cash on application, but it is proposed that this payment should be met by the declaration of a special dividend equal to the amount so payable. In order to provide the funds required for the special dividend, it is proposed to take £31,000 from the insurance fund, £14,000 from the contingency fund, and £5000 from the reserve fund. The new shares will not participate in any dividend declared in April, 1914, but will participate in all dividends declared thereafter pro rata with the existing shares of the company. The proposals will not interfere with the usual dividend on the existing capital of the company, which will be dealt with in the forthcoming annual report. Our last New Zealand exchanges gave the market quotation of Westport shares as "Buyers £1 11s. 3d."

# VICTORIAN MINING ACTIVITIES.

## Ballarat and District.

(From Our Correspondent.)

The Britannia crosscut at 1180ft. has been opening up a fair amount of stone during the past week or two, though it is not of the grade hoped for. Better stone is expected to be met with very shortly. Preparations are being made to extend the rise near the northern boundary at the 1030ft. level put up by the old company into stone. There is a good block of unworked reef hereabouts, and the directors have been applied to by miners willing to take blocks on tribute. This company has a big area of ground, embracing the old Sulieman Pasha mine, in which work was not carried on below a depth of 700 or 800ft., and in which mine some good returns were won from the lode. The lease also embraces the spot on which the famous Welcome nugget was found over half a century ago.

The stronger enquiry for some of the Beaufort district stocks suggests a likelihood of the early termination of the strike. Many of the men are known to be tired of idleness; and, of course, the company directors, while determined not to give way on the question of the open mine, are anxious to see operations in full swing again. The manager of the North Hope is ready for work to be resumed underground, and he expects three or four weeks' work in driving and rising will reveal wash once the men go below.

Interest in the New Jubilee has been revived by the 900ft. south drive opening up payable ore 4ft. wide. The stone was met a little beyond the crosscourse, and the country appears to be keeping regular, as the same fault was passed through in the level above. Work hereabouts will be facilitated, as the rise has holed through to the winze from the level above. Driving has now been resumed in the 800ft. south drive. The company having taken over the North New Jubilee Company's lease, which is to be known as No. 3 shaft, work is in full swing there, and stone from the 100 and 150ft. levels is being crushed. There is 2 to 3ft. of quartz, giving fair prospects at times. The 800ft. and 900ft. drives are regarded as of the greatest importance, as very little stoping has been done at that depth.

After about seven years' work in the long 1500ft. level at the New Normanby, the 1600ft. crosscut has been got under way, and should this open up stone of anything like the average value of that worked at 1500ft., the life of the mine should be materially prolonged. During the first four or five years' work in the 1500ft. level, a fair number of dividends was paid, notwithstanding that the company pays tribute to the original leaseholder. There seem to be large bodies of good payable quartz underfoot, and, in addition, a make between 150ft. and 170ft. from the main lode is giving fairly satisfactory returns. The 4ft. slates may be met in the 1600ft. level, at about 100 or 150ft., and the main lode should be cut at 230 or 250ft. from the shaft.

The North Woap Hawp shaft is being sunk from 1400ft. to 1500ft., which, besides being hoped to intersect the downward continuation of the stone now showing in the south drive, from the winze below the 1400ft. level, should also enable the management to command to better advantage the payable stone now being mined from the new Normanby 1500ft. level, and which has given a long series of yields, averaging about 11 dwt. per ton.

The Golden Reef mine, at Dereel, has come under notice on account of the opening up of a good body of payable stone, going north, in the No. 2 (130ft.) level. The east crosscut off this drive has proved 12 to 14ft. of stone, and the best of it is in the footwall side, where some ounce per ton quartz is showing. A crushing is being put through. This reef is thought to be identical with that seen in the tunnel by a former management.

The Easter Monday shaft will be deep enough next week for cross-cutting to be started for the lode worked at the 265ft. level. This proved a rich shoot of stone, though not of great length (150ft.).

The No. 7 south drive at the William's Fancy is now carrying stone of fair quality, which is rather better than when the face was just into the lode beyond the crosscourse, though not up to the appearance of the reef at a corresponding point in the level above, where the drive went into a good payable shoot of gold. It is intended to crosscut further east off the 600ft. south drive, to try the eastern reefing zone, which, it is thought, has been thrown nearer the workings at this point. Here also an independent mine may also be revealed.

An important discovery has been made by boring on the Carngham Estate, by the Russell's Reef Gold Estates Co., a combination of metropolitan and Geelong investors. Boring has been carried on during the past month, and 10 or 12 bores have been sunk, most of which proved the existence of an extensive shallow alluvial system, at a depth of from 25 to 30ft. Three bores showed gold, and the bore which proved 15ft. of gravelly wash gave a very satisfactory prospect. The lead lies between two old-time rich gold diggings—the Back Creek and Russell Flat. The fact that the area now being bored was held by the well-known family of squatters whose name it bears, and who declined to allow the sheep runs to be honeycombed by diggers, is said to account for the country being so long neglected by the mining prospector. Following the acquisition of the lease by the Russells' Gold Estates Co., a large tract of country has been pegged out.

## Bendigo and District.

(From Our Correspondent.)

The gold production for the week ending November 22nd, 1913, amounted to 3615 oz. 15 dwt. The principal producers were Golden Pyke, 352 oz.; Central Red, White and Blue, 300 oz. 4 dwt.; Ironbark, 236 oz. 18 dwt.; Great Northern, 216 oz. 10 dwt.; Virginia, 200oz. 10 dwt.; New Chum Goldfields, 175 oz. 8 dwt.; Carlisle, 149 oz. 16 dwt.; North Bendigo, 139 oz. 3 dwt.; Johnson's Reef, 126oz. 7 dwt. Two dividends were announced, totalling £2172 10s.—viz., Golden Pyke, 1s.; £1372 10s. (total to date, £84,920 7s.). New Chum Goldfields, 6d.; £800 (total to date, £22,400).

Johnson's Reef reported better prospects in the new reef, above 1225ft., gold showing more freely in driving an intermediate level off the rise; at about 25ft. below the cap. The west back of this formation carried a few inches of stone in the 1225ft. crosscut, which is now in course of extension to the east back. In rising 75ft. on the west leg, the beds dipped rapidly, the rise gaining a considerable distance east before the saddle was reached. The west steadily enlarged after passing through the lava, and later payable prospects were revealed in 4ft. to 5ft. of quartz, with one or two breakings. On approaching the cap, the upper portion of the reef was of low grade, similar results attending the breaking across east through the cap, but the east back is stated not to have been reached. Finding nothing of value in the cap and the neck of the leg, which was traversed by the winze from 1150ft., the company started the intermediate close to where the prospects were brightest in rising. Owing to the south pitch of the beds, this intermediate will be getting lower on the back. It is also proposed to open up the reef in a similar way southward. In order to ascertain its resources further north, a crosscut is in course of extension from the old 1150ft. north level, driven on the west back of the overlying reef. This crosscut is about 300ft. ahead of the intermediate, and should reach the reef in a couple of weeks. The point at which the reef will be intersected here depends on the pitch of the reef channel. On the old reefs above 1150ft. there is no material alteration in the north workings, beyond the resumption of stoping on the west leg. The level gaining north from the south crosscut has not shown so much gold lately, though the east leg here is still profitable. Much interest attaches to the opening up of the new formation at and above 1225ft., for nothing is known of it, apart from the rise, and the west leg has a very promising appearance. On the Paddy's Gully line operations were less successful last term, though the Collmann Reef maintained its favourable character.

Golden Pyke resumed underground operations to some purpose after completing the new head-gearing, by sending in the larger yield of 352 oz. 10 dwt. from 325 tons, also reflecting a higher average. This result is officially stated to be chiefly due to the excellent quality of the main reef in the stopes north of the Nos. 1 and 3 rises, above the 543ft. north level. Stoping here is in the vicinity of the rich shoot, traversed in the No. 3 rise. More gold had also been showing in the 447ft. stopes, on the outer formation, for the greater part of the week. The customary 1s. dividend was made available for the 27th inst. The 730ft. east crosscut entered the downward continuation of the main reef, which has been opened up for a width of 3ft., without being through it. Though well mineralised, the stone had failed to show gold up to the time of writing. As the work proceeds at this depth, however, there is a strong probability of the quartz ing the 345ft. east crosscut, to ascertain the value of the upper limits of the outer reef and the lower portion of another formation.

Carlisle experienced a more remunerative term by drawing more freely on the better grade stone in the leading stope above the 1140ft. south level. This stope is close to the end of the timber, and about 140ft. south of the shaft. Taking 20ft. to 25ft. of crushing material, which disclosed a coarse sample of gold, after the last few breakings. The level is in 300ft., with three or four spurs of low value in the end. No side stoping is in progress till you get 100ft. from the face, where fair gold is visible in the spurs to westward. It would be good prospecting, and legitimate mining, to extend a rise to the top fault from the end of the south level. This would determine the position of the slide, which is about 30ft. over the rails at the main crosscut, and provide several more stoping faces. Near the crosscut the back stope is not quite up to the fault. There is 25ft. of crushing material here, but its value is not as profitable as in the north level. The big drop in the yield of the previous week was hardly anticipated, and every precaution is likely to be taken in future to prevent a recurrence of such a violent fluctuation. Good stone is known to exist under the south level, at 120ft. in, and, if necessary, this will be extracted at any time to ensure a profitable return, by sinking a winze. At 1200ft. the north intermediate is in 377ft., and as yet the top fault has not pitched into these workings. This fault is at 12ft., under the 1140ft. north level, where the winze was put down at 90ft. from the shaft. In the winze there is good stone for a depth of 15ft. under the slide. If the pitch of the fault was maintained, it would have been in the intermediate level some time ago. The bottom fault rose over the intermediate at 50ft. from the end, and appears likely to junction with the top break. There are indications in the top of the intermediate level at present, suggesting the close proximity of the faulting. The end is about half quartz, in which a little gold is visible. The failure to disclose any of a profitable character at this depth appears to be due, chiefly, to the restriction of operations to the Victory back for the last 200ft., the more productive stone probably existing in the footwall beds further west. Side stoping has been in progress for a length of 50ft. off the rise connecting the 1140ft. level, exposing stone for a width of 27ft., but of low value. The south intermediate level is to be resumed shortly, above the bottom slide. At 1260ft. there is a full width of spurs, with a little gold in the rise, at 15ft. overhead. A crosscut will be driven to the Victory back at 1040ft. about the end of the year. This work should disclose the auriferous spurs, seen in centre, and associated with the lava in the Unity Co.'s 920ft. crosscut. On the whole, the prospects are encouraging, and another 6d. dividend is likely this month.

## Castlemaine and District.

(From Our Correspondent.)

Spring Gully had an important development towards the end of last week. Thompson's Reef has always been regarded as the richest on the lease, and before it was lost it provided many rich returns. Many years ago a rise was put up from the old 240ft. level south, in order to pick it up, and stone was got, which, although regarded as Thompson's, was not of good value. Lately the present manager has returned to the same spot, and 6ft. from the old rise has struck a reef which he regards as the real Thompson's. The rise of long ago just failed to reach it. More will be known within a few days. The northern stopes show a little gold. Last week's crushing—170 tons, for 45 oz. 16 dwt.—just about maintains recent averages.

Driving is being done in both the Spring Gully No. 1 and South Spring Gully.

South Wattle Gully has at last got its crushing plant delivered on the ground, and the contractors are pushing on with its erection. Vigorous prospecting is also being done, and stoping, in order to have everything ready to keep the battery going.

Campbell's Creek bucket dredge's No. 1 plant is in particularly rich ground, 144 hours' work yielding 60 oz. 5 dwt. The second plant is still out of action, undergoing repairs.

## Maldon.

(From Our Correspondent.)

Derby United have extended the north drive of the 825ft. level from the crosscut, and the stope over the south level shows fair gold. In the rise over the 680ft. level a start has been made to drive south on a reef 5ft. wide, and estimated to be worth 3 dwt. A start will also be made this week to crush at the battery. The cyanide plant treated 300 tons of sand for 35 oz. 10 dwt.

South German Co. is extending the intermediate level north off the winze below 1750ft., and the reef is wider than the drive. The stone looks payable, and is being sent to the battery. The rise over the back at 2000ft. has been taken 25ft., and is showing 3ft. of laminated stone on the east wall, which reveals gold, where broken, of an assay value of over an ounce. Baxter and party are taking out stone of high value from both north and south of the winze, and the other tribute parties are operating without change.

Maloney's Red, White and Blue (Gowar) is doing fairly well. From 14 tons, 4 oz. 13 dwt. was returned, and J. Manson, from a tribute, got 3 oz. 18 dwt. There is about 2000 tons of sand on hand, and it will be cyanided at once.

Blow Reef, Newstead.—At the 360ft. (bottom) level, the crosscut has been extended to 101ft. from shaft, and is now in clean country. They have opened out north on first lode track, passed through at 80ft. from shaft. It is now in 11ft., with a good wall, and pug and mineral seam, trending east. It is expected to junction with other tracks passed through.

New Day Dawn (Maldon).—Payable prospects still continue in the north drive, on the prospecting shaft. The No. 1 level main drive is out 126ft., with spurs in the end, carrying colours of gold. A short crosscut has been put through the hanging wall, in quartz leaders, carrying gold colours. The Cricketers' Reef south drive, off the east crosscut, in 29ft., on good wall, with 2ft. of stone, of promising appearance.

## Daylesford.

(From Our Correspondent.)

Developments of note are not as frequent as could be desired, considering the amount of prospecting that is being pushed ahead in the principal mines. The Ajax Central is showing up consistently on the bright side, particularly as the western lode is shown to be payable at the latest level opened up. At the level above, some 90ft. south on the same formation, there is, at present, a foot of similar value in the face. In other parts there is little or no change, the faces and stopes returning about the usual average of milling stone. There is really nothing new at the Ajax; the bottom levels, so far, have not opened up as was anticipated. The lowest level drive north is out some 65ft., but shows nothing better than twelve inches of stone, of practically no value.

The Nuggety Ajax are making fair progress in deepening their shaft; for the last 50ft. a formation of somewhat encouraging appearance is being sunk into, which is strong in mineral, and carries a sample of gold.

The North Nuggety Ajax have no intermediate crosscut going out east above No. 6 level, some 30ft., where a couple of feet of stone shows a little gold. The make met with at No. 8, in extending the western crosscut, is pretty well 3ft. wide, and reveals a little gold; to all appearances it is a flat make, and shows a dip in a westerly direction.

The Lord Roberts continues to give encouragement. The drive going south, at the 110ft. level, follows a full face of payable stone. It is expected that another 30ft. of driving will strike the downward continuation of this formation at the lower level, where the main drive has reached a point 26ft. from the shaft, travelling out in a similar direction.

The Ajax Consolidated have cut the lode in their east crosscut at 90ft. from the shaft. It is about 2½ft. in width, and of good appearance, well mineralised and defined, and, on prospects, will easily prove ½ oz. stone. Recently 14 dwt. stone was crushed from a winze 130ft. south of where this was met with. The New Cornish lease has again changed hands, this time to a Victorian syndicate of some strength, and expectation runs high as to the future of the property. The last company have run for nearly three years on the gold won from the mine, but this has only been done by judicious management. Though at times a fair number of men have been employed, the return did not permit of systematic prospecting work being carried out; hence the management was hampered, and debarred from doing what was really necessary to properly develop the property. One thing that seems desirable is the deepening of the main (Bonward's) shaft, which is practically in the centre of the lease, from which, in the past, most of the valuable stone was obtained.

---

After being carried up King William-street, Adelaide, for about 50 years, the Glenelg railway traffic will be diverted to another route before Christmas.

# QUEENSLAND MINING.

## North Queensland Fields.

(From Our Correspondent.)

Mareeba, November 14th.

The Oaks No Liability, which company has been resurrected from the ashes of the old Oaks Amalgamated Gold Mines, No Liability, which broke all records for mis-management, is now in operation. The first meeting of shareholders was held in Cairns on Monday, 3rd inst., when Messrs. Jas. Lyons, J. A. Carpenter, A. J. P. MacDonnell, L. G. Grimshaw, and Harvey Draper were elected a board of directors. The above are all good, sound business men, but they will have to rely solely on their manager with regard to the practical working of the mines. Mr. Fred. Laby was appointed general manager—a position he held with the old company. The appointment of Mr. J. J. Tully as mill manager is the best bit of work done by the new company, as he is a most competent man, with a long experience on Charters Towers. He has already started on the demolition of the old battery, and a new milling plant is expected along at an early date. Even with a new plant, it is doubtful if the shareholders will get any returns, as no reefs of any size have been proved in the company's ground. The leaders, although numerous, are small and sometimes rich. The formation is the most interesting feature of the field, as sometimes over large widths gold is obtainable; however, not in sufficiency to justify battery treatment. The future life of the Oaks Rush, or Kidston Goldfield, will never be determined by battery treatment. If the new company were to go in for an extensive hydraulic sluicing plant, then there would be a chance of something in the nature of a reef being discovered. The hill easily lends itself to sluicing, but the scarcity of water during a few months of the year acts, no doubt, as the deterrent to those who have thought of sluicing.

The Thompson's Oaks G.M. Co., N.L., situated on the same field, is almost in the same unhappy position as its sister mine, and unless a reef is soon located it will also have to reconstruct. It is at present living from hand to mouth. The north crosscut from the 200ft. level is now in 120ft. in diorite and quartzite country, and so far there is no appearance of the pipe of stone worked by the original prospectors. There are, however, several other leaders and reefs, which might be picked up by further development work. The salvation of the Kidston goldfield lies on the baser metals in the deeper ground, as in the sulphide zone copper has made its appearance. The field is worth prospecting by means of a diamond drill.

Several of the individual owners of mines are getting small rich crushings, and Messrs. Craven and Jansan are still doing well from the big low grade reef on their Mountain King lease.

The Tyrconnel Gold Mines, N.L., Kingsborough, are looking very promising. The manager has just completed the skidding of the shaft, from the bottom of the shaft to the surface. A safety cage and tank are now installed, and are working. Drives have been started north and south along the reef. The suction-gas plant arrived safely at Dimbulah, but for some time the manager was unable to get teams to cart it to the mine, despite the fact that he was offering £3 per ton carriage, over a distance of twenty miles. However, he has now overcome the difficulty, and the plant is at the mine, and in course of erection. Messrs. Hargreaves and Williamson have applied for a twenty-acre lease of the ground adjoining the Tyrconnel, on its north-western boundary. This ground is only 300ft. distant from where the gold was struck in the Tyrconnel. Already option offers have been received by the holders from Melbourne and Sydney syndicates. Mr. Hargreaves is proceeding south shortly, and some arrangement will then be come to regarding the future working of this lease.

The Lass O'Gowrie tin mine, at Stannary Hills, is providing good dividends for its shareholders. A crushing of 92 tons has just been completed at Loudon Mill, Irvinebank, for a return of 20 tons 13 cwt. of tin concentrates, the whole parcel bulking over 20 per cent. for black tin. In the slope 50ft. below the No. 2 tunnel the lode is very strong, and over a width of from one to two feet the lode is worth from 35 to 40 per cent. black tin. In the rise from the 331ft. mark in the tunnel there is six inches of 30 per cent. ore showing, in addition to the lode above mentioned.

The Russell River alluvial gold leads, hitherto so long neglected, given sufficient inducement, are about to be re-opened by Mr. Fred Brown. Only the margins of the leads, up to the present, have been worked, and those by hydraulic sluicing, by means of long races and nozzles, under water pressure. The system of races probably aggregates thirty miles of well surveyed and properly constructed work, some of which includes tunnels through ridges up to 400 feet in length. Portions of these have fallen into disrepair, but it will not take much money to place them in proper working order. Out of the score or two of extensive faces which have been worked during the past twenty years, the first it is now intended to attack is the "Astronomer," which is probably the main branch of the numerous gold leads of the Russell goldfield. The present intention is to tunnel from the Russell River fall towards and underneath the "Astronomer" lead, and thence to rise into the auriferous wash, and to break down the existing faces into gold-saving boxes in the tunnel. The success (which can hardly be doubted) of such work at the "Astronomer" would lead to the re-opening of the Russell goldfield on a scale equally as large as some of the gold-bearing leads in Victoria. The results originally obtained amount to an ounce of gold per square fathom of ground, and less than half of that amount in Victoria is considered dividend-paying dirt. Mr. F. G. Brown, whose name is intimately connected with these ventures, hopes to re-open the "Astronomer" mine shortly, and I feel sure that, with his intimate knowledge of the field, and his previous success in it, will lead to the resurrection of a very valuable mining district. Of course, consideration has to be taken into account that railway connection is now so close to the Russell field as compared with the old expensive method of pack-tracks to Cairns. The topography of the Russell goldfield indicates almost certainty that the ancient river channels are even more numerous than the existing channels that are seen in the country to-day. Nothing but impenetrable scrub, remoteness, and expensive carriage has debarred the district from receiving that attention which it so thoroughly deserves.

The returns of crushings from the Herberton mineral field for the month of October, just to hand, show that 2428 tons 18 cwt. of stone were treated for a yield of 102 tons 5 cwt. of tin, valued at £9228. Under the heading of purchased ore are the following:—Stream tin, 13 tons 12 cwt., value £1602; Wolfram, 1896 tons stone yielded 16 tons wolfram, value £1596; Copper, 168½ tons ore yielded 19½ tons metal, value £1450; Lead, 39 tons stone yielded 10 tons lead, value £199, and 3147 oz. silver, value £377. The total value of all ores won and treated being £14,452. Among the mines the Vulcan heads the list, having crushed 725½ tons of stone for 40 tons 17 cwt of tin, valued at £3489. At the Loudon mill the Governor Norman crushed 538¼ tons of stone for 5 tons 6 cwt. tin, value £586.

The Gilmore tin mine is still attracting a lot of attention, and there is a good demand for shares. The manager has located a shoot of rich ore at 110ft. in the Dolly Gray shaft, on the hanging wall side. The shoot is about 3ft. by 18in., of soft kaolinised matter, carrying exceptional tin values. It is to be hoped that the shoot will lead to another of the well-known "Dolly Gray" patches which yielded such good returns in the past. This find is one of great importance, as it is in virgin country, and behind any ground worked out in the bottom level 145ft. The manager intends to start men developing this new find in a few days. The crushing of 86½ tons of headings sent to Gurrumbah for treatment yielded 3 tons 8 cwt. of tin concentrates. Messrs Dwyer and party, tributers, crushed 27 tons for 6 cwt. of high-grade tin concentrates. In addition to the new shoot of ore locates, the manager can now turn attention to the rich patch worked by Lynch and party, tributers, as the lode has gone out of the tribute area into the company's ground, and it is sweet rich patch. The prospects for the Gilmore are excellent, and next report should provide some interesting reading for shareholders.

The declaration of a 3d. dividend by the Vulcan tin mine was not unexpected, as I predicted same some weeks ago in these notes. Rumours are to hand regarding a further good mine development, and buying orders have been coming in freely, and the market is at present very firm. There is every probability of another dividend being declared before Christmas or else early in the New Year. A recent visitor to the mine states that in his opinion the Vulcan has never looked so well as at present, and payable tin ore is showing in all the faces.

A find of mica has been made at Springfield Station, Etheridge railway line. Mr. J. H. Fulford, owner of the property, has sent samples to the Mines Department. Speaking to Mr Fulford a couple of days ago, he said the lode was an extensive one, and would produce 4in. mica. So far practically no work has been done on it, as Mr. Fulford is waiting to receive a reply from the Mines Department regarding its commercial value. Mica mines are few and far between in these parts, so the find on Springfield Station is attracting attention.

At the Chillagoe smelters, the whole of the Huntington-Heberlein plant is in operation, the first time for many months. The copper furnace is working away steadily, good supplies of ore coming forward from Einasleigh.

The "holiday" trouble at Koorboora is not yet ended; but a number of men have resumed work.

# NEW SOUTH WALES MINING.

## Broken Hill.

(From Our Correspondent.)

Broken Hill, November 21.

Whilst the cities are in the throes of mining half-yearly meetings and dividend-declarations, people in Broken Hill know less than people in the cities. The very latest news is sent by the general manager of the mine to the directors for issue at the meeting, whilst the poor searcher-after-news is put off for a day or two. This is not the case all along the line of lode, but is so in most cases, and the result is that when the searchers are able to use their titbit the directors have used it just a few hours before. Therefore what I could say has been printed already, and is probably appearing officially in other parts of this journal. This growl, of course, is unjustified. The directors are really the people to tell the shareholders what is going on, and are entitled to get the news first hand; but the newspaper writer endeavours to let the general public know as well as the shareholders. Anyway, the directors have had nothing to report but decent developments and good dividends.

Apropos one remark I just made, a prominent mine manager said to me a few years ago: "D—— the shareholders and the public! We will let them know what we want when we want." This axiom his mine fully follows.

But holders of Broken Hill scrip, according to the half-yearly reports issued and the remarks made in writing and publicly, seem to have little to fear. The saying of the manager of Block 10 (Mr. McBryde) at the meeting of shareholders could be made a good optimistic text for Broken Hill generally. The dividends of the South, Block 10, and British mines tell their own story. To the outsider everything looks lovely, but through the wide end of the telescope folk are looking at a prospective fall in lead (three months forward—£15 10s.) and possible industrial incidentals. Broken Hill is never secure—for two reasons—(1) fluctuations of the metal market, (2) industrial worries. I was going to write three reasons, including lack of ore, but the man who says Broken Hill is likely to die for that reason is far out of his reckoning.

So soon as a few more official figures are forthcoming I shall endeavour to tabulate the future. In a general conversation among some mining men the other day this prism of talk leapt through—"A life of 15 years?" "No, 50." "But proved?" "Yes, 15 is proved, but that is what we can all see." And in the talk that ensued evidence (oral) was given freely that no single man in the assembly was likely to see the end of Broken Hill.

Now, this is nice news to hear, and just before the approach of the Christmas season, when people think of the future, it is something to base that future on. An ounce of facts is worth a column of comment.

The latest assays from the 615ft. level on Block 10 (at 158ft. in) go 19.2 per cent. lead, 4.5 oz. silver, 9.4 per cent. zinc.

On the British the lode at the No. 11 level got into rhodonite and mixed ore at 206ft. From 200ft. to 206ft. the assays averaged 16.25 per cent. lead, 12.0 oz. silver, 11.0 per cent. zinc. Then what may prove an intrusion was met with: if it is only an intrusion, the ore at the back may be of even better grade.

For some reason or other the Junction Co. has issued no figures for the past week.

Whilst speaking generally of the mines, it seems unnecessary to mention all individually, especially as elsewhere I anticipate later official figures will be printed.

All one can say is that on the surface Broken Hill seems as safe as could be sought for.

But all one can write about concerns only the mines directly along the line of lode. Outside possibilities are not at present even considered—publicly—by the big directors.

## Lithgow and District.

(From Our Correspondent.)

Lithgow, Nov. 20.

Good accounts concerning the mining activities of the district continue to come to hand, and it is very evident from the number who are at present making good livings at gold fossicking and developing copper and silver shows that the Lithgow mining area is by no means being overlooked by the right class of people—men with both energy and means. At Tuena, to the south-west of the town, Messrs. McKellar and party a few days ago put through a valuable crushing of 35 tons of quartz, which, it was anticipated, would be exceptionally rich. The stone realised 59½ ounces of gold for the 35 tons. The same party to-day (20th inst.) finished crushing a 40 ton lot, which is said to be exceptionally rich. In the same vicinity the lease held by Mr. G. Balmer, at Copperhannia, and until lately worked by a Sydney party, but now abandoned, has been applied for by Mr. James Carmichael, of Sunny Corner renown, who intends to give the place a thorough trial.

Word comes from the New Burragorang Silver and Lead Mining Company's mines at Yerranderie, that good ore is now showing in the face of the workings, and that when the double tramline, now nearly completed, is operative, the mines will be worked more scientifically and to much greater advantage than ever before. A consignment of about 12 tons of ore has just been despatched to the smelters. The last two parcels of ten tons each, from the same country, returned £202, and, after paying all smelting and transit charges, gave a net return of £17 19s. 4d. per ton. A further five tons assayed—Gold, 3 dwt. 5 gr.; silver, 110 oz. per ton; lead, 57.55 per cent. Arrangements have now been made for a larger water catchment area in connection with the present storage dams at the mine.

Mount David gold miners are now working on about six inches of crushed rock in the face between hard felsite walls. There is a small making of quartz at this point in the face, but it does not carry gold to any considerable extent.

## South Coast.

(From Our Correspondent.)

Wollongong, Nov. 22.

In the Tilba district, Mr. Twyford, who acquired the whole of the property on the reef named after him, has disposed of half his interests, and there is now a battery on the show, which is shortly expected to be treating a big pile of stone which has accumulated at grass. The stone coming up now looks good. None of the other holders have been rewarded by striking the reef so far.

In the Warden's Court, Cobargo, application was made on behalf of Eliza Moorcroft and Alfred Boyle for suspension of labour conditions on their barytes mine, Wangaruka. It was stated that the applicants were forming a company which could instal machinery for the treatment of the ore, and expected, when the machinery was provided, to be busy. Crude barytes could not be profitably raised, as, owing to the failure of a paint factory in Sydney, there was no demand for it. The warden said he was not satisfied with the evidence given. If a suspension was wanted applicants must be prepared with evidence. Mr. Richards, who appeared, was granted an adjournment till the 28th inst.

---

# WESTERN AUSTRALIAN MINING

(From Our Correspondent.)

Kalgoorlie, Nov. 17, 1913.

Although the Augusta mine, at Laverton, was floated so long ago as Jan., 1912, and most of the plant, including a ten-head mill, was installed nearly eighteen months ago, the 152 h.p. suction gas engine, to drive the treatment plant, was only ordered in July, 1913, and has just arrived in the State. It is evident now that operations will not start till after the annual holidays, or exactly two years since the flotation of the company. Eighteen months ago Mr. Arthur Pearson, one of the directors, after a visit to the mine, reported that there was plenty of gold-bearing stone to keep twenty head of stamps going, as well as a good water supply, and the two years' delay seems inexplicable. Prior to the mine being acquired by the present Melbourne company, it had produced £99,000 from 26,700 tons of ore, taken from the 500ft. level to the surface. The ground is very hard, and the ore shoots short, and that was the reason why Mr. Campbell Shaw, when manager of the Golden Reine Co., advised its abondonment, and the acquisition of the Ida H. in its stead. A few months ago the ore in sight was stated to be eighteen months' supply, of the value of 15 dwt., or 63s. 9d. per ton. As the mill has ten 1250lb. stamps, capable of crushing 1750 tons monthly, this means 31,500 tons, which appears to be a very liberal estimate. The previous owners, in four years, only crushed 11,200 tons, for £52,000, and paid £18,200 in dividends, and it seems strange that so much ore, of such high values, has been left behind or developed since.

In the October report of the Bullrush Gold Estates, it is stated that, at the 270ft. level of the Royal Standard mine, in the west drive, at 75ft. from the shaft, a slide has been struck of similar underlay and appearance to the fault which caused the displacement of the reef in the shaft at 299ft., and points to the probability of the reef having been thrown into the hanging wall. Before Mr. J. Joice resigned from the management, in March, he admitted that the alleged fault was really granite. In September, Mr. J. T. Jutson, Government Geologist, in his official report, stated that, at a depth of 300 to 305ft., on the underlay, the reef and greenstones are sharply cut off by a nearly flat plane, below which rather coarse-grained grey granite intrudes. There is no lode channel in the granite. In the October monthly report, it is also stated that the large rope-driven pulley broke on October 21st, and stopped the mill. This pulley had eight grooves, and weighed about 4 tons. As the alignment of this pulley is wrong, the ropes had to be kept in their grooves by wooden guides, and, naturally, the constant friction cut the guides away, and a smash-up followed. A new pulley, costing £100 odd, has been ordered, but it must share the same fate, unless it is brought into alignment.

During the week the management of the Adelaide Enterprise Syndicate has erected a head-gear on their Ziegler mine, forming part of the water reserve on Mt. Charlotte, the site of the Government reservoir, which supplies the Kalgoorlie district. The area held by the syndicate is so restricted (as no mining is allowed within 200ft. of the reservoir), that the life of the mine must be very short, and it hardly looks like the class of property for a capitalised company, even of 5000 shares of 20s. each.

The Golden Horseshoe Co.'s main shaft is now completed to 2780ft., and, in sampling the crosscut previously put in from the Great Boulder workings, a new lode was found, 80ft. east of the shaft, assaying 42s. 6d. per ton, over a width of 48in. As developments are now being pushed ahead at the two bottom levels, where the rich No. 4 lode is being exploited, a gradual improvement in returns and profits may be looked for. The London press is taking strong exception to the recently-paid dividend, on account of the weak financial position of the company; but that will be remedied in the very near future.

The recently reported rich development at the 2100ft. level of the Lake View Consols was a mere flash in the pan, as, after assaying 80s. per ton for a length of 7ft., the grade suddenly dropped to 16s. Although Dr. MacLaren gets the whole credit of pointing out the usefulness of prospecting in calc schists, this was pointed out by Mr. Chas. G. Gibson in his preliminary report on Kalgoorlie in 1909, when he wrote: "The quartz diabase (dolerite) are by far the most important series of rocks on the field, as it is in them that all the more important ore bodies occur. Ore bodies found in the calc schists cannot compare in importance with those in the biabase." In his final report, Mr. Gibson wrote:—"The schistose and carbonated bodies found in the calc schists are more patchy in their contents, and, on the whole, of lower grade than the quartzose deposits found in the quartz diabase. As an example of this might be mentioned the Associated G.M.; here the same lode was worked in both the diabase and the calc schists, and, while it gave good returns in the former, it was unpayable in the latter." In the Chamber of Mines Journal for October, the Government is advised: "That the State could well afford to employ the keenest intellect in this line, the first specialist brain in Europe or America, as in two mines alone something like half a million of money has been spent unsuccessfully in prospecting unprofitable rock for new shoots of pay ore." Mr. Gibson's is a case of a prophet not being honoured in his own country.

It is reported that Messrs. Bewick, Moreing and Co. have paid £7000 deposit on behalf of the Mountain Queen Co., to bind the bargain with the owners of the Great Victoria. Apparently they are satisfied with a lower grade proposition than Mr. Hamilton, of the Great Boulder. The Mountain Queen Co.'s second string, the Transvaal, although rich enough in gold contents, has such a superfluity of arsenic that it is doubtful if the ore can be treated on a commercial basis. Another mine that is developing arsenical pyrites is the Yuanmi, and it may go out of commission, like the Lancefield, Gwalia Consols, Bellevue and Transvaal, unless some new metallurgical process is evolved.

Something definite should be known very shortly about the fate of the Edna May. In his last progress report, Mr. M. T. Williams, the manager, says that the crosscut at 150ft. is being extended in "hard schistose formation," while a writer in a Perth daily says that the crosscut is in "granitic country," though, he adds, "it has the appearance of being a granite dyke, going down with the reef, and is in no case a flat granite bar." The result of the next few feet of the crosscut is being eagerly awaited locally.

# PUBLICATIONS RECEIVED.

The Peerless Manufacturing Co. of New York (for whom B. K. Morton Pty. Ltd. are the Australian agents) has issued an interesting wall map of the Panama Canal and the Canal zone.

* * *

Official Year Book of New South Wales, 1912. By John B. Trivett, Government Statistician. Part xv., Local Government; Part xvi., Employment and Industrial Arbitration; Part xvii., Food and Prices; Part xviii., Index (Government Printer, Sydney, 1913). The price is 6d. for each part.

* * *

New South Wales Statistical Register for 1912. Edited by John B. Trivett, F.R.A.S., F.S.S., Government Statistician. Part I., Population and Vital Statistics; Part II., Shipping; Part III., Commerce. (Government Printer, Sydney, 1913),

# ENGINEERING AND ELECTRICAL SECTION

Australian
General Electric Co.
217 Clarence Street, Sydney.
Tel.—Central, 3495, 4397; City, 2381.
"Penfold House," Cr. Queen and Little Collins Sts., Melbourne.
Tel.—Central, 2647.
Representing—
GENERAL ELECTRIC CO., U.S.A.
The
BRITISH THOMSON-HOUSTON CO. LTD., of Rugby, England.
The GUARANTEE of EXCELLENCE on GOODS ELECTRICAL

## VICTORIAN RAILWAYS.

With the passing of the Developmental Railways Act, the Victorian Government was launched upon a more systematic plan of railway construction, having for its main object the opening up of large areas of valuable country which have been kept backward sheerly through lack of railway facilities. Possibly this consequence of lack of railways would have been less marked had other districts been in a similar position, but it was impossible for localities with no railroads and very poor roads for teams to compete successfully with more favoured areas. These remarks apply particularly to many parts of Gippsland, and it is in that portion of the State that the first line to be constructed under the new Act is to be built, and the recommendations of the Railways Standing Committee were tabled in the Legislative Assembly last week. The committee recommends the construction of a railway from Bruthen through the Upper Tambo Valley, via Ensay and Swift's Creek, terminating at the foot of the Tongio Gap, near Tongiomunjie, as such a line will reasonably meet the requirements of the residents of Omeo and the landholders on the Omeo Plains, as well as those in the Cobungra country. The committee, however, recommends that a survey be forthwith made of the Timbarra River route for both a broad and a narrow gauge line. The broad gauge, it is thought, would be the more suitable for travelling live stock, as transfer to main line trains would be simplified, and the committee favours the broad gauge wherever the cost of construction is not prohibitive. When the survey by way of the Timbarra is finished, and the quantities and cost of the earthworks have been taken out, the committee will determine the route and gauge of the railway. The length of the railway by either route will be upwards of 50 miles, and will probably cost about £300,000 or £400,000, according to the gauge and gradient adopted. The committee acknowledges that owing to the isolation of the Upper Tambo Valley it is practically impossible to develop its agricultural resources, as cattle, sheep, and pigs which had been fattened before leaving have now to travel so far on foot that they reach it in an impoverished condition.

The Railways Commissioners are offering opportunities for 132 youths to enter the service as apprentices, as follows: — Blacksmiths, 11; boilermakers, 22; bricklayers, 2; carpenter, 1; car and waggon builders, 15; coppersmiths, 2; electrical fitters, 3; electroplater, 1; fitters and turners, 31; French polisher, 1; lamp maker, 1; moulders, 11; painters, 9; patternmaker, 1; sailmakers, 8; upholsterers, 4; wood machinists, 9. Amongst the inducements held out by the Commissioners are prizes and scholarships awarded in connection with the classes of instruction held at the Workingmen's College, where successful candidates are afforded tuition at the expense of the Department.

As we mentioned some time ago, it is proposed to enlarge the accommodation and the plant at the Railway timber seasoning yards at Newport, where the House process is being very successfully operated. A new shed is to be erected and equipped at a cost of about £2000, and a commencement is to be made in cutting up the enormous logs of blackwood purchased about 18 months ago and to convert them into marketable timber, after which they will be made available for tradesmen outside the Department, and as blackwood is so well known as one of the handsomest and everyway best timbers in the world, and particularly useful for furniture, there is no doubt there will be a ready demand for well-seasoned supplies.

There is a good deal of dissatisfaction just now amongst the employees of the Railways Department. For some reason, the Department is not under the Public Service Board, but is controlled entirely by the Commissioners, with the Minister of Railways as a Parliamentary head. The men do not complain of this, but they have a union of their own, and for months past representations have been made to the Commissioners, particularly regarding the working of the goods sheds, but actually having reference to the whole of the service, and in respect of both hours of employment and rates of pay, as compared with the Public Service. Another complaint is that no action has been taken on the report of a special board appointed last July, from which it was expected that some serious effort would result to allay the discontent by increasing pay, reducing hours, increasing office accommodation, and making additions to the staff, so that the excessive strain might be lifted. The Commissioners reply that no action has been taken because they are awaiting further information which they have asked for. The conditions of employment at goods sheds, they say, will be improved despite what had been said to the contrary. As far as wages were concerned, the increases, if any, would not be announced until the new regulation now being framed was published. The men have asked for a Royal Commission, but the Premier declines to recognise the need for any such thing, and states that the conditions of the service to-day are better than at any previous time in his experience.

## MUNICIPAL COUNCIL OF SYDNEY.

At last week's meeting of the above, the following recommendations of the electric light committee were adopted:—

That the makers of the conveyor in the old boiler house at the power house (Babcock and Wilcox) be instructed to supply 1200 wheels "B," 1200 bushes "A," 600 pins "D," and 600 special washers "F" at an estimated cost of £157 10s.

That 100 tubes for the Stirling boilers required to renew such tubes as fail from time to time be obtained from the agents for the boilers (the Austral Engineering Supply Co.) at an estimated cost of £135.

That three 15,000 volt 300 amp. non-automatic remote control oil switches be ordered from the Australian General Electric Co. at an estimated cost of £55 for the whole, to make proper provision to guard against danger to the public from the 10,000 volt overhead mains, the cost to be a charge against capital.

That a complete oil pump, to be retained as a spare in connection with the three 4000 k.w. turbines, be obtained from the makers, Willans and Robinson, at an estimated cost of £53 3s.

## AUSTRALIAN WIRELESS.

The Postmaster-General, Mr. Wynne, last week assured the ex-Postmaster-General, Mr. Frazer, that the Government had none but the Balsillie wireless system in use or in contemplation, and that the Marconi company had made no proposition to the Government with respect to erecting a long-distance station at Port Darwin since Mr. Frazer himself left office, neither had he any idea where Mr. Frazer got the idea that such had been the case. However, if something better than the Balsillie system came along it would not be turned down without due consideration.

During the recent brief visit to Australia of Mr. S. Swinbourne, the English wireless expert, the opportunity was taken by the Postmaster-General to obtain his view of the desirability of adopting that system for communication between Melbourne and way-back townships which are not at present provided with any more rapid means of communication than the mail-bag, or, at best, the telephone. From the nature of the country to be traversed, as well as the distance to be covered, the cost of erecting telegraph poles and lines had been prohibitive, amounting in some cases to from £2000 to £3000 for 100 miles; the consequence was that the people situated in those districts were excluded from the general scheme. A wireless installation which would remove this disability could be put up for about £200, and, as Mr. Wynne has been assured that there would be no difficulties in the way of operating it, he has decided to at least make the experiment. Where the first station will be put up has yet to be decided. It is considered that as so many amateurs have been experimenting with wireless, and, therefore, have at least a general knowledge of the subject, there should be no very great difficulty in finding a sufficient number of young men who would be ready to train in the department for the position of operator, though at present the department has no trained staff to admit of such extensions.

## MELBOURNE TRAMWAYS.

The Victorian Premier, Mr. Watt, has notified the Municipal Tramways Conference that the Government has no intention of introducing a Bill this session to constitute a Metropolitan Municipal Tramways Trust. This is little more than a formal repetition of declarations previously made by the Premier to the effect that his "Metropolitan Council (Greater Melbourne) Bill embodies the Government's policy with respect to tramways control, as well as the control of other public utilities." That Bill, however, is opposed by most of the municipal councils, all of which appear to have anticipated some benefit without making any sacrifice, and by the public bodies which it proposes to absorb in the Metropolitan Council, while Parliament has indefinitely postponed its consideration. But Mr. Watt is not disposed to allow the outcome of an immense amount of work to be thus quietly thrust aside and forgotten, and there is every likelihood that the measure, which was outlined in our issue of October 2, will be revived next session. Meantime, the Government declines to introduce fresh legislation which would run counter to it. The Lord Mayor complains that Mr. Watt's attitude puts municipalities in a very serious position regarding the taking over of the cable tramways, the lease of which expires in July, 1916, for if the Bill is introduced next session there will only be two years to get ready.

The Lord Mayor of Melbourne, Councillor D. V. Hennessy, stated last week that he was seriously considering the desirability of taking over the motor 'buses now running into and through the city, and running them as a municipal concern. "They are coming into such vogue as vehicles for passengers who wish to travel with expedition," he said, "and there seems such an excellent prospect before them from a business point of view, that I fear they will enter into very great competition with the tramways, and we shall suffer when we take the trams over. I intend to approach the City Council's committees to see if some move cannot be made to take them over entirely as a municipal concern. If it is to be done it must be done as soon as possible, before the cost becomes prohibitive."

Comparing the tramway services controlled by the Prahran-Malvern Tramways Trust, Councillor Naylor reported to the Prahran council last week that the Trust's service compared very favourably with the cable system worked by the Melbourne company. The cable system cost £2,000,000 for 95 track miles, whilst the electric system, totalling 40 track miles, cost £400,000. He claimed that the Trust operated a better system than the cable at one-third of its cost. One drawback to their system was the shortage of cars to cope with the traffic, but that would be rectified in time. In three years the Trust had distributed profits amounting to £12,000, whilst the Brighton electric service, managed by the Government, had resulted in a loss of £17,433 since its inception.

The Prahran-Malvern Tramways Trust has accepted the tender of the Steel Company of Australia for points and crossings at a lump sum of £912.

By a majority of 4 to 3 the St. Kilda City Council adopted last week a proposal, also passed the same evening by the South Melbourne Council, to extend the proposed electric tramway in South Melbourne, from the terminus in Patterson-street, via Fraser-street, Beaconsfield-parade and Acland-street to junction with the St. Kilda-Kew electric tramway, which, it was pointed out, would link up two tramway systems, extending from the city via South Melbourne, St. Kilda, Caulfield, and Malvern, to Kew and Hawthorn, and vice versa, with access to all branch lines. The South Melbourne council's approval of the scheme is subject to ratification by a poll of the ratepayers. When a deputation from the two councils asked the Premier to legislate authorising the scheme, Mr. Watt pointed out that the extension might jeopardise the South Melbourne proposed line, to which the Railways Standing Committee had already agreed. If they amended the Bill now, he did not think there was the least chance of its being passed this session.

---

## DREDGERS AND STEEL.

To the history of this age of iron and steel Australia has not yet contributed a page, however important a part it may play in the production of other raw materials. But that it will ultimately assume that position in the industry of iron which its natural resources in this respect demand there need be no doubt.

For many years engineering firms and ironfounders have been with us, suffering all the disadvantages attached to being remotely situated in regard to actual supply of raw material, only able to partly satisfy local requirements, and in many branches of the trade for a long time failing utterly to achieve anything at all. But the situation is now changing, and in spite of many difficulties there has been progress and achievement, and in the manufacture of steel Australia can now boast of having commenced to produce a quality which nearly always equals, and often excels, the quality of that produced in the old world.

In substantiation of that statement, we give the following figures concerning the quality of the steel turned out by the Chas. Ruwolt Pty. Ltd., Richmond (V.). In accordance with the specification laid down by the Victorian Railways, the quality of the steel used in the manufacture of wheel centres, for example, must conform to the standard of 20 per cent. elongation and 26 tons tensile. Within four weeks of starting its foundry the Chas. Ruwolt Pty. Ltd. delivered 10 wheel centres (portion of the first contract secured by it) to the Victorian Railways Department, the quality of the steel in which was found to be equal to 25 per cent. elongation and 30½ tons tensile. A further 50 wheel centres (forming part of a contract for 500) were found by test to contain steel of a quality equal to 29 per cent. elongation and 30 1-3 tons tensile. These results are as good as the best, and better than the average, results obtained at Woolwich Arsenal.

A visit to the firm's works is apt to leave on one a profound impression of ultimately great achievement. Situated near the Victoria Bridge, with a substantial frontage to the river Yarra, the works occupy portion of a total area of 11 acres. In these works there is the beginning of a great enterprise, to which water transport will eventually form a valuable adjunct.

The works is divided into six departments, commencing with the power house, in which is installed a Garrett compound superheated steam engine of [illegible] h.p., and boiler, a compound horizontal tandem engine (manufactured at the works) of 120h.p., and a return tube boiler, supplying steam to the horizontal engine pumps and blowing engine for the steel converter. The blowing engine consists of a vertical steam engine direct coupled to a high pressure [illegible] blower, and installed also in the power house is a belt-driven cupola blower and belt-driven dynamo to supply power to the electric apparatus used in the working of the steel foundry. This plant is centrally situated, distributing power throughout the whole of the works by means of shafting running in ball bearings.

The iron foundry, designed chiefly with the object of executing the firm's own work, has a capacity of 20 tons of castings per week, and consists of 3 bays, 25, 40, and 25ft. wide respectively by 105ft. long. The cupola platform is common to both the iron and steel foundry, the material being raised in skips by an electric hoist. This portion of the works is equipped with the usual stoves, core ovens, emery grinders, etc., and lifting appliances, consisting of several jib cranes, in addition to the two overhead travelling cranes. The class of work turned out here is chiefly medium to heavy, and is principally for the construction of bucket dredgers, which constitutes one of the most important branches of the firm's business.

Adjoining the power house are the engineering and boiler making departments. These, as well as the works generally, are built of steel sections throughout, special attention being paid to both lighting and ventilation. Each department is served by an overhead travelling crane, while the most modern type of machine tools are installed.

There is always something suggestive of romance in steel; associated with it are giant enterprises and colossal wealth, for it is one of the prime factors in modern progress. The steel foundry of this firm is the largest this side of the equator, and consists of the most modern appliances and methods known to metallurgical science.

Steel Converter after 10 Minutes' Blow.

The process of manufacture is a modification of the improved and well-known Tropenas process which is used extensively in Europe and America, notably by the Woolwich Arsenal in the manufacture of armour piercing shells.

The building in which the steel foundry is situated consists of three bays, 25, 50, and 25ft. wide respectively by 120ft. long. All the work in the central bay is controlled by an electric crane of a capacity of 10 tons, and numerous wall jib-cranes, the latter being for special work. The steel making plant consists of a cupola 36in. inside diameter, in which is melted the raw material, which is tapped into a ladle suspended from an electric jib crane, and transferred into a converter. This converter has a capacity of 2 tons for each blow, and it is possible to make with it single steel castings up to 10 tons in weight. Two blows aggregating 4 tons of steel are made in an hour, the actual blowing time being from 15 to 18 minutes. At the end of a blow, i.e., when all the carbon, silicon and manganese has been eliminated, weighed quantities of certain materials are added to the steel in order to obtain any desired composition. The metal is then poured into a ladle suspended from the electric crane and distributed among the moulds prepared for its reception. The castings, after being fettled, are annealed in a stove heated by producer gas, the temperature being controlled by an electric recording pyrometer. Producer gas is also used for supplying heat to the drying stoves and core ovens.

In all castings a substantial quantity of head metal is allowed, which plays an important part in ensuring soundness, and as the steel cast is as tough as an ordinary mild steel bar the heads cannot be broken off, as in the case of an ordinary iron casting. Metal saws have therefore to be used for removing the heads, one being a flush-sided circular, and the other a band saw. The necessity for employing the most up-to-date appliances for this work will be realised when it is understood that from 20 to 25 per cent. of the steel made is allowed for head metal, which has to be sawn off, and is afterwards remelted.

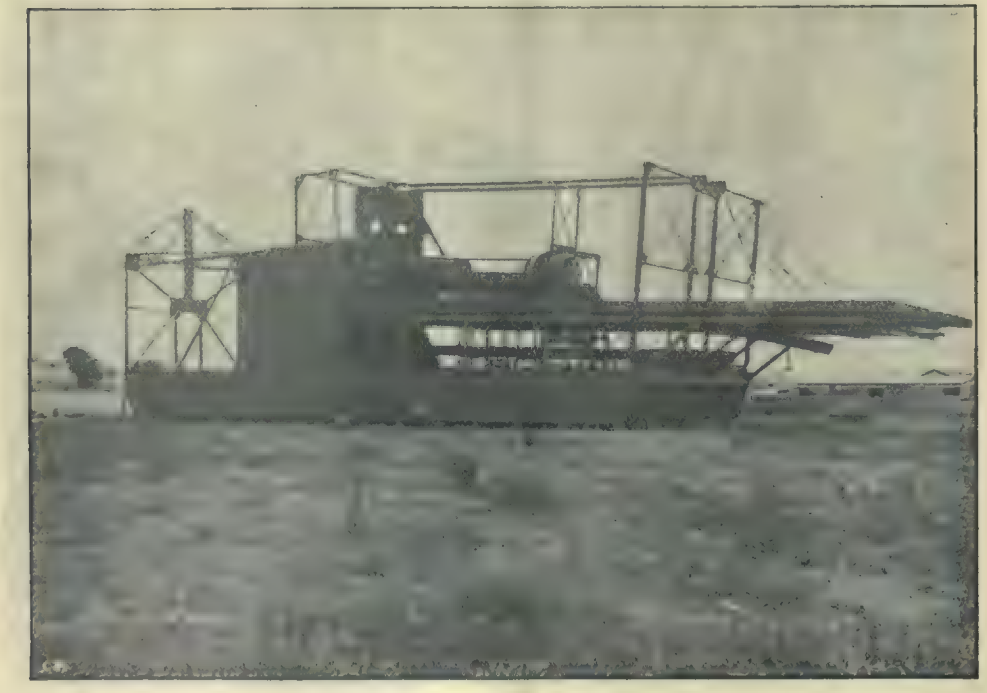
We give an illustration of the steel converter in action. Adjoining it on the right is the cupola, between which and the converter is the jib crane for transferring the molten metal. The expedition with which the total operation of conversion is performed, is evident by the arrangement of the cupola and converter on each side of the jib crane. The illustration shows the converter when it has been "blowing" for about ten minutes; at the time of completion of blow the light and heat is so intense as to render successful photography practically impossible.

It might be stated here that this plant has only been in operation for six months. It was designed and laid out by Mr. A. M. Henderson, who was specially engaged by the firm to proceed to England and the Continent to secure the most modern and approved appliances and methods, and the result as seen reflects great credit on the enterprise of the management and the ability of Mr. Henderson.

In addition to the foundries, the works are equipped with complete engineering tools and appliances, comprising the latest and best machines available and necessary for an enterprise of this description.

Last, but not least, and ranking in importance with its steel venture, is the dredger construction branch of the firm. At present a dredger, made to the order of the Deebook Tin Dredging Co., Renong, is practically complete, and will be shortly dismantled, and forwarded in sections to Renong, where it will be reconstructed and equipped with the necessary machinery. In the illustration of the deck of the dredger it will be noticed that all sections are marked, which would enable the work of rebuilding being undertaken by any ordinary individual. A representative of the firm, however, is despatched to advise in connection with this work. The operation of dredging and tin or gold saving is not by any means as complicated as the largeness of the dredgers would indicate. As a matter of fact, it is a question of scale, the buckets, being of 6 cubic feet capacity each, and close-connected, bringing up huge quantities of material continuously, the average capacity of a dredger of this description being about 25,000 yards per week. As will be seen the material goes through a revolving screen of immense size. The screen revolves on a single driven roller, and is held in position by idlers at the side. The management assert that this method of the screen revolving on a single roller, instead of two, gives highly satisfactory results. The rubbish escapes by way of the trough sloping down between the pontoons, the tin bearing material going through the tin saving boxes, which it will be seen occupy practically the whole of the deck space of the pontoons. The firm has now on hand orders for constructing tin dredgers for the Katoo Deebook Co., adjoining the Deebook Co., and the two recently authorised by the Kampong Kamunting Co., besides one very powerful plant, with 8 cubic feet close-connected buckets, having a theoretical capacity of 30,000 yards per week, for the Philippines Dredges Ltd., an Australian venture. The only difference between the last-mentioned plant and those for the Straits Settlement is in the substitution of gold for tin-saving appliances.

Deebook Dredger, showing Tin-Saving Boxes and Screens.



General View of Deebook Dredger.

It will thus be seen that this firm has its hands pretty full for some time to come. All conditions being favourable, the actual time involved in constructing one of these plants varies from six to seven months.

The work turned out from the departments previously described is largely for this branch of the firm's business. In connection with the steel plant, however, one of the objects was to cater for what is considered to be a long-felt want in Melbourne. That this departure was well justified is evidenced by the work which this plant has been called upon to do since its installation. A special feature of this department, and one which deserves notice, is the study devoted to producing a steel which will dispense with forgings. Our representative was given an opportunity of witnessing some rough tests of varying qualities of steel, and that which is produced to supplant forgings can be placed in a vyce and bent with infinitely greater ease and certainty and less discomfort than a piece of red-hot iron fresh from the fire. Unremitting attention is devoted to the matter of the right quality of steel for certain purposes, and in this respect the firm has a fully-equipped laboratory in the brick offices situate at the works. Commensurate with its scope, it is clear that the enterprise has every provision for making its work interdependent and thorough. That it is just on the threshhold of achievement is only a cause for regret that adequate attention has not hitherto been devoted to the production of the raw material in which Australia abounds, and which would make beginnings such as we have just described into giant enterprises of fact and not of fancy.

---

The Northcote Council agreed last week, by 7 votes to 6, to a scheme of electric tramway construction recommended by a conference of representatives of the Fitzroy, Northcote, and Preston councils, the route to be along St. George's-road, thence east and west through Preston. The estimated cost of the line was £65,000, to be borne on the following basis:—Preston, £23,000; Fitzroy, £21,000; Northcote, £21,000. The Mayor, Cr. Denis, said that the construction of the line would save them £400 a year in road maintenance alone. The Fitzroy council agreed to the scheme the same evening.

## BRITISH AND EUROPEAN DEVELOPMENTS.

(From Our Correspondent.)

London, October 24.

The burning of the "Volturno," like the disaster to the "Titanic," has drawn attention in a striking fashion to the importance of all sea-going vessels being equipped with wireless apparatus. The wireless telegraphy decisions following last year's inquiries related chiefly to passenger carrying vessels, and those who go down to the sea in mere cargo-carrying ships desire that they shall be likewise provided with facilities for calling for help in case of need. The "Volturno" fire has led workers, through the medium of their organisation, the National Seamen's and Firemen's Union, to put their foot down emphatically. They have gone so far as to pass a resolution refusing to serve on ocean-going vessels which are not equipped with wireless by the end of April next.

The Postmaster-General's report for the year ended March last has just been issued, and, among other things, it shows that there was an increase of £19,705 in telegraph revenue, making a total of £3,167,410. The telephone revenue advanced from £2,822,965 to £5,785,701, in which connection it must be remembered that the National Company's system was taken over at the beginning of 1912. There was a decrease of 667,000 in the inland telegrams, which numbered about 88½ millions; but telegrams sent to and received from abroad increased by 567,000 to about 11½ millions. There was an increase from 44,507 to 51,109 in wireless telegrams handled at the Post Office stations at the coast. Trunk telephone calls on the inland lines were 35,816,000, the receipts per conversation averaging out at 6.11d. The telephone calls originating in London were close upon 289 millions.

When the owners of South Kenmuir colliery decided to re-open it for winding coal, they had not sufficient space available for a steam plant, and, as cheap electricity was available in the mains of the Clyde Valley Electric Power Co., they invited estimates from electrical firms for electric winding equipment. They had prepared steam estimates, and calculating upon a basis of 110,000 tons per annum, the cost was 2.958d. per ton; the electrical figures, however, were only 1.938d. per ton. The steam estimate was for a second-hand plant, whereas the electrical was new. The work was eventually placed with Messrs. Crompton, and in a very valuable paper which he read at Edinburgh last week before the Mining Institute of Scotland, Mr. W. M. Dunn gave actual working figures which showed up even better than the estimate given above for electricity. As a matter of fact, the gear was found to be capable of doing 180,000 tons per annum; that is, running continuously raising 720 tons from a depth of 76 fathoms every eight hours. Working thus, the figures were only 1.123d. per ton. Over a certain period referred to by Mr. Dunn, the output of minerals was 29,605 tons, the electrical energy consumption being 26,438 units, or .893 unit per ton.

The Glasgow electrical exhibition, run by the Corporation, and under the auspices of the British Electrical and Allied Manufacturers' Association, is now open. The Coroporation itself, of course, has a strong exhibit, designed to catch consumers and educate the public. In addition to the display of maps of the area of supply intended to show the visitor where the mains are or are not laid, and other facilities to assist business-getting, there is a window of ordinary dimensions shown lighted by systems suitable for various trades, also heaters and fans for use in windows for the dissipation of frost and moisture. An automatic device switches in the various systems and turns a drum, giving information as to the cost of installing and the current costs for one year. But the exhibition is not a mere domestic or shop lighting affair, for the Glasgow load is very industrial indeed. Therefore, we find such exhibits as the "Triumph" stoker, Keith and Blackman electric blowers and forges and fans; Leskole distance thermometers and thermo-electric pyrometers; Reyrolle mining and other switchgear; Skefko ball bearings; St. Helen's cab tyre cable; Brook-Hirst switchgear; Allen-West controllers, etc.; Verity's motors and fans; cables, mining fuses, electric welders, and so forth, by the British Insulated and Helsby Cables; Siemen's direct coupled electric generating plants, "Stannos" wiring, Wotan and tantalum lamps, etc.; Ferranti meters and switchgear; Callender's alloys, pumps, etc., for shipbuilding, motor car, and other works; the Edison and Swan Co., lamps, switchgear, ship and colliery installation apparatus, etc.; Western Electric cables for all purposes, telephone apparatus and many electrical lines; British Electric Plant Company's turbine pumps; Empire automatic control gear; Union Electric motors, switchgear, arc lamps, and projectors; General Electric, lighting, heating and cooking apparatus, advertising signs, petrol-electric sets; Waygood electric lifts; British Westinghouse boxes, wiring; Berry, Skinner, mining and other gas engines, electric lamps; Henley's cables, joint switchgear; Reavell's compressors, and so forth. There are some good displays of electric heating and cooking apparatus by different makers, including Simplex, Ferranti, Verity, Schonfield (Hestia electric stoves), Falk, Stodelmann, Calor, Kelim, Bottomley, and Baird, Magnet (G.E.C.) British Westinghouse, British Electric Heater Company's (geysers, etc.), Carron, Jackson (electric stoves), etc. The Glasgow Branch of the Electrical Contractors' Association has a joint exhibit by eighteen firms. In addition to the foregoing, there are also a number of quite popular features. The success of the exhibition from practically every point of view is a foregone conclusion. It is to remain open for three weeks.

**The Manchester section of the I.E.E. opens on** November 4 with the inaugural address of Prof. E. W. Marchant. The subjects announced for the session are:—A two-rate tariff system without time-operated control; Characteristics of insulation resistance with an appendix on insulation values; Employment of power in H.M. Post Office; Train lighting; British practice in the construction of high tension pole lines; The use of reactances in A.C. circuits; Electric furnaces; Turbine-driven auxiliaries; Design of traction motors for alternating and continuous currents; A high duty low tension cable; The Cascade induction motor; Experiments on air blast cooling of transformers.

The address by Mr. H. Faraday Proctor at the Western Section at Bristol bears to some extent on the possible effect of the half-watt lamp on electric supply. The matter will be referred to in our next issue.

## PANAMA AND AUSTRALIAN TRANSPORT.

By Jas. Alex. Smith.[*]

Foreword.—In a previous address the writer sketched some of the world relations of Australia in respect to railways, coastal concentration, and external communications. Later the delimitation of the freight areas of local centres was dealt with on the basis of lines of equidistance. The present brief notes are a development of the treatment in its extension to the problems of large segments of the sphere, arising as a sequence to the cutting of the Isthmus.

The geometric solution, which is fundamental, is all that is herein attempted. It is left to administrative engineers to themselves discern the applications in respect to their individual policies. The plate records the results for their use. The lesson is clear. For the principle is basic, and any policies that deviate therefrom can continue to do so only by a continuous and commensurate expenditure of energy withdrawn from other uses.

Premises.—Let it be granted that—

i. Racial energy and national resources—
ii. Power to economically dominate natural conditions by artificial restraint—
iii. Physical conditions (other than distance) by alternative routes—

are equal, or are in a numerically expressible ratio in regard to given national centres of concentration in their relations with any other points.

The paper then details the mathematical processes employed, demonstrating that the curves are, in brief, particular applications of hyperbolas, or variants thereof. It will be found that they comply with the geometric equivalent of the actual geographical conditions, and with the premises given above.

Graphs.—The computation of such curves, in their spheric application, involves labour not always justified by the degree of accuracy essential and readily attainable by much simpler methods in solid graphics, which can be depended upon to within ½ degree, or, with care, within 1-10th degree of arc.

Bearing in mind the method of describing hyperbolas by connecting the intersections of successive arcs described from the foci as centres, no difficulty will be found in plotting them, with compass and a thin narrow steel scale, as spherics on a globe. All straight lines are to be treated as arcs of great circles, and all distances are to be thus measured.

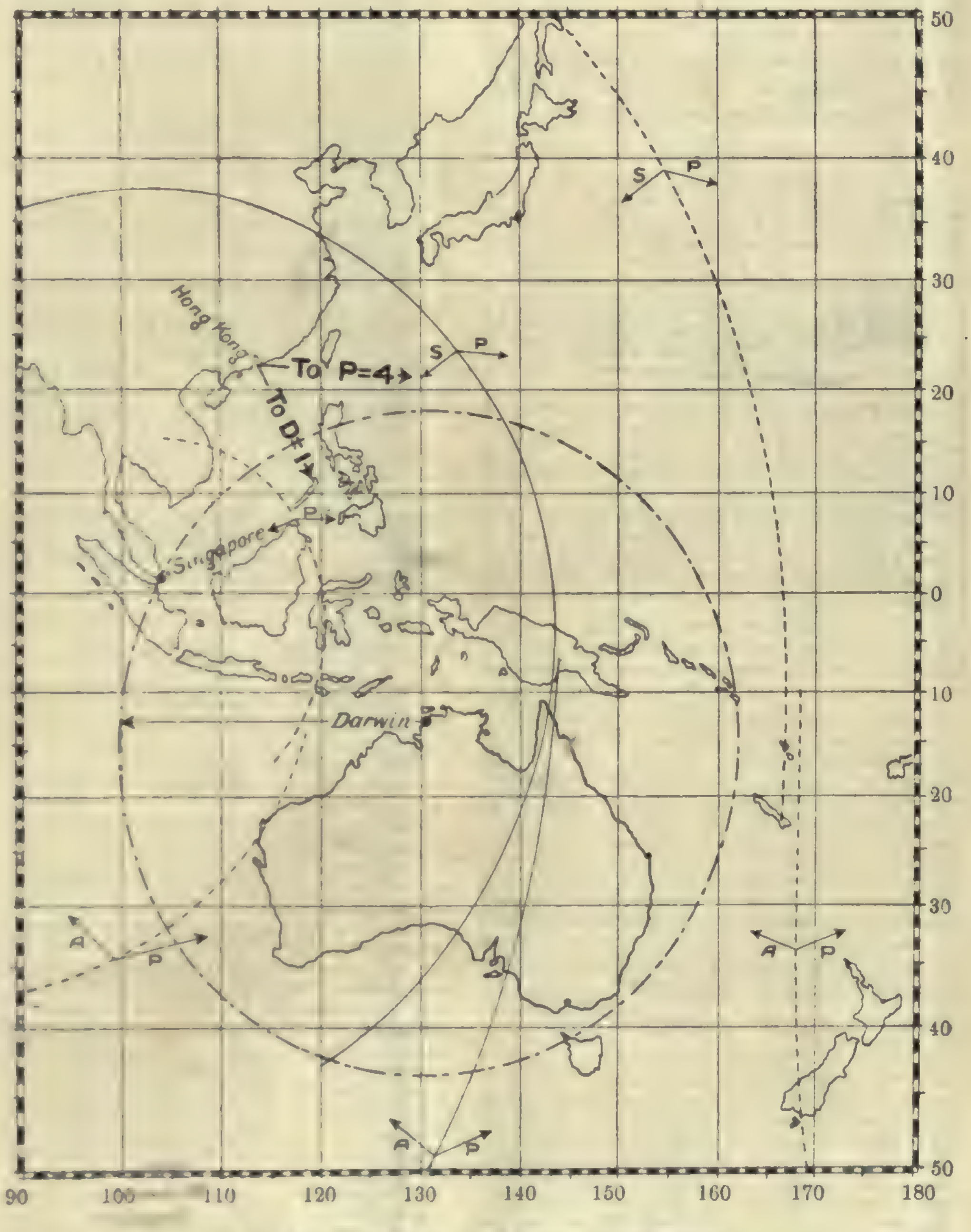
The globe used in the present case was that exhibited. It is 10in. in diameter, of hollow, smooth plaster, provided with two graduated circles, one on the axis, and one meridianally. The circles enable any given points or courses to be accurately plotted on the globe from charts, and the resultant curves to be, in turn, re-transferred from the globe to the chart.

But the distortions of all plane projections—particularly Mercator's—of surfaces of double curvature render it difficult, or quite impossible, to grasp the true relation of series of curves in three-dimensional space. Their connection, significance, and consequences appeal to the understanding in a far more effective way when they are described and examined on their appropriate curved surfaces.

Conclusion.—It will be noted that the line of equi-distance, or equi-influence between Plymouth, via Suez, and New York, via Panama, bisects Australia in an approximate way. Thus, in respect to New York, Panama tends to change the basis of transportation of the Eastern States of the Commonwealth, but less so in relation to Plymouth, since the distances from thence, by either route to, say, Sydney, is, by the Admiralty track charts, about 1300 miles in favour of Suez.

But, in fixing attention on Panama in its relation to Europe, let it not be forgotten that Port Darwin is as near to Asia as it is to Melbourne, or as Melbourne is to Fremantle; also the great Chinese centre of concentration at Canton (Hong Kong (see plate), is appproximately four times nearer to Darwin than to Panama.

Since the Institute is precluded from considering phases of the question other than those distinctly relating to engineering, it would be unwise to hazard conclusions which could not be supported by discussion.



A = Aden ; D = Darwin ; P = Panama ; S = Singapore.
—— – Indicates lines of equi-distance, or equi-cost, in respect to Plymouth and New York.
. . . . Indicates lines of equi-cost on an efficiency basis of 3 : 4 and, alternatively, 4 : 3 in respect to Plymouth and New York.
— — — — Indicates a line described about Port Darwin at a distance equal to Darwin-Singapore.

It is obvious, however, that changing geographical conditions require the consideration anew, perhaps the revision of Australian transport policies.

It is obvious too, that the plan of all Australian internal transport engineering postulates that sea control which is also the political determinant of sea frontiers.

Also, sea frontiers are modified when long alternative land lines intervene. Then the rail, supported by internal interchange—the path across the ocean is a path across a desert—is a factor which must be considered, for it cannot be contended that the rail has approached its ultimate economic possibilities. It has yet to break away, as naval architecture and engineering have broken away, from the limitations of its past.

Canada must be considered. Africa must be considered, and when Asia—which is physically one with Europe—shall be traversed by trunk railway systems designed in a larger spirit of fitness for their future purpose, when it shall be reticulated with subsidiary systems, when the inevitable consequent homogeneity of industrialism shall have followed, Australia's engineering plan and commercial future may be no less closely knit with the East and the rail, than with the Panama and the new sea route.

---

[*] Abstract of paper read before the Victorian Institute of Engineers, November 6, 1913.

## MISCELLANEOUS.

The scope of the operations of the Prahran-Malvern (V.) Tramways Trust has been so greatly enlarged since its formation, and the number of lines under its control has been increased to such an extent, that new car-sheds alone are expected to cost £59,000, besides which a new sub-station has to be erected at Kew, and new cars have to be provided. The Trust proposes to seek authority to increase its borrowing from £500,000 to £700,000.

The railway men at Perth have given their Labour Government 14 days' notice that unless their grievances are redressed "drastic action" will be taken.

* * *

Comparing the New Zealand railways of to-day with those of 1895, when he became their general manager, Mr. T. Ronayne, who has just retired, said recently that in 1895 the passengers carried numbered 3,905,578; in 1913, 15,400,000. The total tonnage of goods in 1895 was 2,123,343; in 1913 it was 5,957,000. The total revenue 18 years ago was £1,150,852; for the year ended March 31, 1913, it was £3,971,002. With reference to salaries, he stated that whereas in 1895 a cadet started at £30 per annum, he now received £50. The highest salary paid to men in the clerical division now was £425 per annum, and this would rise to £475. In 1895 the most an officer in the clerical division received was £300.

**P. & O. COMPANY'S ROYAL MAIL STEAMERS**
FOR MARSEILLES, PLYMOUTH AND LONDON.

Leave Sydney on the subjoined dates, calling at usual ports.

FIRST AND SECOND SALOON ONLY.

| Steamer, | Tons. | Commander. | Noon. | Melb., 3 p.m. |
|---|---|---|---|---|
| MONGOLIA | 10,000 | Lewellin | Nov. 29 | Dec. 2 |
| MACEDONIA | 10,500 | Bennett | Dec. 13 | Dec. 16 |
| MALWA | 11,000 | Thompson | Dec. 27 | Dec. 30 |

PASSAGE MONEY TO LONDON—
Single, £41 16s. to £82 10s.
Return, £69 6s. and £123 4s.

Return Tickets between Inter-State Ports are available for return by Orient, Messageries Maritimes, and N.D.L. steamers having room.

SPECIAL HOLIDAY RETURN TICKETS to COLOMBO are now issued, available for two months. Fares from Sydney, £45 2s. first saloon, and £31 18s. second saloon.

A. GORDON WESCHE, Superintendent IN AUSTRALIA, 63 Pitt-street, Sydney.

**The COLONIAL MUTUAL FIRE Insurance Company Limited.**

Principal Office: 60 MARKET-ST., MELBOURNE.

Branches in all the States.
Transacts Fire, Guarantee, Employers' Liability, Marine, Burglary, and Plate Glass, Accident, Workers' Compensation and Live Stock Insurances.
Send for Prospectus.
W. TUCKER, General Manager.

**Harringtons Ltd**

**ANALYTICAL & METALLURGICAL DEPT.**

Highest prices given for all gold, silver or platinum residues, etc.
Lowest fees for all kinds of Assay, Analytical, and Metallurgical work.
Expert Advice on Ore Treatment, Bullion Refining, Smelting, etc., etc., Directed by a qualified Analyst from Messrs. Johnson and Sons, London: Assayers and Refiners to Bank of England, H.M. Mint, The Council of India, etc.

**HARRINGTONS LTD.**
**386 George Street, Sydney.**

In connection with the estimates of expenditure for the Railway Department for 1913-14 passed in the Queensland Legislative Assembly last week, the Minister of Railways (Mr. W. T. Paget) announced that the total gross increase in the amount voted was £230,047, being distributed as follows.—Classification, £33,455; special increases in salaries, £4835; promotion of engine-drivers and firemen, £14,690; excess of expenditure over amount voted for 1912-13, £111,954; expansion of business £18,634; extra required for opened lines, £25,355; for new lines, £7334; additional sleepers and ballasting for Townsville railway, £6430; new boilers for engines, £6000, and miscellaneous, £1360. After deduction of certain decreases amounting to £17,000, the total net increase is £213,047.

* * *

Our Lithgow (N.S.W.) correspondent writes:—"At the ironworks, the second blast furnace, which was "blown in" about a fortnight ago, is, Mr. C. H. Hoskins reports, operating very satisfactorily. Considerable new work at this section of the iron and steel industry is still in progress. Not least under this heading is the installation of three large new Babcock and Wilcox boilers, which are being placed in contiguity to those at present in use. When this work is completed the line of boilers will be known as "boiler avenue." Then, a second powerful turbo-blower is being installed in the main engine-room, to provide additional power for the second blast furnace. The railway track system within the furnace enclosure is being re-modelled and considerably extended, so as to render the ore and flux bins at the new furnace to be more conveniently worked. A few days ago, a huge slag-pot, weighing a couple of tons or more, was upset while being emptied, and, sliding off the carriage frame, slid to the bottom of the slag-heap, a distance of quite 40ft. Eventually, a gang of men, with the aid of plenty of gear and powerful locomotives, got the pot into its proper position. At the new coke works recently erected by the firm, there are now 80 ovens under fire, while some 20 others are practically completed and ready to be charged. A large quantity of coke is stacked near by, and it is stated that the product of the ovens is of satisfactory quality. Here, too, a big gang of bricklayers are engaged in extending the working platform between the coke ovens and the railway sidings."

# *Invited and Accepted Tenders*

It is particularly requested that the information regarding contracts open, and the successful tenderers, be forwarded to The Editor not later than Monday of each week.

The following contractions are used throughout:—S—supply; D—delivery; M—manufacture; C—construction; E—erection; P—purchase; I—installation; R—removal. Where no contractions appear, supply and delivery is understood. The date at the beginning of each paragraph refers to the closing of tenders.

## INVITED.

### Commonwealth.

Specifications, tender-forms, etc., for tenders invited for the Postmaster-General's Department of the various States under this heading may be had as follows:—Victoria—Various State G.P.O.'s. New South Wales—Departmental Stores, Sydney, and various G.P.O.'s in other States. South Australia—Adelaide, Melbourne, Sydney and Brisbane G.P.O.'s. Western Australia—Departmental Stores, Perth, and various G.P.O.'s in other States. Queensland—Various State G.P.O.'s. All States—Various G.P.O.'s. If the specifications, etc., may be had elsewhere, in addition, the places will be given in parentheses.

POSTMASTER-GENERAL'S DEPARTMENT, Melbourne.—2nd December.—S. and D. of 2000 pairs of brass lightning guard brackets, as per schedule No. 987.

9th December.—S. and D. of 1000 reinforced concrete poles, as per schedule No. 959.

11th December (extended from 11th November). — D. and E. of eight automatic telephone switchboards at the Ascot, Canterbury, Malvern, Cheltenham, Footscray, Oakleigh, Sandringham, and Williamstown Telephone Exchanges, as per schedule No. 953.

16th December.—S. and D. of one common battery multiple switchboard at the Telephone Exchange, Wills-street, Melbourne, as per schedule No. 968.

30th December.—S. and D. of telephone material, as per schedule No. 976.

27th January, 1914.—S. and D. of switchboards, telephone, etc., as per schedule No. 990.

17th February.—S. and D. of cable boxes, as per schedule No. 986.

POSTMASTER-GENERAL'S DEPARTMENT, Sydney.—3rd December.—S. and D. of 8000 jointing sleeves, for use with galvanised iron wire.

3rd December.—S. and D. of 181 tons wire, galvanised iron, 400, 200, and 60 lbs. per mile, as per stores schedule No. 346.

3rd December.—S. and D. of 3 miles wire, copper, No. 18 L.S.W.G., and I.R. insulated, as per stores schedule No. 347.

3rd December.—S. and D. of 48,500 insulators, porcelain (brown and white), as per stores schedule No. 348.

3rd December.—S. and D. of 42,000 spindles, steel, galvanised.

3rd December.—S. and D. of 1500 stay rods, as per stores schedule No. 349.

3rd December.—S. and E. of about 104 wooden poles and erection 4 miles wires.

3rd December.—S. and E. of 324 wooden poles and 14¾ miles wires.

10th December.—S. and D. of 63,000 insulators, as per stores schedule 296.

17th December.—S. and D. of 11,875 steel galvanised spindles, as per stores schedule 351.

18th March, 1914.—S., D. and E. at the Telephone Exchanges, Epping, Ryde, Hunter's Hill, Drummoyne, Wahroonga, Paddington and Waverley, Sydney, of seven (7) automatic switchboards, with associated equipment, as per schedule No. 179.

POSTMASTER-GENERAL'S DEPARTMENT, Brisbane.—1st December.—S. of all material specified, and erection about 107½ miles H.D. copper wire to Roma and Pickanjinnine.

9th December.—S. and D. of all material specified, and workmanship necessary erection 63 miles 200-lb. H.D. copper wires between Blackwall and Tambo.

17th December.—S. and D. of insulators, as per stores schedule No. 280.

31st December.—S. and D. of insulators, as per stores schedule No. 282.

7th January, 1914.—S. and D. of switchboards, as per schedule No. 274.

7th January, 1914.—S. and D. of telephone instruments, as per stores schedules Nos. 275, 276 and 277.

7th January, 1914.—S. and D. of protectors, parts, etc., as per schedule No. 278.

POSTMASTER-GENERAL'S DEPARTMENT, Perth.—3rd December.—S. and D. of H.D. copper wire.

10th December.—S. and D. of 60 tons galvanised iron wire.

21st January, 1914.—S. and D. of switches, telegraph line with plugs.

POSTMASTER-GENERAL'S DEPARTMENT, Adelaide.—17th December.—S. and D. of 5000 protectors, as per schedule No. 309.

11th February.—S. and D. of 50 cable terminals, 26 pair, as per schedule No. 308.

POSTMASTER-GENERAL'S DEPARTMENT, Hobart.—1st December.—S. and D. of dry cells, as per schedule No. T. 84.

22nd December.—S. and D. of conduits, as per stores schedule 103.

DEPARTMENT OF HOME AFFAIRS.—Kalgoorlie-Port Augusta Railway.—28th November (extended from 5th November).—M., S., D. and E. of 4 locomotive engines and tenders (N.S.W. "P" type); tender capacity, 4500 gallons of water, and approx. 7½ tons of coal.

1st December.—S. and D. of 22 tons G.I. wire, 200 lb. per mile, 2 cwt. 60 lb. per mile, at Fremantle and Port Augusta respectively.

2nd December.—600 pairs of wheels and axles (9in. x 4½in. journals).

2nd December.—S. and D. of 15 bogie cattle waggons and 30 bogie sheep waggons.

DEPARTMENT OF HOME AFFAIRS.—Quarantine Station, Sydney.—1st December.—S. and D. of one overhead travelling crane.

DEPARTMENT OF DEFENCE.—St. Kilda-road, Melbourne.—8th December.—S. and D. of typewriters.

DEPARTMENT OF DEFENCE—Small Arms Factory, Lithgow, N.S.W.—29th December.—P. of scrap steel, brass, jute bags, whale oil, etc.

12th January.—S. of iron and steel for manufacture of rifles.

DEPARTMENT OF EXTERNAL AFFAIRS.—15th December.—S. and D. of complete tin dressing plant, Northern Territory, viz., 10 head 1200 lb. stamp battery, concentrating tables, etc., with necessary power plant. (See advertising columns.)

DEPARTMENT OF TRADE AND CUSTOMS.—9th December.—S. and D. of ketch, fully equipped and in seagoing order.

### States Invited.

### Victoria.

RAILWAY DEPARTMENT.—27th November.—S. of infusorial earth.

27th November.—Mantles for Bland burners.

28th November.—Best compressed Manila paper pinions.

28th November.—Double pole tumbler switches.

28th November.—S. and D. best mixed tallow.

28th November.—S. and D. continuity elbows and tees.

28th November.—S. and D. of auto-meter (speed recorders).

3rd December.—P. of quantity old zinc, tallow casks, benzine cases and tins, old C.I. gas retorts, oil drums, etc.

3rd December.—Steel blooms, for piston rods.

3rd December.—S. and D. of vulcanised rubber electric light wire.

**SPECIAL NOTICE!**

**The Mount Morgan Gold Mining Co. Ltd.**

**ARE PREPARED TO PURCHASE** Ores, Concentrates and Furnace Products, containing Gold and Copper, at most favourable rates.

**ALSO TO INSPECT MINING PROPERTIES** with a view to Developing, Financing, or Purchasing same.

Address:—**MR. B. MAGNUS**, GENERAL MANAGER, MOUNT MORGAN, QUEENSLAND.

10th December.—M., S. and D. of one 15-ton electric crane for Ballarat.

10th December.—M., S., D., E. and maintenance of one four dial electric turret clock, Maryborough.

12th December.—S. and D. of copper plates.

31st December.—S. and D. of planished mild steel sheets (lead coated or galvanised).

7th January.—S. and D. of 10,000 porous pots for batteries.

7th January.—S. and D. of best steel boiler plates.

7th January.—S. and D. copper rod.

7th January.—S. and D. copper plates.

7th January.—S. and D. of cast steel wheel centres.

7th January.—S. and D. of steel blooms for crank pins.

7th Jan.—S. and D. of locomotive brass boiler tubes.

7th January.—S. and D. of best Yorkshire iron angles.

7th January.—S. and D. of locomotive seamless copper tubes.

7th January.—S. and D. of steel channel bars.

14th January.—S. and D. of five feed lubricators.

14th January.—S. and D. of 100,000 lineal yards tarpaulin canvas.

14th January.—S. and D. of high speed twist drills.

14th January.—S. and D. of one concrete mixer.

21st January.—S. and D. of one high axle speed lathe.

21st January.—S. of hydraulic jacks.

28th January.—S. and D. of 200 forged and rolled steel disc wheels.

28th January.—M., S., D. and E. of one three-phase alternator, complete, at Newport.

4th February.—S. and D. of 1500 felt body blocks.

4th February.—S. and D. of 25 five-feed lubricators.

11th February.—S. and D. 10 tons commercial sodium acetate.

18th February.—S. and D. of pig iron.

25th February.—S. and D. 20 tons galvanised telegraph wire No. 10½.

VICTORIAN RAILWAYS COMMISSIONERS STATE COAL MINE.—28th November.—S. and D. of mild steel casing for boreholes, 4in., 5in. and 6in., steel shoes for casing boreholes, horn socket, core breakers, fishing top.

1st December (extended from 24th November).—S. and D. of steam and water flow meters.

17th December.—S. of one motor driven ventilating fan.

STATE RIVERS AND WATER SUPPLY COMMISSION.—6th December.—M. and S. of one centrifugal pump and quick revolution steam engine about 800h.p.

TREASURY DEPARTMENT.—9th December.—S. and D. of iron and steel as per schedule No. 42.

## New South Wales.

PUBLIC WORKS DEPARTMENT.—8th December.—M., S. and D. of steel bridges for Cooperbung and Piper's Creeks on 6th section, North Coast Railway, viz., Wauchope to Kempsey.

22nd December.—M., S. and D. of twenty 20 ton cart weighbridges, ten 20 cwt., and forty 10 cwt. weighing machines for railway station yards.

27th January.—M., S. and D. of steel bridges for Saltwater and Smith's Creeks; for Christmas, Warrel, and Snaky Creeks, and Lagoon, at 216 miles 60 chains; and for Bucca Creek, on the 5th, 6th and 8th Sections, respectively, North Coast Railway, viz., Wauchope to Kempsey, Kempsey to Macksville, and Coff's Harbour to Glenreagh.

M., S. and D. of 14,000 tons steel rails and 900 tons fishplates for 60 lb. rails.

RAILWAY DEPARTMENT.—26th November.—S. of one 2000 lb. storage battery freight truck.

14th January, 1914.—S. of 2 electrically driven turbine pumps, 50 gallons per minute.

METROPOLITAN BOARD OF WATER SUPPLY AND SEWERAGE.—15th December.—M. and D. of one turbine centrifugal pumping plant for Crown-street Pumping Station.

SYDNEY HARBOUR TRUST.—15th December.—S. and E. of four 3-ton electrically operated freight lifts for berths 6, 7, 8 and 9, Woolloomooloo Bay. (See advertising columns.)

## Queensland.

TREASURY DEPARTMENT.—6th January.—S. and D. of 23 miles steel rails, 28 lb. per lineal yard, with all fastenings, to be delivered at Cairns wharf in July, 1914.

WATER SUPPLY DEPARTMENT.—Tambo Water Works.—15th December.—C. and E. of steel tower surmounted by steel tank.

5th January.—S. and D. of 85 tons cast-iron water pipes, special castings and valves.

## South Australia.

SUPPLY AND TENDER BOARD.—2nd December.—P. of 200 tons mixed steel scrap.

9th December.—S. and D. of 200 rubber washers, 4in. dia. x 1⅛in. thick x 1⅞in. dia. hole in centre.

9th December.—S. and D. of 300 india-rubber buffing springs for No. 202 cylinders, 1⅞in. hole; 200 india-rubber draw springs for No. 180 cylinders, 1⅞in. hole to suit 1¾in. dia. draw bars.

9th December.—S. and D. of 550 Wallis patent buffers.

9th December.—S. and D. of 350 volute springs.

9th December.—S. and D. 400 spiral bearing springs, 1⅛in. diameter wire; 400 spiral bearing springs 15-16th in. wire; 400 spiral bearing springs ⅞in. wire; 300 nests spiral bearing springs.

9th December.—C. and E. of two corrugated steel tanks, 10,000 gallons capacity each.

6th January.—S. and D. of 1500 bars chain iron, various sizes.

6th January.—S. and D. of 1559 tons steel rails, 41 lbs., and 18 tons steel fishplates for same.

13th January.—S. and D. of five 30-ton weighbridges for 3ft. 6in. gauge railway.

13th January.—C. of 12 bogie goods break vans, with passenger compartments, 3ft. 6in. gauge.

PUBLIC WORKS DEPARTMENT.—16th December.—S. and E. at Renmark of complete pumping plant.

MINES DEPARTMENT.—29th November.—P. of Parramatta and Yelta mines plant and machinery.

## Western Australia.

GOVERNMENT TENDER BOARD.—4th December.—S. or 16,000 gallons oil.

18th December.—S. and D. of copper plates, pipes, bars, and sheets, for Railway Department.

18th December.—Mill rolled plate glass for Railway Department.

18th December.—S. and D. of telephone material for P.W. Department.

18th December.—S. and D. of printing machinery, etc., for Lithographic Department.

8th January.—S. and D. 16 steel blooms for Railway Department.

## General.

MELBOURNE HARBOUR TRUST COMMISSIONERS.—9th December.—S. and D. of stores for year 1914, consisting of brushes, chains, cordage, ironmongery, oils, paints, engineers' and plumbers' supplies, rope, ship chandlery, tyres, etc. Any single item may be tendered for.

MELBOURNE CITY COUNCIL.—2nd December.—S. and D. of W.I. gully gratings.

SHIRE OF PRESTON (Arnold Dean, Sec.).—29th November.—E. of brick sub-stations.

PRAHRAN AND MALVERN TRAMWAYS TRUST.—5th December.—M.S. and D. of rails, fishplates, fastenings and bonds.

BALLARAT WATER COMMISSIONERS (V.) (Alex. Fraser, Secretary).—11th December.—C. of reservoir embankment, on the Moorabool River.

SHIRE OF SWAN HILL.—2nd December.—S. and D. on site of all machinery and labour for duplication of electric power plant at Swan Hill.

BRISBANE METROPOLITAN WATER AND SEWERAGE BOARD.—13th January.—S. and D. of material for aerial ropeway.

10th February.—S. and D. of steam crane excavator.

CITY OF TOOWOOMBA (Q.) (Frank H. Merritt, Town Clerk).—9th February.—1000 water meters.

MUNICIPAL COUNCIL OF SYDNEY.—8th December.—Annual contracts, electrical accessories, electrical castings (Part I.—cast iron; Part II.—copper, brass, etc.), electrical wires and cables. (See advertising columns.)

9th December.—Annual contracts. (For full particulars, see advertising columns.)

9th December.—S. and D. of wood blocks. (See advertising columns.)

CHRISTCHURCH CITY COUNCIL (H. R. Smith, town clerk).—5th January, 1914.—S. and D. of series street lighting plant and accessories. Specifications may be seen Town Clerk's office, Melbourne.

BURNT CREEK G.M. Co. (S. J. Warnock, Collins-street).—1st December.—P. of heap of slimes and sand, near Dunolly (V.). (See advt. columns.)

MARINE BOARD, Hobart (J. Adams, Secretary).—2nd December.—S. and D. of 6000 imp. gallons mineral colza oil for light house purposes. (300 deg.) (See advertising columns.)

SHIRE OF SWAN HILL (Wm. Bird, Shire Secretary).—2nd December.—S. and D. of necessary machinery for duplication of electric power plant.

THE SULPHIDE CORPORATION LTD., Central Mine.—6th December.—S. of stores for year 1914.

CYANIDING.—P. of 200,000 tons (about) of sands and slime.—James Paton, Main-street, Stawell (V.).

CO-OPERATIVE BRICK CO. PTY. LTD., 120 Queen Street, Melbourne.—For Sale:—Two Tan-

A.U.S.N. Co. Ltd.

*Fast, Regular, and Comfortable Passenger Steamers*
(also carrying cargo) from and to
MELBOURNE, SYDNEY, ADELAIDE, FREMANTLE, BRISBANE, and all QUEENSLAND PORTS.

Passage Tickets interchangeable, with other Inter State Companies, on certain conditions.

Full Particulars at
COMPANY'S OFFICES
at all principal Australian Ports.

The Mount Lyell Mining & Railway
CO. LIMITED.

Purchasers of **Ores containing Copper, Gold and Silver.** Rates obtainable on application to the Secretary.

Manufacturers of **Coke for Smelting and Foundry Purposes, Acids, Etc.**

HEAD OFFICE—
39 QUEEN-STREET, MELBOURNE.

D. G. LUMSDEN,
Secretary.

THE
-PACIFIC CABLE BOARD-

Best route to Great Britain, Canada, New Zealand, Germany, etc.

New Direct Cable to Auckland from Board's Sydney Office opened December, 1912.

A Week End rate is now available between Great Britain and Australasia.—Rate 9d. per word, with minimum of 18/- (24 words). Week End Cable Letters are accepted up to midnight on Saturday for delivery in Great Britain on the following Tuesday morning.

TARIFF PER WORD "VIA PACIFIC."

| | Ordinary. | Daily Deferred. |
|---|---|---|
| GREAT BRITAIN .. .. .. .. | 3/- | 1/6 |
| GERMANY .. .. .. .. .. .. .. | 3/- | 1/6 |
| NEW ZEALAND .. .. .. .. .. | 4½d. | — |
| CANADA .. .. .. .. .. .. .. | 2/4 | 1/2 |
| U.S.A. .. .. .. .. .. .. .. .. .. | 2/4 to 2/8 | 1/2 to 1/4 |
| ARGENTINE, BRAZIL, CHILI and PERU .. .. .. .. | 5/8½ | 2/10¼ |

West Indies, Central America, and other rates, on application.

Cable forms, Deferred and Week End Regulations, may be obtained at—

THE PACIFIC CABLE BOARD,
77 Pitt Street, Sydney. Tel., City 1346 (3 Lines).
108 Collins Street, Melbourne. Tel., 2588.

J. Milward, Manager in the Pacific, 77 Pitt Street, Sydney.

Dunlop Mining Goods

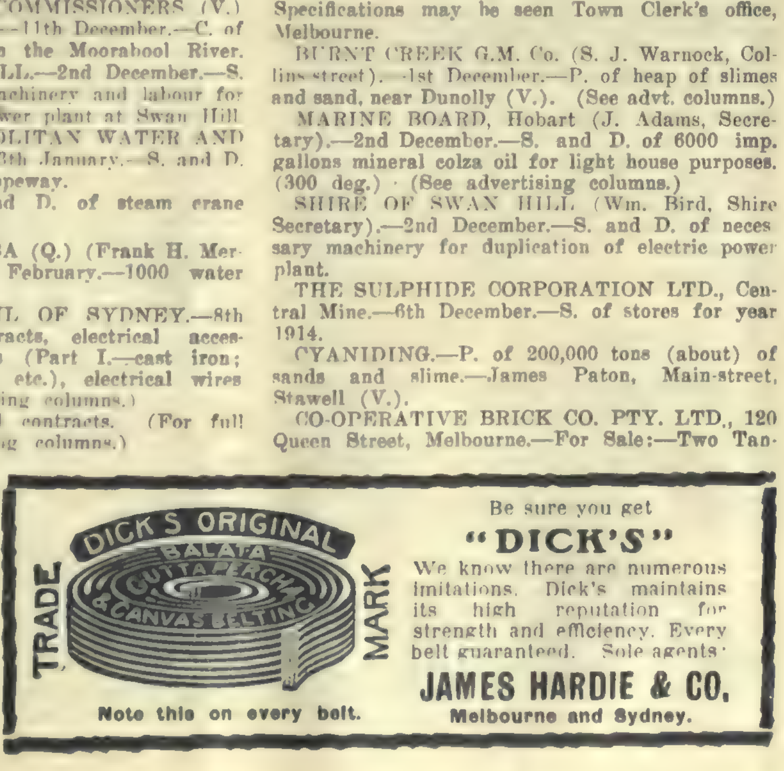
Are now used with satisfaction in most of the leading mines of Australasia. Their quality & wear are unsurpassed.
Tenders & Samples submitted
Correspondence Invited
Send for Illustrated Catalogue

The DUNLOP RUBBER Co. AUS. LTD.
108 Flinders St., MELBOURNE.
& ALL STATES

Dunlop Rubber Belting

Is more efficient than Leather belting for Outdoor & Wet Work.

Sample & Price on application



Note this on every belt.

Be sure you get
"DICK'S"

We know there are numerous imitations. Dick's maintains its high reputation for strength and efficiency. Every belt guaranteed. Sole agents:

JAMES HARDIE & CO.
Melbourne and Sydney.

gye suction gas engines. (See advertising columns.)

## ACCEPTED.

### Commonwealth.

DEPARTMENT OF HOME AFFAIRS—Kalgoorlie-Port Augusta railway.—S. and D. of 4 locomotives (4-6-0 type), £20,208—Newell and Co., Melbourne.

### Victoria.

RAILWAYS DEPARTMENT.—S. and D. of one high-speed eccentric sawing machine, £36—Gibson, Battle and Co. Ltd.

S. and D. of one improved heavy automatic cut-off machine, £166 7s. 11d.—R. W. Cameron and Co.

M., S. and D. of metal gates, £1 12s. 6d. each—H. V. McKay.

S. and D. of mild steel plates for A2 engines, £8 7s. 10½d.—Stewarts and Lloyds (Aust.) Ltd.

P. of number speed recorders and charts, £819—Mons Flaman.

P. of 6 selective ringing telephones, £90—Wm. Adams and Co.

P. of one steel bloom, £47 2s. 6d.—Noyes Bros. (Melb.) Pty. Ltd.

P. of 10 railway cylinder lamps, £117 10s.—Lux Light Co. of Victoria.

P. of one circular planer tool machine, £62; P. of one cylinder portable boring bar, £60 15s.—Benson Bros.

P. of 3 steel side-tipping waggons, £39—Dierks and Co. Pty. Ltd.

P. of No. of lightning arresters, £35—British and Helsby Cables Ltd.

P. of quantity of Westinghouse brake parts, £11,948 2s. 6d.—Westinghouse Brake Co. of Australasia Ltd.

M. (in the State of Victoria), S. and D. of locomotive parts for 20 ''DD'' locomotives—Item No. 6, release cock cranks (to motion plates) and brackets, cross shafts with levers (complete) and brackets, at £6 1s. 10d. per set; item No. 19, hand brake handle, spindle, socket screw and nut, at £4 7s. 9d. per set; item No. 22, tender brake fulcrum levers (long and short), horizontal pull rod (to bell crank), pull rods, forked, and pull rod connecting fulcrum levers, at £6 1s. 4d. per set—F. Long and Co.

M. (in the State of Victoria), S. and D. of locomotive parts for 20 ''DD'' locomotives—Item No. 10, screw jacks and bars (complete), screw jack ratchet handles, at £25 4s. 6d. per set; item No. 14, engine horn guides and studs, engine horn guide stays, engine horn guide wedges and bolts, engine axle boxes (complete) with keeps and pins, at £111 16s. per set—Charles Ruwolt Pty. Ltd.

M. (in the State of Victoria), S. and D. of locomotive parts for 20 ''DD'' locomotives—Item No. 3, intermediate guides boxes (complete) with oil covers, intermediate links, etc., quadrants and gudgeons (complete), quadrant blocks, hanging links, etc., eccentric rods, back and fore gear, etc., and motion bars, etc., at £98 per set; item No. 5, reversing screw and bracket, hand-wheel, handle nut and pin, guide, shaft brackets eccentric sheaves, straps, etc., at £63 per set; item No. 8, smoke box door cross bar, hinges, butts, pins, stop, etc., at £6 per set—Thompson and Stinton.

M. (from iron which will be sold to the contractor by the Corporation), S. and D. of ¾-in. dog-spikes for 80 and 100 lb. rails, at £13 19s. per ton—Sewell and Gaskell.

M. (from iron which well be sold to the contractor by the Corporation), S. and D. of ¾-in. dog-spikes for 80 and 100 lb. rails, at £13 19s. 6d. per ton—Victoria Iron Rolling Co. Propty. Ltd.

PORTS AND HARBOURS.—S. and D. of 4 electric motors for shipbuilding yard, £133 6s.—Siemens Bros.' Dynamo Works Ltd.

### New South Wales.

METROPOLITAN BOARD OF WATER SUPPLY AND SEWERAGE.—S. and D. of reflux valves for low level pumping stations, £7 10s. each—Jones Bros., Sydney.

M., S. and D. of 36in. and 30in. sluice valves at Leichhardt deport, £1019—H. Vale and Sons, Auburn.

M., S., D. and E. of a steel coal bunker and three steel roof principals at Ryde pumping station, £193—Mountney and Co., Sydney.

PUBLIC WORKS DEPARTMENT.—E. of a septic tank and laying of drains, etc., at police station, Ryde, £159—J. Frizelle, Parramatta.

S. and D. of 90 tons of fishbolts for 60 lb. rails, £14 per ton—R. W. Cameron and Co., Sydney.

S. and D. of 10 tons of fishbolts for 80 lb. rails, £15 per ton—R. W. Cameron and Co., Sydney.

### Western Australia.

GOVERNMENT TENDER BOARD.—Coal to State steamers at Fremantle, 25s. per ton—McIlwraith, McEacharn's Line Pty. Ltd.

S. and D. 3in. x 4in. steel pipes—Item 1, £864 12s. 6d.; item 2, £174 17s. 6d.—American Trading Co.

### General.

MELBOURNE & METROPOLITAN BOARD OF WORKS.—S. and D. of 920 lineal feet 18in. diameter reinforced concrete pipes, £152 16s. 4d.—R. Taylor.

MUNICIPAL COUNCIL OF SYDNEY.—Feeder pillars, £970—Wm. Adams and Co. Ltd.

S. and E. of a complete pneumatic ash-handling plant for new boiler house, £3450, plus £800 duty—Babcock and Wilcox Ltd.

S. of two circulating pumps for turbine sets 6 and 7, £540—Willans and Robinson Ltd.

Spare parts for switchboard, portable and recording instruments, Eversted and Vignoles—W. C. Rowe and Co., agents, estimated cost £25; Elliott Bros., London—Noyes Bros., agents, estimated cost £12 10s.; the British Westinghouse Co., estimated cost £22.

## CASTLEMAINE STRIKE.

The firm of Thompson and Co. (Castlemaine) Propty. Ltd. has not escaped the prevailing epidemic of strikes. The executive officers of the Boilermakers' Union at the Trades Hall have made themselves busy in trying to bring this enterprising firm to its knees. It was a most unfair thing to utilise the question of Crown stays in locomotive boilers as a lever to effect the purpose. The Wages Board determination set out a certain wage for boilermakers and for assistants and labourers. The union officials held that putting in Crown stays was boilermakers' work, and the firm contended that it was merely a labourer's task. To settle the question the firm was prosecuted in the police court by the Factories Inspector. The P.M. (Mr. A. Barlow) had a weighty set of evidence put before him by each side, Newport being strongly represented, as well as other metropolitan ironworkers. It is not too much to say that the evidence was overwhelmingly in favour of the firm's contention. The length of time in which the operation could be learnt varied, according to different witnesses, from a quarter of an hour up to half a day. The employee who was used as a medium for the prosecution admitted he was only a labourer, and had to be shown only once how to put in the stays. The union witnesses could not gainsay that the old Phœnix Foundry always had the work done by labourers, nor the fact that it is now done at Newport by the same class of men. The case was dismissed with heavy costs against the Crown. Instead of an appeal, which would seem the honest way of disagreeing with the law, the central executive first of all notified the local branch of the Boilermakers' Union of its intention, and then sent a stand-and-deliver ultimatum to the firm that unless tradesman's wages was paid for that work (and a second demand for three non-unionists' dismissal was added) the unionist boilermakers would be called out. The firm called the boilermakers together, and elicited the remarkable set of facts that they were perfectly satisfied with their wages and conditions; that they had no hand in the decision that they were to leave work; and, in fact, that the firm knew they were to strike some days before they knew it themselves. The firm simply took no action beyond intimating that they intended to abide by the decision of the court. On Monday, the 17th inst., twelve unionist boilermakers refused to start work. The tocsin of loyalty to unionism was vigorously tolled by metropolitan and other agitators amongst the unionists belonging to the allied ironworkers' associations with a view to a more or less general sympathetic strike. The sentiment of preference to unionists was not nearly strong enough to promise any success, and the ''strike'' grew flatter and flatter until by the week end it had shrunk into a contemptible thing with which one and all seemed ashamed to be connected. The different meetings of other unions carried resolutions antagonistic to the strike.

The strike was doomed to failure from the very beginning, and before many days elapse the deluded dozen will either be back in their places working under the old conditions, or they will be permanently off the staff.

## THE GREAT LAKE SCHEME (T.).

A new proposition has been put before the Tasmanian Government by Mr. J. H. Gillies, managing director of the Hydro-Electric Power and Metallurgical Co. Ltd., in connection with the completion of the hydro-electrical portion of the company's undertaking. The directors are very anxious not to lose the advantages offered by the summer months for carrying out their scheme, and it may be taken for granted that the latest proposal is not intended as a substitute for that already made by the Government and adopted by the House of Assembly, but held in abeyance on the resolution of the Legislative Council, but rather as an alternative should it be finally decided to its turn-down. The latest suggestion is that the Government should advance to the company on a prior lien security £150,000, at 4½ per cent. per annum, in order to complete the scheme, the period of the loan to be for 10 years, the company to have the right to pay off the whole or any portion of it at any time during its currency, the money to be advanced as required; the company to give to the Government the option of purchase at a valuation, to be arrived at by arbitration, over the hydro-electric portion of its property, with all rights and contracts appertaining thereto, extending over a period of five years, the option to commence one year after the completion of the work (being the end of the contractors' maintenance period), which shall be exercisable by giving to the company one year's prior notice of the intention of the Government to purchase. This offer is made with the approval of the trustees of the debenture holders, and is submitted "as the best means to enable the work to be completed as quickly as possible, and at the same time fully protect the interests of the State." Several other conditions are attached, provided the Government decides to take over the property, as, for example, the supply to the company of whatever electric power may be required between a minimum of 3500h.p. and a maximum of 20,000h.p. at 5 per cent. above the cost price, provided the demand does not exceed one-half of the power available from the water of the Great Lake. This proposition will be considered by the Government in conjunction with its own proposal.

A couple of days after this was received by the Premier, Mr. Earle gave notice in the House of Assembly that he would move that it was desirable that further consideration should be given to the matter during the present session of Parliament, after a valuation of the works and assets as at present has been obtained. And on the same evening the Premier stated that Mr. T. W. Fowler, Engineer-in-Chief, had left for the Great Lake, with a view of making a thorough investigation of the work done, and of reporting on it and the scheme as a whole. Pending receipt of his report, the Government was not prepared to indicate its probable attitude to the proposals of the company.

## DIVIDENDS.

The following dividends and bonuses of mining companies in Australia have been declared, and are payable on the dates noted:—

November.

27th.—New Chum Goldfields, Bendigo (V.), 6d., £800.

27th.—Golden Pyke G.M. Co., Bendigo (V.), 1s., £1400.

27th.—Elsmore Tin S. Co., Elsmore (N.S.W.), 6d., £600.

27th.—Cathcart Central G.M., Ararat (V.), 2s., £5000.

December.

1st.—Silverton Tramway Co., Broken Hill, (N.S.W.), 1s., and bonus, 2s., £37,500.

3rd.—Williams' Fancy G.M. Co., Berringa (V.), 6d., £600.

4th.—Talisman Consolidated Ltd., Karangahake (N.Z.), 1s. 9d., free of taxes, £30,187.

5th.—Edna May G.M. Co., Westons (W.A.), 1s., and bonus 1s., £4285.

6th.—Vulcan Tin M. Co., Irvinebank (Q.), 3d., £500.

8th.—British Broken Hill Propty. Co. (N.S.W.), 3s., £56,250.

9th.—South Berry G.M. Co., Creswick (V.), 6d., £750.

12th.—Black Range G.M. Co. (W.A.), 1s., £3625.

15th.—Mt. Lyell M. and R. Co. (T.), 1s. 3d., £80,424.

17th.—Broken Hill Propty. Block 10 (N.S.W.), 1s. and bonus 3s., £20,000.

19th.—Tongkah Compound, Siam, 1s. and bonus 1s., £5000.

19th.—Great Boulder Proprietary, Kalgoorlie (W.A.), 9d., £5625.

19th.—Broken Hill South S.M. Co., Broken Hill (N.S.W.), 8s., £80,000.

20th.—Sons of Gwalia Ltd., Mt. Leonora (W.A.), 1s., less income tax, £17,500.

22nd.—Hampden Cloncurry Copper Mines (Q.), 2s., £35,000.

29th.—Mt. Bischoff T.M. Co. (T.), 10s., £6000.

29th.—Zinc Corporation, Broken Hill (N.S.W.), 1s. 6d., less English income tax, all shares, £67,400.

January, 1914.

6th.—Broken Hill Water Supply (N.S.W.), 1s. 6d. and bonus 6d., £20,000.

15th.—North Mt. Farrell S.L.M. Co. (T.), 6d., £2000.

---

The Minister of External Affairs, Mr. Glynn, has been notified that the Northern Territory Railway Commission, which he recently instructed to curtail its wanderings and prepare its report, is on its way to Melbourne on board the steamer "Aldenham," and should reach Melbourne early next week.

## Commonwealth of Australia.

WANTED.

### TEN ARMAMENT ARTIFICERS FOR COMMONWEALTH PERMAMENT MILITARY FORCES.

Pay, from 10/- to 13/- per day. Uniform Allowance, £5 per annum. Eighteen days' recreation leave annually. Medical attendance free.

Applicants must be between ages of 21 and 30 years, and competent tradesmen (fitters and turners), with a knowledge of mechanical drawing. Applications close on December 15, 1913. Full particulars and application forms obtainable from Secretary, Department of Defence, Melbourne.

---

## Government Notice (N.S.W.).

Sydney Harbour Trust Office,
Circular Quay, November 21, 1913.

### ELECTRICALLY OPERATED FREIGHT LIFTS.

TENDERS will be received at this office up to 2 p.m. on Monday, the 15th proximo, for the **Supply and Erection of four 3-ton capacity Electrically Operated Freight Lifts for Berths Nos. 6, 7, 8 and 9, Woolloomooloo Bay.**

HAROLD F. NORRIE,
(7.436) Secretary.

---

## MUNICIPAL COUNCIL OF SYDNEY.

TO CONTRACTORS.

Sealed and Endorsed Tenders will be received by the undersigned until 3 o'clock p.m. on Tuesday, December 9, 1913, for the Supply and Delivery of Woodblocks.

Specification, etc., may be seen upon application at the Office of the City Surveyor, Town Hall, Sydney.

The lowest or any tender not necessarily accepted.

Tenderers, please note that they must pay their cash deposits direct into the City Treasury, and not enclose same with their tenders, otherwise their **tenders will be rejected as informal.**

THOMAS H. NESBITT,
Town Hall, Sydney, Town Clerk.
November 20, 1913.

---

## MUNICIPAL COUNCIL OF SYDNEY.

TO CONTRACTORS.

Sealed and Endorsed Tenders will be received by the undersigned until 3 o'clock p.m. on Tuesday, December 9, 1913, for Annual Contracts for the following —

Brushware.
Blacksmith's Work.
Cement.
Chemicals.
Coal—General
Castings—General
Disinfectants.
**Engine Packings and Stores, Part 1.**
Engine Packings and Stores, Part 2
Earthenware Pipes.
Glass
Liquid Soap.
**Locksmiths' Work.**
Laundry Work.
Oils—General
**Plumbers' Requisites.**
Painters' Requisites.
**Rubber Hose.**
Rubber Tyres.
Repairing Chairs.
Stationery.
**Stores (General), Part 1.**
**Stores (General), Part 2.**
Sandstone Kerb and Gutter.
Trachyte Kerb and Gutter.
**Timber, Part 1.**
**Timber, Part 2.**
Uniforms.
Also Purchase of Residual Oils from the Tar Plants.

Specifications and full particulars may be seen upon application at the Office of the Comptroller of Assets and Stores, Town Hall, Sydney.

The lowest or any tender not necessarily accepted.

**Tenderers, please note that they must pay their** cash deposits direct into the City Treasury, and **not enclose same with their tenders, otherwise their** tenders will be rejected as informal.

THOMAS H. NESBITT,
Town Hall, Sydney, Town Clerk.
November 21, 1913.

---

## Government Notice (V.).

GENERAL STORES.

TENDERS will be received until 11 o'clock a.m. on Tuesday, December 9, 1913, for the Supply of Iron and Steel, as per schedule No. 42, in such quantities as may be ordered by the Victorian Government and by the Commonwealth Government for its offices situated in Victoria, if required, to June 30, 1915. Preliminary deposit, £10; security, 5 per cent.

Schedules as above, with full particulars, may be obtained from the Secretary to the Tender Board, by whom also any information will be afforded to persons tendering.

The lowest or any tender not necessarily accepted.

Tenders, enclosed in a separate envelope, and having the words "Tender for Iron and Steel" written thereon, must be deposited in the Tender Box at the Pay Office, Treasury, Melbourne.

W. A. WATT,
**Melbourne, Nov. 5, 1913.** **Treasurer.**

---

## MUNICIPAL COUNCIL OF SYDNEY.

TO CONTRACTORS.

Sealed and Endorsed Tenders will be received by **the undersigned until 3 o'clock on Monday, December 8, 1913, for Annual Contracts for the** following:

Electrical Accessories.
**Electrical Castings—Part I., Cast Iron.**
**Electrical Castings—Part II., Copper, Brass, etc.**
Electrical Wires and Cables.

Specifications and full particulars may be seen upon application at the Office of the Comptroller of Assets, Town Hall, Sydney.

**The lowest or any tender not necessarily accepted.**

Tenderers, please note that they must pay their **cash deposits direct into the City Treasury, and not enclose same with their tenders, otherwise their tenders will be rejected as informal.**

THOMAS H. NESBITT,
Town Hall, Sydney, Town Clerk.
November 21, 1913.

---

## MUNICIPAL COUNCIL OF SYDNEY.

TO CONTRACTORS.

Sealed and Endorsed Tenders will be received by the undersigned until 3 o'clock p.m. on Monday, **December 8, 1913, for the Supply and Delivery of Bare Copper Cable.**

Specifications, etc., may be seen or obtained upon application at the Office of the City Electrical Engineer, Town Hall, Sydney, upon payment of the sum of 10/6.

The lowest or any tender not necessarily accepted.

**Tenderers, please note that they must pay their cash deposits direct into the City Treasury, and** not enclose same with their tenders, otherwise their tenders will be rejected as informal.

THOMAS H. NESBITT,
**Town Hall, Sydney,** **Town Clerk.**
November 22, 1913.

---

## SHIRE OF TOWONG.

**Applications, addressed to the President, and endorsed "Engineer," and accompanied by recent** testimonials, will be received up to noon, on Monday, **December 8, from gentlemen qualified under the Local Government Act, for the position of** Shire Engineer. Salary at the rate of £350 per annum, and an allowance of 3 per cent. on the **amount of Government grants expended, which will include Government money expended under the direction of the Country Roads Board and supervised by Shire Engineer. Also 2½ per cent. on amount of contracts for which tenders are invited,** and plans and specifications, estimates and quan**tities are supplied to the contractor. No private or other practice allowed. State age. Two months' notice to be given by either party to terminate appointment, such notice to be given to the Council during a sitting of same. Plans, etc., for transfers** in new road deviations to be furnished promptly by engineer.

W. H. MADDOCK, Shire Secretary.
**Tallangatta, November 17, 1913.**

---

## MARINE BOARD OF HOBART.

TENDERS will be received at this Office until noon on Tuesday, December 2, for Six Thousand **Imperial Gallons, 300 Degrees, Mineral Colza Oil,** for lighthouse purposes, in 750 cases, each con**taining two 4-gallon tins, c.i.f. and e, Hobart.**

The lowest or any tender not necessarily accepted.

Envelopes to be marked "Tender for Oil."

Delivery of oil to be in February or March, 1914.

J. ADAMS,
Marine Board Office, Secretary.
Hobart, November 12, 1913.

---

## ONE HUNDRED MACHINE MINERS WANTED.

PERMANENT JOB.

**Contract Miners last year averaged 17/4 per Shift.**

Wages Miners, 11/- per Shift.

Apply on Job—

MOUNT MORGAN GOLD MINE,
QUEENSLAND.

---

NOTICE is hereby given that the patentees of Australian Letters Patent No. 3571/1912, dated January 10, 1911, for "Improvements in or Relating to Magnetic Separators," are prepared to satisfy any demands and all requirements of the public **respecting the said invention. Offers will also be received for the issuance of licenses. Further information and particulars obtainable from Edward Waters & Sons, Patent Attorneys, 414-418 Collins**-street, Melbourne, and 7 Moore-street, Sydney.

---

TENDERS **are invited for Purchase or Working** on Royalty of Ransome International Conduit Co.'s "Improvements in Apparatus for Progressively **Moulding Plastic Material into Conduits in situ," Commonwealth Letters Patent No. 9480, of 1907.** Proprietors will dispose of whole or part interest **in patent, or will grant licenses to work same to** fulfil full requirements of the public. Address: C/o **Phillips, Ormonde & Co., Patent Attorneys and** Consulting Engineers, 17 Queen-st., Melbourne.

---

## WILLIAMS'S FANCY GOLD MINING CO., Berringa, No Liability.

A Dividend (45th) of 6d. per share has been made this day, payable at the office of the Company, Lydiard-st., Ballarat, on Wednesday, December 3, 1913. Transfer books close on Saturday, November 29, at 12.30 o'clock.

S. STRETCH, Manager.
Ballarat, November 21, 1913.

---

## FOR SALE.

**One Tangye Suction Gas Engine, 170 I.H.P., and Generator, complete.**

Also, One Tangye Suction Gas Engine, 75 I.H.P., and Generator, complete.

Specifications can be seen at Co-Operative Brick Co. Pty. Ltd., 120 Queen-street.

---

## EDNA MAY G.M. CO. NO LIABILITY, WESTON, Western Australia.

NOTICE is hereby given that the Annual Meet**ing of shareholders will be held in the Board Room, 7th floor, Broken Hill Chambers, 31 Queen-street,** Melbourne, on Wednesday, December 3, 1913, at **2 p.m.**

**Business:**

To receive and adopt reports and balance-sheet.
**To elect five directors.**
**To elect two auditors.**
**To transact any other ordinary business legally brought forward.**

By order of the Board,
FRED TRICKS, Manager.

---

## BROKEN HILL SOUTH SILVER MINING CO. No Liability.

**NOTICE is hereby given that a Dividend (58th)** of 8/- per share has been declared, due and payable on Friday, December 19, 1913. Transfer books will close at the offices of the Company, Collins **House, Collins-street, Melbourne, Brookman's Building, Grenfell-street, Adelaide, and 16 O'Connell**-street, Sydney, on Friday, December 5, 1913, at 4 **o'clock p.m.**

**By order of the Board,**
FRANK G. HICKEY, Secretary.

**Shareholders are notified that their dividends will be posted direct.**

**360 Collins-st., Melbourne, November 19, 1913.**

### GREAT LANGI LOGAN GOLD MINES CO. No Liability.

NOTICE OF MEETING.

NOTICE is hereby given that the Half-yearly General Meeting of shareholders in the above Company will be held in the Board Room, 123 Queen-street, Melbourne, on Monday, December 1, 1913, at 11 a.m. Business: 1, To receive balance-sheet and reports. 2, Election of directors and auditors. 3, To consider any other business which may be lawfully brought forward. By order of the Board,

W. BRUCE FOX, Manager.

### WILLIAM TELL G.M. CO. N.L., DAYLESFORD.

The Half-yearly General Meeting of shareholders in above Company will be held at London House, 97 Elizabeth-street, Melbourne, on Thursday, November 27, 1913, at 3 p.m. Business: To receive and adopt reports and balance-sheet; general.

S. J. PLAIN, Manager.

### BROKEN HILL WATER SUPPLY LIMITED.

NOTICE OF DIVIDEND.—Notice is hereby given that a Dividend (81st) of 1/6 per share and Bonus of 6d. per share has been declared, payable on January 6, 1914. Transfer books close on Wednesday, December 10, 1913, at 3 p.m.

By order of the Board,
THOS. ROLLASON, Secretary.
31 Queen-st., Melbourne, 21/11/13.

### BLACK RANGE MINING CO. NO LIABILITY.

A Dividend (83rd) of 1/- per share has been declared, payable at the Company's office, 47 Queen-street, Melbourne, on Friday, December 12, 1913. Transfer books close on Friday, December 5, 1913, at 4 o'clock p.m., until after date of dividend.

WM. JACKSON, Manager.

### THE HAMPDEN CLONCURRY COPPER MINES Limited.

NOTICE is hereby given that the Annual General Meeting of The Hampden Cloncurry Copper Mines Limited will be held at the registered office of the Company, Collins House, Collins-street, Melbourne, on Thursday, December 4, 1913, at 12 o'clock noon.

Business:—1, To receive and consider the balance-sheet and profit and loss account for the half-year ended August 31, 1913, and the reports of the directors and auditors. 2, To elect directors (2). 3, To appoint auditors (2). 4, To transact any other business that may be legally brought forward. By order of the Board,

HAROLD L. SHACKELL,
Collins House, Collins-st., Assistant Secretary.
Melbourne, November 20, 1913.

### THE HAMPDEN CLONCURRY COPPER MINES Limited.

NOTICE is hereby given that a Dividend (3rd) of 2/- per share on all the issued shares in the capital of the Company has been declared, and will be payable at the registered office of the Company, 360-6 Collins-street, Melbourne, on Monday, December 22, 1913. Dividend warrants will be posted direct to shareholders. Transfer books and share register will be closed from Thursday, December 11, until Saturday, December 20, 1913 (both days inclusive). By order of the Board,

H. L. SHACKELL,
Melbourne, Assistant Secretary,
November 20, 1913.

### MARAROA GOLD MINING CO. NO LIABILITY.

NOTICE is hereby given that a Dividend (20th) of 1/- per share has been declared, payable on Thursday, December 18, 1913. The transfer books will be closed from December 15 to December 18, 1913, both dates inclusive. Dividend warrants will be forwarded to the registered addresses of shareholders.

JOHN S. SCOTT, Secretary.
Grenfell-st., Adelaide, November 25, 1913.

## REPORTS OF COMPANIES AND CORPORATIONS.

### Tasmanian Copper Co. Ltd.

In the very belated report for 1912 of the Tasmanian Copper Co., Rosebery (T.), the directors give supplementary particulars of the position up to the end of August last, and that they are alive to the necessity of determining at an early date some definite form of treatment, is evidenced by their statement that it is their object to end the present uncertainty at the earliest possible moment. In September of last year, the company entered into an agreement with the Tasmanian Metals Extraction Co. for the delivery of ore, since which late shareholders have been advised by circular of the details of the ore delivered under that agreement. The amount advanced to the company by the Tasmanian Metals Extraction Co., repayable by ore deliveries, was £25,500. Since November, 1912, to August 31 last 12,100 tons of ore were delivered under this contract, the estimated return to the Tasmanian Copper Co. (after the payment of treatment charges) being £14,130. Cash payments were £4197, and the amount credited against advances £9933. Of the total tonnage of ore, however, it is pointed out that 5000 tons were, in the terms of the agreement, "constructively delivered," and 7100 tons actually sampled and assayed. Of the latter amount 3380 tons were taken from previously rejected ore on the dumps and 3720 tons from the mine.

Although the directors look upon this as satisfactory they "do not hesitate to state quite plainly that, so far as they are aware, proof on commercial lines of the value of the process to its owners has not yet been supplied at Rosebery." In view of this, it is the desire of the Board to end the uncertainty on this point, and to prepare for the contingency beforehand of adopting some other form of treatment. The mine itself is stocked with a large ore reserve, that being available for stoping being estimated at 227,308 tons, while probable ore is estimated at 773,333 tons. Unfortunately, the total estimated value of the actual ore reserves is not given, but the assay value and width of the various blocks is stated, with which the total actual reserve should nearly correspond. The ore raised during the period was 50,826 tons, of an assay value of 0.145 oz. gold, 12.3 oz. silver, 7.96 per cent. lead, 28.8 per cent. zinc. The balance-sheet at December 31st showed that liabilities included £24,730 on account of the debenture issue and £23,700 on suspense account in reference to Rosebery ore sales. Among assets cash represents £6243, of which £2350 is in the hands of the debenture trustees, while the South Australian venture, which is closed, still figures at £59,710.

### Zinc Corporation (N.S.W.).

The operations, earnings, expenditure and profits of the Zinc Corporation for the last two months were as follows:—

| | | Sept. | Oct. |
|---|---|---|---|
| Ore milled .. .. .. .. .. | tons | 15,512 | 13,354 |
| Tailings treated .. .. .. | tons | 28,220 | 26,440 |
| Zinc middlings treated .. | tons | 2,440 | 2,440 |
| Zinc concentrates produced, | tons | 7,796 | 7,044 |
| Lead concentrates .. .. .. | tons | 4,148 | 3,931 |
| Estimated income (spelter at £23, lead at £15) .. .. .. .. .. | | £50,830 | £46,626 |
| Working expenditure .. .. .. | | 27,768 | 25,408 |
| Office estimated expenditure .. | | 400 | 400 |
| Working cost per ton on ore mined and milled .. .. .. | | 15/5 | 15/9 |
| Working cost per ton on tailing and middlings treated .. .. | | 10/4 | 10/4 |
| Redemption tailings (approx.) .. | | £6,689 | £6,048 |
| Exported profit for month over working, including cost of tailings .. .. .. .. .. .. .. | | 15,973 | 14,770 |
| Mine development .. .. .. .. | | 2,532 | 2,136 |
| New construction work .. .. .. | | 3,649 | 1,276 |

### Mararoa G.M. Co. (W.A.).

The working costs and other expenditure, revenue and surplus of the Mararoa G.M. Co., Norseman (W.A.) for October were:—

| | | | | Per ton. | |
|---|---|---|---|---|---|
| | | | | s. | d. |
| Mining 2730 short tons .. | £1277 | 10 | 4 | 9 | 4.31 |
| Treatment .. .. .. .. .. | 1186 | 18 | 7 | 8 | 8.35 |
| Realisation of Bullion .. | 89 | 3 | 10 | | 7.84 |
| Total Working Costs .. | £2553 | 12 | 9 | 18 | 8.50 |
| Spent on Development .. | 401 | 18 | 4 | | |
| Spent on Capital Account | 8 | 18 | 3 | | |
| Spent on Sydney Leases— | | | | | |
| Development Account .. | 444 | 15 | 3 | | |
| Spent on Capital Account | 238 | 6 | 9 | | |
| Total Expenditure .. .. | £3647 | 11 | 4 | | |
| Value of Bullion Recovered | 5002 | 9 | 10 | | |
| Net Surplus .. .. .. .. | 1354 | 18 | 6 | | |

Secretary's Memo.—In the above, "Treatment Costs" include cost of treating slimes and concentrates. The total expenditure in the various treatment processes is aggregated and the per ton cost estimated on the basis of the tonnage sent to the mill. This explains the slight increase in working costs. The above form of stating costs is in accordance with the request of the Chamber of Mines of W.A.

---

The gold received at the Melbourne branch of the Royal Mint during the week ended the 22nd inst. amounted to 3565.3 oz.

The Blue Funnel liner, "Menelaus" (4672 tons), reached Hobson's Bay unexpectedly last Thursday, having made a run of 12,000 miles, from Glasgow to Melbourne, without calling at any port, and in 46½ days.

A telegram from Darwin (N.T.), published in the press last week, stated that unfavourable reports were coming to hand from men who have visited the place respecting the Marranboy tinfield; they think it would be advisable for miners to wait for further information.

## MIXED MEMS.

Since the commencement of lime-burning and sand lime making at the State brickworks, at Botany (N.S.W.), the dust nuisance has become so acute that the Minister of Public Works, on a recent visit, decided to instal a complete system of dust absorbing apparatus, which would necessitate the closing down of the works for a short time. It was not the Minister's intention to do this for some weeks, and he offered the men affected 1s. a day additional dust money to cover the interval. This, however, appearing not to give the men satisfaction, Mr. Griffith has ordered the closing of the works, and the immediate installation of the necessary plant.

Altogether 300 bodies have been recovered from the Universal Colliery, Senghenydd, South Wales, the scene of the terrible disaster of October 14, and the exploring parties have completed their search.

Further criticism of the West Australian Government's venture into the shipping business was forthcoming in the State Legislative Assembly last week, when Mr. Male, Liberal member for Kimberley, alleged that the capital cost was £100,000. For a year's depreciation, all that was allowed was £6000, though more than that amount had been spent in replacements. Any shipping company, he said, would have allowed 10 per cent. for depreciation on steamers purchased first hand, whereas the State steamers were secondhand. Was it not time, he asked, that the Premier (Mr. Scaddan) stated that there was a loss of £1500 on every trip by the State steamers to Port Darwin?

The following tenders have been accepted by the Department of Home Affairs in connection with the construction of the Trans-Australian railway between Port Augusta (S.A.) and Kalgoorlie (W.A.):—Locomotive Engines and Tenders—Two for Kalgoorlie, at £5260 each, and two for Port Augusta, £4844 each; total, £20,208, Messrs. Newell and Co., Melbourne. Tasmanian Blackwood Timber for Port Augusta—30,000 sup, ft., 9in. to 12in. wide, 35s. per 100; 40,000 sup. ft., 12in. to 15in. wide, 37/6; 30,000 sup. ft., 15in. to 18in. wide, 40s.; total, £1875, Mr. E. Alexander, Tasmania.

The revenue of the Victorian railways for the first quarter of the financial year amounted to £1,208,822, as compared with £1,156,096 for the same period last year, and with £1,222,893 in 1911. Considering the greatly increased cost of working, however, nothing can be learned from the figures for this year and last as to the relative net income, though it is clear that as compared with 1911 there has been a heavy decline. This occurred in the goods traffic which, in the first quarter of 1911, amounted to £539,255, and this year to only £462,916.

Some interesting tests were carried out last week at Surrey Hills on the "Turnbull" boiler, with highly satisfactory results. An inspection of the boiler shows it to be compact and new in design. It is of the water-tube type, but, unlike that type, there is no circulation of water through the tubes. The boiler is clearly fool-proof, being purely automatic once it is fired. As to compactness, a 50h.p. boiler measures 5ft. 10in. x 6ft. x 9ft. high. The prominent advantages of this boiler is the rapidity with which steam is generated, and the little attention it then requires; 60 lb. of steam can be raised in about five minutes, only sufficient fuel being consumed to maintain a required head of steam, the fire being governed by a self-operating damper. The fire space in an 8h.p. boiler is 2ft. 10in. x 2ft. 6in., and at no time does the quantity of water in the tubes exceed 2 or 3 lb., it being automatically fed from a reservoir at the side of the boiler.

There remain yet a batch of 200 applicants for positions as electrical mechanics in the Postmaster-General's department to be examined, and these will be dealt with next month. The experience of three weeks ago, discouraging as it was, coming so soon after previous disappointments, has not entirely disheartened the heads of the department and the Public Service Commissioner, and, at the risk of keeping back the work which calls loudly to be attended to, the determination has been announced not to import any mechanics until the December examinations have been completed and the results known. Those already in the service do not need permission to give any instruction or assistance to young men anxious to qualify, always providing that their own duties are not interfered with. It is proposed, also, to open a school of instruction in connection with the department, and the question of apprenticeship is being considered with a view to the training of a small army of recruits.

For the month of October the Baker's Creek gold mine, Hillgrove (N.S.W.), has been developed 33ft. at the No. 12 level, the reef being 12in. wide and showing low values. At No. 14 level, the winze on a narrow branch of the shaft reef was deepened 18ft., total depth 30ft., width of reef 2in., carrying 12oz. gold per ton. Stoping work was proceeded with at No. 11 level on the middle reef, and also at levels 15 and 16 on the shaft reef, which continues to yield four tons battery stone per fathom.

## FROM FOREIGN SOURCES.

(Translated Specially for the "Mining Standard.")

In connection with the approaching of what is called the Berlin city and circle railway, the first experimental runs of an electric rail motor car took place towards the middle of last September. As the section in question is noted for its large number of curves and in part rather heavy gradients, the idea was to ascertain, in addition to the consumption of current, the greatest speed attainable. During the course of the trials the speed could be increased to over 40 miles an hour, although to achieve this result it became necessary to make only a few stops along the line, which has a total length of some 64 miles. The electric tram, the first that was ever tried on the city railway, consisted of an accumulator car of the latest pattern, and similar to a large number of cars doing good service on various sections of the Prussian Government railways. These cars consist of two close-coupled separate cars accommodating 100 passengers. The new car, however, is distinguished from them in that there is a third close-coupled carriage sandwiched in between the two other cars. This third car contains a travelling post office, a luggage compartment, and a passengers' compartment, seating 18 persons. The whole, therefore, has accommodation for 16 second-class passengers, 40 third-class passengers, and 62 fourth-class passengers. It offers a very pleasing outward appearance, and its total length is 128ft. Its weight, empty, is about 84 tons. The trial runs took place in the presence of a number of superior officials belonging to the administration of the Prussian Government railways.

As already reported, an exchange of wireless telegrams took place the other day between the German Telefunken Co.'s large station at Nauen and its station at Sayville, L.T., in the United States, where the company is represented by the Atlantic Communication Co. This is the first time that a message of 28 words has been sent from Sayville to Nauen with the aid of the high-frequency machine invented by Count Arco. The most remarkable feature in connection with this achievement was that it required only 6 kilowatts of electric energy, whereas recently 100 kilowatts were required for transmitting mere sounds from the Nauen station. The importance of the high-frequency machine invented by Count Arco lies in the fact that, with the aid of the appliance, messages are no longer transmitted by exciting sparks, but the electric waves of high frequency are generated in the same direct just as in an ordinary alternating current machine. It must be admitted that, in order to render messages between sender and receiver more distinct than is ordinarily the case, the appliance will have to be constructed with still greater precision. Nevertheless, if present expectations are verified by the trials which are now going on, a most important step in advance will have been achieved in order to render wireless telegraphy still more valuable for commercial purposes and widening its field of application.

According to the latest return, the number of telephones connected with the district of Berlin was not less than 224,311 on July 1. Up to June 30 the increase of subscribers for the first six months of the year amounted to nearly 10,000. Of the total number of connections, 149,811 fall to the share of the Berlin city exchanges, the remaining ones are represented by suburban exchanges. Of the various exchanges, the so-called long-distance exchange with the sub-exchanges of Kurfuerst, Zeutzow and Wollendorf, has the largest number of subscribers, viz., 39,889. Then follows the central exchange with 28,668 subscribers. Next in order are the exchanges No. 4, No. 7, and No. 3, with 25,373, 21,588, and 19,839 subscribers. The smallest exchange, viz., that of Moabit, alone has 14,454 subscribers.

**Critchley C·P Parker**

**Publications**

**Past and Present Metal Markets.** W. E. Figgis. Book and 2 Charts, 15/-. Posted, 16/3; foreign, 16/5.

**Coalfields and Collieries of Australia.** F. Danvers Power. 440 pages, 229 illustrations, demy octavo. 25/- nett. Posted, 25/3; foreign, 26/8. (Size, 9 x 6.)

**High Explosives.** W. R. Quinan. 224 pages, royal octavo, 21/-. Posted, 21/3; foreign, 22/4. (Size, 10 x 7.)

**Power.**
(*Issued under authority Sydney Municipal Council.*)
2/6 nett; post free.

**Australian Mining and Metallurgy.** Donald Clark. 600 pages, royal octavo. 21/- nett. Posted, 21/4; foreign, 22/9. (Size 10 x 7.)

**Gold Refining.** Donald Clark. 134 pages (plates), demy octavo. 12/6 nett. Posted, 12/7; foreign, 13/1. (Size, 9 x 6.)

**West Australian Mining Industry.**
(*By authority W.A. Government.*)
250 pages, crown folio. 10/- nett. Posted, 10/2; foreign, 10/8. (Size, 14½ x 10.)

**New South Wales Mines and Minerals.** 250 pages, crown quarto. 5/- nett. Posted, 5/1; foreign, 5/7. (Size, 10 x 7½.)

**Victoria, and its Mining Resources.**
(*By authority Victorian Government.*)
84 pages, crown quarto. 3/- nett; post free.

**Mining and Railway Map of Australia.** (In preparation.) Cloth, 21/-.

**Ventilation of Mines.** Johann Sarvaas. 60 pages. 2/7 post free.

**Australasian Joint Stock Coy's Year Book.** R. L. Nash (Financial Editor, "Daily Telegraph," Sydney). 600 pages, demy octavo, 10/6 nett. Posted, 10/8; foreign, 11/9. (Size, 9 x 6.)

**Australian Mining Standard.** Issued every Thursday 26/- per annum. British possessions, 32/6; foreign, 34/8; post free.

Size stated in inches.

Order through your Bookseller, or

***AUSTRALIAN MINING STANDARD,***

**Sydney: 12-14 O'Connell-street.**
**Melbourne: 376 Flinders Lane.**
**London:** Hill Publishing Co., 6 Bouverie St., Fleet St.

*Also published by us, but now out of print.*

**Tasmania and its Mineral Wealth.**
(*By authority Tasmanian Government.*)

**Metallurgy of Tin.** P. J. Thibault. Demy octavo. 12/6.

**Resourceful Queensland.**
(*By authority Queensland Government.*)

**Electrical Progress of Australasia.**

**SIAM OFFERS**

A splendid new field for Australian Business Enterprise.

**SIAM WANTS**

Mining and Agricultural Machinery, Seeds, Hides, Tallow, Meats, Jams, Butter, Cheese, Potatoes, General Manufactures, also Horses, Cattle and Sheep.

**The Siam Observer (Daily),**
**The Siam Maitri** | **The Siam Weekly Mail** (Weeklies.)

Siam's Leading Newspapers, which, with

**The Siam Directory**

are published at the Siam Observer Offices, Bangkok, will put you in touch with this market. Rates and Particulars from

***GORDON & GOTCH,***

**SOUTH** THE AUSTRALIAN GAS RETORT & FIRE BRICK MANUFACTURING CO., TOORAK ROAD, SOUTH YARRA—
For Fire Clay goods for all purposes.
Send for Catalogue. **YARRA**

***SHAW'S Steel Wire Ropes***

***FOR ALL MINING PURPOSES.***

Large Stocks always on band at HEAD AUSTRALASIAN DEPOT

**JOHN SHAW Australia, Limited,**

**445 KENT STREET, SYDNEY.**

*Victorian Agents: Welch, Perrin and Co., and Inglis, Smith and Co.*
*Brisbane: Engineering Supply Co. of Australia Ltd.*

***CARL WERNER & CO.,*** *OPHTHALMIC - OPTICIANS—*

The Finest Illustrated Catalogue of Scientific Instruments in Australia mailed on request—comprising

THEODOLITES, LEVELS, LEVELLING STAVES, BRUNTON'S AND VERSCHOYLE TRANSITS, ETC., ETC.

All the Requirements for the Drawing Office in Stock.

***336 COLLINS STREET - - MELBOURNE.***

250 H.P. Turbine.
Showing Wheel and Guide Vanes.

**G. Weymouth Pty. Ltd.**

Electrical Engineers,

Neptune-street, RICHMOND, VIC.

Telephones:—
Office, 2651 Windsor.
Works: 2507 Central.

Manufacturers of all Classes of Electrical Machinery, Turbines, Pumps for Irrigation and Mining, Underground and Surface Mining Locos., Winches, Haulage and Winding Plants, Motors, Generators, etc.

Estimates submitted.

Correspondence invited.

## PROFESSIONAL CARDS.

### GERALD AHERN, A.O.S.M.,

MANAGER COMET MINE,
DUNDAS, TASMANIA.
Mines Sampled and Reported On.

Tele. Address—Gerald Ahern, Zeehan, Tasmania.

### G. H. BLAKEMORE,

CONSULTING METALLURGIST
For Copper and Lead.
MINING ENGINEER,
CASTLEREAGH CHAMBERS, 10 CASTLEREAGH ST
Telegraph Codes · Bedford McNeill 1908 Edition.
Moreing & Neal.
A.B.C. 5th Edition.
Cable Address. Radgarn. · Telephone 7124 City

### MATTHEW C. COATES, A.M.I.E.E.

CONSULTING MECHANICAL and ELECTRICAL ENGINEER. Expert Reports given for Power Generating Plants, Factory Installations, Steam, Gas and Electric.
99 QUEEN-STREET, MELBOURNE.

### VALENTINE J. CROWLEY,

CONSULTING ELECTRICAL ENGINEER.
Hydro-Electric Plants and Transmission Lines
Designed and Supervised.
Austral Chambers, Telephone 7736.
97-99 QUEEN STREET, MELBOURNE.

### W. A. T. DAVIES,

M. Amer. Inst. M.E., F.G.S. (Lond.)
CONSULTING ENGINEER ALL METALS.
48 QUEEN STREET, MELBOURNE.
Code Used- Moreing and Neal.
Telephone 4633 Central.

### T. J. GREENWAY, M.I.M.M., F.I.C.

MINING AND METALLURGICAL ENGINEER.
60 QUEEN STREET, MELBOURNE.

### GOYDER & HALLETT,

ASSAYERS AND ANALYSTS.
110 Gawler Place, Adelaide.
Telephone 169.
Metallurgical and Chemical Processes
Investigated.
Ores Sampled and Assayed.

### HARGRAVES & DAGGAR,

CONSULTING ENGINEERS & METALLURGISTS,
Broken Hill Chambers, 31 Queen Street, Melbourne,
and at Bendigo, Vic., and Sydney, N.S.W.
Consultations, Examinations,
Reports for Investors, Machinery Erection
and Supervision.
Tel. Central 6964. Process Devisors, &c.

### KAY, MACNICOL & CO.,

Mechanical, Mining &
Electrical Engineers.

BROKEN HILL CHAMBERS.
31 QUEEN STREET, MELBOURNE.
Cable Address: "Engineer," Melbourne.
Telephone, No. 4883.

### McCARTY, UNDERWOOD & CO.,

CONSULTING ELECTRICAL AND MECHANICAL
ENGINEERS,

31 QUEEN STREET, MELBOURNE

Telephone, 7096

### E. A. WEINBERG,

MINING AND METALLURGICAL ENGINEER,
19 QUEEN STREET, MELBOURNE.

### J. D. AUDLEY SMITH,

MINING ENGINEER,
9 Bridge-street, Sydney
Telephone No.—
City 2677.
Telegraphic Address—
Audley Smith,
Mining Engineer,
Sydney

### WALTER F. SMITH,

MANAGER FLOATER G.M.
Ravensthorpe, W.A.
Mines Sampled, Valued, and Reported on.
ASSAYS MADE.

Code: Bedford McNeil.
Reliable Information Furnished on the Phillips River
Gold and Copper Field.

### GEO. W. STEWART,

A.I.E.E. (A.M.I.E.E., America),
CONSULTING, ELECTRICAL & MECHANICAL
ENGINEER, DRAUGHTSMAN & DESIGNER.
Country Town Lighting. Lifts a Speciality.
Ludstone Chambers, 352 COLLINS ST., MELBOURNE
Telephone 5334.

### A. A. SUMMERHAYES,

CONSULTING MECHANICAL ENGINEER,
1 VIADUCT BUILDINGS, MELBOURNE.
TELEPHONE 4528.
Supervision or Erection Mining and Metallurgical
Plants.

### FRANKLIN WHITE,

MINING ENGINEER.
CITY MUTUAL CHAMBERS,
62 HUNTER ST., SYDNEY
G.P.O., Box 1498.
Code: Broomhall Imperial Combinatior

Reuter's Telegram Co. Ltd. will pay a dividend for the half-year ended with June 30 at the rate of 6 per cent. per annum.

## ALPHABETICAL LIST OF ADVERTISERS.

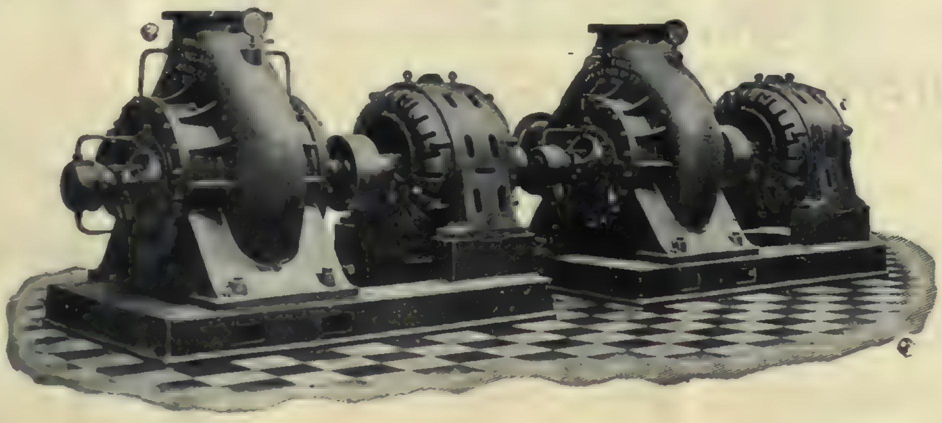
(—) *Indicates Fortnightly or Monthly Advertisements.*

| | Page. |
|---|---|
| Acton Lamp Co., The | XXIII. |
| Adams, Wm., and Co. Ltd. | IV., XXIX. |
| Ahern, Gerald | XIV. |
| Ainsworth, W., & Sons | Cover III. |
| Allen, Edgar, and Co. Ltd. | — |
| Allen, W. H., and Co. Ltd. | XXVII. |
| Allgemeine Electric Co. | XI. |
| Allis-Chalmers Co. | XV. |
| Armstrong, Sir W. G., Whitworth & Co. Ltd. | IX. |
| A.U.S.N. Co. | 495 |
| Austral Otis Engineering Co. | XXX. |
| Australian Gas Retort and F.B. Co. | XIII. |
| Australian General Electric Co. | 490 |
| Australian Metal Co Ltd. (Elec. Dept.) | XI. |
| Australian Patents Ltd. | XVIII. |
| Australian Wood Pipe Co. Ltd. | XII. |
| Babcock and Wilcox, Ltd. | Front Cover |
| Bannister, L. | XVII. |
| Bessemer, Henry, and Co. Ltd. | V. |
| Blakemore, G. H. | XIV. |
| British General Electric Co. Ltd. | VI. |
| British Imperial Oil Co. Ltd. | XXVIII. |
| British Aluminium Co. Ltd. | XXIII. |
| British Westinghouse Elec. Manuf. Co. Ltd. | — |
| Broken Hill Pty. Co. Ltd. | Cover II. |
| Brown, Bayleys Steel Works Ltd. | XXVI. |
| Bruce, Peebles and Co. Ltd. | — |
| Brisbane Charcoal Retort | XVIII. |
| Bullivants' Wire Ropes | Front Cover |
| Coates, Matthew C. | V., XIV. |
| Cole, E. W. | — |
| Colonial Mutual Fire Insurance Co. | 494 |
| Commonwealth Bank of Australia | — |
| Cowlishaw Brothers | IX. |
| Crowley, Valentine J. | XIV. |
| Curtis's and Harvey Ltd. | XX. |
| Darley Firebrick Co. Pty. Ltd. | 481 |
| Davidson and Co. Ltd. | — |
| Denny Bros. Ltd. | XXX. |
| Diercks and Co. Pty. Ltd. | Cover IV. |
| Draeger (R. Jacobson) Rescue Apparatus | XXVI. |
| A. L. Campbell & Co., Pty. Ltd. | XXVI. |
| Davies, W. A. T. | XIV. |
| Dunlop Rubber Co. of Aust. Ltd. | 495 |
| Dudbridge Gas Plant | XIX. |
| Dyason, Edward and Co. | — |
| E. and A. Copper Co. Ltd. | IV. |
| Edwards Pyrites and Ore Reduction Co. | I. |
| Edison and Swan | Front Cover |
| Elder's Metal and Mercantile Pty. Ltd. | XX. |
| Elliott Bros. Ltd. | XXX. |
| Engineering Supply Co. | XVII. |
| Falkiner Boll Electric Co. | XIX. |
| Ferguson, Mephan, Pty. Ltd. | Front Cover |
| Ferrier and Dickinson | — |
| Ferranti Ltd. | IV. |
| Firth, Thomas, and Sons Ltd. | IV. |
| Fraser, Alex., Pty. Ltd. | XXVIII. |
| Fyvie and Stewart | XXVII. |
| Gardner, Waern, & Co, | XXVII. |
| Gen. Elec. Mfg. Co. of Sweden | XXVII. |
| General Electric Co. Ltd. | VI. |
| Goldfields D.D. Co. | II. |
| Goodall, T. M., and Co. Ltd. | XV. |
| Gorler, Max. | XXI. |
| Government Tourist Bureau, N.S.W. | — |
| Goyder and Hallett | XIV. |
| Granowski, O., C.E. | XVIII. |
| Great Cobar Ltd. | XXIV. |
| Green, E., and Son | XXV. |
| Greenway, T. J. | XIV. |
| Guthridge, N., Ltd. | XXVII. |
| Hadfield's Steel Foundry | — |
| Hales Ltd. | XXIII. |
| Hardie, James, and Co. Ltd. | 495 |
| Hart Accumulator Co. Ltd. | VII. |
| Harringtons Ltd. | 494 |
| Hargreaves and Daggar | XIV. |
| Hassell, A. H. | — |
| Henley's Telegraph Works Co. Ltd. | — |
| Hirsch and Sohn, Aaron | XXVIII. |
| Hornsby and Sons Ltd., R. | XXIV. |
| Hordern, Anthony, and Sons Ltd. | Cover III. |
| Horrocks, Roxburgh Pty. Ltd. | — |
| Hopkins Bros. and Odlum | — |
| Ingersoll-Rand Co. | XII. |
| I.R., G.P., and Telegraph Co. Ltd. | X. |
| Kay, McNicol and Co. | XIV. |
| Klinger, Richard, and Co. | XXIV. |
| Knox, Schlapp and Co. | Cover III. |
| Krupp, Fried | — |
| Kynoch, Ltd. | XXIX. |
| Laidley, Wm., and Co. | XXIV. |
| Lawrence and Hanson Elec. Co. Ltd. | — |
| Lempriere, W. and J. | Cover IV. |
| Lincona Belting | — |
| Lodge, Gilbert, and Co. | IX. |
| Lohmann and Co. | — |
| Ludowici, J. C., and Sons, Ltd. | XXIV. |
| Lufft, E., and Co. | VIII. |
| Mackensen, A. W. | XXIII. |
| Malleable Fitting and Agency Co. | XXIX. |
| Mannesmann Tubes | XVII. |
| Martin, Jas., and Co. | VIII. |
| Melville and Mullen | XXI. |
| Miller and Co. | — |
| Mines Department, Queensland | XVI. |
| Mines Department, Victoria | XVII. |
| Mines Department, Western Australia | XVI. |
| Mines Department, South Australia | XVII. |
| Minerals Separation and De Bavay's Ltd. | XXII. |
| Morton, B. K. | XVI., XXII. |
| Mt. Lyell M. and R. Co. Ltd. | 495 |
| Mt. Morgan G.M. Co. Ltd. | 494 |
| McArthur Engineering Co. Ltd. | IV. |
| McCarty, Underwood and Co. | XIV. |
| McDonald, A. H., and Co. | XV. |
| McMicking and Co. | XX. |
| Nobel's Explosive Co. Ltd. | Front Cover |
| Noyes Bros. (Sydney), Ltd. | XVII. |
| Noyes Bros. (Melb.), Pty. Ltd. | XI. |
| P. and O. Company | 494 |
| Pacific Cable Board | 495 |
| Parrington, Lascelles | XXIII. |
| Pearn, Frank, and Co. | Cover II. |
| Peerless Rubber Co. | XXII. |
| Pels, Siegfried | XXVIII. |
| Perrot, Frank R. | XV. |
| Price, Martyn, and Co. | III. |
| Robertson, Geo., and Co. Pty. Ltd. | XXI. |
| Roeblings, J. A., Sons and Co. | XXVIII. |
| S.A. School of Mines and Industries | XVII. |
| School of Mines, Ballarat | XVII. |
| School of Mines, Kalgoorlie | XVI. |
| School of Mines, Charters Towers | XVI. |
| Shaw, John, Ltd. | XIII. |
| Siskol Drills | Cover IV. |
| Siemens Bros. Dynamo Works Ltd. | VI., XXV. |
| Silberberg, H. B., and Co. | XXVIII. |
| Sirocco Fan | — |
| Short and Mason | XXV. |
| Smith, T. and W. | XVI. |
| Smith, Walter F. | XIV. |
| Smith, J. D. Audley | XIV. |
| Snow, Francis H. | XXVIII. |
| Stanley, W. F., and Co. Ltd. | — |
| Stawn, Ltd. | — |
| Steel Co. of Australia | V. |
| Steanes, T. K. | Front Cover |
| Sterling Telephones | XIX |
| Stewart, Geo. W. | XIV. |
| Sulphide Corporation Ltd. | XXVIII. |
| Sullivan Machinery Co. | II. |
| Summerhayes, A. A. | XIV. |
| Taylor, P. T., Ltd. | — |
| Thompson and Co. (Castlemaine) Pty. Ltd. | II. |
| University of Sydney | XVII. |
| Union Elec. Co. of Aust. Ltd. | Front Cover |
| Walkers Ltd., Queensland | XX. |
| Watson, W. G., and Co. Ltd. | XXII. |
| Weinberg, E. A. | XIV. |
| Werner, Carl and Co. | XIII. |
| Western Elec. (Aust.) Ltd. | XXVI. |
| Westinghouse Brake Co. of A'sia Ltd. | Cover II. |
| Weymouth, George, Pty. Ltd. | XIII. |
| White, Franklin | XIV. |
| Willans and Robinson Ltd. | — |
| Worthington Pumps | Front Cover |

**W. H. ALLEN, SON & CO. LTD.**

**Queen's Engineering Works, Bedford,**
**Queen Anne's Chambers, Westminster, London S.W., England**

**The 'Conqueror' Centrifugal and Turbine Pumps**



**High or Low Lift**

**Motor Driven**

**High Efficiency**

**Steam Driven**

Particulars and Prices obtained from the above or their Representatives:

FYVIE & STEWART

**Collins House: 360-366 COLLINS STREET, MELBOURNE**
**Australasia Chambers, 2 MARTIN PLACE, SYDNEY.**

**Everything for Mining**

SUPPLIED BY US.

**CANDLES,**
**EXPLOSIVES,**
**CHERSEN ROCK DRILLS,**
**WINDING ENGINES,**
**STONE CRUSHERS,**
**ROAD MAKING PLANT.**

**CARD CONCENTRATOR,** Sole Manufacturers
**DORR THICKENER,**
**DORR CLASSIFIER,**
**B and M TANKS,**
**TILGHMAN'S AIR COMPRESSORS.**

QUARRY BARS.
WELL BORING PLANTS. BLOW OFF VALVES, ETC.

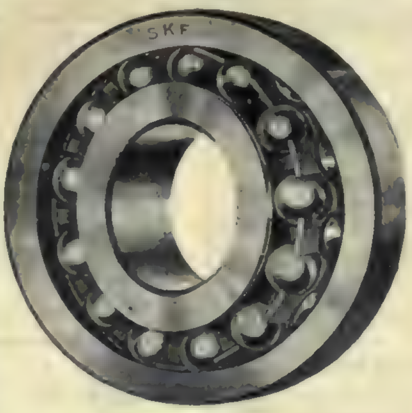
Agents in all CAPITAL CITIES of Commonwealth and NEW ZEALAND

**N. GUTHRIDGE LTD.**

Offices and Stores—SYDNEY and MELBOURNE.

**S. K. F. BALL BEARINGS.**

A new system, being adopted by many factories and engineers for shafting, machines, fans, pumps, etc.



Saves up to 70 per cent. power, and use practically no lubricant.

Radial, Thrust, Double Thrust.

S. K. F. are self-aligning, thus overcoming the worst features of other bearings.

Swedish Diesel "Polar" Motors—the coming power.

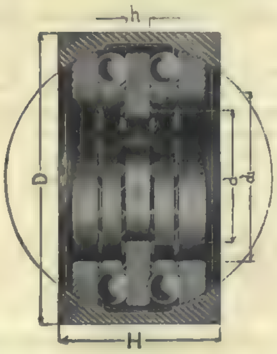
General Electric Mfg. Co. of Sweden: Power Plants.

Motors, Dynamos, Transformers, Etc.

Dissolved Compressed Acetylene for Welding, Light, etc.

Rewinding and all Electrical Repairs a speciality.

Jungner Indestructable Accumulators.



**GARDNER, WAERN and CO.,**
**57 Queen St., Melbourne; 334 Kent St., Sydney.**
*Stores and Showroom, 369 Flinders Street, Melbourne.*

**COCKLE CREEK**
**SMELTING WORKS, N.S.W.**
**THE SULPHIDE CORPORATION LIMITED,**

**Purchasers of:**

Ores, Concentrates, and Slags, carrying Gold, Silver or Lead, on specially favourable terms for net cash.

**THE WORKS** are situated only 9 miles from the Port of Newcastle, where the Corporation has every facility for taking delivery of consignments on behalf of shippers.

**Manufacturers of:**

Superphosphates, Sulphate of Ammonia, and other fertilisers, also Tar and Sulphuric Acid.

Tariff and full particulars can be obtained on application to—

**THE MANAGER, Cockle Creek, N.S.W.** **GIBBS, BRIGHT & CO., Agents.**

*OBTAINABLE FROM ALL BOOKSELLERS.*

**HIGH EXPLOSIVES**
By W. R. QUINAN.

224 PAGES, ROYAL OCTAVO. **PRICE - £1-1-0**

AUSTRALIAN MINING STANDARD, Melbourne and Sydney.

The extent to which gold is absorbed by copper plates was recently illustrated by analysis and the reason therefor was revealed by the microscope. In the examination of a copper plate which has been in use for 12 years films of 0.02in. thickness were successively taken off and analysed. Some gold was found in each layer, but the first 0.12 of film contained over 99 per cent. of the gold. Microscopical examination of an unused plate showed the presence of minute blowholes, etc., which in the used plate had become filled with amalgam. Examination of the cast-iron of discarded retorts and amalgam trays showed a similar partial penetration of gold (in amalgam) along the surface of plates of graphite, but in neither case was there proof of absorption of gold by the metal.

**Siegfried Pels,**
26-28 Neuerwall,
Hamburg - - Germany.

**Wolfram-Scheelite**

Bismuth Tin.
Tantalite. Lead.
A
MARKET
for all
—ORES—
and
MINERALS
Molybdenite Copper.
Vanadium. Silver.
Argentiferous — Auriferous.
**ASHES and SWEEPS.**

*Cable Address: — Siegpels.*

CODES:
A.B.C. 4th and 5th Ed., A1, Liebers, Western-Union, Bedford McNeill.

All Australians visiting London should read the "British Australasian," 6d. weekly—an illustrated paper containing mail and cable news from Australia, and news of Australians in Europe and at home.

Australians are cordially invited to visit the "British Australasian" Reading Room at the offices, 115 High Holborn, London, W.C., where they can see the home papers, meet their friends, use the telephone, and obtain information without charge.

**H. B. Silberberg & Co.,**
*443 Bourke St.,*
Cor. Bourke and Queen Sts.,
*MELBOURNE.*
Tel. 1377. 8 O'CONNELL STREET, SYDNEY.

Large Stocks of—
Ainsworth's Balances, Morgan's Crucibles.
Braun's Laboratory Ore Crushers. Gasolene Furnaces.
Fluxes. Assayers' Requisites.
Jena Chemical Glassware, Etc., Etc.

**FRANCIS H. SNOW,**
Buyer of
ORES, MATTES, METALS, CONCENTRATES, & MINERALS
—of every description—

Australasian Representative of:
ELECTROLYTIC R. & SMELT'G Coy. of A'LIA Ltd., Pt. KEMBLA, N.S.W.
ARON HIRSCH & SOHN, HALBERSTADT, GERMANY.
L. VOGELSTEIN & Co., NEW YORK.

Head Office—KING WILLIAM-ST., ADELAIDE.
Sydney Office:—8 BRIDGE STREET.
Perth Office:—ST. GEORGE'S TERRACE.
Broken Hill:—F. G WHITE, P.O. Box 78.
Zeehan:—A. J. SPOTSWOOD.

**JOHN A. ROEBLING'S SONS CO.**
New York,
ELECTRICAL COPPER WIRE AND CABLES.
HIGH QUALITY FLEXIBLE
**WIRE ROPES**
STOCKS ON HAND.
ANY LENGTH CUT.
Representative:
**ALEX. FRASER PTY. LTD.** Cobden Buildings, 368 Flinders-street, Melbourne.
FOR MINES, HAULAGE, ELEVATORS, ETC.

**COALFIELDS AND COLLIERIES OF AUSTRALIA.**
440 pages, 229 illustrations. 25/- nett. Posted, 25/3. Foreign, 26/8.

***LIQUID FUEL* for Diesel & all Crude Oil Engines.**
"SHELL" SPIRIT, "SHELL" BENZINE, LUBRICATING OILS AND GREASES.
Prices and particulars on application to
**THE BRITISH IMPERIAL OIL CO. LTD.** Adelaide, Brisbane, Fremantle, Melbourne, Sydney and New Zealand

## CONTENTS

### THURSDAY, DECEMBER 4.

EDITORIAL—
Victorian Electorates .. .. .. .. .. .. 499
Leaderettes .. .. .. .. .. .. .. .. .. 500
News and Notes .. .. .. .. .. .. .. .. 501
Personal .. .. .. .. .. .. .. .. .. .. 502
Investors' Column—
Mt. Lyell Blocks (T.) .. .. .. .. .. .. 502
Great Langi Logan (V.) .. .. .. .. .. 502
Nuggety Ajax (V.) .. .. .. .. .. .. 502
Metal Quotations .. .. .. .. .. .. .. 503
Sydney Stocks .. .. .. .. .. .. .. .. 503
Brief Comment .. .. .. .. .. .. .. .. 503
Oil Notes .. .. .. .. .. .. .. .. .. 504
The Coal Mining Industry .. .. .. .. .. 505
Tasmanian Mining .. .. .. .. .. .. .. 506
Western Australian Mining .. .. .. .. 506
New Zealand Mining .. .. .. .. .. .. 506
Our Big Mines .. .. .. .. .. .. .. .. 507
Queensland Mining .. .. .. .. .. .. .. 508
Barytes at Mt. Major (V.) .. .. .. .. 508
New South Wales Mining .. .. .. .. .. 509
Victorian Mining Activities .. .. .. .. 509
Copeton Diamond Mines (N.S.W.) .. 510
Mine Managers' Association (V.) .. 511
Fire-Fly Field (N.S.W.) .. .. .. .. .. 511
Mount Lyell Co. (T.) .. .. .. .. .. .. 512
Victoria's Pottery Clays .. .. .. .. .. 512
Books Reviewed .. .. .. .. .. .. .. 512
Mineral Returns .. .. .. .. .. .. .. 512
Reports of Companies, etc. .. .. .. .. 513
Bank of New South Wales .. .. .. .. 513
Victorian Oversea Trade .. .. .. .. .. 513
British and European Developments .. 514
West Australian Railways .. .. .. .. 515
Launceston (T.) Elect. Undertakings. 515
Advance of Electricity .. .. .. .. .. 515
Electric Lighting Amalgamation .. .. 516
Melbourne Tramways .. .. .. .. .. .. 516
Monolite Houses .. .. .. .. .. .. .. 516
Institute of Inventors of N.S.W. .. .. 516
Industrial .. .. .. .. .. .. .. .. .. 516
Long Distance Electric Railways .. .. 517
Small Arms Factory .. .. .. .. .. .. 517
Miscellaneous .. .. .. .. .. .. .. .. 517
Invited and Accepted Tenders .. .. .. 518

---

**BACK NUMBERS OF THE "MINING STANDARD."**

The following is the rate for back copies more than a month old. Applications by post must be accompanied with cash and postage added. In no case can we guarantee to supply copies, as our storage accommodation is limited.

A postcard will be sent if the number required is out of print.

For copies three months old, ninepence; six months, one shilling; and beyond that period, one penny per month per copy.

As there is a regular demand for back copies of the "Mining Standard," newsagents are requested to send back all returns uncut and in good condition, otherwise they will not be accepted.

All Returns from Newsagents must reach us by the end of each month (the whole paper must be sent). No credit will be allowed beyond this term.

Postage: British, 1d; Foreign, 1½d; Australasia, ½d per copy.

Stamps will be accepted as pre-payment.

Address communications: Publishing Department "Mining Standard."

---

**HENLEY'S**

**Electric Wires and Cables**

**AND INSULATING TAPES**

**ARE THE BEST.**

**W. T. HENLEY'S Telegraph Works Co. Ltd.**

546 COLLINS ST., MELBOURNE.
61 YORK ST., SYDNEY.

**BELTING!**

**Largest stock of all kinds of Machine Belting in the Commonwealth.**

**Conveyor and Elevator Belting for all purposes.**

**HOPKINS BROS. & ODLUM PY. LTD.**

LEICESTER ST., CARLTON, MELBOURNE.
'Phone, Central 754 and 5202. Box 377 G.P.O.

**MINING STANDARD.**

PUBLISHED EVERY THURSDAY.

Forwarded Post Free to any Address.

| | Per annum. |
|---|---|
| Australasia | 26/- |
| British Possessions | 32/6 |
| Foreign | 34/8 |

Payable half-yearly or yearly, in advance.

All amounts should be made payable to order of "CRITCHLEY PARKER, Bank of Australasia."

12 O'Connell-street,
Sydney.
Tel. City 8103
P.O. Box 331.

376 Flinders-lane,
Melbourne.
Central 7931 & 1838
P.O. Box 253.

---

**CASUAL ADVERTISEMENTS.**

The rate for this class of advertisement is governed by the position it occupies.

If it appears on leader page or amongst or next to reading matter, the rate is 15s. per inch (nonpareil) per insertion.

Towards end of reading section—
Brevier, 16 ems width, 6s. per inch per insertion.
Nonpareil, 8s. per inch per insertion.

For the convenulence of advertisers, we might state that—Brevier has approximately 7 words to a line, and 8 lines to the inch—6s. Nonpareil has approximately 8 words to the line, and 11 lines to the inch—8s.

**ALTERATION TO ADVERTISEMENTS.**

As our publishing arrangements necessitate the "Mining Standard" being issued simultaneously in Sydney, Melbourne and Adelaide on the same day each week, advertisers wishing to change their advertising matter must supply same ten days in advance of publication.

**ADVERTISEMENT PROOFS.**

Proofs are submitted to advertisers in order to give them an opportunity of going over the advertisements before printing.

Advertising Copy must be typed and so arranged as to clearly indicate the display required for the more important features of the advertisement.

Any departure from the original copy will be charged for. Advertisers are specially requested to instruct their publicity departments to give us clear and definite instructions respecting changes of matter or new copy in order to avoid incurring unnecessary charges.

---

*NOTICE.*

*The Christmas issue of the "Mining Standard" will appear on Wednesday, December 24, instead of Thursday, December 25.*

---

AUSTRALIAN
**MINING STANDARD.**
PUBLISHED EVERY THURSDAY.
ESTABLISHED [illegible]

It is requested that all business communications be Addressed to Critchley Parker

THURSDAY, DECEMBER 4, 1913.

## VICTORIAN ELECTORATES.

There are several ways in which the Victorian Ministry's scheme for the re-shuffling of the electorates for the State Legislative Assembly may be regarded. It may be looked at as an attempt to rectify certain inconsistencies and inequalities that have arisen in connection with the shifting of population, or it may be considered as a move for the provision of additional seats to improve the chances of present members retaining their membership. There is one broad principle actuating, or said to be actuating, the Government's action in regard to this redistribution: that is, the remedying of an inequality that has arisen between the representation of metropolitan districts and the representation of country districts. At present, according to the Government's statement, there are 20 metropolitan districts, with an average of 15,173 electors per district, and 45 country districts with an average of 8436 per district, and it is proposed to alter these numbers to 24 metropolitan districts with an average of 13,198, and 46 country districts with an average of 7964. But a division into country and metropolitan districts is not sufficient. We may distinguish, not merely two classes of electorates, but four classes. There are the strictly metropolitan, at present numbering 5, the suburban, numbering 15, the urban, numbering 5, and the rural numbering 40. The rural electorate may be said to have no representative save its own member, while an electorate which consists of a provincial city is at an advantage, inasmuch as it can, to a very large extent, depend, not only on having its interests watched by its own member, but on having his efforts supported by the members of the districts for which it is the natural centre. The suburban areas are still better placed, for, while Parliament is sitting, a very large proportion of the members of country districts reside in some or other of these suburbs, and identify themselves more or less with their interests. The metropolitan area proper is still better off, inasmuch as, not only do many members live there, temporarily at least, but it is the actual seat of Parliament, which may be reckoned to consider the interests of the city whatever other portions of the State may suffer. The metropolis, in fact, would be thoroughly well-looked after if it had no direct representation whatever. Apart from the differences we have mentioned, the rural districts are marked off very clearly from the other three classes of electorate by the very extensive areas they cover. For one member to represent 9978 people, stretched over the 14,620 square miles which are contained in the electorate of Swan Hill, is a very much more serious and difficult thing than for another to represent the 13,705 voters huddled together within the 570 acres that are contained within the Fitzroy electorate. As against this may be set the fact that the revenue production of the rural districts is not such as to warrant their obtaining a proportion of representation based as much upon area as upon population. In this respect, of course, the metropolis must claim most, and the rural districts least, consideration, and the suburban areas rather more than the country towns. Taking all these facts into consideration, it seems to us a fair thing that the metropolitan quota should be half as large again as that for the rural districts, and that the quota for the urban and suburban electorates should be half-way between these two limits. To adopt the Government's scheme for a division into 70 electorates would mean giving 37 to the rural districts, 5 to the country towns, 25 (to be strictly proportionate, the number should be 26) to the metropolitan suburbs, and 3 to the metropolis itself. On this calculation, the Government is proposing to give three electorates too many to the rural districts, and three too few to the suburban areas, and yet the proposal means an increase of only one country electorate out of the five new ones that are being created, the metropolis having grown at so much greater a rate than the country districts that the quota at the present time is 11,912 for the 5 metropolitan areas (now, by a different apportionment, to be reduced to 3), 16,260 for 15 suburban areas, 10,235 for 5 country town electorates, and 8223 for 40 rural electorates. Thus, we consider that, though the Government proposes to effect a rectification that will tell against the country districts, its proposals are eminently fair and reasonable.

But that is only one side of the question; there is the other yet to be considered. Why should the number of electorates be increased? Why should it not be rather decreased? Sixty-five is an absurdly large number of electorates for a small state like Victoria. When Federation was established, it was fully understood by a credulous and foolish population that Parliament would reduce itself to very small dimensions. In supposing so, the people were, of course, failing to reckon on the unlikelihood of members of Parliament depriving themselves of seats. It was for that reason that the reduction effected was ludicrously small. Human nature being what it is, there is no particular call to cavil at Parliament's action in the matter; but there is plenty of reason to take exception to the present proposal to extend the number of members of the Assembly. There is no earthly reason why the number should be increased. To keep the House at its present dimensions, a fair distribution on the lines we have laid down would be—rural districts, 34 members; country towns, 4; suburban districts, 24; and metropolis, 3; but, as the three provincial cities are widely separated from one another and two of them might reasonably expect more than one member apiece, their number of representatives would have to be 5, while the number of rural representatives would be reduced from 34 to 33, some portions of adjacent rural areas being added to urban electorates. But, after all, this is not the ideal. What ought to be done, but what no one in Parliament is willing to do, is to reduce the number of constituencies to 48 or 50. Then, if we were to take the rural quota at 12,000, and the metropolitan at 18,000, and Ballarat, Bendigo, Geelong and the various metropolitan suburban districts at 15,000 each, we should get a House composed of 26 representatives of rural districts; 3, of provincial cities; 2, of the metropolis itself; and 18, of its suburbs—a total of 49. That, we repeat, is the ideal thing; it is the thing which ought to be done, but which no one in Parliament will have either the desire or the strength to bring about, and which the general public will not have the enthusiasm or the wisdom to insist upon.

---

Patriotism, in the matter of the letting of tenders for public supplies, is a watch-word with Australian Governments, Federal as well as State; but not patriotism at any cost. Always a fair margin is allowed, beyond that provided by a substantial protective tariff, to enable local manufacturers to secure Australian orders, but even the late Federal Government and existing Labour Governments in some States, refuse to put themselves entirely at the mercy of Australian manufacturers and to submit to any charges they may be pleased to make. In order to keep work here, and to enable employers to pay the high wages now forced upon them, without forfeiting their own claims to substantial rewards for their enterprise, special consideration is given when tenders are under examination, and it is no foregone conclusion that local men will either receive or be refused the contract. The matter was raised again last week by the iron trades council in connection with the building of the new steamer which is to replace in Papuan waters the Federal steamer "Merrie England," which was wrecked some months ago. The iron trades council, sitting at the Melbourne Trades Hall, thought that the Federal Government should not have called for tenders in Great Britain while the Victorian ship-building yard at Williamstown was quite able to build the boat. The Minister for External Affairs, Mr. Glynn, in reply to the protest, states that the fact that tenders have been invited in England, as well as in Australia, does not mean that the boat will not be built in the Commonwealth. The plans and specifications were prepared by a Sydney naval architect, and he (Mr. Glynn) thought it best to call for tenders in both England and Australia, in order to check the estimates of cost. Otherwise, there would be no adequate check on the prices submitted. The advantages of building the vessel in Australia would, other things being equal, be taken into consideration. It will not have been lost sight of by the Minister that there would almost certainly have been a similar outcry had the contract been let in Australia and secured by a private firm which had been similarly fortunate on previous occasions; the only difference in that case would have been that the iron trades council, or someone on its behalf, would have smelt a ring, a combine, a trust, whichever it might be pleased to dub the monster. This cry has been raised more than once, and it is not unlikely that the unlimited preference which the unions now and again appear to advocate might generate such a brood. The method which is commonly adopted nowadays by State and Federal Governments, and which has been followed in the present instance, will commend itself to public opinion as sound and sane from every point of view. There remains the alternative of buying a suitable vessel already in Australia; for example, Mr. Scaddan, of Western Australia, may be glad to "trade off" one of his non-paying fleet.

* * *

The Victorian Mines Department has instituted inquiries, through the Agent-General, as to the most efficient means available for rescue work in connection with mining disasters, the methods employed both in Great Britain and abroad to be taken into full account. This is a step in the right direction, but, it may be asked, has the Victorian department availed itself of all the information procurable in Australia? Only recently the New South Wales Government commissioned its Senior Inspector of Collieries, Mr. W. Humble, to make a personal examination of various systems in use in Great Britain and on the Continent of Europe, and his report, an abstract of which appeared in our issue of October 2, will be available for the guidance of the Victorian department, so far as coal mining is concerned. Other inquiries of a similar character were also made, a little further back, by the Governments of New South Wales and Queensland with respect to metalliferous mines, and though these are not quite "the very latest" the reports should contain a great deal of very useful information, for new methods of rescue are not of annual occurrence. Provided that use is made of reports easily accessible here, there can be no great harm done by further inquiries, though they will probably add little fresh information. Mr. A. H. Merrin, Chief Inspector of Mines, and Mr. G. H. Broome, General Manager of the State colliery at Wonthaggi, will be entrusted with the task of collating the information gathered and of devising a general scheme of mine rescue for Victoria. The probability is that a trained staff will be located at Wonthaggi, as the only locality in which the State owns a mine, and that its services will be made available for any other part of the State when occasion requires. Fortunately, the coal mines of Victoria are not so liable to explosions and poisonous gases as are those on older coal-beds, but falls of earth are a constant peril to the miner's life wherever he operates. A start being made, some endeavour will be necessary to keep the trained men as much as possible in the same district, so that their joint services may be available at short notice, and should the first experiment prove as successful as there is reasonable hope it will, other stations in leading mining centres may follow.

* * *

It does not require a great amount of perspicacity to discover the readiest way of converting non-paying tramways to paying ones, namely by raising fares, but that is the only way which has occurred to the Chief Railway Commissioner in New South Wales, Mr. Johnson. Whether the facts connected with the financial losses on the Sydney tramways will be turned to capital account by the opponents of State ownership has yet to be seen; certainly they will not serve the purpose of the advocates of State ownership. Last year, according to a statement by Mr. Cann, Treasurer of New South Wales, there was a loss of £26,000 on the Sydney tramways, and during the first four months of the current financial year the loss was £12,000, or at the rate of £36,000 for the year, although the best season of the year has yet to come. It is hardly fair that the people all over the State should be asked to pay this deficiency on a service which accommodates only Sydney residents and its visitors. These are days when decentralisation is in the air, and a proposition so utterly opposed to that principle will not be appreciated. Not that the question of abolishing State ownership is seriously considered in the mother State; it is not. But in all the circumstances, residents of Sydney are hardly in a position to offer very strong objections to the proposal of Mr. Johnson to make those who use the tramways pay for them. Some time ago the first step was taken, when fares were doubled on tramways running to racecourses and sports grounds, and the returns were naturally increased by some thousands of pounds, though not sufficiently to make any very great reduction in the annual deficit. Mr. Johnson now proposes to raise the fares on all holidays and Sundays, and he is anxious, if possible, to do this in time to reap the benefit during the coming Christmas and New Year holidays. Here another difficulty gives the Commissioner food for reflection. A general election is pending. Will the present Government care for the responsibility of sanctioning such a step just now? Mr. Cann admits that something must be done, but he is not certain by whom, and he does not pledge his colleagues to any definite course, even supposing that they remain in office. But next Saturday will decide the fate of the Ministry, and after that Mr. Johnson will be free to move. There are certain considerations put forward, however, which will tend to reduce not only the additional revenue anticipated; for example, on Sundays extra wages have to be paid to tramway employees of all grades. Again, it is pointed out that much of the popularity of the tramway system is due to the system of penny sections, and it would be almost suicidal to abolish that system; yet, how else can the revenue be appreciably raised? For to slightly shorten the sections would embarrass the public without doing much in the direction sought.

* * *

It is as interesting as it is unusual to find the secretary of a trade union grieving that an employer of labour has his valuable plant lying idle; but it need hardly be said that, in this instance, the union secretary was not responsible for laying it up. On the contrary, his lamentation is attributable to the fact that 18 months ago 300 men were at work with this plant. It is possible, therefore, fully to appreciate the solicitude of Mr. T. Price, the secretary of the Iron Trades Council, that such a state of things should exist, and to sympathise with both the employer and his erstwhile employees at the slackness of business which brought it about. Last week, the Acting Minister of Home Affairs, Mr. Kelly, was asked in the House of Representatives for an explanation of the fact that ammunition waggons are being imported from England, and the reply was that as 16 howitzers had to be imported, and as each would require three ammunition waggons, the Government had ordered one such waggon for each gun, leaving it to Australian builders to supply the remainder. It must be admitted that Mr. Kelly's reply conveyed no explanation why such a step should have been taken, for, even if the idea was to secure the latest model, one waggon would have sufficed for the purpose. But, if Mr. Price's statement be correct, what has actually taken place can only be regarded as a breach of faith on the part of the Government in relation to manufacturers, who are encouraged to lay down extensive and expensive plants for certain classes of work, in what should be well-grounded confidence that Government orders will be forthcoming. But the gravamen of Mr. Price's complaint is that these waggons are being imported, although Messrs. Robison Bros. and Co. have already built others for the Federal Government, and now have thousands of pounds' worth of machinery lying idle and a large portion of their foundry, which some months ago employed 300 men, is closed, and a couple of hundred engineers and turners are looking for work in their own trade. Naturally, Mr. Price's regrets have their rise in union interests, but he certainly points out what seems like a grave injustice to the company concerned.

---

## NEWS AND NOTES.

It is only a few weeks since Broken Hill (N.S.W.) suffered from shortness of water through the bursting of a main belonging to the Water Supply Co., and the experience was repeated last week. Fortunately, the mines did not have to stop immediately, but residents were greatly inconvenienced at the stoppage of supplies, particularly as the temperature has been high, reaching 101.2 deg. on Thursday, and 106 on Saturday. Water to extinguish a fire at a wooden cottage had to be drawn from the Junction North mine; what the consequences would be should an extensive conflagration occur is difficult to realise. The whole trouble is attributed to the neglect of one man to follow this instructions. On Friday night the supply to the mines and treatment works was cut off, in order that the citizens might have the benefit of the partially restored service, but the full service was restored by Monday.

The Victorian State coal mine at Wonthaggi completed the fourth year of its existence on November 23rd. In that period, omitting the coal used at the mine and that supplied to miners, the output has been 1,535,212 tons, and the wages paid have amounted to £570,445.

An interim dividend of 1s. per share has been declared by the directors of the Yuanmi Gold Mines Ltd. (W.A.), payable on December 30th, to shareholders on the register on the 10th inst.

Dynamiters are at work in the Calumet district, Michigan (U.S.A.), in connection with the strike of copper miners. Last week they attempted to blow up the compressor-plant at the Ahmeek mine, and succeeded in doing a good deal of damage to the building which contained it, the guard inside the building having a narrow escape from death. Murders have been frequent in several of the districts affected by the strike, and martial law has now been proclaimed.

Owing to the political feeling engendered in Colombia and Ecuador, as well as in the United States, through the granting of concessions by the Governments of the Central American States to Lord Murray, the Master of Elibank, under conditions which permitted him to develop their oil propositions for a number of years, on conditions which included the building of railways, quays, etc., Lord Murray has informed Lord Cowdray, chairman of S. Pearson and Son Ltd., that he has abandoned the scheme.

Subsequently to the turbulent doings at the Beaufort Deep Leads mine, Trawalla (V.), on October 17th, and after the arrest of two men named George Thompson and Thomas Abrey, on charges of shooting with intent and attempted murder, summonses were issued against 17 other men for disturbing the peace and damaging property, but four of the summonses were not served. The other 13 men were before the Beaufort Police Court on the 25th inst., the charges being taken collectively. After hearing the evidence, Mr. S. J. Goldsmith, P.M., acquitted all the accused, on the ground that although there was evidence of their being on the lease there was no proof that they had committed any overt acts, the Police Magistrate adding that it was left to the Crown to take any action they liked.

A telegram from Dr. Gilruth, Administrator of the Northern Territory, received at the Department of External Affairs last week, stated that after travelling in his motor car over 2000 miles since leaving the Queensland railways, he had reached Barrow's Creek on November 22nd, having met with minor accidents and hindrances en route. At Barrow's Creek, however, two tyres of the motor blew out, and Dr. Gilruth was compelled to leave his car behind until the rainy season was over, and to proceed to Darwin on horseback, hoping to reach there in three weeks from that time. The distance is estimated to be about 600 miles.

The Ballarat (V.) Worn-out Miners' Fund benefits to the extent of £29 out of the proceeds of the recent carnival.

A dividend of 2s. has been declared by the Ajax Central G.M. Co., Daylesford (V.), payable on the 18th inst., and amounting to £3000. The stone crushed last month (1330 tons as compared with 1500 tons a month earlier) was of lower average than the previous, giving only 2 dwt., but it is explained that they are taking stone for a greater width from the whole of the stopes on the Ajax lode. It was deemed necessary to do this because of the gold-bearing veins having gone into the country off the lodes. This system of stoping will be continued.

The mine manager of the Pioneer Tin Mining Co., Bradshaw's Creek (T.), reported last week cleaning up from a nine weeks' run of No. 2 electric plant for a return of 40 tons stream tin.

During four weeks in November, approximately 30,000 tons of ore were sent to the furnaces by the Mt. Lyell M. and R. Co. (T.), and estimating this to be of the average grade, it will return an output of at least 600 tons of copper, which will be higher than for any similar period since July, 1912. The North Lyell mine is maintaining an output of about 10,000 tons monthly, the bulk of which is coming from the 850ft., 1000ft., and 1100ft. levels. The North mine, generally speaking, is in splendid productive order, and under ordinary conditions it may safely be said that the standard output of approximately 10,000 tons of ore monthly has been regained. The Mount Lyell mine continues to put out about 5,000 tons of pyrites monthly, and the production of this tonnage is practically assured for an indefinite period.

It should not be long now before something definite is known as to the fate of the Victorian Manganese Mines, Iron, and Steel Co., in other words, whether the directors have succeeded in raising the money in London which is required to carry out the work of building a railway from the mine. The half-yearly report states that the London syndicate which is considering the matter had asked for a few weeks longer before giving its decision. Prospecting work has been confined to the iron ore outcrops at Canui Creek and Nowa Nowa. These have been traced for the full length of the lease, and are from 20 to 25 feet in width.

The Border Mining Co. No Liability, Koetong (V.), has recently made application for additional leases, and now holds something like 700 acres of tin-bearing country. Unfortunately, the company got into difficulties through laying out its plant at the wrong place, having no fall for tailings. The plant has been removed to about 2 miles lower down the valley, and it is anticipated that the company will be able to pull through without further calls being made on shareholders. The company is in 30,000 shares of 10s. each, of which 22,500 have been issued as paid-up to 2s., and on which calls of 11d. have been made. The ground has not been actually averaged, this apparently being somewhat difficult, but in parts some high values have been obtained. Some trouble has been experienced with hard ground, necessitating the use of explosives. As a sluicing proposition, the company seems to have some prospects, once it can find its legs, as it has a large area of ground to work out.

In settlement of the action taken against it by the Broken Hill Junction Co., the Junction North has agreed to pay the sum of £3000 and all costs incurred by the plaintiff company. In the last statement of accounts of the Junction North £6000 is provided for cost of this case, which, with other sums previously apportioned, swells the total provision made for this litigation to £12,642. Together with the cost actually incurred by the Junction North Co., already about £7,000, by the time the Broken Hill Junction Company's costs are assessed it is probable that the total provision will be exceeded.

According to preliminary estimates, the mineral production of Canada for 1912 is valued at £27,412,400, an increase of over £6,000,000 on the previous year. Porcupine contributed £360,000, being the only new camp added to the list of Canada's producers.

The bores sunk by the Mines Department at Trawalla (V.) have proved a definite lead. A few colours of gold were revealed in the bores. Evidently the lead is trending eastward from the Hope group of mines, and its depth is about 283 feet. The prospects are distinctly encouraging.

A Victorian Mines Department drill will shortly be sent into the Alberton (V.) district to continue the work of defining the area of brown coal deposits in that part of South Gippsland. Mr. Stanley Hunter, of the Geological Survey, will, about the same time, investigate the whole of the country between the Alberton district and Sale, with the object of determining its general geological features, in order to plan a systematic series of bores.

The first bore put down by the Mines Department on the Upper Langi Logan (V.) has bottomed at 170ft. without revealing any values. The next bore will be placed 10 chains to the west, and should be in the vicinity of the deep ground.

The reported discovery of iron near Wonthaggi (V.) is not regarded as important. The iron formation, which is situated at Leongatha South, is said to be derived from decomposition of the older basalt.

The Department of External Affairs has now secured another complete boring plant for the Papuan oilfields. Mr. Locke, a Government official, who has charge of a plant in the Vailala district capable of boring to 2000ft., has reached a depth of 470ft., at which point it is reported encouraging prospects have been encountered.

The result of a trial crushing from the Currajong Tin Mining Syndicate's property at Mount McLaurin, near Germanton (N.S.W.), is considered satisfactory. A parcel of 4 tons 9 cwt. yielded 9 cwt. of concentrates, valued at £55. The syndicate has made arrangement for another parcel of about 20 tons to be crushed within the next four or five weeks. As soon as the lode has been proved to a deeper level it is the intention of the syndicate to erect a plant for the treatment of the ore on the ground.

If indications count, it is only a question of time when the Great Southern Consols mine, Rutherglen (V.), will become a Sydney-owned property. Reports from the mine are to the effect that developments are satisfactory, a new run of wash having been found making from the south-west of the property. As the result of this, the manager estimates that a further 2000 or 3000 feet of profitable ground will be available in the south end of the mine.

A cabled summary of the annual report of the Mt. Elliott Ltd. (Q.) shows the profit for the year to be £141,811. This figure is the net result after £10,644 for development and £14,208 for depreciation had been written off, and the total expenditure, except cost of sinking the new main shaft on the Consols mine and cost of options, had been charged to revenue. The general manager's estimate of ore reserves is:—High-grade ore, Mt. Elliott, to the 400ft. level, 35,000 tons; Consols mine, to the 250ft. level, 8000 tons; and Selwyn mine, to the 120ft. level, 1500 tons, all assaying from 10 to 12 per cent., with a probable addition of 37,000 tons, assaying from 10 to 12 per cent.; low-grade ore (sulphide), 350,000 tons of 3 per cent. value. The smelter ran seven and a half months during the year, and 41,633 tons of ore treated. Some 4673 tons of blister copper were produced, containing 4631 tons copper, 7285 oz. silver, and 8757 oz. gold.

A parcel of 5 tons from a new find on the Golden Junction mine, near Oodla Wirra (S.A.), treated at the Petersburg Cyanide works, has yielded 12½ oz. gold, or 2½ oz. per ton. This is the first crushing taken from this property since 1908.

At Ruby Well (W.A.) Holden's find, held under option by the Ruby Well Options Syndicate, of Adelaide, has been turned down. The syndicate still holds an option over Davey's and Whittaker's leases, developments on which are reported to be satisfactory.

Dr. Jensen, the Government Geologist in the Northern Territory, has reported to the Minister of External Affairs, Mr. Glynn, on a recent discovery at Perwick Creek beyond Providence Knob, and about 100 miles from Pine Creek. Dr. Jensen declared that the lode was apparently a permanent one, and covered a wide field of about (on the first estimate) ten square miles. Between 50 and 60 men were already there. Tin-mining, Mr. Glynn pointed out, was carried on in about twenty widely scattered places in the Territory. Last year about 270 tons of tin ore was exported. The trouble up to the present had been that the tin had either not maintained itself or had not been proved at depth. However, as the development of the country so much depended on mining, he had felt justified in calling for tenders for the erection of a battery at Berwick Creek. The nearest battery at present is about 70 miles away, and, in the absence of roads, this made dealing with the ore a very expensive affair.

On the morning of November 24 it was discovered that the filter-house of the Oswald mine at Maldon (V.) had been surreptitiously entered and most of the slimes for the month stolen, their value being estimated at £400. The police, aided by black trackers, are still searching for the thieves, and the directors are offering a reward of £100 for the arrest and conviction of the thieves, and the recovery of the property, or £50 for such information as may lead to the conviction of the thief or thieves.

Dr. A. C. D. Rivett, organising secretary of the committee which is arranging for the visit of the British Association for the Advancement of Science to Australia next year, has cabled from London that probably over 300 visitors will form the party. The various State Governments have been asked to provide free railway passes for about 400, with very various results. South Australia will extend railway facilities to 300; Western Australia will provide railway passes and other facilities to enable members to reach any part of the State desired; Queensland will issue general passes for 200; Victoria will provide free railway travelling for 150; New South Wales will provide for 300; Tasmania for 12.

The London Board of the Melbourne Electric Supply Co. recommends a final dividend of 6 per cent. on the consolidated ordinary stock, making a total of 10 per cent. for the year ended August 31, as compared with a total of 8½ in dividend and bonus for 1911-12. The transfer books of the Melbourne register will be closed from December 8 to December 16 inclusive.

At the half-yearly meeting of the Beaufort (V.) Deep Leads last Friday, the chairman, Mr. W. D. Thompson, stated that, much as they regretted the strike which had been caused by the directors refusing to allow unionist officials to dictate who should and who should not be employed in the mine, the company were getting better working results now than they had before the trouble started. Three shifts a day are now being worked without any alteration in the attitude of the Board.

The P. and O. S.N. Co. has decided to form a contingency fund by adding £200,000 out of profits to the existing suspense account of £250,000, the object being to go as far as possible towards equalising dividends. This step is attributed to the rising expenditure on coal, wages, victualling, and repairs; the uncertainties with regard to the new mail contract, and the depression in the freight market.

A suggestion as to the value of the Ardlethan (N.S.W.) tin field is the voluntary liquidation of the Big Bygoo Ltd., proposed by the directors at an extraordinary general meeting of shareholders of that company. The chairman explained the position of affairs at the mine, pointing out that the ore bodies at the eastern end of the lease are extremely patchy in character, and produced only small quantities of ore of sufficiently high grade to send away for treatment. At the western end, the "Big Blow" is a strong and well-defined lode of low-grade ore, which, with a battery on the lease and abundance of water, would pay well, but is worthless under present conditions. Under the circumstances, as there seemed no hope of getting the money out of the ground with which to take over the option on January 27 next, the directors recommended that the company should go into voluntary liquidation, and distribute the surplus assets, consisting of cash in hand and the proceeds of some 30 tons of ore in transit, amongst the shareholders. After discussion, a resolution was unanimously passed leaving it to the directors to decide the question of liquidation.

## PERSONAL.

Great regret was expressed in Melbourne at the end of last week when it became known that Mr. A. W. Craven, M.L.A., had passed away. Deceased, who was born in 1855, had represented the Benambra Electorate in the Victorian Parliament for a quarter of a century, and for four years was chairman of the Railways Standing Committee of the House. Amongst the professional achievements by which he will be remembered is the survey for the incline shaft at the Long Tunnel (Walhalla) mine, which was so remarkably accurate that, although the work was commenced at both ends, when the upper and the lower sections met it was found that they were less than three-eighths of an inch from perfect alignment, and had been completed on the very day which calculations had anticipated, though the work had been through 2270ft. of country.

Mr. C. A. Whitehead, for many years resident engineer of the Broken Hill Water Supply Ltd., at Broken Hill, has resigned that post and will leave the service early next year.

Mr. R. Murray Smith having resigned his position on the Melbourne directorate of the Northern Assurance Co. Ltd., has been succeeded by Mr. J. J. Falconer, manager for Australia of the Australian Mercantile, Land, and Finance Co. Mr. G. A. Kay succeeds Mr. Murray Smith as chairman of directors.

Messrs. Barry and Williams, formerly superintendent and assistant superintendent respectively to the Waihi G.M. Co. (N.Z.), have both retired from those positions, but are still associated with the company in an advisory capacity, and from time to time will visit the mine and report to the board. Mr. E. G. Banks, who has been in the service of the company as head metallurgist for about 20 years, has been appointed superintendent, and Mr. W. P. Gauvain, chief engineer, who also has been with the company for many years, has been appointed assistant superintendent. Mr. J. L. Gilmour will have charge of the underground works.

# THE INVESTOR'S COLUMN.

## Some Companies Attracting Attention To-day.

(By Our Exchange Reporter.)

### Mt. Lyell Blocks (T.).

The substantial business in the shares of this company was not without a touch of excitement, inasmuch as the change in public opinion which took place after the highest price was recorded was something like a southerly burster after a sultry day.

About a month ago the shares were comparatively lifeless in the vicinity of 1s. 6d., but recently a slightly better enquiry had brought them up to 2s., and this was the quotation at which one of the members secured about a thousand shares. This transaction set the market jigging merrily, and the exchanges were heavy and numerous, until 4s. was reached; that is, just double what they opened at. As there are 300,000 shares in the company, the improvement in the market valuation of the stock came to £30,000—not a bad record for the week. But if the rise was quick (it extended over two or three days) the decline was even more sudden, for, after the high water mark had been touched at High 'Change, lower prices were accepted in the Vestibule, and after lunch the highest sales were at 3s. 1d. A pressing order then forced the quotations down to 2s. 9d.

Still lower prices were accepted on the following morning, but later on a slight recovery took place. This was followed by a further decline, and the present market valuation is at 2s., 2s. 5d. The reason for the increased interest in the stock is to be found in the last official report from the mine, wherein it is stated that the main shaft from Consols' tunnel has been sunk to a depth of 1209ft., and that small patches of copper pyrites are showing in white schistose country in the bottom.

It can hardly be said that the development is as yet of a very substantial character, and when the number of the shares in the company is taken into consideration, can hardly be said to justify such a rise in the price of the stock as has taken place. That a change for the better in the prospects has occurred may be admitted, but it is certainly about time that some such improvement took place, for the shareholders have had a long period of waiting to endure.

Up to the end of last August the shaft had attained at depth of about 1150ft., the sinking for the last 200ft. having been mostly through hematite; a change had, however, taken place to a white and grey schistose material heavily mineralised, which was regarded as a favourable indication, as this is the class of rock in which the Lyell ore-bodies generally occur. Some difficulty had been experienced in connection with the haulage of the buckets, so a winch was installed at the No. 4 level, which is approximately 1100ft. deep, a chamber having been cut for that purpose, and it was expected that better progress would be made. A new boiler and compressor have also been installed, and should now be at work. At a depth of 1000ft. a crosscut has been driven, in order to effect connection with the Mount Lyell workings, which company has also put out a crosscut with the same object. There is a difference of 26ft. in level between the two, but a rise has been put up from that of the Mount Lyell, which is the lower. This connection, which was undertaken soon after the disaster at the Mount Lyell mine, will give improved ventilation, and afford means of escape in case of any further accident or mishap. The company has not only been carrying on wearisome dead-work, but has also been doing so under adverse conditions, both as regards sinking, as already mentioned, and in connection with firewood, which is scarce and hard to obtain, so much so that arrangements had to be made with the Union S.S. Co. in order to get a supply of coal—but even this policy was carried out with difficulty, owing to adverse weather conditions. The Development Account showed that the expenditure for the half-year amounted to £4225, which, with the balance brought forward of £16,685, gives a total amount under this heading of nearly £21,000. It will be gathered from these figures that the shareholders in the present company have expressed their faith in its prospects in the most convincing way. Undoubtedly the strongest card in their hand is the manner in which the size and value of the North Mount Lyell ore body is being maintained with depth. Were it not for this fact, Mount Lyell Block shares, under the expensive working conditions, would indeed be a rash speculation, and even giving all their prospects due weight, the shares at 3s. seem quite high enough, for such a price represents a market value for the stock of £45,000.

There should be something more than some small patches of copper pyrites in the bottom of the shaft to justify such a valuation. In such cases, however, the market generally takes an optimistic view of the position, and now that a favourable change in the mine has occurred, it is to be expected that further developments of a similar character will be followed by an improvement in price. As a matter of fact, something pretty good is really required to represent the existing quotations.

Our Queenstown (T.) correspondent writes, under date November 28:—"According to the reports of Stock Exchange operations, someone is having a "flutter" in Lyell Blocks shares, and local holders are considerably exercised in their minds as to what is the cause of the recent sharp rise in the scrip. And it seems incredible that simply because a few veins of schist flaked with copper pyrites have been met with in the Blocks shaft, at a depth of 1200ft., the market value of the shares should jump up 100 per cent. Anyway, a good many local holders were naturally very pleased at the rise, and tried to get out at Exchange quotations, but they have found that the actual price obtainable for their shares when they wanted to sell was very much below the published market quotations. And consequently they are both disappointed and angry, and are speaking in very disrespectful language of certain persons who don't live on this side of Bass Straits. But evidently a good many people have been buying the shares at prices up to 3s. or 3s. 6d."

### Great Langi Logan (V.)

Among the neighbouring stocks which came into prominence in sympathy with the strong demand for New Langi Logans may be mentioned this low-priced venture, and although the work done on the property is so far not great, yet the position of the mine justifies a belief that it will later on attract increased attention. For some reasons, the proposition is an attractive one, especially to those members of the public who like a speculation or investment with large possibilities.

In the first place, the length of the holding on the main trunk lead is exceptionally great, being proved by the boring operations to be 18ft.; this is large enough to allow for three or four more companies, especially if the gutter proves to be as wide as it is in the New Langi Logan holding further south, the estimated width there being 800ft.

The gold-bearing character of the wash has been established by a comprehensive series of bores, which have been put down from the surface, and from a majority of which very favourable prospects have been obtained. Until quite recently the operations have been confined to establishing the course and depth of the alluvial channel, and also to selecting a suitable site for the shaft. After an initial disappointment in connection with the latter important matter, a very satisfactory location has been found close to the No. 30 bore, the depth to bedrock being 237ft. The basalt was passed through at 207ft., and the remaining portion of the overlying strata is strong clay, which is a safe and suitable country for the purpose required. From this point the distance to the lead should not be more than 400ft., so that once shaft sinking is completed it should not be long before the the drive is under the gutter; up to about 50ft. has been sunk, a small temporary plant having been erected which will be adequate for the present operations. The heavy permanent machinery and plant which will have to be installed later on have already been purchased at a cost of about £3500, and it may be mentioned here that the liabilities of the company are a little over £4000, while the cash in hand is only a few hundreds.

Monthly calls of 2d. per share are being made, but now that work has been started in earnest, an increase in the amount may be expected. If it may be taken as established that the New Langi Logan gutter will be a good payable one, and there is good reason for such a belief, then it is very probable that Great Langi Logan shares will eventually be worth a good deal more than their present price.

### Nuggety Ajax (V.).

There was a wholesome improvement in the tone of the market for this stock, as is shown by the quotations, for whereas the shares about 10 days ago had been offered down to 3s. 6d. or a little lower, the closing price on Monday afternoon was buyer 5s., after a sale had been recorded at 5s. 3d. Some comment was made on the fact that no news had been received by the Exchange which would account for the better support, but the probable explanation is that the necessary information is to be found in the weekly official report from the mine, dated November 29th, wherein it is stated that two promising developments have taken place. The full text of the statement, referring to the matter, is as follows:—"Main shaft at 622 passed through lode about 6ft. wide underlying west, showing a clean footwall, little gold. No. 6 level rise over north drive cut stone about 8 inches wide showing very fair gold, have driven west on this 6ft." It is likely that the stone cut in the shaft is the Ajax or eastern vertical, and its characteristics support this belief, being apparently similar to those of the same reef at the lower levels in the North Nuggety ground—that is to say, that it is a large, well defined lode, carrying gold, but not, so far, in payable quantities. The absence of a statement one way or the other on this point seems to justify the latter assumption. The development in the rise, although the make of stone is not very large as yet, appears to be the more promising discovery of the two, and is probably the cause of the better enquiry in the market. It is too early to express a decided opinion upon the importance of these recent discoveries, but perhaps the suggestion may be hazarded that for the present it is better to hold than to sell.

The quotations have for some time been at what may be described as winding-up prices, inasmuch as little, if anything, was allowed for the prospective value of a mine which is situated in an excellent position on the best line of reef in Daylesford, which possesses a large area of ground, is well opened up, well equipped, and has a good record as a gold producer. Perhaps a still better reason is, that the buying came from a good quarter.

The mine may have seen its best days—it is hard to say, but it is altogether too soon to regard it as worked out.

---

## METAL QUOTATIONS.

(From Our Correspondent.)

### By Cable.

London, Tuesday.

There was a slight improvement in the copper demand for the week, although the opening price showed a drop of 25s. compared with the previous Friday, and the tendency was downward again as the end of the week approached. Tin also began badly, but recovered later in the week. Lead went downwards persistently, there being a decrease of 12s. 6d. per ton between last Friday and the preceding one, without even a momentary improvement during the week. Spelter had a fair recovery. Wolfram, also, was weaker.

COPPER.—Spot metal began the week at £65 2s. 6d., then rose to £66 17s. 6d., and £67 12s. 6d., receding again to £67 and £66 15s.

For three months' delivery the rates were £65 5s., £65 17s. 6d., £66 7s. 6d., £65 12s. 6d., and £65 7s. 6d.

Electrolytic brought £69 5s., £69 10s., and £69. Yesterday's quote was £68 5s.

TIN.—Monday and Tuesday's rate for spot tin was £179 5s., showing a fall of 25s., after which the quotations were £180 10s., £180 15s., and £180 10s.

Three months' metal was taken at £180, £180 10s., £181 15s., £182, and £181 12s. 6d.

LEAD.—On Tuesday the price was £18 12s. 6d., showing a fall of 5s., then came £18 10s., £18 7s. 6d., and £18 5s.

SPELTER recovered from £20 15s. to £21 5s. per ton.

SILVER.—The daily rates were 26 7-8d. (a rise of 1-8d.), 27 1-16d., 27d., 26¾d., and 26 7-16d.

ANTIMONY.—"Star" fell to £28, but 50 per cent. ore remained at £6 5s. per ton.

WOLFRAM (70 per cent. ore) dropped to 32s. 6d. per unit, or £115 10s. per ton.

MOLYBDENITE remained at 3s. per lb., equal to £336 per ton.

MANGANESE (50 per cent. ore) fell back again to 9d. per unit, or £1 17s. 6d. per ton.

---

The British Chamber of Commerce, 9 Rue des Pyramides, Paris, the official representative of the Commonwealth in France, reports on October 27 the following latest quotations on the French market:—Copper (Havre), £74 10s.; Tin (Havre), £186 8s.; Lead (Havre or Rouen), £23 10s.; (Paris), £24; Zinc (Paris), £23 16s.; Nickel (Paris), £165 to £175.

---

The gold received at the Melbourne branch of the Royal Mint during the week ended with November 29 amounted to 16,069.03 oz.

A dividend of 1s. and a bonus of 1s. will be paid by the Oswald's Gold Mines Ltd., Maldon (V.), on the 15th inst.

## SYDNEY STOCKS.

Investment stocks continue to attract plenty of attention on the Sydney Stock Exchange. In fact, buyers have predominated for some time past. But holders of steady dividend-paying propositions have shown little inclination to let their shares go unless the buyer offered inducement in the way of price. That has been the cause of the recent strength of leading investments. Of course, there have been irregular movements during the week, but the principal securities have maintained very firm levels. There has been considerably less speculation going on lately, and new flotations have not figured so extensively, but solid investments have been in demand on all sides.

The inquiry for bank shares has been pronounced of late, and as banking stocks are regarded as the barometer of good or bad times, the run on that class of security, and the consistently high prices which have prevailed, must be accounted very encouraging. Money has been tight, and appears likely to continue so for some time to come. But the money has been here all the same, as the profit-earning capacity of the banks plainly demonstrates. The net profits of the 23 commercial banks operating in the Commonwealth announced this year have totalled £3,220,827. The amount paid in dividends has represented £1,749,723, while over £1,000,000 has been added to reserves. It is not surprising, therefore, that shareholders are content to hang on to their scrip. The net profits this year constitute a complete record in Australian banking, and equalled 15.4 per cent. of the entire capital employed. The Bank of New South Wales held its meeting during the week, and the position of that company, as disclosed by the accounts, was enviable. The net profits for the half-year ended March 31st were £285,746, and £84,838 was brought forward, making £370,584 available for distribution. The profit for last half-year was somewhat less, and amounted to £251,852, which, with the £87,503 brought forward, gave £339,355 available. The bank could have made larger profit had it desired to do so. The fact of holding something over £13,000,000 in cash naturally tended to restrict its profit-earning capacity. The advances showed contraction on the year. The bank has certainly pursued a very cautious policy in the granting of financial accommodation. Advances spell profit, and it does not do to discourage progress to too great an extent. The fact of the matter is that the banks realise that they will have to meet considerable Government demands in the none too distant future.

The week's operations in mining shares in the Stock Exchange have continued of a desultory character. The continued decline in industrial metals in London has not encouraged speculators. Copper ventures have suffered further retrogression on account of the slump in the price of raw copper. Mt. Elliott shares fell back to 80s., although there has been a slight recovery in London prices to 82s. 6d. But that doubtless was due to the dividend to be paid on December 22nd. Hampden Cloncurry, Lloyd, Mt. Morgan, and Grafton shares all show some leeway in prices on the week. From the lack of support given to Oxide Creeks and the consistently low prices quoted, the inspired statement as to the prospects and possibilities of the mine published in one of the Sydney dailies, did not have the desired effect from the "Bulls'" point of view. Mt. Oxide Options have continued to slump, and the "Bears" seem to have it all their own way. Sales at £27 5s. must make certain holders of that scrip feel pretty blue, and the bottom is not yet reached according to reports. Rather more attention has been manifested in silver-lead shares. The week's movements in Broken Hill quotations have generally favoured the holder. Ardlethan stocks have also received more attention latterly. There are still some believers in certain shows on the field. Carpathia contrib. shares have gained a point or two in firmness. Even the paids have met with support and have improved their position somewhat. Some outsiders have been talking Wild Cherries, and White Crystals have had attention. With production going on steadily at the Vegetable Creek mine, it seems as if the price of those shares is low. Gold propositions have mostly ruled out of favour. The New Burragorang silver mine is sending another consignment of ore to the smelters. The shares have kept steady, and are regarded favourably in some quarters. The shareholders of the Port Jackson and Manly Steamship Co., at an extraordinary meeting held during the week, voted themselves a bonus of 5s. per share, to be paid out of reserve fund. Quotations for that scrip on the Stock Exchange have recently dropped back. The chairman of the Big Bygoo, at an extraordinary meeting held during the week, stated that there seemed no hope of coining sufficient money out of the ground with which to take over the option on January 27th next. The directors recommended that the company should go into voluntary liquidation, and the surplus assets, consisting of cash in hand and proceeds of some 30 tons of ore, be distributed amongst the shareholders. That was agreed to. It was the only thing to be done under the circumstances.

During the four weeks ended November 13th, the Vulcan Tin crushed 1121.25 tons of stone and produced 51 tons of tin concentrates, which realised £4377 12s. 3d. A dividend of 3d. per share has been declared payable in December. The company has a cash balance of close upon £7000.

---

## BRIEF COMMENT.

In their last half-yearly report, the directors of Amalgamated Zinc (De Bavay's) Ltd. directed attention to their fixed basis of £22 per ton for spelter, and for the first time since the incorporation of the company had to forecast the probable effect of a fall in the price of the metal below that price. It is obvious that for the current term the company may expect to suffer to the extent of at least £1 per ton below the basis of £22; probably in round figures 24s. per ton. As pointed out in the report, this fall will be reflected in the accounts at the end of the current term. Taking the company's figures from 30th June last to date, it is evident that the directors will be able, at the end of the year, to report an increased output of zinc concentrates, which in some measure should compensate for the fall in the price of spelter. At present it may safely be estimated that the total output of zinc concentrates for the current term will exceed 70,000 tons, the average zinc, silver, and lead contents of which will approximate the same as for the previous term.

The first half-yearly meeting of the Long Tunnel G.M. No Liability, Walhalla (V.), was held at 60 Queen-street, Melbourne, on the 25th November. In their report, the directors point out that since the inception of the new company development work has been of a most difficult character, the mine having previously been worked to a standstill, and generally left in a very unsatisfactory condition. However, as the result of considerable energy on the part of the manager, the mine has been thoroughly ventilated and made ship-shape for future operations. At the south end of the 3375ft. level a shoot of ore about 200ft. long, 20 inches wide, and averaging 25 dwt. per ton, has been opened up. This stone will be made available for stoping as soon as a connection is made with the No. 11 level, in about three months. Access to this ore should enable the company to show enhanced returns for the current term. The stone and values are going down strongly, and preparations are now being made to extend a level (No. 13) at 3500ft., at which, if the ore shoot and values above referred to are found to persist, the future of the present company will be assured. At an extraordinary meeting which followed the ordinary meeting, the shareholders' sanction was sought to secure from the Government, on the assets of the company, a loan of £20,000. It was not anticipated that the whole of this amount would be utilised, but the directors considered it advisable to remain on the safe side. Already £7803 of this grant had been spent, but on present appearances the mine should soon be in the position of reducing liabilities before many more were incurred.

"In conclusion, I think you will have one of the best mines ever opened up in Victoria." Thus Mr. Dodd, chairman of directors of the New Langi Logan gold mines, Ararat (V.), at the half-yearly meeting of shareholders, held at 123 Queen-street, last week. During the half-year boring has been carried on energetically, and the company is now in the satisfactory position of having proved about 2½ miles of lead of an average width of about 1000ft. At present efforts are being directed to draining the water in order to enable the work of rising to the wash being undertaken. The pressure is being reduced at such a rapid rate that the chairman, although he would not commit himself to a definite statement on the point, remarked that he anticipated rising would commence inside a week or two. As a guide to the value of the lead, the bores in nearly every instance show excellent prospects. In addition, the Cathcart lead has been proved by bores, and on the plan issued with the report the probable trend and width of the Langi Logan lead is shown, together with the Cathcart lead, from the boundary to where it junctions with the Langi Logan lead. In the matter of ready cash the company is not, of course, in the best street, but the prospects of further calls being made on shareholders is more than compensated for by the outlook for the property. The company's liabilities to the Bank total £2373, and its uncalled capital is £24,375. Three sixpenny calls have been made during the past six months, and when the cost of plant for No. 2 shaft has been defrayed, the directors consider that calls can be materially reduced.

A new company, known as the Oxide Junction, has been formed in Sydney to acquire on option two 40-acre leases on a new find at Oxide Creek

(Q.). It is said there are two outcrops on the property, samples from which assayed 29 and 31.2 per cent. copper respectively. To allay doubt, the decimal fraction is quoted. It is honestly time the discovery of a 20 per cent. lode at Oxide was reported. A person of attainments once remarked: "So many people now agree with me, I really think I must be wrong." So many people agree on the 30 per cent. basis for finds at Mt. Oxide that no one can be blamed for thinking on the same lines. And now the figure "30" becomes more conspicuous than ever by the reported discovery of gold at Mt. Oxide. By a remarkable coincidence, this find is reported to be worth 30 oz. This, however, yet remains to be confirmed—the find as well as the value.

Another company which has developed a substantial length of the Langi Logan lead, Ararat (V.), is the Langi Logan Central Co. At the half yearly meeting of shareholders held at 123 Queen-street, Melbourne, on the 27th inst., Mr. W. A. Rain (chairman) stated that the work done during the half-year had been successful. Fully a mile of lead, bores into which have shown excellent prospects, has been proved in this property. The company has increased its holding by the acquisition of areas to the south, south-west, and west, which the chairman hoped would considerably prolong the life of the property. He believed there was not a property at Ararat which had better prospects. Shareholders, however, are not yet out of the wood, as funds will shortly be required for shaft sinking and equipping the property with a plant.

For the half-year ended November 15 the William Tell G.M. Co., Daylesford (V.), has derived sustenance from two sources—the mine and the shareholders—between which the receipts were about equally divided. Calls, crushing, deposits and debentures realised £1686, and gold and pyrites £1482; total, £3168. Expenditure on all accounts absorbed £3431, the difference being balanced by £263 bank debit, which item last term stood at £427. In his report, the manager strikes an optimistic note for the future of the mine. It is intended to do some lateral development work at No. 5 level to intersect the "Unnamed" and "William Tell" lodes, at about 110 and 230ft. respectively from the shaft. In these lodes the manager is of opinion that the chances of exposing payable ore are good.

Another company which lives on the bounty of shareholders is the Lebrina gold mines (T.). During the six months ended 12th November, the company spent £1389, rendered possible by £1079 being received from shareholders and forfeited shares, £111 from gold won, and £199 from the bank. The capital of the company is very small, being in 30,000 shares of 5s. each, making a total of £7500, of which £4294 has been made available. As to the mine, the manager considers prospects very encouraging. On this score his report is not convincing. At the 100ft. level a large horse of mullock occupied nearly the whole of the lode-channel, but this the manager hopes will ultimately be displaced by clean quartz. One favourable feature of the development work was the intersection of a good body of alluvial wash carrying a little gold and some good gold-bearing quartz specimens. This occurrence, however, is only useful as an indication of the reef being gold-bearing at a point below the present workings.

To anyone acquainted with the time and difficulty involved in pegging leases by the broad light of day, the performance of one Cummings (agent for A. E. Langford, of Melbourne), who pulled ashore from a smack in Cox's Bight (T.), during the dark hours, walked four miles inland, and pegged a lease between those held by a Melbourne company, all in three hours. is a remarkable one. This formed the basis of a case between Cummings and G. H. Smith, master of the ketch, employed to take Cummings and party to Cox's Bight; Smith objecting to the application of Cummings for lease No. 6566/M, on the grounds that the lease was not pegged as stated, and, indeed, that the performance was impossible. The Warden agreed with this view, and upheld the objection. The point is: How does Smith come to figure in the case? Does he want the lease himself, or does somebody else not want Langford to get it? It need hardly be supposed that Smith would arrogate to himself the right to see that the Mining Act is properly administered unless he had something to gain by it. Probably the facts will leak out in a prospectus.

Concurrently with the appearance of the prospectus of the South Australian Oil Wells Co. No Liability, a note of warning has been sounded by the Government Geologists of S.A. and W.A. (Mr. L. K. Ward and Mr. A. Gibb Maitland). Having done that, these two gentlemen have done their duty, and the oil business may now proceed. We really cannot see what all the fuss is about. No secret is made of the nature of the enterprise; therefore, those who embark upon it cannot blame anybody but themselves if the sovereigns sink beyond hope of recovery. True, there have been many bores sunk all over Australia, many of which have bottomed on granite, but many have also penetrated to considerable depths with only negative results. So far as these results go, they certainly tend to weaken optimism. Still, Australia is a very large country, and the only thing that can be said to render the efforts so far made inconclusive is the fact that these have been too sporadic to finally settle the question. The commendable feature about the present promotion is that the policy is right if it be the earnest and conscientious intention of its sponsors to carry it right through to the end. The question will then be determined, either one way or the other, for ever.

The Tasman and Crown Lyell Extended Co. (T.) is in the same boat as nearly all the West Coast companies which possess troublesome ore. As the chairman (Mr. T. C. Dunster) stated at the meeting of shareholders held at 31 Queen-street, Melbourne, on the 25th November, the future of the mine depends upon the successful treatment of the ore, which is estimated to contain 31.9 per cent. lead; 19.8 oz. silver; 0.01 oz. gold; iron, 13.2 per cent.; zinc, 18.5 per cent.; sulphur, 29.3 per cent.; and silica, 4.9 per cent. The mine manager estimates ore reserves at 40,000 tons. Hope is entertained that the flotation process of the Minerals Separation Co., which has been tried recently on Hercules ore with highly satisfactory results, would afford the final solution of the difficulties attached to the treatment of Tasman ores. All this will hardly check the wholesale forfeiture of shares, of which there are now 102,190 which the directors have authority to dispose of to the best advantage. It is evidently left to inference that the value quoted is the average value of the 40,000 tons estimated to be in reserve, but it is hardly conceivable that so many shares would be forfeited in a mine of proved value so long as there was a chance of difficulties in treatment being overcome.

The patience of shareholders in the Great Cobar Ltd. (N.S.W.) has apparently reached the breaking-point, as at an informal meeting held in London last week the manner of working the property was condemned and a committee appointed to devise means of effecting a change in the directorate. How strong is the dissatisfied section yet remains to be seen. According to advices, the quarterly return to 30th September shows that £164,000 was realised at an expenditure of £146,000. The return for the previous six months was £261,267, and expenditure £215,121. Altogether, considering the magnitude of the company, it has made a very sorry showing since its inception in 1906. In the following year the confidence of shareholders was won with a dividend (the only one the company has paid) of 15s. per share, the price of which soared to over £12. The debenture debt is the chief source of worry. All things considered, it is not to be wondered at that shareholders are dissatisfied, and the outcome of the present move will be awaited with interest.

According to Mr. Jaquet, Chief Inspector of Mines, the copper-silver-lead-zinc find near Hall's Peak, Hillgrove (N.S.W.), is a very promising one. Mr. Jaquet directs attention to the fact that he reported on a find in the same locality in 1896 (that of a man named Keys), took samples which assayed in round figures 40 per cent. copper and 10 oz. silver per ton. Mr. Jaquet complains that the development of the field is being seriously retarded for want of a proper approach. According to his description, the field is practically inaccessible, but this disadvantage is one which may ultimately find many compensations. For instance, he describes the situation of the lodes in relation to a precipice from which the ore could be opened up, and afterwards cheaply worked by gravitation, an abundance of water being available in the Chandler River below. It is hard to appreciate why, in the face of a discovery such as that made by Keys seventeen years ago, this locality should have remained neglected ever since.

---

## OIL NOTES.

A report issued by Mr. Gibb Maitland, the West Australian Government Geologist, in reply to Mr. G. D. Meudell's pamphlet "Petroleum in Australia," published by the Australian Oil Wells Company, gives little reason for hoping that any discoveries of the kind will be made in that State. Mr. Gibb Maitland states that over 110 bores have been put down in the sedimentary rocks, which form a relatively narrow fringe in the maritime districts from Eucla to Wyndham. In the Kimberley district there are nine bores, in the north-west twenty-four, in the south-west 47, and in the Eucla division nine, without any trace whatever of oil being found. These are the only districts of the State in which petroleum can occur, if such exists, of which, at the present time, there is no evidence. Belief in the occurrence of oil-bearing rocks at Albany led, in 1906, to the formation of the Princess Royal Harbour Mineral Oil Co., and an application for State aid in boring operations. At the time he inspected the harbour and its surroundings, and submitted a report and a geological map to the Government. This report showed the harbour to be everywhere underlaid by granite and allied rocks, which were met with in two of the bores put down by the Mineral Oil Co., at 46 and 48 feet. Low ground around the harbour had also been pierced by bore holes, and in every case the floor was of crystalline rocks, the greatest depth being at 234ft. There was nothing to in any way indicate the occurrence of mineral oil.

Representatives of the Australian Oil Wells Company have been negotiating with private owners in the south-east of South Australia to secure options over prospective oil-bearing areas. Some owners object to tie up their land for 30 years, although they are willing to grant plenary rights if the company will start boring operations right away. This the company will not undertake to do. The advent of any syndicate prepared to sink two or three bores would be welcomed. The chairman of the Millicent district council (Mr. M. White) has been approached by the company for an option, but he has written to the Premier (Mr. A. H. Peake), and Messrs. Bodey and Angus, urging them to induce the Government to test the south-east.

The Mining Bureau of California announces that the State Mineralogist, Mr. F. McN. Hamilton, has commenced the preparation of an exhaustive special report, which will cover the petroleum industry of California "from every angle," giving particular attention to its geology, occurrence, production, transportation, refining and uses. The completed work will give full information upon every known occurrence of oil in the State; data concerning methods, costs and results of drilling, pumping, cementing and storage; transportation cost by rail, ships and pipe lines; capacity of pipe lines; future possibilities in regard to the refining of crude oil, including the manufacturing of gasoline from natural gas, and the conservation and economical use of waste gas. As Mr. Hamilton published an extensive report (430 pages) on Petroleum in Southern California so recently as February of this year, his Government evidently takes the industry very much to heart.

---

## DIVIDENDS.

The following dividends and bonuses of mining companies in Australia have been declared, and are payable on the dates noted:—

December.

4th.—North Bendigo G.M. Co., Bendigo (V.), 6d., £600.

4th.—Carlisle North Garden Gully G.M. Co., Ironbark (V.), 6d., £900.

4th.—Central Red, White and Blue G.M. Co., Bendigo (V.), 2s., £3200.

4th.—Talisman Consolidated Ltd., Karangahake (N.Z.), 1s. 9d., free of taxes. £30,187.

5th.—Edna May G.M. Co., Westons (W.A.), 1s., and bonus 1s., £4285.

6th.—Vulcan Tin M. Co., Irvinebank (Q.), 3d., £500.

8th.—British Broken Hill Propty. Co. (N.S.W.), 3s., £56,250.

9th.—South Berry G.M. Co., Creswick (V.), 6d., £750.

12th.—Black Range G.M. Co. (W.A.), 1s., £3625.

15th.—Oswald's Gold Mines, Maldon (V.), 1s., and bonus 1s., £2500.

15th.—Mt. Lyell M. and R. Co. (T.), 1s. 3d., £80,424.

17th.—Broken Hill Propty. Block 10 (N.S.W.), 1s. and bonus 3s., £20,000.

18th.—Ajax Central Co., Daylesford (V.), 2s., £3000.

19th.—North Broken Hill S.M. Co. (N.S.W.), 2s., £60,000.

19th.—Tongkah Compound, Siam, 1s. and bonus 1s., £5000.

19th.—Great Boulder Proprietary, Kalgoorlie (W.A.), 9d., £5625.

19th.—Broken Hill South S.M. Co., Broken Hill (N.S.W.), 8s., £80,000.

20th.—Sons of Gwalia Ltd., Mt. Leonora (W.A.), 1s., less income tax, £17,500.

22nd.—Hampden Cloncurry Copper Mines (Q.), 2s., £35,000.

22nd.—Mt. Elliott Ltd. (Q.), 5s., less English income tax, £37,500.

29th.—Mt. Bischoff T.M. Co. (T.), 10s., £6000.

29th.—Zinc Corporation, Broken Hill (N.S.W.), 1s. 6d., less English income tax, all shares, £67,400.

30th.—Yuanmi G.M. Co., Mt. Magnet (W.A.), 1s., £17,500.

January, 1914.

6th.—Broken Hill Water Supply (N.S.W.), 1s. 6d. and bonus 6d., £20,000.

15th.—North Mt. Farrell S.L.M. Co. (T.), 6d., £2000.

6th.—Kalgurli G.M. Ltd., Kalgoorlie (W.A.), 4s., less English income tax, £24,000.

# THE COAL MINING INDUSTRY.

## New South Wales.

### Northern District.

(From Our Correspondent.)

Newcastle, Nov. 29.

The miners who are working the afternoon shift in the Maitland district are again complaining that nothing is being done to have the shift abolished. Representatives of the lodges have met in conference, without reference to the Federation, and have sent on to the delegate board a demand that immediate action be taken to "appease the unrest and dissatisfaction that obtains in the district." The only course that the board could suggest, after discussing the matter at the meeting held this week, was to ask for a conference with the colliery proprietors, to consider the question. The Maitland men are dissatisfied at the delay in the hearing of the case by the Wages Board. The facts are that the Pelaw Main men acted in such a way, at the end of last year and the beginning of this, as to cause the death of the joint committee, a body which would have dealt with this and other important questions some months ago, if it had continued its existence. Then, when the Wages Board was set going, the Pelaw Main men were foremost amongst those who caused such trouble that there were several references to the Wages Board to end or prevent strikes. Now, from the same quarter, comes the chief outcry about the delay in the hearing of the case. So far as can be ascertained, the colliery proprietors will not consent to meet the miners in conference about the matter, as it would really mean that they would be consenting to the establishment of a board, or committee, subsidiary to the Wages Board, and taking away from the latter such an important matter as the abolition of the afternoon shift. On the other hand, the men in the Maitland district are getting out of hand, and there are ugly rumours of stoppage of work if their wishes are not met in the matter. Those who know the district well are aware that there is every probability of a strike over this matter, for it appears impossible to get a certain section of the men in the district to listen to reason. On the face of it, it would appear as though they had good cause for complaining of delay in the hearing on the abolition of the shift, but when it is remembered that the men themselves have been chiefly responsible for the delay, public sympathy will not be with them.

The Wages Board has concluded the Stockton Borehole's case, and fixed the hewing rate on the longwall system at 2s 3¾d per ton. The standard rate is 2s. 2½d. for a 4ft seam, with an increase of ½d. for each inch below that height. The seam as now worked is 3ft. 9½ ins., and so the men will get 2s 3¾d per ton. The men met yesterday, and after hearing the officers explain the award they decided to accept it without demur, and to go to work next Monday. The mine has been idle for nearly eight months, and the loss to the men and to the owners of it has been very heavy.

The men have stopped work at Whitburn colliery, because two men who had travelled a special place were asked to widen it out, and refused to do so. The men met to consider the matter, and contended that a place travelled special at the beginning of the quarter should remain so until the end of three months. The proprietors are very much annoyed at the action of the men, for the pit has been idle several times lately, and there have been stoppages at other mines in both the Newcastle and the Maitland districts. When spoken to to-day, several of the proprietors said they would have to consider whether they would go on with the Wages Board on Monday, if this sort of thing was to be continued. The Whitburn men would have to go back to work, and there would have to be some sort of guarantee that there would not be any more stoppages in this way. A special meeting of the men was held, and they have decided to return to work on Monday. This decision is the outcome of advice tendered by the officers of the federation. The men will carry out the instructions of the manager to widen out a special place.

The Coal Dust Commission was in this district on Tuesday and yesterday. Some inspections were made, and on Friday a conference was held, at which there was further discussion of the matter before the commission. Mr. D. A. W. Robertson, the chairman, went to Sydney on Friday afternoon, and the future movements of the commission will be determined after the other members also have gone to the metropolis.

The delegate board of the Colliery Employees' Federation has decided to send another deputation to interview the Minister of Mines on the establishment of a testing station for explosives. The object of the deputation is to urge the founding of such a station as soon as possible.

The Colliery Employees' Federation has declared itself in accord with the aims and objects of the Labour Federation of Australasia. At the meeting of the delegate board this week, it was stated that 50,000 unionists were already identified with the federation, and that shortly it would embody the whole of the unionists in the Commonwealth.

The report of the Scottish-Australian Mining Company for the half-year ended the 30th June states that the sales of coal from the company's collieries during that period amounted to 128,996 tons. The state of the Australian coal trade for the period under review had been good in respect of the demand for the mineral, but the cost of winning the coal continues to increase, but it is still impossible for the company to obtain sufficient labour to work its collieries up to their full capacity. The labour position remains uneasy, and gives cause for anxiety. Although no general strike had occurred, there had been intermittent stoppages at the company's and at other collieries. One of the company's pits, Lambton B, was laid idle by the men in March last, and had not resumed work until October 20th.

### Western District.

(From Our Correspondent.)

Lithgow, Nov. 29.

Unfortunately, the colliery managers of the Lithgow Valley have not yet got rid of the railway truck shortage trouble. The manager of the Oakey Park colliery complains that on the 26th inst. the mine lost a day's work through trucks not arriving at the mine in time. He was informed by the railway authorities that a good supply would be run into the colliery siding at 6.30 a.m., but they did not arrive until 8 o'clock, by which hour the miners had returned to their homes. Sufficient trucks were then brought in to contain the whole of the coal that would have been won during the day, but owing to their lateness a considerable loss was suffered by both the miners and the company.

### Southern District.

(From Our Correspondent.)

Wollongong, Nov 29.

Brisk conditions of the coal trade continue; one of the current troubles is the difficulty in getting wheelers, which is rather surprising, considering the pay which the lads earn at it. The lack of wheelers was responsible for a short strike at South Clifton tunnel during the week, as the miners called upon to wheel often got dissatisfied and stopped work. The management have the right to call a miner to wheel, but it is contended that there should be a sufficient number of wheelers. The scarcity is being put forward at the Wages Board's hearing of the claim for increases, by which the wages of a wheeler of 18 years would be 10s. per shift.

The multiplicity of awards affecting the same crafts was exemplified at the Wages Board sitting to-day. The Board began to deal with the claims of colliery mechanics, and a representative of the Amalgamated Society of Engineers appeared as advocate for the employees. The blacksmiths' society had a representative there, and a distinct set of claims in, and wanted to be dealt with as distinct. The other representative claimed to have been accredited by the Iron Trades Federation as the representative at this board of all crafts. The chairman said that employees' claims as craftsmen had been dealt with by various boards, and probably the last word had been said on the subject; there could not be two representatives, he said, and they had to settle between themselves which would stand down.

Mr. P. Bowling, after his defeat at the extraordinary election of officials of the Miners' Association, was nominated for the presidency at the annual election which takes place in a fortnight. He had a project for getting that office made the salaried one, thereby, in the event of his election, becoming once more a Labor leader. However, he has since seen fit to withdraw his nomination, and he is at present working as a surface hand at the Balmain colliery.

Queensland mining fields are a good market for the coke product of this district, but the colliery proprietaries there have long been trying to make a coke which would secure this trade for them. Recently a quantity of coal from the Blair Athol company's seam was sent for trial to the B.H.P. coke ovens at Bellambi, but the product was of a quality which would not do for the trade. The Blair Athol company's report states that the unsatisfactory result was due to the class of oven.

The people of Robertson district are setting about the development of the local coal seams with much spirit. An executive committee appointed by the Progress Association has been collecting funds, and the response has been sufficiently good to admit of a start being made. A couple of experienced miners are to be engaged to prospect the outcrop and determine the best point at which to open out. As is usual in all such enterprises, the Government is to be asked for help. Some years ago the Dapto people wanted the department to put down a bore on the coal there, but the department's reply was that it does not participate in coal prospecting enterprises.

## Victoria.

### Powlett River District.

(From Our Wonthaggi Correspondent.)

Trouble has arisen again between the management of the State coal mine and the wheelers, with the result that the miners may be drawn into it. On Wednesday three of the wheelers went on as usual to work in the No. 8 section, and the deputy made an inspection of the roads, coming to the conclusion that one was too wet and unsafe to work in. He told the wheelers this, and also said that as there was not sufficient work for the three, one would have to go home for the shift. They could decide between themselves which this should be. The wheelers then complained that the other roads were wet and dangerous and declined to work in them. They went home, and one of the under-managers requested the assistant-platman to go on wheeling. This he refused to do, as he considered it was against union principles to go into a place in dispute. The outcome of this was that the mine manager decided that the wheelers and assistant-platman should be put on the night shift. When this decision was made known, the wheelers would not go to work. The union officials pointed out to them in strong terms the seriousness of their action. If they stopped the pit it meant that a breach of the agreement was being committed, and Mr. Broome, general manager, would refuse to meet the executive officers of the union to discuss the trouble whilst the mine was idle. This, however, had no effect on the wheelers, and they adhered to their decision. On the following morning they held a meeting and decided to resume work, so that Mr. Broome could deal with the matter. They claimed that they were asked to wheel in all roads in No. 8 and did not inform their executive officers that the deputy had stopped them from working in a place which he considered unsafe. At a conference on Saturday the facts came out, and were not contradicted by the wheelers, but they maintained that the other roads were unsafe. The union officials also claimed that the assistant-platman had not been treated fairly in being penalised for refusing to work in a place in dispute. They were then informed that the assistant-platman's place was finished owing to the men having been taken from the section, and that by putting him on night shift another place had been found for him. At the conclusion of the discussion, Mr. Broome said there were one or two serious aspects of the case to be considered, and promised to give his decision an hour or two later. This he did, and it was to the effect that after inspecting the roads he saw no reason for the wheelers refusing to work on them. The assistant-platman should have complied with the orders of the under-manager, and by not doing so had committed a breach of the special rules of the colliery. The stopping of the mine made the matter serious, and as similar occurrences had happened before, disciplinary measures were necessary to prevent its recurrence. The wheelers by their action had broken their contracts, which were liable to be terminated, and he desired the wheelers to show cause why this should not be done. The wheelers would work on shift rates for the present, and the three who caused the trouble would go on night shift on Sunday night. He would be prepared to meet representatives of the wheelers on Monday to deal with the contracts. A special meeting was held on Sunday, at which the reply was discussed for over three hours. The action of the wheelers in stopping the mine was condemned in strong terms, as also was the action of the management in penalising a man for refusing to work in a place in dispute. That the roads were not in proper order was supported by Mr. Mathieson, district president of the V.C.M.A. Mr. Murphy, general secretary, said that an understanding should be arrived at with the management in reference to sending men into disputed places. Men would not do it, neither would he, to be called blacklegs. They should observe the agreement they were working under, or else break it openly and honourably. A number of those present said the responsibility of observing the agreement was thrown on the men. The management had not observed it and had altered the conditions of work since it was signed. They considered a loophole had been provided by which the agreement could be broken, and this idea found favour with a great many. A motion was eventually carried by a small majority, that the wheelers concerned take out their tokens on Sunday night, and that the union look further into the matter. The president, Mr. J. Hasson, said that the wheelers, in face of the advice given them by the executive officers, had taken a serious action in stopping the pit. If their case had been as good as they said it was, there was no necessity for them to have done so, as the union would have taken it up. In future he would be up against such actions. They had a set of rules, and when members ceased to obey them and brought about serious trouble, as in this instance, it was time they dealt with somebody. Drastic action would have to be met by drastic action. The organisation should occupy a dignified position and not be made a laughing stock of by irresponsibles. The wheelers were dissatisfied with the motion, but decided to go to work until the result of Monday's conference was made known. There appears to be little doubt that unless Mr. Broome modifies his decision the wheelers will again cease work.

## TASMANIAN MINING.

### Mount Lyell District.

(From Our Correspondent.)

Queenstown, Nov. 21.

The heavy downpour of rain last week—8½in. in three consecutive days—brought about a big soakage of surface water into the underground workings of the North Lyell mine. At the 1100ft. level the water beat the electrical pumps, and rose 5ft. on the plat, with the result that baling had to be resorted to for a couple of shifts from Friday to Saturday last, and during this time the hoisting of ore had to be suspended.

At the Mt. Lyell mine, where 530 points of rain fell in 24 hours, the abnormal precipitation did not cause any trouble underground, and the usual daily output of 800 tons has been maintained.

Three furnaces continue in constant operation at the Reduction Works, and the fact that the converter plant has been running pretty well full time indicates that the smelters are producing a satisfactory tonnage of first matte.

Another interruption to operations was caused by the partial breakdown of the power transmission line from Queenstown, but everything is again in working order; and since Monday the outputting of ore has been proceeding on usual lines. The short stoppage is not likely to interfere to any appreciable extent with the normal production, and the output for the current month is expected to reach nearly, if not quite, 10,000 tons.

The official report of the Mount Lyell Co., to be submitted to shareholders on the 28th inst., will, no doubt, be regarded as of a highly satisfactory character, especially as far as concerns the North Lyell mine, which is practically the ''king pin'' of the company's operations. The quantity of ore standing in the North Lyell mine on September 30 last shows that there is 1,086,112 tons of 6 per cent. material actually available for extraction, and this tonnage is, of course, exclusive of any ore existing below the 1100ft. level, and also of the ore which is comprised within the extension of the North Lyell ore bodies into the Comstock lease, and of which it is not yet possible to arrive at any accurate estimate as to tonnage. The quantity of ore standing in the mine at the end of March last was 1,078,384 tons, but a re-estimate shows an accession of 44,067 tons on the previous estimate, from which 36,594 tons extracted during the half-year closing on September 30 has to be deducted. On these figures, therefore, there was 7473 tons more ore in the North Lyell mine on September 30 last than there was on March 31 last six months previous, and this after allowing for 36,594 tons taken out during the half-year.

The output of the mine for the six months under review, although very gratifying under the circumstances, was, of course, a long way below the normal, which, under ordinary conditions, is about 60,000 tons or 120,000 tons a year, but as these conditions have now been regained, it is practically certain that the current half-year will see a restoration of the standard output. Taking, then, the tonnage of ore in reserve on September 30 last and estimating the annual extraction at 120,000 tons, there is at the present date enough ore actually in sight in the North Lyell mine to maintain this output for the next nine years. As to the quantity of ore which it is absolutely certain exists in the mine (taking in that extending into the Comstock lease), but which is not regarded as being actually in sight, it is, of course, not possible to form any accurate estimate, but that it amounts to many thousands of tons ''there is no shadow of doubt, no possible doubt whatever.'' And a mine that has nine years' life actually assured on such a profit-earning basis as that possessed by the North Lyell, and possessing also such great prospective possibilities of increasing this period, may fairly be said to hold out the glad hand of numerous dividends to the shareholders in the company which owns it.

In the case of the Mount Lyell mine, the quantity of ore standing on September 30 last is given as 2,202,335 tons, this being exclusive of the ore in the South Lyell mine, which is not taken into calculation, owing to the fact that it is not yet sufficiently developed to allow of an estimate being made on the similar position and definite bases to those customary in the case of the North Lyell or Mount Lyell mine. Dealing, however, with the ore in the Mount Lyell mine alone, the present and prospective standard output may be put at 5000 tons a week, or, roughly, 250,000 tons a year, and on these figures there is enough ore in sight to maintain the present output for another nine years, giving the mine practically the same assured duration as that of the North Lyell mine. And a company which operates on such extensive lines as the Mount Lyell does, and owns and controls two such properties as the North Lyell and Mount Lyell mines along with profitable contingent industries, is necessarily a most important contributing factor to the prosperity, not only of the West Coast portion of Tasmania, but to the whole of the State. Incidentally, it is also a very handy company to own a few hundred shares in.

Operations at the Tasman and Crown Lyell are proceeding on a small scale, but no important developments appear to be occurring. Presumably, the management is ''going easy'' until the erection of the proposed flotation treatment plant is decided on. Perhaps!

## WESTERN AUSTRALIAN MINING.

(From Our Correspondent.)

Kalgoorlie, Nov. 24.

Chaffers reconstruction has gone through with an issue of 463,828 shares in London and 137,650 in Adelaide, a total issue of 601,478. The 1/- call brought in £30,074, from which has to be deducted £3500 for commission, and £1000 for preliminary expenses, leaving a net balance of £25,500 working capital. This is not much to cover development and a new treatment plant. On the 148,522 unissued shares, Messrs. Lionel Robinson, Clark and Co. have an option for three years at 4s. apiece. In addition, there is a liability of 6d. on the issued shares. So far as recent developments are concerned, the No. 3 lode was met in the main west crosscut at 376ft., where it was unpayable. Ot 427ft. west the west branch of No. 3 lode was penetrated, and has been driven on south for a distance of 176ft., the ore averaging 116s. 6d. per ton for the width of the drive. The face is 50ft. from the Star boundary. At 529ft. west No. 4 lode was cut, and has been driven on north for a distance of 60ft. in low grade ore. This drive has still 30ft. to go to connect with the south drive, which started at a point 567ft. west in the west crosscut 319ft. north of the shaft. In this drive the lode for the 326ft. driven averaged 29s. per ton for the width of the drive. At No. 15 level the main west crosscut penetrated 30in. of ore, assaying 26s. 9d. at 117½ft., and 10ft. of ore, assaying 25s. 6d. per ton, at 367ft. This is probably No. 3 lode, which was cut at 376ft. at No. 16 level. When Mr. John Morgan reported on the mine on March 31, 1912, he estimated the ore reserves at 74,900 tons, of an assay value of 30s. 5d. per ton, of which 52,400 tons were in No. 1 lode. This is the Boulder boundary lode, known in the Horseshoe as No. 4, in which the rich developments at 2630ft. and 2780ft. have been recorded during the last two years. So far as Chaffers has tested it, this lode is unpayable below No. 15 level.

Local shareholders in Edna May scrip are relieved at the cutting of the reef at the 150ft. level, 40ft. below where it was cut in the winze before Mr. M. T. Williams took charge on March 1. The fact that an 18in. granite bar was cut in the shaft at 124ft., in the south crosscut at 134ft., and is showing in the present face of the drive at 145ft., entirely disproves Mr. A. E. Morgan's contention that there was no granite within half a mile of the Edna May. No one can foretell definitely whether the granite will, or will not, eventually interfere with, or cut off, the reef at a depth, as it has done on the adjoining Greenfinch on the west, and holders of scrip have this eventuality still to face. Mr. Morgan, in a press interview, in a Perth daily, states it as his opinion that the Edna May Central is a more valuable property than the Edna May. He bases his contention on the fact that the ore-shoot is 500ft. long, against 250ft. on the Edna May, and that there are 4 winzes below the 70ft. level varying from 25 to 50ft. deep, against one of 40ft. deep on the Edna May. The Edna May will take a lot of beating, so far.

The Fenian, at Meekatharra, had a bumper crushing in October, when 3327 tons were treated for a return of £10,596, and a profit of £5800. This brings up the total output since 1904 to £436,000, from 110,000 tons, and the dividends to £176,000. The mine is now equipped with two Kynoch gas engines of 165h.p. each, driven by a Commonwealth down-draught wood gas generator, 20-head mill, cyanide plant, etc. The lode is now being opened up at No. 7 and No. 8 levels, where very high values have been encountered. The ore reserves are estimated at two years' supply on present capacity of mill. Since August, the mine has been in charge of Mr. E. Bails, who succeeded Mr. R. G. Prior. Adjoining the Fenian on the south is the Marmont, which is producing £1500 a month from 600 tons, and adjoining on the north is the Ingliston Consols, whose monthly output is £3900 from 1950 tons. On the west of the Consols is the Queen of the Hills, belonging to the Lake View and Oroya Exploration Co. Last month this mine produced £5900 from 3400 tons, for a profit of £2400. On the north-east is the Ingliston Extended, with a monthly output of £1700 from 450 tons. Still further north is the Commodore, producing £1750 from 850 tons monthly, for a profit of £700. In addition to these there are several other smaller mines, which bring up the monthly production of Meekatharra to £30,000. It is expected that the monthly output early next year will be advanced to £40,000. Although Meekatharra has been known since 1898, no capital was introduced till the Ingliston Extended was floated in London in 1904. Owing to its being a comparative failure, the district was left to the working mine-owner till 1910, when B. M. and Co. acquired the Queen of the Hills, on the recommendation of Dr. Malcolm MacLaren. About the same time, the Commodore was floated in Adelaide, while the Halcyon was taken on option by the Star Exploration Co., and the Ingliston United by Messrs. Lionel Robinson, Clark and Co., but neither option was exercised. In 1912 the Marmont was placed under option to the Great Fingall Co. for £30,000, but the option was abandoned in January, 1913. As rich developments have recently been recorded in several properties over an area two miles long, attention is again being attracted to the district, which is reckoned by many to be the most promising area next to the Golden Mile.

## NEW ZEALAND MINING.

The Waihi G.M. Co., during the interval between September 27th and October 22nd (3 days less than four weeks), crushed 14,732 tons of stone for a yield of about 5989 fine oz., the value being £25,439. The September yield (four full weeks) was 6181 fine oz., value £26,254, from only 14,367 tons. The output for the 10 months has been 64,811 fine oz., value £275,299, from 154,657 tons. The total gold produced to date has been 90,523 fine oz., the value being £10,384,516. Dividends and bonuses have amounted to £4,557,411.

During October the Talisman Consolidated G.M. Co. crushed 4400 tons for a return of about 5230 fine oz., the value of which was £22.214. In October last year only 12 days' crushing was done, the yield being 4395 fine oz., worth £18,668. The total gold recovered to date has been 493,609 fine oz., the value being £2,096,716. The total dividends and bonuses since reconstruction have amounted to £849,097 (including that payable on December 4th).

The conditions of affairs with regard to the Thames Deep Levels remains unchanged, the only work in hand being that of keeping the shaft clear of water. During the last week or two there has been a gradual decrease in the volume of water to be contended with, and the speed of the pumping engine has now been reduced to 12 revolutions, which is found sufficient to keep the water clear. No further attempt has been made to inspect the underground workings, and the blower is still idle, so as to conserve the coal on hand for actual pumping operations, for which there is a sufficient supply to last for several weeks.

The production of the Consolidated Goldfields of New Zealand, Greymouth, for October, was as follows:—

Progress mine crushed 3370 tons, yielding 665 oz. 17 dwt. of bullion, valued at £2749 7s. 9d.; cyanided 240 tons, yielding 293 oz. 7 dwt., valued at £997 1s. 4d. The estimated value of sulphurets produced is £415. Blackwater mine crushed 3892 tons, yielding 1471 oz. 17 dwt. of bullion, valued at £6046 2s. 9d.; cyanided 2154 tons, yielding 259 oz. 11 dwt., valued at £895 9s. 4d. The estimated value of sulphurets is £456. Wealth of Nations mine crushed 2220 tons, yielding 610 oz. 11 dwt. of bullion, valued at £2496; cyanided 1400 tons, yielding 254 oz. 12 dwt., valued at £858 4s. 4d. The estimated value of sulphurets is £53.

A find of rich alluvial gold, about three miles from Ophir township, is reported to have occurred early in this month. The gold is of a rough nature, and several pieces weighing a few dwt. have been obtained. The locality was, in the early days of the goldfields, famous for rich patches of gold-bearing wash, but the difficulty of bringing in water has always been a bar to the systematic working of the field.

The gold returns from the various mines in the Auckland Province during the past month totalled £77,647. Of this amount £72,781 came from Ohinemuri. Compared with the return for the previous month, the present figures show an increase of £3836. In October of last year bullion valued at £29.019 was obtained from the mines of the province, therefore the yield for the past month, as compared with the same month of 1912, is greater by £48,628, but the Waihi strike troubles were accountable for the poor returns last year.

# OUR BIG MINES.

## Examinations of their Yearly and Half-Yearly Reports.

(By a Mining Accountant.)

### Mount Lyell Mining and Railway Co. Ltd.

Report for Half year ending September 30, 1913.

While the results for this period are too abnormal to be accepted as a guide, the report is interesting because of the strides that have been made toward standard conditions. Already a return to the dividend list has been accomplished since the close of the half year, and before long the mine and smelter output should grow to its previous dimensions. **The company deserves a run of luck.**

Underground operations were of an active and **useful nature, in preparation for continuous production.** At the Mt. Lyell mine, both surface excavation and the underground breaking of pyrites proceeded without interruption, the total tonnage being nearly twice that of the preceding period. The **grade of pyrites is gradually becoming poorer in** metal contents. No new development work was done during the period, such being deemed unnecessary. This continued lack of activity in this direction, for a long time past, suggests that the boundaries of the deposit are fairly well known to the **management. Such, of course, has not been admitted** to be a fact, but the report states that the dead work required to fully open up the orebody, according to the original scheme of underground extraction, may be said to have been completed. At the South Mt. Lyell, the pyrites mass, which is separate from that of the Mt. Lyell, is now being worked as one with the latter, the material broken being delivered to the inclined shaft, which goes to the surface at the Mt. Lyell mine. Early in the half year the drive from the No. 8 level of the Mt. Lyell mine connected with a stope at the 600ft. level of the South Mt. Lyell, and it is interesting to note that the condition of the stope was found to be excellent in all respects, though the workings had been closed and under water for ten years. In addition, the connecting of the old South Lyell shaft, which goes to the surface, with the main tunnel at No. 5 level of the Mt. Lyell mine, was carried out, and the conversion of the shaft itself into a mullock pass, for the supply of filling material from the surface, was partly completed. The South Mt. Lyell is now nearing the producing stage, and with the Mt. Lyell mine in scheduled condition these two should be able to supply a large output of pyrites. The pyrites of the South Mt. Lyell is of lower grade, in copper, gold, and silver, than the pyrites of the Mt. Lyell mine. Whether the pyrites should be termed ore is an interesting question; **there is much to be said for regarding it** merely as a flux for the rich silicious ore of that remarkable mine, the North Mt. Lyell.

This mine, the famous North Lyell, is now almost back to standard conditions, after the disastrous fire that was accompanied by so much loss of human life. At the instance of the State Mines Department, **on the score of providing an auxiliary exit,** connection was made at the 1000ft. level with the Mt. Lyell Blocks mine. Ore production is proceeding apace, and the return of the old rich 6 per cent. copper ore must be keenly appreciated by all concerned. That the orebody is making toward the recently purchased Mt. Lyell Comstock is evidenced by the manager's report, which states that the No. 22 stope at the 850ft. level is within 5ft. of the Comstock boundary, and that the stopes on the 1000ft. and 1100ft. levels have approached within 70ft. and 40ft. respectively. Later advices record that the No. 22 stope is now well over the boundary, and going strong. The purchase of the **Comstock may thus mean a lot to the future welfare of the company.**

In addition to the prospects afforded by the developments at the North Mt. Lyell, the Comstock mine has an orebody about a mile, in a direct line, north of the North Mt. Lyell. The work done here by the old company has been dealt with in previous reports. The ore from these workings is also silicious, **but not as silicious as that of the** North Mt. Lyell, and only about half as rich in metal contents. During the cessation of operations at the North Mt. Lyell, this ore was treated in the furnaces. But the report under review states that **under present conditions of mining and smelting,** the ore cannot be profitably treated. So that the future of these workings would appear to depend on successful concentration by milling methods. **Meanwhile the mine is being worked only on a small scale, with the view of obtaining reliable in**formation as to the quantity and quality of the ore reserves. Steps are also being taken to ascertain whether any appreciable quantity of the ore can be mined by open cut. If this be demonstrated as practicable, it will have an important bearing on the future working of this property.

The Lyell Tharsis mine supplied a small quantity of metal-bearing flux, but when the North Mt. Lyell ore again became available work on the Tharsis was stopped. The Chester mine in the **North Pieman district was worked for the usual** supply of pyrites for acid making at the Yarraville and Port Adelaide chemical works. "The available higher-grade ore in this property has now been worked out." Meaning doubtless, the higher-grade ore that once was available. Consequently, the shipment of pyrites has been suspended. **The possibility of concentrating the lower-grade ore is being investigated.**

During the period the company has been busy acquiring fresh interests. The Crown Lyell lease, which adjoins both the North Mt. Lyell and the Comstock leases on the west, has been purchased **at a total cost of £2840. This property offers faci**lities for the further development and working of **the North Lyell ore bodies below the present workings. The leases owned by the Copper Mines of Mt. Lyell West (70 acres) and by the North Prince** Lyell Company (10 acres) have also been acquired.

Details of the underground history are to be **found in the following table:—**

Table A.—Output of Metal-bearing Material.

| | Half-year Ended<br>Sept., 1912.<br>Tons. | <br>March, 1913.<br>Tons. | <br>Sept., 1912.<br>Tons. |
|---|---|---|---|
| Mt. Lyell ore— | | | |
| Open cut | 21,523 | 7,364 | 15,392 |
| Underground | 74,724 | 48,953 | 74,269 |
| | 96,247 | 56,317 | 89,661 |
| South Mt. Lyell ore | — | — | 2,398 |
| North Mt. Lyell ore | 58,768 | 5,368 | 36,339 |
| **Nth. Mt. Lyell precipitate** | 145 | 116 | 255 |
| Mt. Lyell Comstock ore .. .. .. .. .. .. | — | 3,757 | 8,357 |
| **Lyell Tharsis Flux..** | 83 | 21,242 | 3,394 |
| **Total tons (dry) ..** | 155,243 | 86,800 | 140,404 |

**Included in the 255 tons of copper precipitate from the North Mt. Lyell mine is 109 tons, representing the metal (16 tons of copper) precipitated** by the steel and ironwork, etc., out of the water **with which the mine was flooded. The precipitate from the usual mine flow was 146 tons, containing** 63 tons of copper.

One of the chief features of the report is the table of ore reserves. These have been re-estimated at the hand of specially obtained data. The figures, as at September 30, are as follow:

Table B.—Ore Reserves.

| | Tons. Dry. | Average Assay.<br>Cop. p.c. | <br>Silver. oz. | <br>Gold. oz. |
|---|---|---|---|---|
| **Mt. Lyell mine—** | | | | |
| **Available for open-cut extraction ..** | 408,101 | 0.58 | 1.94 | 0.038 |
| **Available for un**derground extraction | 1,794,234 | 0.52 | 1.97 | 0.025 |
| Total . | 2,202,335 | 0.531 | 1.96 | 0.0275 |
| North Mt. Lyell mine | 1,086,112 | 6.0 | 1.33 | 0.005 |

These are substantially in agreement with its previous estimate. The figures testify to a long life for the two mines. Neither the South Mt. Lyell nor the Lyell Comstock is yet sufficiently de**veloped to make feasible a definite calculation of their reserves of ore. The tests regarding mill concentration of the ore from the Comstock are worthy of notice. The directors state that the bulk tests with the Minerals Separation Process have given gratifying results and demonstrated that the ore is amenable to flotation. The general manager, however, appears to be of the opinion that, though a high recovery of metals can be achieved, the treatment will not be profitable unless the mining costs are low. This may exclude everything except the ore won by opencutting, and opencutting on any large scale is not yet assured at the Comstock. The Minerals Separation process is also** being tried on the low grade ores from the various **mines of this company, and doubtless this, or some modified form of flotation treatment, will eventually play a large part in the operations of the future. Good progress is being made with the Lake Margaret hydro-electric power scheme. To date the work has absorbed £38,000. Contracts have been entered into for the supply of the necessary hydraulic and electrical plant, the various contracts involving a total cost of £64,000. Communication by steam tramway between the reduc**tion works and the power station site is now estab**lished. At the reduction works no improvements were considered necessary, and operations proceeded along their usual lines towards the end of the period. During the half-year the average number of furnaces in continuous running was two and one-third. The blister copper output was greater than that of the preceding period, but of** course it did not reach a normal figure. The details of the input of ore and metal bearing fluxes **to the furnaces are as follows:—**

Table C.—Half-yearly Input to the Furnaces.

| | Dry Weight. Tons. | Average Assay.<br>Copper. p.c. | <br>Silver. Oz. | <br>Gold. Oz. |
|---|---|---|---|---|
| Mt. Lyell Mine (inc. South Lyell)— | | | | |
| Opencut and Underground .. | 93,470 | 0.47 | 1.83 | 0.039 |
| North Mt. Lyell Mine— | | | | |
| Opencut and Underground .. | 35,998 | 5.97 | 1.13 | 0.002 |
| Precipitates.. .. | 257 | 31.64 | 0.32 | Tr. |
| Mt. Lyell Comstock Mine .. .. .. .. | 8,544 | 3.28 | 0.27 | 0.033 |
| | 138,269 | 2.13 | 1.55 | 0.029 |
| Metal-bearing Flux | 4,257 | 1.69 | 0.31 | 0.006 |
| | 142,526 | 2.12 | 1.51 | 0.029 |
| Purchase Ores. .. | 88 | | | |
| Total .. .. .. | 142,614 | | | |

**The metal-bearing flux consisted of 71 tons of** North Lyell quartzite and 4186 tons of Lyell **Tharsis flux. The average grade of the ore was slightly lower than usual, but this fact alone does** not necessarily indicate much of importance. **From the above input to the furnaces the output from the converters was as shown in the third column of the following table. The metal output of the two previous periods is shown in comparison:—**

Table D.—Metal Output.

| | Half-year Ending<br>Sept., 1912. | <br>March, 1913. | <br>Sept., 1913. |
|---|---|---|---|
| Blister copper produced .. .. tons | — | 825 | 2,474 |
| Estimated to contain— | | | |
| Copper .. tons | 3,124 | 813 | 2,442 |
| Silver oz. | 213,285 | 95,283 | 187,097 |
| Gold .. .. .. oz. | 4,316 | 2,260 | 4,050 |

**The average grade of the blister copper produced during the period under review was 98.74 per cent. copper, 75.64 oz. silver, and 1.637 oz. gold. This compares with the average since the year 1903, as follows:—98.78, 82.05, and 2.104 respectively. Thus the blister copper is becoming poorer in gold and silver. The average grade of metal-bearing material fed to the furnaces during that period of years has been 2.44 per cent. copper, 1.81 oz. silver, and 0.043 oz. gold, which is considerably higher than the grade of the 142,526 tons indicated in Table C. During the ten years a total of 3,597,407 tons of this material has been treated by the smelters. The ore reserves approximate to this tonnage, but as the average grade of the reserves is lower in metal contents, the assured future of the mines does not pro**mise to be so profitable as have been the past ten **years. During this latter period £1,770,000 has** been distributed in dividends and bonuses. **Into the bargain, the cost of copper production has been steadily mounting, partly due to higher wages and cost of stores, partly due to the successively lower** copper contents of the ore treated each period. **A detailed consideration of the costs this period is hardly warranted, owing to the exceptional conditions prevailing during the greater part of the half-year.**

**From the foregoing it will be seen that the process of profit reduction has been double-ended.** Nevertheless, the mines should yet give a good ac**count of themselves. And there is a compensating factor that has not yet been considered. This is the profit that the company may reasonably expect from another branch of its operations, the manufacture of superphosphates.** The published accounts **hardly refer to this matter at all. But that this business has grown to a substantial size is indicated by the announcement of the directors that they have decided to amalgamate the company's South Australian interests with those of the Wallaroo Phosphate Co. Ltd. It is intended to form a company, with a capital of £400,000, to be called the Wallaroo Mount Lyell Chemical Works Limited. Final details may be given to the shareholders at the annual meeting fixed for November 28th. In addition to the South Australian interests, the Mt. Lyell Company has chemical work in Victoria and West Australia. The capital valuation of the three chemical works at present stands at £189,168, probably a most conservative figure. Yet, search the report as one may, this is the type of illuminating information to be found concerning them. "The acid and superphosphate works at Yarraville, Port Adelaide, and Fremantle, also call for no particular remarks. They have, as heretofore, supplied all requirements." The output, the cost, and the profit are kept profound secrets. The working account contains no debit to Chemical Works Account, nor is there any mention of such in the profit and loss account. The former account is credited by a compounded item: "By blister copper and chemical works accounts, £246,392." The credit to blister copper account may be independently at**tempted on the following data, supplied by the di**rectors:—"At 31st March last, 559 tons of copper on hand, unsold, were taken into that half-year's accounts at £60 per ton. This copper was sold at** an average price of £70 2s. 8d. In addition to these sales, 1527 tons have been sold at an average price of £73 5s. 3d., leaving 915 tons unsold at 30th September, which have again been taken into account at £60 per ton." This financial information is so explicit as to almost excite suspicion. It will be noticed that there is no mention of the gold and silver contents of the copper, and herein may lie a nasty pitfall for the unwary, or the ill-informed. Those who are not well acquainted with the details of the realisation charges—and doubtless few there are who are so acquainted—must of necessity be content, at best, to belong to the latter class. Freight and charges on copper are stated in the working account at £19,292, equal to nearly £8 per ton of copper produced during the period. This £8 may be the gross charge, or it may be net after the deduction of certain amounts of copper, gold and silver. Taking the former alternative as the more probable, the directors' information works out thus:—

| | |
|---|---|
| 559 tons copper at £10 2s. 8d. .. .. | £6,167 |
| 1,527 tons copper at £73 5s. 3d. .. .. .. | 111,872 |
| 915 tons copper at £60 .. .. .. .. .. | 54,900 |
| Total from copper .. .. .. .. .. .. .. | £172,939 |
| Add 187,097 oz. silver at, say, 2s. 3d. .. | 21,048 |
| Add 4,050 oz. gold at 84s. 11½d. (fine) | 17,204 |
| | £211,191 |

This leaves £246,392, less £211,191, equals £35,201 as the credit to chemical works account. This £35,201 cannot be gross revenue, it being either gross or net profit from the superphosphates, according as the profit and loss account does, or does not, contain a debit to chemical works account. But there are too many "ifs" to make any assumption sure. The only certainty about the matter is that shareholders are unable to make a correct valuation of their holdings when such an important feature as this is deliberately obscured. How much of the actual profits from the superphosphates have not been transferred to the published accounts at all is a mystery. Those who do know are given, or perhaps rather take unto themselves, an undue advantage, becoming privileged investors, privileged speculators, as the case may be.

If the foregoing deductions are based on correct assumption, the total profit of £41,943 for the half-year is made up as follows:—

| | |
|---|---|
| From copper production .. .. .. .. .. | £3,245 |
| From railways .. .. .. .. .. .. .. | 3,497 |
| From superphosphates .. .. .. .. .. | 35,201 |
| | £41,943 |

It will be observed that copper production is debited with all the charges in profit and loss account. The reasons for this have been given in previous criticisms of this company's reports. The balance-sheet is not a model by any means. It fails in at least one of the chief functions of a balance-sheet—that is, the indication of the growth or decline of the assets represented. The financial position is exceedingly sound, the liquid assets exceeding the liabilities by £486,489. The following table gives a comparison of the financial results for the last five half-yearly periods:—

Table E.—Financial History.

Part 1.

| | Half-year Ended | | |
|---|---|---|---|
| | Sept., 1911. | March, 1912.* | Sept., 1912. |
| Revenue .. .. .. | £306,331 | £163,694 | £326,689 |
| Expenditure .. .. | 217,437 | 128,106 | 204,442 |
| Written off .. .. | 19,860 | 15,055 | 15,518 |
| Net profit .. .. .. | 69,034 | 20,523 | 106,749 |
| Dividend .. .. .. | 75,000 | — | — |
| Paid capital .. .. | 1,200,000 | 1,200,000 | 1,286,739§ |
| Liquid assets .. | 510,281 | 540,623 | 661,812§ |
| Liabilities.. .. .. | 121,389 | 126,042 | 117,154 |
| Surplus of liquid assets .. .. .. | 388,892 | 420,581 | 544,658 |

Part 2.

| | Half-year Ended | |
|---|---|---|
| | March, 1913. | Sept., 1913. |
| Revenue .. .. .. .. .. .. | £136,809 | £264,775 |
| Expenditure .. .. .. .. .. | 148,508† | 200,576 |
| Written off.. .. .. .. .. .. | 16,273 | 22,256‡ |
| Net profit .. .. .. .. .. .. | 27,972 (=loss) | 41,943 |
| Dividend .. .. .. .. .. .. | — | — |
| Paid capital .. .. .. .. .. | 1,286,786 | 1,286,786 |
| Liquid assets.. .. .. .. .. | 641,800 | 629,486 |
| Liabilities .. .. .. .. .. .. | 147,281 | 142,995 |
| Surplus of liquid assets.. .. | 494,514 | 486,489 |

*Strike during period.

§Premium £21,685.

†Includes £21,283 North Lyell fire expenses.

‡Balance £20,859 of North Lyell fire expenses charged to reserve fund.

---

A dividend of 4s. per share, less English income tax of 1s. 2d. in the £, will be paid by the Kalgurli Gold Mines Ltd. (W.A.) on January 6th.

A dividend of 2s. per share has been declared by the directors of the North Broken Hill S.M. Co., payable on the 19th inst. This distribution will amount to £60,000, bringing the total dividends to date up to £892,940.

# QUEENSLAND MINING.

## North Queensland Fields.

Mareeba, Nov. 19.

The Etheridge goldfield is languishing for the want of water at the present time, and this fact is amplified by the official crushing returns for October, the output of the field being lower than it has ever been before.

"At Kidston, the batteries are hung up on account of a shortage of water, but as soon as rain falls, all (35 head) will be running to their full capacity; in fact, the older hands at Kidston predict that next year is going to be the best known at the Oaks, and are doubtful whether there will be sufficient stamps to crush all the available stone." So says Warden Curtis, after visiting the field.

Mr. Walter Colley, who is in charge of operations for the Chillagoe Co., at Percyville, has nearly completed the erection of a 5-head battery. If rain falls, the battery will be crushing stone for the Union and other mines in a few weeks' time.

During Warden Curtis' visit to the Percyville, he, in company with Mr. L. C. Ball, the assistant Government geologist, journeyed to see a promising copper show known as "Thorn's Find," which is situated about 14 miles from Percyville, near the old Oaks diggings. Mr. Ball expressed a favourable opinion of the find, and considered that it was worthy of more attention than it has yet received.

Work is going on apace at the Ortona copper mine, where Mr. Maxwell Reid is in charge. A new boiler, winch, Holman hoist, mine pump, and a large feed pump have just been landed at the mine, and the management expect to have their machinery in going order early in the new year. At present development work is being carried on in No. 6 shaft, where ten men are engaged, but it is expected to have No. 1 mine at work before the end of the year. Mr. A. Linedale has applied for four additional leases in the neighbourhood.

At the Captain mine, Dry River, driving is being continued both ways at a depth of 200ft. There are about 45 tons of firsts and about 50 tons of seconds at grass, which should average 8 per cent. A drive was started on Monday going towards the General lease, owned by Ledlie, Johnson and Bimrose. The Gibraltar, which adjoins the General and Captain, is down 80ft., and another 45ft. of winzing the shaft should cut the Captain lode. Timbering is now being carried out, and it is expected that sinking will be continued shortly. This mine is owned by Barratt Bros. Stoping is being continued at the Rainbow in the winze. Driving in the crosscut off the tunnel has disclosed 3ft. of good ore. There is about 20 tons of ore in the hopper. The Lovely Nancy is the premier mine at present, and underhand stoping is being continued on a face of highly payable ore. A tribute has been let on the Good Friday lease, and operations were commenced last week. After the shaft has been timbered up, a whip will be installed to cope with the water.

Although it is not generally known, a good deal of tin getting is taking place in the Mt. Molloy district. Mr. Maurice O'Connell is working the Standard claim, and has got good results during the past two years. The claim is situated near Station Creek, and about 12 miles from Molloy, being about midway to Mt. Carbine. A tunnel has been driven about 150ft., and is now in wash from 5 to 7ft. in depth, which will bulk about 4 oz. tin to the dish. The lead is about 300ft. in width, and, so far, it has only been handled in a casual and primitive way. The dirt was wheeled to the mouth of the tunnel and sluiced. An effort is now being made to form a syndicate to work the property on an extensive scale by means of a hydraulic sluicing plant. There is plenty of water available at no distance from the mine, and there is 150ft. of pressure all the year round. A race three-quarters of a mile long has been cut, and 150ft. of fluming erected. The race is in fair condition, and needs little repairing. During the past 12 months, the owner, who has been working single handed, has recovered a fair quantity of tin. In the hands of a syndicate this should be an excellent proposition, as the lead has been proved for a considerable distance. The syndicate will have very few difficulties to contend with, as the mine lends itself eminently to hydraulic sluicing. The property is well worthy of inspection by intending investors.

Advices from Mt. Lewis state that Con. Sullivan has struck a rich patch of alluvial, and is getting from 2 to 5 lb. of tin to the dish. The find is a small dyke of tin bearing ground, 5ft. in width, with a depth of 4ft. of wash. The owner is getting over a bag of tin per week, despite the fact that he has to carry the dirt down a hill to the creek and wash it by means of the dish. Given good water facilities, the owner should do very well out of this claim.

At Sandy Creek, three miles from Mt. Molloy, P. MacNamara has two head of wood stampers to treat stone from the lode he is working. The lode is small, but very rich. It varies in width from 6in. to 18in., but contains about 60 per cent. black tin. He has everything in readiness to start crushing this week.

At Bell's Hill, J. Swallow is getting a little alluvial gold. He is just about making tucker, and has not yet located the main run of the gold. Where he is working is not far from the short track to the Mossman.

## Anakie Field.

(From Our Correspondent.)

Sapphiretown, Nov. 15.

After a very prosperous time for nearly two years, with all classes of stones saleable, there appears at present to be something of a slump in "machine stone"—i.e., low grade or off-coloured sapphires, used for mechanical purposes, and worth about 3s. per oz. The local buyers state that they have been informed by their principals that this is owing to the congestion of this class of stone on the European markets; while some of the miners are inclined to think that the state of affairs has been artificially created by the European buyers. Slumps in machine stone have occurred several times in the history of this field.

Washing operations are still being pursued with great activity here; and, in spite of the greatly increased facilities for treatment, heaps of wash dirt are stacked in many places awaiting treatment.

---

# BARYTES AT MT. MAJOR (V.).

Mr. W. H. Ferguson, of the Geological Survey branch of the Victorian Department of Mines, recently visited Dookie, and made an inspection of the deposit of barytes which outcrops in the neighbourhood. In a report supplied last week to the Minister of Mines, Mr. A. A. Billson, the officer says:—Mount Major is about three miles south of the Dookie township. The railway station at Dookie is 488ft. above sea level, and the mountain is about 800ft. above the township. The mineral, which consists of barium sulphate and calcium sulphate, outcrops 5½ chains north-west of the cairn on Mount Major. It was traced for 86ft. in a direction from east to west and for 70ft. from north to south; but a large lump was noted 2 chains further east, so the deposit may be larger than the appearance of the outcrop suggests. The surface here is covered with rough herbage and the relation of the barytes to the surrounding strata is obscure. It probably occurs as a lode in cherts, but whether the lode has distinct walls, or more nearly resembles the deposits of limonite, etc., which occur irregularly in bands through the cherty rocks, cannot be gathered from the surface appearance. The barytes, as exposed at the surface, is white in colour, even-grained, and massive. A hole about 3ft. long by 2ft. wide and 18in. deep was made, and from this point one ton of the barium ore was obtained. Some of the ore in the hole was more crystallised, but some was inclined to be marly and stained with iron. Previous to this visit Mr. Leech (a representative of the Maltese Cross Colour and Paint Co., Port Melbourne) had seen a sample of the mineral at the Museum, which, on testing, he considered suitable for the manufacture of pigment. This was a white surface sample. It is doubtful if the stained marly material would be useful, but I do not consider that it will be met with all over the deposit as it is sunk upon; it is more likely that, in places, veins of crystalline material will be found. A former assay taken from the surface contained a very small amount of silver; it is possible that some veins may contain more. To ascertain the dimensions and quality of the deposit, I would suggest that trenches 4ft. deep be made across the outcrop in a north and south and in an east and west direction. Should definite walls be met with, the samples should be assayed. On the same range, about half a mile further east, two deep trenches have been made by the department in the cherty iron ore, and considerable masses of limonite are exposed. Closely associated with the limonite there is a good deal of yellow ochre, which Mr. Leech considers will be suitable for pigment manufacture. On the eastern end of Mount Major, about five miles from Dookie, there is an interesting deposit of calcite, crystallised and pure white; this, Mr. Leech considers, will be suitable for whiting manufacture. I understand that the Dry Colour Co. is applying for leases of the barium, ochre and calcite deposits.

The Mt. Major Range consists of a complex of basic igneous rocks, now in the condition of cherts, etc., through which there is a considerable amount of iron ore. The igneous and sedimentary rocks of Dookie closely resemble and are probably of the same age as some of the strata at Heathcote, called "Heathcotian." The igneous rocks of Dookie yield a very rich chocolate-coloured clayey soil.

Samples of the minerals mentioned have been placed in the geological museum, Gisborne-street, Melbourne.

# NEW SOUTH WALES MINING.

## Broken Hill.

(From Our Correspondent.)

Broken Hill, November 28.

After a few weeks of calmness the mines are being subjected to further worry and trouble. The water supply is again the cause of the bother. A man's carelessness on Sunday caused a burst in one of the mains. The water was cut off for a period, but the mines kept going by drawing on their reserves. When the water company's pumps got going again the mines sought to get all the water necessary for daily work and also to even up the reserves. The result was that the city supply was affected. The service reservoir was empty, and as the water ran into the tanks it had to be taken into consumption. The result has been that the water company has decided to cut the water off from the mines and treatment works from midnight to-night. With this drain relieved, the company will be able to fill the service reservoir, and so be able to supply the citizens. Hopes are entertained that the mines will be connected up on Sunday, so they will lose comparatively little time. As things have been all the week the mills have only done partial work; when they restart on Monday they will be able to work on a regular basis.

The end of the year is fast approaching, and the figures for 1913 will be available ere long. They will be very good, heavier than for previous years in every way. Zinc concentrates will show a big advance in quantity, though values have been lower. Amalgamated Zinc, by the way, still calculates its monthly profits on a £22 per ton basis, whereas spelter has been below £21 for quite a while.

The half-yearly meeting of the Junction North Co. was held in Melbourne on Tuesday. The reports of the directors were fairly reassuring on sundry disputed points, but shareholders wanted to know more, and some very pertinent questions were asked. Nowadays directors cannot be too frank. Shareholders have rights, and should be kept *au fait* with what is going on. Of course, certain matters of policy and certain figures a board is entitled to keep to itself, but the broad work of a mine should be given as much publicity as possible. Even the conservative English boards are beginning to recognise this.

The Junction North latest mill return shows well the progress being made with mill work. The figures were:—

Treated.

| | |
|---|---|
| Mine ore | 1928 tons. |
| Purchase ore | 920 tons. |
| Slimes | 1078 tons. |
| Tailings | 198 tons. |
| | 4124 tons. |

Produced.

| | |
|---|---|
| Lead concentrates | 714 tons. |
| Zinc concentrates | 370 tons. |
| Middlings | 225 tons. |
| | 1309 tons. |

This ratio of 3.15 tons to 1 is eminently satisfactory.

The Junction Mill for the past fortnight produced concentrates giving lead, 57.1 per cent.; silver, 25.7 oz.; zinc, 4.6 per cent. The Junction North figures were—Lead, 50.9 per cent.; silver, 22.6 oz.; zinc, 14.6 per cent.

The Junction Mill ratio was 8.78 tons to one.

Latest British figures work out pleasantly. A total of 10,191 tons crudes (for a fortnight) produced—

| | |
|---|---|
| Lead concentrates | 1441 tons. |
| Zinc concentrates | 106 tons. |
| Slimes | 576 tons. |
| Tailings | 7224 tons. |
| | 9347 tons. |

At the No. 11 level the last few feet of the crosscut have been in rhodonite ore, but this may only be an intrusion. Still, a big body of ore, much of it very rich, has been proved.

None of the mines has had much to report this week. Development, in fact, has been decidedly on the dull side, but there has been no check back, and except for the water, nothing to interfere with the rosy atmosphere that surrounds everything.

## Bathurst District.

(From Our Correspondent.)

Bathurst, November 28.

A crushing of 35 tons from McKellar's Reef, near Trunkey, has yielded 60 oz. over the plates, and as the stone carries a fair amount of mineral, no doubt a good bit went in the tailing heap. Owing to a breakdown of the battery, the balance of stone could not be put through. It is a very old plant, and it is high time it was scrapped, and if the Mt. David people exercise their option the mine will no doubt be properly equipped and a modern plant erected on a handy site, as at present the ore has to be carted 3½ miles over a rough bush track, which must tend to take the gilt off the gingerbread.

The small but representative collection of minerals of the district, got together by Mr. Glade for the Bathurst centenary celebrations, was visited by hundreds of people, and was certainly of value from an educational point of view, besides illustrating the variety of ores that are to be found here. His Excellency Sir Gerald Strickland was greatly interested, and to Miss Strickland a presentation was made of a casket containing some choice gold specimens from the Hill End mines. A large block of quartz from the Amalgamated Hill End Co. of the rich mica vein from the 650ft. level was the gem of the collection. The centenary of the discovery of the Bathurst plains by Surveyor General Evans, November, 1813, which opened up the western district of N.S.W., with its vast pastoral and mineral wealth, was a unique occasion. Thousands of people flocked to the city. The weather was perfect, and the financial results were past expectations, and the result will be the erection of a monument worthy of the first white man who viewed and trod upon the "Promised Land."

Land has been taken up for gold at Lockeley on a small mineralised leader, which is said to give high values by assay, but until further opened up, no opinion can be formed of what it will develop into.

Sofala is at a low ebb. The alluvial that remains is too poor to pay, and when the bucket dredge at the Wellaby Rocks works out its ground matters will be worse. The expectation that the Queenslander mine would be put into a large company and employ a lot of labour did not eventuate and has occasioned much disappointment

The Bathurst Brick, Tile and Pottery Co. Ltd., with a capital of £30,000, in shares of £1 each, is being formed to establish works on the Kelso side of the Macquarie River. Strong local support is assured, and the balance of the capital will be subscribed in Sydney. The company have an immense deposit of clay, and experiments made with the material for the manufacture of roofing tiles, show that these can be produced of a quality fully equal to the imported French tiles, whilst the supply is not equal to the demand even at current high prices ruling. The registered office is in Bathurst, and the prospectus is issued for private circulation only.

## Lithgow and District.

(From Our Correspondent.)

Lithgow, November 27.

Word has been received in Lithgow that the Zinc Corporation has definitely decided not to exercise its option over the Sunny Corner Mineral Leases, for the reason, it is stated, that there is not sufficient ore in sight to warrant the erection of the necessary plant wherewith to treat it.

The men about the mine are now employed dismounting the plant, in preparation for a sale of removal of the machinery, etc., and so far as the option-holders are concerned, their operations will cease at the end of the present month, when the obligation of complying with the labour conditions will devolve upon the Sunnyside Syndicate, of London. What the company's intentions are is not known at present. Considerably over £5000 have been spent by the Zinc Corporation, but nothing has been got in return for this expenditure. About 700 tons of ore have been raised, but it is still on the ground, not having been disposed of. There is at present nothing to indicate what the future prospects of the mine are, and further developments are anxiously awaited.

At the Curragh, in the direction of Tuena, Mr. J. Bottrell has erected an aerial tramline from his lease on the top of "The Hill" almost to the river level. It is operating most satisfactorily, and he has started to run 200 loads of wash dirt down to the river for a trial. If it proves payable, it is the intention of the company to continue the tram-line right to the river. Taking samples washed already as a criterion, there can be no question as to its being a good paying proposition. In the opinion of old miners, there is equally as good basalt wash to be had in large quantities in the vicinity. These hills would have been worked years ago, it is declared, but for the difficulty of getting the wash to the river. However, Mr. Bottrell appears to have now solved the problem.

## South Coast.

(From Our Correspondent.)

Wollongong, Nov. 29.

Far South Coast mining news is, of late, principally from Wolumla. A consignment of 2½ tons (C. Momsen's) yielded, at Cockle Creek, at the rate of 4 oz. gold and 8 oz. silver per ton. Chegwidden is working the Eclipse on tribute. Durkin and Biddulph are working on the old Prospectors' Claim. Several who were working here are now trying their luck on the molybdenite at Black Range.

---

# VICTORIAN MINING ACTIVITIES.

## Bendigo and District.

(From Our Correspondent.)

The gold production for the week ended November 29, 1913, amounted to 2880 oz. 8 dwt. The principal producers were Central R., W. and Blue, 260 oz. 10 dwt.; Golden Pyke, 210 oz. 14 dwt.; New Chum Goldfields, 177 oz. 8 dwt.; Ironbark, 169 oz. 8 dwt.; Virginia, 143 oz. 3 dwt.; Great Extended Hustlers, 140 oz. 10 dwt.; North Bendigo, 109 oz. 13 dwt.; Johnson's Reef, 107 oz. Three dividends were announced, aggregating £4695 0s. 6d., viz.:—Central R., W. and Blue, 2s., £3200—total to date, £140,800; Carlisle, 6d., £895 0s. 6d.—total to date, £60,240 6s.; North Bendigo, 6d., £600—total to date, £9000.

Golden Age recently started rising on the Golden Pyke reef at 728ft., the stone having been passed through in crosscutting many years ago. At that time a trial milling yielded 3 dwt. per ton, and the reef, which is somewhat spurry in the crosscut, was abandoned without determining its value overhead. Between this level and 655ft. the formation is intersected by the large fault, known as the bottom slide in the Golden Pyke 643ft. south level and the 543ft. north workings, where the best results have been obtained above it. The Golden Age rise is up 8ft. and probably 25ft. under the slide. Last week's firing disclosed several colours of gold in 3ft. of more consolidated quartz than that traversed in the crosscut. The improvement in the quality of the reef is decidedly encouraging, and better results are anticipated in the vicinity of the faulting. If present prospects are maintained the company will drive south on the reef at this depth, where the fault will be encountered again as it pitches in that direction. At 655ft. the north level should reach the Golden Pyke boundary in a week or two, and as yet nothing of value has been found. As the last milling from the level and stopes yielded a very low average, stoping has been suspended for the present. The south level is opening up quartz of a more promising character, and a trial milling is going through to ascertain its value. At the main shaft the best of the stone has been extracted in the 853ft. south stopes. A couple of stopes are to be kept going above the intermediate level, while a small block of the reef is beaten out below the latter, near the Princess Dagmar boundary. On the Paddy's Gully line the east back of the reef over the 1581ft. crosscut is still in the shaft. As the neck stone at 1581ft., believed to be associated with a new reef, is 19ft. further west than the upper back, the east back of another formation should not be far from the bottom of the shaft.

Johnson's Reef sent in a more favourable report from the No. 3 shaft on the Derby line, having uncovered 2ft. of payable quartz in the 1150ft. north level. The stone represents the continuation of the west leg of the new reef between the 1150ft. and 1225ft. levels, and has been intersected in crosscutting off the old north level at 350ft. from the shaft. The formation was first seen at 1150ft. the main crosscut passing through the neck of quartz, 8ft. to 10ft. wide. As it carried a little gold, a short level was driven north here, but the stone proved of low grade. Later a rise was put up on the west back from 1225ft. and a winze sunk in the neck of the reef to connect the rise. Nothing of interest occurred in the rise till the lava was left behind, when an enrichment of the west leg was found in approaching the cap. This shoot of payable stone, however, proved to be limited in height, the cap being of very low value in breaking over east from the rise. The resources of the east back here were not ascertained, this intermediate crosscut stopping short of the hanging wall. An intermediate level was subsequently started north where the best prospects were seen in the west leg, and a few days since very fair gold was visible after a couple of breakings. This result induced the extension of the north crosscut at 1150ft. With payable stone on the west back at points over 300ft. apart, the outlook on this line has brightened. Levels will be started off the north crosscut before continuing the latter to the east leg. Meanwhile, the main crosscut is being continued to the east back, but may cut it rather low down to reveal much stone. On the old east leg there is profitable stone going under the level, now in course of extension, back to the shaft from a crosscut off the main south level. The Collmann reef, on Paddy's Gully line, is not producing as well as earlier in last month.

Golden Pyke have improved prospects in rising on the outer or tribs' reef, good gold being officially reported near the north boundary last term. This shoot appears to be identical with that followed by the tribs under difficult working conditions in the next property several years ago. The stopes are operating where the stone is smaller and of inferior quality, but should yield better as a greater height is attained. On the main reef there is quartz of excellent quality in stoping north of the No. 1 rise above the 543ft. north level, the reef being also of very fair grade in the stope beyond the No. 3 rise. The former stope appears to be operating in the richer shoot traversed in the latter rise a few months ago, to which is evidently connected with the high grade stone seen in the 447ft. north level a few weeks since. At the latter depth, the formation is small, but still profitable. Both here and at 543ft. the crushing material is expected to increase in width shortly in the south stopes. More gold is visible in the stope going south from the No. 1 rise above 643ft., the improvement being evidently due to the south pitch of the high grade portion of the reef, passed through in rising opposite the shaft. It is expected that the gaining of another stope off this rise will reveal the bottom of the better grade shoot. Near the south rise a little fine gold is visible in the footwall stone.

Great Extended Hustlers stimulated interest in the eastern reefs by uncovered 8ft. of payable quartz with the 1226ft. crosscut. The stone is believed to be connected with the new reef first met in the 1053ft. crosscut and the fault quartz opened up in the syncline fold further north at 1326ft. The development has considerably enhanced the company's prospects. It is proposed to continue the crosscut in search of some auriferous quartz allied to a slide, on which a level is going north at 1326ft. This fault cuts the eastern beds close to the trough, and carries good stone. Below 1053ft. the reef has been followed to a depth of 59ft., the gold-bearing stone, as in the deeper workings, existing in the vicinity of a diagonal fault. On the Little reef further east the 1053ft. north level is in 157ft., showing more gold of late in 6in. to 8in. of bedded quartz. The company have a substantial overdraft to liquidate, but the prospects of wiping off the deficit are more promising than for a considerable time past.

Central Red, White and Blue started an important rise from the 400ft. north level earlier in the month, and are up 44ft. without disclosing payable stone. As the prospects are similar in sinking a winze to meet the rise from 318ft., and operations are within 20ft. of the Little No. 180 boundary, the result has caused some discouragement to shareholders. The winze is something like 180ft. north of the No. 5 winze, where there is still rich stone in the north stope. No change of note has occurred in the other stopes, and at 800ft. the west leg of the cap, showing at the 720ft. plat, has been left behind in the west crosscut, which is being continued to the west back of the 670ft. reef, and no gold has been seen at this depth as yet. The east crosscut should shortly reach the east leg at the 720ft. formation. At 800ft. there is a crosscut going west. Later, levels will be driven north at 800ft. and 880ft. to work both reefs referred to as they pitch in that direction.

New Chum Goldfields look like making a much better showing in working the reef along the east back, and turnover at and below 1076ft. Recent averages have been highly satisfactory, and further remunerative returns are assured for some time, though the standard may not be quite equivalent. Operations are conducted economically and there is a good length of the formation, which is identical with the North Bendigo reef, still intact.

North Bendigo continues to provide 6d. dividends at frequent intervals from the joint reefs at 1100ft. and 913ft. levels. At the former level there is a saddle reef associated with a slidy east back, formed by a strong fault, and above the break there has been an extensive deposition of fault quartz. The latter was first met at the 913ft. plat, and carried good values for some time along the faulting. The lower reef, however, has proved the more consistent producer, with the west leg very prominent in this respect, during the past two months. Over that period an average of more than 11 dwt. per ton has been maintained. The level on this leg is 180ft. from the shaft, with good stone still in the end. At 60ft. ahead there is a crosscut through the cap off a winze from 913ft., and at that point the west leg is smaller, and failed to show much gold. This circumstance recently led to a good deal of scrip being placed on the market. The next place the west leg is visible is at 160ft. further north, and 80ft. nearer the surface; in a crosscut off the 913ft. stopes at 400ft. from the shaft. It is of low value here; but has been only superficially tested. North of this crosscut the saddle reef is intact for a length of about 300ft. This formation has been subjected to the disturbing of a fault in the 160ft. of ground referred to, which has abruptly accelerated the pitch of the reef channel for a short distance. The 913ft. stopes are along the slidy east back to east of the bedded reef, operating in the fault quartz, and fair gold is visible here and there. In stoping off the winze below the 913ft. there is fair quality stone allied to the same back. A lot of the cap stone has been discarded nearer the shaft, which it is now proposed to include in future millings. Recent averages are not likely to be maintained for more than a few weeks, but profitable results should be forthcoming for some time.

## Castlemaine and District.

(From Our Correspondent.)

The Little Nuggety Co., at Campbell's Creek, is making good progress in enlarging the shaft. It has now been cut down and timbered to 90ft. The contractors are making good progress with the poppet legs.

South Wattle Gully contractors are crowding on the hands to erect the plant. The battery boxes and beams are in their places, and part of the battery house has been erected. The boiler is being placed. During the past week, at the 300ft. main level, work was stopped till the battery starts. The drive on the west leg shows a reef 9in. thick, and carries fair gold. This will be stoped on when the battery starts. A crosscut has been commenced west from the main level, 150ft. from the present crosscut, on large spurs. This is to intersect centre country, which should be reached in 40ft. The 350ft. level has been driven 85ft., with a reef in face 10in. wide, showing galena and pyrites. This is reckoned a most important discovery. It is promising-looking stone, and in new country.

Spring Gully reports at latest that much improved prospects have been discovered in the north intermediate level at 200ft. This will be needed, because the tendency for some weeks has been downward, and last week the return got below the payable margin. From various parts of the mine 170 tons were crushed for 38 oz. 19 dwt.

Campbell's Creek bucket dredge had a payable return from the No. 1 plant, 51 oz. 9 dwt. from 139 hours' work. The second plant is still idle through a breakage.

The long-deferred flotation of the company to work the Guildford plateau is at last in sight. The prospectus is available to the public. It is proposed to make it a 60,000 shares company, of which 35,000 are on offer at 1s. on allotment; 16,000, paid up to 7s. 6d., go to the vendors; and 9000 are reserved to provide capital for plant when required. The vendors, in addition to the 16,000 shares, receive £500, which will be applied in underwriting 5000 contributing shares. The legal manager pro tem. is Mr. R. W. Stringer, 31 Queen-street, Melbourne. The prospectus is remarkable for the vision of its promotors. It is intended to acquire, prospect and work the deep lead system extending from Guildford westward to beyond Joyce's Creek, a distance of over 12 miles, underlying the Guildford and Strangways plateau, and following the course of the Loddon river westerly to and beyond the township of Newstead. It will contain in all an area of 5307 acres. It is expected that from 12 to 16 miles of virgin country will be tested for a few thousand pounds. There is a 15ft. x 15ft. shaft 230ft. deep. At most, another 50ft. of sinking should tap the wash by a reef drive of 400ft. It is proposed to take the present shaft to 280ft., and carry a reef drive 300ft. to 500ft. under the deep lead; they will then bore and rise into the wash where the old Plateau Co. is said to have proved 16 dwt. per fathom wash. The vendors—a syndicate—instead of retaining a large portion of the area for future market purposes, have included the whole of it, so that all shareholders will participate in whatever money may be got either from gold won or the disposal of any of the territory to subsidiary companies.

## Maldon.

(From Our Correspondent.)

The champion Maldon mine (Oswald's gold mine) had another splendid month for November, and the prospects continue on an equally high basis. From the battery 395 tons returned 230 oz. 6 dwt.; chlorination, 20 tons, 308 oz. 1 dwt. The gold got by cyaniding 780 tons, unhappily, was stolen by some thieves. The police have been hot in pursuit, but at time of writing there seems no prospect of a recovery of the estimated 100 oz.

---

Work on the Burrenjuck dam (N.S.W.) is proceeding apace. During the past fortnight the wall of the south side of the works has been built up another 12ft., which makes it 60ft. As soon as the south side is completed, operations will be resumed on the north side. It is expected that the gates for the tunnels will be ready for use in about three weeks' time, when the water will be stored another 20ft. It will take at least till Christmas to store this amount of water, provided no further fall of rain takes place in the meantime.

## COPETON DIAMOND MINES (N.S.W.).

(From Our Correspondent.)

Mining operations on the Copeton Diamond Mines are marked with a renewed activity, consequent upon the advanced price paid for the local gems, as won from the diamondiferous wash. These returns are further augmented by the sale of tin oxide inclusions, which are met with in the wash deposit, in such quantities as to form a very important asset. Some writers have published misleading statements concerning Australian diamonds, and when reading these contradictory effusions, one is inclined to think that the writer was describing the gems in a parcel that had undergone a sorting operation—a parcel from which all the best stones had been selected. A glaring case of this misrepresentation is published in a book just to hand, edited by W. R. Cattell, entitled "The Diamond," published by John Lane, London. On page 210 of this book the following words are seen:—"Australian diamonds are usually quite small, and of inferior quality, seldom over [illegible] carat, though a few run up to ¼, and occasionally one is found up to a carat."

To remain silent and to allow these remarks concerning Australian diamonds to pass by unchallenged would exhibit acquiescence in that misleading assertion. Having over 12 years' experience of diamond mining on the Copeton fields, I may be pardoned for entering a strong protest against such misleading statements, and in contradiction I affirm that a parcel of diamonds just as it comes from mine sometimes contains diamonds that weigh up to 2 and 3, and occasionally 4 carats. The largest gem diamond found on this field weighed over 6 carats, and a bort over 8 carats. As regards the quality of Australian diamonds, I purpose quoting from a report furnished to the New South Wales Mines Department upon a parcel sent to London in order to test this point. Mr. Thos. Davies, F.R.G.S., and Mr. R. Etheridge, jun., in this report wrote:—

"1. The diamonds of New South Wales, in their physical characters, are more nearly allied to those of Brazil than any other country.

"2. They have been very largely sold in London as such.

"3. As regards colour they differ but little from those of other fields.

"4. The general absence of 'cleavage' and 'macles' is a point much in their favour.

"In fact it appears from information gathered through most reliable sources, that a large proportion of New South Wales gems have found their way to the London market as Brazilian stones."

Brazilian stones command high prices on account of their great brilliancy and refracting power, and to favourably compare Australian diamonds with those of Brazil is a statement in direct opposition to that made by Mr. Cattell concerning their inferior quality. Medium-sized diamonds are more in request than large ones. Upon this point, in his report submitted to the Mines Department, Mr. Lewis Atkinson wrote:—"There is always a good market open for Australian brilliants, although they are at present small in size in comparison with the African diamonds; with regard to colour in proportion to their production, Australia finds the most white diamonds, and there is always a great demand for fine white stones, and always will be, as being small they are most suitable to set round other coloured gems."

I purpose briefly to outline some of the most important mining operations now under development upon the field. The Malacca tin and diamond mine was once worked by an oversea company. The present operations are carried on by a small tribute party of four men. This mine is remarkable for its rich tin deposits, and many tons of ore have been won during development work. At present returns are of a most encouraging nature, and quite in keeping with past records. The result of operations during the last six months has been the production of fully 9 tons of high-grade tin ore. The diamond returns, however, have not been exceptional. The greater part of the wash treated for this tin return came from top seams resting on the drifts, high above the granite bottom. It is usual when wash is met with at this elevation to find that the smooth exterior of the diamonds has caused them to sink through the drifts and settle in another wash deposit resting on the granite bottom. These top seams are derived from higher ledges of wash that were denuded across dips partly filled in with lighter drifts.

The diamonds won from the bottom wash of this mine are remarkable for their natural uncut brilliancy and plump shapes.

The Soldier Hill diamond and tin mining company has a very fine property, consisting of basalt capped hills in close proximity to Cope's Creek. The company has just installed an hydraulic sluicing plant and a line of pipes in order to convey water up to the mine for sluicing operations. Soldier Hill for a considerable area of the slope into Cope's Creek has little overburden to be contended with. A feature of this mine is the number of rich top seams met with at various levels in the overlying drifts that rest on the granite bed rock. Numerous tunnels are seen on the hill side, at the mouth of which large quantities of this drift have been tipped. From prospects taken from these heaps it is estimated to be worth from 4 to 5 lb. of tin per load in addition to its diamond inclusions. Ground sluicing by means of hydraulic pressure will treat two hundred loads of this wash per day, and, in addition to tin, diamonds will be saved in the races, and the residue of these channels will be put through a pulsating machine for the included redeposited gems. In cutting the races defined beds of tin and diamond wash were exposed, which should give the company a quick return and prove remunerative.

The Flat Bar mine, better known locally as the "Old Farm," is under the management of Dr. Flatau. A main working shaft has been sunk to locate the rich wash known to exist in a central position on the block. Difficulties have been met with in this work which have rendered operations somewhat slow, hard basalt for a depth of 50ft. necessitating the use of explosives. The lower strata, consisting of stream accumulated sand, in which immense quantities of water was stored, entailed pumping operations on a large scale, and close timbering of the shaft in order to secure the ground. It is expected to bottom the shaft in a further 20 feet of sinking. Rich tin and diamond deposits have been won from various points near this shaft, and the present work is almost sure to locate similar deposits.

The Rossmount Company own several blocks occupying important positions in the centre of the diamondiferous area. One of these blocks—known as the "Deep shaft" mine—holds a very prominent place amid the diamond claims of this field, gems weighing up to 4 carats having been obtained from it. The adjoining block, formerly known as "Davis's shaft," has also produced rich deposits of tin and diamonds. As there is a large scope of deep country extending into the hills still unprospected, there is every reason to believe that development work will locate rich runs in the deeper ground—as this feature has characterised past operations.

Situate in the centre of the blocks there exists a natural depression in the overlying basalts, which suggests the presence of a volcanic crater now covered over by the basaltic flow. This formation is now being pierced by means of a shaft, which is being vigorously sunk. Should the location of a payable diamond pipe result, it would revolutionise the diamond mining industry in consequence of proof of the permanency of matrix formation being afforded.

Sweeney and Sons are working the Star mine, and have been well rewarded in prospecting operations. Sinking was carried through about 30ft. of basalt, beneath which stream accumulated sand and pebbly wash was encountered. This wash is rich in its tin and diamond inclusions. The tin values vary from 10 lb. to ½ cwt per load. Recent returns from 8 loads of this wash yielded 150 carats of diamonds. The product of this mine averages throughout about 3 diamonds to the carat. It is, however, not an unusual thing to find diamonds in this wash weighing 1, 1½ and occasionally 2 carats. A crystal bort diamond is sometimes obtained during washing operations. This claim is giving the prospectors a fine return for their labour.

W. Hills and Sons, working on the western slope of the Crown Jewel mine, are raising wash which is fairly rich in its diamond deposits. Sinking intersects basalt for a depth of 40ft., beneath which occurs a sandy drift, with pebbly wash resting on the granite bottom. The wash consists of rounded quartz fragments and waterworn tourmaline stones. This wash is yielding from 5 to 10 carats of diamonds per load, and its tin inclusion about 10 lb. per load a square yard.

The diamonds won are principally round, plump stones, in which whites predominate. The average output is about 3 diamonds to the carat, but stones weighing 1, 1½ and 2 carats are found. Last week a pale green diamond was found in this mine weighing about ½ a carat.

The Round Mount mine owned by T. Cant and Sons is on an isolated hill of considerable acreage, and occupies a prominent position. The work at present undertaken consists of ground sluicing the face of the hill. For a depth of 30ft. drifts and wash seams are exposed. Beneath this is a large deposit of wash, about 15ft. deep. All the face of the hill is being washed into races and concentrated. The races are allowed to run for about a month, when the residue is cleaned up. From the head of the race last week about ½ a ton of tin was taken, and 120 carats of diamonds is reported to have been obtained. This was a fine parcel, which realised 22s 6d a carat locally. A general clean up of the race will take place next week, and a big return is expected, as the race prospects well for tin and diamonds.

Active development work is being carried on by G. Dasey, jun., and mate in a central position on the Crown Jewel mine. From this block tin and diamonds have been won in payable quantities. The shallow ground on the hill has chiefly occupied the attention of the prospectors. The deeper ground in the centre of the hill is still unprospected, and has every chance of being just as rich as the shallow ground. The sinking is in basalt for a depth of 60 or 70 feet, then various depths of sand, with wash deposit resting on the granite. Two perfect white gems weighing over 3 carats each were obtained from this mine, and as they closely resembled each other they were known as the twin stones. It was from this mine that the parcel of diamonds was taken and sent to London to be reported upon.

Geo. Dasey, sen., and Wilfred Smith are prospecting on the Streak O'Luck mine. This claim holds a record of producing some of the finest diamonds won on the field. A former party working this block produced exceptionally rich dirt. In one washing the diamonds, just as they came from the washing plant, averaged under one diamond to the carat. A diamond weighing over 4 carats—an octahedron gem, blue white in colour—was found at a shallow level. The present prospectors are sinking and driving with every prospect of the success which attended former developments. Ground sluicing operations have been responsible for the return of much tin and many diamonds. Many surface patches have been worked by this method. All the tip heaps available have been treated in this way, and the returns proved highly satisfactory. Diamonds and tin that occurred in top seams were trucked and tipped outside, with other waste products, the mine owners deeming it waste of time to look for tin or diamonds in top seams.

T. Cant, jun., and H. Strandt are ground sluicing in the vicinity of the recreation ground, and treating a face from 3 to 4ft. deep, from which encouraging prospects have been obtained. From 4 lb. to 10 lb. tin to the square yard have been won in trial prospects, in audition to diamond inclusions.

Further west J. Roach and P. Marshall are ground sluicing surface deposits—patches that were left when the surrounding country was denuded of its sub-soil. Tin and diamonds are being won from this work, the wash being concentrated in the races and cleaned up every few days.

On the west end of the diamond field are situated the "Banca," "Kirk's Hill," and Oakey Creek mine. At the Oakey Creek mine the diamond matrix was located in a dolerite dyke. Much of this dolerite is spread and disintegrated, but owing to the total absence of a water supply, no bulk tests have been made. The pumping of water from the Gwyder River by means of a pumping station and a pipe line, about a mile long, would supply ample water for a bulk test of 1000 loads of disintegrated dolerite, but this outlay is beyond any prospectors' finances.

On page 213 of W. R. Cattell's book, referred to, these words appear referring to the Oakey Creek matrix.

"In all 4 diamonus were found in the rock matrix, but a further examination of nearly 90 tons of the rock yielded no more."

To examine thoroughly nearly 90 tons of rock in its lump form, as taken from the mine, would be a tedious task, fraught with no conclusive evidence as to what the rock contains. The only method of determining the contents would be to wait until the 90 tons had disintegrated, and then wash the material with a rotary machine, which has not been tried. The absurdity of the "examination" of the rock becomes apparent. The lack of a water supply has prevented a bulk test of disintegrated dolerite. Therefore, the 90 tons is still at grass, unwashed and untested.

---

## MINE MANAGERS' ASSOCIATION (V.).

The council of the Federated Mine Managers' Association of Victoria held its first meeting at the office of the Bendigo Chamber of Mines on November 24. The following officers were elected:—President, Mr. W. H. Roberts, Bendigo; vice-president, Mr. J. W. Tank, Ballarat; secretary, Mr. E. Tremern, Bendigo. The status of shift bosses was discussed, and the following resolution was passed:—"That the Chamber of Mines be informed that this council is of opinion that shift bosses and pitmen should be made officers of the mines, and that sufficient inducement be given them, so that they may leave the Federated Mine Employees' Association." The secretary was instructed to write to the Minister of Mines, urging the passing of the Mines Bill during the present session, and it was decided to ask the Parliamentary representatives of the several goldfields to give it their support. The council was of opinion that much good would accrue to members, and to the industry generally, if mine managers were certificated. It was decided to send circulars to mine managers who are not members of any branch, pointing out the advantages of joining a branch affiliated with the federal association. It was also resolved that the president for the term should be the council's representative on the council of the Chamber of Mines, and that the annual meeting of the federal council be held on the last Monday in February each year.

---

## FIRE-FLY FIELD (N.S.W.).

In his report upon the newly-discovered Fire-fly copper, lead, silver field, near Hall's Peak, Hillgrove District, N.S.W., Mr. J. B. Jaquet, Chief Inspector of Mines, states that "the find is in rough, little-frequented, mountainous country upon the slopes of the Chandler River Gorge, at an altitude of nearly 3000 feet above sea level and 1800 feet above the river. The ore deposits were discovered in July last by two well-known prospectors, Messrs. Borham and Hawkins.

"However, rich copper ore has been known to occur in the locality for many years, and a lode was found and worked by Messrs. Keys, of Hillgrove, in 1896, just above the level of the river near Hall's Peak. Messrs. Keys' discovery attracted considerable attention at the time on account of the richness of the copper sulphide ore, and the fact that it contained a considerable quantity of silver."

Mr. Jaquet inspected the discovery at the time, and as the result of five samples he found that Keys' lode was worth about 40 per cent. copper and from 10 to 13 oz. of silver per ton.

In the present find "the ore deposit consists of a belt of altered slates and schists impregnated with copper pyrites, galena and iron pyrites and zinc blende. These minerals near the surface have been altered to gossanous deposits with copper carbonates, black ore, cerussite, etc.

"The ore is first met with at an altitude of about 1700 feet above the Chandler River, and has been traced for a length of about 1500 feet up the slope of the hillside to an altitude of 1900 feet. The surface of the ground is for the most part covered with talus and boulders, and the exploratory work so far carried out consists only of a few shallow trenches, so it will be understood that it is impossible for any one at the present time to speak with exactitude as to the form and size of the deposit, though it appears to have great dimensions.

"In some places sulphide ore is to be found outcropping at the surface, and in several of the trenches galena and copper pyrites are found in association with cerussite and copper pyrites, so it would appear as if the zone of oxidation does not extend far beneath the surface. This may be accounted for by the fact that the deposit outcrops along a steep mountain slope, which would permit of the oxidised ores being carried away from the top of the decomposing sulphides as soon as they were produced and hinder their accumulation upon the cap of the lode. So far, no chlorides or other rich silver minerals have been discovered, though it is quite possible that bunches of this class of ore may occur in places in association with the cerussite."

The samples taken by Mr. Jaquet show the presence of copper, silver and lead in fairly definite proportions, with only a trace of gold. Copper values vary from 2 to 12 per cent., lead 13 to 18 per cent., and silver 2 to 14 oz. per ton. One sample showed the presence of zinc, the value being 30.37; this sample came from a "galena vein" on lease No. 93, and assayed copper 1.82 per cent., lead 18.60 per cent., iron 5.53 per cent., silver 6.80 oz., and gold a trace, in addition to the zinc.

"A picked sample of copper pyrites from outcrop upon the same lease yielded copper, 21.65 per cent.; silver, 2 oz.; gold, a trace.

"To prevent confusion, it may be necessary to state that the trenches 17, 17 and 8 feet long respectively, from which samples were taken, do not represent the full width of the ore body. Indeed, the ends of all these trenches were still in ore, and the first two were almost in line with one another across the lode and separated by over a chain of country overlain by soil and boulders. There is some evidence to show that the unaltered ores vary very much in character, as one passes from wall to wall of the deposit. Sample 4 is from a band which is 16 inches wide, of compact fine grained galena and zinc blende, and sample 5, from what may be a parallel band of ore of altogether a different character.

"The ore body undoubtedly represents a band or bands of country rock (schists and slates) which has been impregnated or partially replaced by ore. In this respect it resembles Mt. Lyell, Cobar and many other of the largest and most important copper and lead deposits of the world.

"Mr. J. R. Godfrey, B.A., Inspector of Mines, who visited the field a short time before my visit, while expressing a favourable opinion of its prospects, states that the deposits as regards their mode of occurrence are very similar to those which occur at Mt. Lyell.

"By a fortunate coincidence, there is, just outside the southern boundary of the ore, a steep precipice, from which the lode could be drained, expeditiously explored, and cheaply worked by means of a tunnel or series of tunnels. The ore could be transported at a low cost by an aerial tramway or self-acting inclined tram to the Chandler River, below where there is abundance of water.

"I might mention here that a spring, from which a considerable amount of water issued, is to be found upon the hillside about the centre of the lode outcrop.

"The development of the field is being seriously retarded owing to the absence of proper approach. From the west it can only be reached by a long, rough climb on foot, and from the east by a circuitous route on horseback. I am informed that a good route with easy grades for a road has been discovered on to the Armidale-Kempsey road. At any rate, until a track adapted for vehicular traffic is provided, the trucks, rails, tools, etc., necessary for carrying out mining operations cannot be brought to the field, and operations will be at a standstill.

"I was very favourably impressed with the prospects already obtained, and believe that the discovery may lead to the opening up of an important new mining field. The true value and extent of the deposit or deposits can only be determined after the expenditure of a considerable amount of capital, and I can confidently recommend that the circumstances warrant the required outlay."

## MOUNT LYELL CO. (T.).

The half-yearly meeting of shareholders of the Mt. Lyell Mining and Railway Co. Ltd. (T.), held at 31 Queen Street, Melbourne, on November 28, was presided over by Mr. T. Bowes Kelly (vice-chairman), Mr. Jamieson (the chairman) being absent on a holiday. The restoration of this property to normal working conditions is the most satisfactory feature, and for the current term the prospect of continuous ore production is assured. The total quantity of ore treated from the various leases of the company was 142,614 tons, the blister copper produced amounting to 2474 tons, the contents being 2442 tons of copper, 187,097 oz. silver, and 4050 oz. gold. The cost of producing the blister copper was slightly higher than for the previous period, being £1 2s. 2.21d., as against £1 1s. 6.88d. At March 31 last the company had unsold 559 tons of copper, which was taken into the accounts at that date at £60 per ton. This copper has since realised £70 2s. 8d. per ton, the difference being credited to the accounts of September 30 last. In addition 1527 tons were sold at an average price of £73 5s. 3d., leaving 915 tons unsold, which have been credited to the accounts under review at £60 per ton. The net profit for the six months from all sources is stated at £41,943, after £10,865 for development and £11,390 for depreciation of mine plant had been written off. The liquid assets of the company are shown at £629,484, and liabilities at £142,995, the surplus of assets being £486,489. The loss sustained by the company in connection with the late deplorable disaster in the mine is quoted at £42,141 (inclusive of claims for compensation, all of which have been settled). Of this amount £21,282 was debited to the profit and loss account of the previous term, and £20,859 has since been charged to the reserve fund. The ore reserves in the Mt. Lyell mine stand at 2,202,335 tons, assaying 0.531 per cent. copper, 1.96 oz. silver, and 0.0275 oz. gold per ton; and in the North Mt. Lyell, at 1,086,112 tons, assaying 6.0 per cent. copper, 1.33 oz. silver, and 0.005 oz. gold per ton. In his address, the chairman directed attention to the nominal increase in the ore reserves of the latter mine. The actual increase amounted to 44,000 tons; but the operations for the period accounted for 36,000 tons being extracted, the net increase standing at about 8000 tons. The company has increased its holding by the acquisition of the Crown Mt. Lyell lease (comprising 30 acres); the area formerly held by the copper mines of Mt. Lyell West (70 acres), and the North Prince Lyell Copper Co. (10 acres). A special lease of 60 acres near the Lyell Comstock Mine has also been secured for residence purposes. With regard to the low-grade ore in the Comstock lease the versatility of the flotation process of concentration comes into evidence. Tests conducted with this process have been highly satisfactory, and it is hoped that the cost of mining and concentrating low-grade copper ores can be reduced to such a point as to render the Comstock mine a payable proposition. The outlook in this connection is considered distinctly encouraging. With regard to the chemical branch of the company's works, operations are said to be proceeding satisfactorily. In view of the fact that economically the competition of the company's products with that of the Wallaroo Phosphate Company Ltd. is wasteful and unsound, a satisfactory amalgamation of the company's branch with the Wallaroo Co. has been effected. The merge will be known as the Wallaroo Mt. Lyell Chemical Works Ltd., and will have a capital of £400,000, in £1 shares, of which 336,900 will be issued, the Mt. Lyell Co. receiving 136,900 fully-paid. This is regarded as a satisfactory transaction. The Mt. Lyell Co. will have ample representation on the board of the new company. The Lake Margaret hydro-electric scheme was also touched on by the chairman, who remarked that progress was largely influenced by weather conditions. Making reasonable allowance for this and other delays, it is hoped that power from this source will be available by the middle of 1914.

## VICTORIA'S POTTERY CLAYS.

Requests having frequently been sent to the Victorian Mines Department for information as to localities where pottery material is obtainable in the State, officers of the Geological Survey branch were asked to supply such information with respect to their several districts. Deposits of pipeclay have been reported from Snowy Creek, half a mile north of post-office; Knowsley, on mineral lease No. 2994; Dunolly, Bacchus Marsh, Castlemaine and Wedderburn. In forwarding a sample from Omeo, Inspector Grieve states that the material could be transported to Bairnsdale in quantity at a cost of £2 or £3 per ton. Inspector Mackenzie reports that at Twist Creek, Yackandandah, there are thousands of tons of the material, some on private, and some on Crown lands; he adds that it also occurs in fair quantities three miles from Newtown and eight miles from Stanley. Extensive deposits of red clay are reported to be in the basin of Granite Flat, where also there is a fine-grained brown clay, from 12 to 18in. wide. Pottery clays are also found at Snake Valley, Morwell, Bendigo, Dunolly and two miles S.W. of Huntly. China clay, containing felspars, may be obtained at Murphy's Flat, about four miles north of Dunolly; at Puddler Bill's Creek, on McIsaac's lead and McCrumb's lead, Moliagul; at Beechworth, Dandenong and Skipton. Felspar occurs in metamorphic rocks extending from Wodonga to the head of the Mitta Mitta River. Mr. Ferguson states that the largest deposit he has seen is at Campbell's Knob, Gelantipy, on the west bank of the Snowy River, just above Moon's Crossing; there are also deposits a mile east of Laurie railway station and about five miles S.W. from Dunolly railway station, the latter being a fine sample, of which a few tons could be obtained by the use of explosives. Decomposed quartz and felspar occur at Bristol Hill, near Maryborough, at Rocky lead, Blakeville and Darley. Large quantities of quartz sand and tailings are obtainable around Eaglehawk, but all deposits there carry iron. Similar suitable material may be had at Marong, Castlemaine and Bendigo, and a fine white sand at Fossil Beach, Balcomb's Bay, Mornington, and on the south bank of the Barwon River, at Highton, Geelong, where it is 6ft. thick. Kaolin is reported from the Avon River, Armstrongs, Beechworth, Bacchus Marsh, Briagolong; Boolarra and Bradshaw's Creek, while there are large deposits at Pyalong, Knowsley and Epsom; also in the Wedderburn district. Fireclay occurs at Darley, Dog Trap Gully, near Bacchus Marsh, Daylesford, Sale, Stawell, Lal Lal, Oakleigh, Greensborough and Hazeldene. Decomposed bleached basalt may be had near Parwan and Bacchus Marsh, and decomposed felspathic dyke, probably suitable for glazing, at Dookie and Broadford. Samples of most of the above may be seen at the Departmental Museum in Melbourne.

## MINERAL RETURNS.

A return furnished by the Under-Secretary for Mines, New South Wales, shows that the gold yield for the month of October was 18,794 oz. crude, equal to 16,193 oz. fine, valued at £68,785, as compared with 18,026 oz. crude, equal to 15,441 oz. fine, valued at £65,592, for the same month in 1912. The yield for the first ten months of this year amounts to 152,665 oz. crude, equal to 123,346 oz. fine, valued at £523,940, as compared with 165,568 oz. crude, equal to 137,366 oz. fine, valued at £583,495, for the same period in 1912, thus showing a decrease of 14,020 oz. fine and £59,555 in value.

New Zealand's output of gold for October amounted to 25,723 oz. gross, or 22,815 oz. fine, valued at £96,913, as compared with 20,322 oz. gross, or 18,863 oz. fine, valued at £80,125, for October, 1912, the increase being 5401 oz. gross or 3952 oz. fine, valued at £16,788. The output for the 10 months was 314,719 oz. gross, or 288,694 oz. fine, valued at £1,226,295, as against 299,705 oz. gross, or 276,710 oz. fine, valued at £1,175,392 for the corresponding portion of last year. The production of silver in October amounted to 68,965 oz., valued at £8049, as against 37,650 oz. valued at £3673, in October, 1912. The output for 10 months was 835,059 oz. (£88,989), against 750,825 oz. (£78,942) for the corresponding period last year.

The value of minerals other than gold exported from Western Australia during September was as follows:—Copper, £3297; tin, £4175; silver-lead ore, £7230; bunker coal, £3554. The totals for the expired nine months were:—Copper, £61,015; tin, £48,278; silver, £15,308; silver-lead ore, £37,515; other minerals, £37,711, that amount including £5504 for scheelite, and £31,793 for bunker coal.

The Board of Trade returns show that the imports and exports of metal to and from Great Britain during September last, and for the nine months passed, were as follows, the corresponding figures for 1912 being added in parentheses:—September.—Copper, imports 11,936 (11,195) tons, exports 7203 (4860) tons; tin, imports 4070 (2814) tons, exports 3684 (2732) tons; lead, imports 15,518 (14,819) tons, exports 5343 (6818) tons; spelter, imports 14,904 (11,182) tons; pig iron, imports 14,130 (23,881) tons, exports 106,907 (101,943) tons; iron and steel, imports 96,196 (90,466) tons, exports 173,123 (237,496) tons; galvanised iron, exports 63,564 (60,868) tons; tin plates, exports 36,572 (39,325) tons. Nine months.—Copper, imports 119,958 (116,215) tons, exports 54,932 (44,960) tons; tin, imports 34,345 (30,472) tons, exports 33,211 (33,208) tons; lead, imports, 152,222 (153,470) tons, exports 46,267 (42,617) tons; spelter, imports 103,421 (97,753) tons; pig iron, imports 157,389 (144,032) tons, exports 854,206 (971,988) tons; iron and steel, imports 758,377 (753,757) tons, exports 1,877,131 (1,696,820) tons; galvanised iron, exports, 561,637 (463,141) tons; tin plates, exports 371,031 (353,977) tons.

## BOOKS REVIEWED.

By Alter Idem.

CARBURATION IN THEORY AND PRACTICE. By Robt. Brewer. Crosby, Lockwood and Son—through Melville and Mullen Pty. Ltd. 253 pp.

The aeroplane, as a successful flying machine, was rendered possible by inventors supplying an engine with a maximum horse-power and a minimum weight. The petrol engine of the motor car was its natural predecessor. The evolution of the motor car is practically the evolution of the petrol engine. No operation is more important in successful working of petrol engines than that of carburation or the successful blending of a liquid fuel with a certain amount of air.

A perusal of this work will show that although a certain amount of progress may be attained by empirical methods and improvement after improvement effected in design of motor engines, yet for successful designs the automobile engineer must be a man well trained not only in the purely mechanical sections of his work, but also in the scientific principles and laws connected with the physics and chemistry of gases and liquids used. The work under review would be an excellent text-book for motor engineering students. The scientific portion is clearly written and the connection of underlying principles, with practical applications, well brought out. The diagrams can readily be followed by those interested in the subject. The defects of the early carburettors and the effort made to overcome such defects are fully explained, while the carburettors adopted on modern cars are illustrated with profusion of detail.

The work is absolutely necessary to every motor car student.

* * *

ELECTRIC CIRCUIT THEORY AND CALCULATIONS. By W. Merren Maycock, M.I.E.E. Whittaker and Co. 355 pp. 3s. 6d. net.

This work is written for students of electrical technology.

The ground covered is primarily that embraced by the requirements of the final examinations in "Electrical Wiremen's Work" of the City and Guilds of London Institute.

The author has no doubt realised that the modern competent electrical foreman or wireman cannot proceed far without a knowledge of mathematics sufficient for the solution of those problems which confront him in daily practice. He has introduced about 40 pages of elementary arithmetic and algebra to enable those who may be rusty in this work to brush their knowledge up again before proceeding to deal with the subject matter of the book. Two things are necessary for the modern electrical engineer; he must have the electrical sense, or, in other words, have a clear conception of the meanings of the technical terms, such as the units employed, as well as the power to work out numercial examples from given data. Both of these points have been emphasised. As the author points out, electricity is of a very intangible nature compared with other forces. The ABC of electricity is much less easy than the ABC of mechanics and chemistry; for example, the latter two sciences deal with very tangible things. It is somewhat doubtful from this very contention whether this work could be intelligently followed by the beginner—it should be preceded by a work dealing with the subject from an experimental standpoint. The fundamental principles, laws and language of the science would be more easily grasped than by a mere study of book terms. Formulae, figures and diagrams mean very little when detached from basic experimental and testing work.

Assuming the student possesses such fundamental knowledge, the course of work outlined by the author in the book is absolutely necessary for those connected with the practical application of electricity. The best way of becoming familiar and acquiring a mastery of any branch of physical science is to work out numerical examples. Students may consider they know all about steam pressures, but their general knowledge is of very little value from a technical point of view if they cannot, from given data, determine safe working pressures in boilers of various types. Resistance, density, conductivity and other terms are better explained and their exact meanings more permanently fixed on the mind by means of numerical examples applied to the materials commonly used. In this respect the work is an excellent one and well suited to the requirements of the students of electrical technology in our technical schools. The examples are well selected and their solutions well explained from an electrical as well as an arithmetical standpoint. The work also has the merit of being up-to-date, of not containing unnecessary theory for the class of student requiring it, and of dealing with a wide range of subjects covering most of the practical problems and their details with regard to power, distribution and lighting.

* * *

**B. K. Morton Pty. Ltd.** (512 Little Collins Street, Melbourne) are well to the fore in forwarding us a copy of the Handy Pocket Diary for 1914, issued by Thos. and Wm. Smith Ltd., wire rope manufacturers, Newcastle-on-Tyne, England. The diary is beautifully got up, and contains a variety of useful information regarding wire rope.

* * *

Victorian Year Book, 1912-13. By A. M. Laughton, F.S.S., Government Statist. Part viii., Interchange. Part ix., Social Conditions. (Government Printer, Melbourne, 1913).

* * *

Mining World Index of Current Literature. Vol. III., first half year 1913. By Geo. E. Sisley, Associate Editor of the "Mining and Engineering World." (Mining World Co., Chicago, 1913. This is one of those invaluable books which may justly be called the busy man's friends, and just such a friend as a busy professional man is likely to need, and sure to appreciate. The literature of mining, metallurgy and allied topics is now-a-days so voluminous, originating in all progressive countries, scattered through so many hundreds of periodicals, that no man can hope to keep in touch with the best that can be said on any of the subjects which closely affect his professional equipment without some such compendious indexing and classification as the Mining World Index supplies. Its claim to be "an international bibliography of mining and the mining sciences" is no vain boast, for such it really is, references being given to all articles of any importance, as well as to more ambitious literary efforts bearing on the wide field of research, experiment and practice in which mining engineers, mine managers, metallurgists and directors of companies are most vitally interested. Several chapters at the beginning deal with the current literature on metals and metal ores, their geology, milling, assaying, etc.; then follow others on non-metals, with similar further details. For example, under the heading Coal, we have not only mining, but also preparation, marketing, etc., briquetting, mechanical cutters, coal dust and gases, etc. Again, a subject attracting much attention in Australia just now is petroleum, and on this and natural gas we have here four and a half pages of references to literature published in the first half of this year. The third part of the book deals with mines and mining, and then come mills and milling, chemistry and assaying, metallurgy, power and machinery, and a miscellaneous section on a variety of cognate topics. Should there be a writer who holds so special a place in one's esteem that anything he has to say on these subjects is readily sought, the "Authors' Index" towards the end of the volume will indicate the page on which particulars are given. And for readier reference than is given in the full analytical contents, there is also an alphabetical "Subject Index." The book is not an exciting one, truly, but it will be found an eminently useful one.

# REPORTS OF COMPANIES AND CORPORATIONS.

## Broken Hill Proprietary (N.S.W.).

The refinery reports of the Broken Hill Proprietary Co. Ltd. for the last two four-weekly periods were as follows:—

| | | Four weeks ended Oct. 22. | *Nov. 19. |
|---|---|---|---|
| Own ores, silver | oz. | 194,874 | 211,778 |
| Do., do. lead | tons | 3,116 | 3,367 |
| Purchased ores, silver | oz. | 128,712 | 120,957 |
| Do., lead | tons | 2,981 | 3,505 |
| Antimonial lead | tons (est.) | 81 | 73 |
| Zinc concentrates | tons | 6,950 | 6,900 |
| Containing silver | oz. | 90,853 | 89,614 |
| Do., lead | tons | 520 | 507 |
| Do., zinc | tons | 3,175 | 3,158 |

*Produced also 1189 oz. gold from own and purchased ores.

## Broken Hill Proprietary Block 10.

The output of the Broken Hill Proprietary Block 10 Co. Ltd. (N.S.W.) for the last two four-weekly periods was as follows:—

| | | Four weeks ended Oct. 15. | Nov. 12. |
|---|---|---|---|
| Ore treated | tons | 7,493 | 8,800 |
| Assaying— | | | |
| Silver | oz. | 9.2 | 9.2 |
| Lead | per cent. | 12.1 | 12.1 |
| Zinc | per cent. | 12.6 | 13.0 |
| Concentrates | tons | 1,022 | 1,211 |
| Assaying— | | | |
| Silver | oz. | 31.8 | 31.5 |
| Lead | per cent. | 65.6 | 65.3 |
| Zinc | per cent. | 6.0 | 6.2 |

## Amalgamated Zinc (De Bavay's) Ltd.

The mill returns, assay values, working costs and estimated income and profits of the Amalgamated Zinc (De Bavay's) for the last two four weekly periods were as follows:—

| | | Four weeks ended Oct. 18. | Nov. 15. |
|---|---|---|---|
| Tailings | tons | 35,906 | 41,460 |
| Zinc concentrates | tons | 10,341 | 12,510 |
| Assaying— | | | |
| Zinc | per cent. | 49.0 | 49.2 |
| Silver | oz. | 9.0 | 9.1 |
| Lead | per cent. | 6.2 | 5.8 |
| Lead concentrates | tons | 125 | 122 |
| Assaying— | | | |
| Lead | per cent. | 50.4 | 51.5 |
| Silver | oz. | 35.6 | 34.2 |
| Zinc | per cent | 20.2 | 19.0 |
| Est. income from all sources (spelter at £22) | | £29,582 | £36,024 |
| Working expenditure (inclu. cost tailings treated) | | £15,487 | £16,902 |
| Est. profit on working account (spelter at £22), after deducting amount due to Broken Hill S.M. Co. under partnership | | £10,051 | £13,248 |
| Provision for royalty | | £1,293 | £1,564 |
| Net profit on working account | | £8,758 | £11,684 |

No credit is taken in above figures for interest on investments or dividends on shares in other companies.

## Chillagoe Ltd. (Q.).

The smelting returns of Chillagoe Ltd. for the last two four-weekly periods was as follows:

| | | Four weeks Ended Oct. 10. | Nov. 7 |
|---|---|---|---|
| Ore treated | tons | 4,729 | 2,637 |
| Recoveries— | | | |
| Copper | tons | †328 | ‡135 |
| Silver | oz. | 16,477 | 8,757 |
| Gold | oz. | 155 | 192 |

†Copper furnace ran 28 days.
‡Copper furnace ran 22 days.

## Mt. Morgan G.M. Co. (Q.).

The smelting returns of the Mt. Morgan G.M. Co. for the last two months were:

Smelters—

| | | *Oct. | *Nov. 16. |
|---|---|---|---|
| Copper ore | tons | 20,091 | 16,242 |
| Many Peaks ore | tons | 4,625 | 2,881 |
| Blister copper | tons | 611 | 640 |
| Copper contents | tons | 605 | 634 |
| Gold contents | oz. | 7,584 | 8,160 |
| Proportion Many Peaks ore (approx.)— | | | |
| Copper | tons | 67 | 49 |
| Gold | oz. | 35 | 26 |
| Secondary products (approx.)— | | | |
| Copper | tons | 27 | 46 |
| Gold | oz. | 349 | 462 |
| Estimated value, blister (copper at £60) | | £68,213 | £72,377 |

*Reductions chiefly due to smelting lower-grade ore and higher silicious ore.

# FINANCIAL.

## BANK OF NEW SOUTH WALES.

At the half-yearly meeting of the Bank of New South Wales, held at Sydney on November 25, the president, Sir Charles Mackellar, remarked upon the arrest of private accumulation by the spending impulse all round. He added: "There are evidences before us that an adjustment of the national income to the expenditure, so as to leave a margin of the former, is in operation, so far, at least, as the general public are concerned. It may reasonably be hoped that those who are responsible for the public finances of the country will come into line in due course. Unless money comes into the country from some outside source, which is only the case here to a small extent, it is to our own savings that we must look for funds to carry on the developmental work of the country, and the various financial requirements in connection therewith, and our expanding trade." Deposits in the bank were £613,000 less than in last September, but this was due to the transfer of the Commonwealth Government deposits throughout Australia to the Commonwealth Bank, and to the smaller funds at the credit of the various State Governments. Ordinary deposits held from the public had slightly increased. On the assets side of the balance-sheet, coin and Australian notes are £2,665,000 more. On the other hand, money at short call in London is £645,000 less, and Government securities £217,000 less. The item, bills receivable in London, etc., is £420,000 higher, which indicates that exchange business is well maintained. It is proposed to add £100,000 to the reserve fund, £80,000 of which comes from the half-year's profits. The need for new head-office premises in Sydney has led to plans being prepared for an up-to-date building on the old site; and plans are being got out with the view of putting up an entirely new building in Melbourne also, which will include suites of offices likely to bring in a fair return on capital. Sir C. Mackellar considers the outlook, as regards trade and business for the coming year, as a very fair one. The balance-sheet for the half-year appears in our advertising pages.

---

## VICTORIAN OVERSEA TRADE.

The oversea imports of Victoria for October amounted to £2,152,061, as compared with £2,423,680 for the same month last year. Amongst the items were: Gold, bullion and specie, £15,317 (£8221); implements and machinery, £147,407 (£128,530); iron and steel, £119,627 (£106,213); leather, £19,328 (£18,218); manures, £11,026 (£8639); oils in bulk, £68,288 (£63,395); rubber goods, £47,786 (£54,533); timber, £93,913 (£139,143). The exports for the month amounted to £1,669,576 (of which £1,641,359 was for Australian products), as compared with £1,105,759 (including £1,056,660 for Australian produce) for October, 1912. Amongst the items were: Gold, bullion and specie, £11,976 (£16,898); implements and machinery £8259 (£15,445), including Australian made £6153 (£12,679); leather, £22,742 (£29,118); manures, £6746 (£7805); oils in bulk, £7004 (£3336), including £6459 (£3023) Australian; ruber goods, £7820 (£6599), including £6295 (£5897) Australian; skin and hides, £246,899 (£172,222). The total imports for the expired 10 months amounted to £19,877,587, as compared with £21,012,750 for the corresponding portion of last year. The items included: Gold, bullion and specie, £327,809 (£297,057); implements and machinery, £1,105,358 (£1,194,669); iron and steel, £1,175,987 (£1,081,106); leather, £221,390 (£220,096); manures, £190,996 (£181,559); oils in bulk, £379,044 (£512,898); rubber goods, £520,015 (£473,309); timber, £779,063 (£842,729). The total exports for the 10 months amounted to £11,282,690, of which £10,933,045 represented Australian produce, as compared with £13,321,186, including £12,893,272 Australian produce for the corresponding period in 1912. The items included: Gold, bullion and specie, £596,032 (£3,163,613, of which £3,070,783 was Australian); implements and machinery, £247,466, of which £225,829 was Australian (£165,449, including £146,105 Australian); leather, £184,325, including £179,710 for Australian (£194,266, of which £187,049 was Australian); manures, £64,176, of which £62,588 was Australian (£50,845, £49,962 being Australian); oils in bulk, £47,960, Australian representing £41,642 (£35,156, of which £31,402 was for Australian); rubber goods, £71,210, including £44,295 Australian (53,840, including £46,461 Australian); skins and hides, £1,312,687, including £1,309,978 Australian (£1,035,823, including £1,033,657 Australian). The total exports for the 10 months, therefore, show a decline of £2,038,498, while those of purely Australian production fell off by £1,960,227 as compared with 1912. Imports also declined to the extent of £1,135,163.

# ENGINEERING AND ELECTRICAL SECTION

**W. T. GLOVER**
**and Co. Ltd., Manchester**
Specialists in the Manufacture of
All Classes of
**WIRES and CABLES**
for
**MINING WORK.**
Large Stocks kept by the
Sole Agents—
THE
**LAWRENCE & HANSON**
**Electrical Co. Ltd.**
33 YORK ST., SYDNEY.
405 LONSDALE ST., MELBOURNE,
and at WELLINGTON, N.Z.

## BRITISH AND EUROPEAN DEVELOPMENTS.

(From Our Correspondent.)

London, October 31.

The Chairman of the Western Section of the Institution of Electrical Engineers, Mr. C. Faraday Proctor, city electrical engineer of Bristol, in his address at the opening meeting last Monday, referred to several matters of interest. The first was the somewhat well-worn subject, the proper course of training for an electrical engineer. He suggested that it was desirable that the boy be first a gentleman, secondly, make him into a man, and thirdly, into an engineer. If he lacked the instincts of a gentleman, he would not gain confidence; if he had not learned to behave like a man he would progress but slowly on his own initiative, and would require constant pushing; whilst if he had not the elementary principles of engineering ingrained, he would not get on, even when pushed; he would be for ever searching for complex solutions for simple problems and giving attention to details when broad principles were at stake. It was very generally admitted that the study of mechanical engineering was an essential preliminary to becoming an electrical engineer. Mechanical engineering was the broad foundation upon which electrical engineering was based. It was too often forgotten that the mechanical engineering must itself have a foundation broad in proportion to the superstructure to be erected upon it and capable of unlimited expansion in every direction. The young engineer did not know in what direction he might have to develop, and a broad intelligence based upon a sound general education was the best asset of an engineer when combined with resourcefulness and an anxiety to understand and give due regard to all matters which appertained to the subject under consideration, although such might not strictly belong thereto. The foregoing remarks applied more particularly to the student or young engineer, rather than to men who had already passed those stages and made their way in the world. Amongst the many things to be learned from America was to keep well in mind the American definition of an engineer, namely, "A man who can do for one dollar that which any fool can do for two." The higher a man ascends the ladder the less time he has to devote to technicalities, and it is only by close attention to the commercial and financial side of business that men can hope to rise. Other points following upon this one, were the economy of time and freedom from worry resulting from anything approaching perfect method in office working; standardisation of paper sizes for catalogues and correspondence; compilation of a standard subject index, etc.

Mr. Proctor entered a field of greater interest when he referred to new lamp developments. When the one watt lamp came to the fore, there was doubt in the minds of many as to its probable effect upon the sale of electricity. As another change of similar character, though less in extent, was about to be introduced, a few figures relating to the former change were given by the speaker. In regard to the half-watt lamps, they might expect to see them in use within the next month or two, but like their immediate predecessors they would not in the first instance be constructed of small candle power for the pressures most usually found on supply mains. Increased intensity of illumination would not be necessary, but lighting by electricity would, with the half-watt lamp, cost so small a sum that business premises would be more generously lighted, and in residences artistic effect would be given greater consideration, whilst less attention would be paid or necessitated as regarded economy. Since the light given forth by the half-watt lamp was very much whiter than of the one-watt lamp, it should be excellent for the judging of colours. The lamps should, however, be kept well out of the direct line of vision, thus indirect lighting should be encouraged to the utmost extent. The cost of electric lighting would be so reduced as to put all competitive forms of illumination out of court, and the fact that electricity would henceforth be adopted for lighting of premises requiring artificial illumination, even if only for the sake of economy, would tend to keep the cable system satisfactorily loaded. With the diminished revenue per consumer, the cost of making new connections would become a still more serious factor in the costs of supply.

The developments in electric cooking apparatus was touched upon by the speaker, who said that the standardisation of details would enable electricity to displace its rivals in this department. The satisfactory heating of water for domestic purposes would soon remove what was now the greatest obstacle advanced against the introduction of electric cooking. To get rapid and highly efficient water heating, it would, he considered, be necessary to use immersion heaters, probably applying the heating element direct to the water, avoiding the risk or possibility of shock by utilising the resistance of two columns of water, one on the supply side, and the other on the delivery side of the heating appliance, the supply and delivery extremity of these columns of water most remote from the heating elements being electrically short-circuited and earthed. The elements must in such an appliance be either self-cleaning, or be arranged so that they might be very readily cleaned, so as to avoid trouble due to lime or other deposits. Mr. Proctor said that he looked to such appliances, arranged alternatively for rapid water heating, supplied at the usual heating rate of charge, and for continuous use supplied on a fixed annual kw. charge as the probable solution of the domestic hot-water problem.

Monday last, October 27, also saw the opening of the new Post Office Telephone and Telegraph Society of London. The Society is practically a continuation and extension of the old Telephone Society of London, which existed for many years under the auspices of the National Telephone Company, now absorbed. The Postmaster-General is the president, and the extended scope of the Society will allow it to embrace in its membership all the members of the post office staff whether engaged in the telephone or telegraph services or not, subject to approval by a committee. The opening meeting was occupied with an address by the chairman, Mr. A. Moir, superintendent engineer of the London Engineering District. The meeting will take place monthly from now until April next. Mr. J. Newlands, controller of the Central Telegraph Office, will give an address on "The Telegraph Service: Methods and Results" at the November meeting. Mr. Moir touched a number of matters in his address. He referred to the fact that the need for technical education of the staff had been before the post office for many years, and during the past three years, in the London Engineering District alone, 259 boy messengers, who otherwise might have been thrown out of State employment, had been trained in electrical work, and found employment. Special arrangements had been made for the training of workmen, arrangements involving close co-operation between the London County Council, the Polytechnic Institutes, and the Department. The response for joining the technical classes was very gratifying. Over 1000 workmen and 54 boys had entered for the current session—an increase of nearly 100 per cent. on last year's figures. These were distributed over the various institutes. Other means were also employed by the Department to assist youths to qualify as skilled workmen as early as possible. Mr. Moir mentioned facilities that existed for testing young men in practical knowledge of open line construction and underground jointing and cabling, and workmen were able to see specimens of the different types of outside plant for their guidance. For internal equipment, a central school had been equipped with the different types of telephone apparatus, and instruction is given to apparatus men upon the practical difficulties that arise in connection with the tracing and removal of faults. Mr. Moir made a comparison between the densities of the telephone services of New York and London, and he also stated that during the past year 102,000 miles of underground wire had been provided here to replace overhead wires that had been taken down. Since the National undertaking was transferred, seven new telephone exchanges had been opened, and two others were nearing completion, providing additional capacity for 62,000 lines. By December 31 the exchange capacity in London would be 194,000 lines, an increase of 31 per cent. in two years.

"Power Transmission in Collieries" was the title of a paper by Mr. W. H. Telfer at a joint gathering of Scottish members of the National Association of Colliery Managers, and of the Association of Mining Electrical Engineers, last Saturday. The author said there was no doubt about electrical transmission having taken premier place, for it was superseding the older methods to a large extent. Electricity was now in successful use operating all classes of mining machinery with the exception of reciprocating drills and holing machines. The questions of large units and good load factors were the deciding points in producing electricity cheaply, and these questions would settle whether energy should be bought or generated. For fairly large collieries requiring generating plant of 400kw., and upwards, if put down on modern lines, separate plant would be justified. The case was still stronger when there was a large quantity of exhaust steam available for use in a turbo-generator. Where the maximum required was under 200kw., and the load factor was not good, and the colliery was not near other mines, power might be better bought than specially generated. From the point of view of safety, electricity, if it were treated with the care it deserved, could be rendered as safe as steam pipe transmission, but the same liberties could never be taken with it as with its principal competitor, compressed air. In order to minimise the risk of explosion from defective or damaged cables, bad joints, defective switchgear, or excessive sparking, only the best class of cable should be used, and of such capacity that no undue heating could take place, and, as far as possible, they should be kept clear of combustible material and liability to mechanical injury. The same remarks related to joint boxes, switchgear, and motors.

Edinburgh is the latest municipality to be confronted with the necessity for big extensions of its electric generating plant if future requirements are to be efficiently met, and, like a number of other important cities, it is thinking of putting down an entirely new station instead of carrying out extensions of the M'Donald-road plant. One proposition is to put the new works down by the sea, where plenty of water can be easily obtained. Sir Alexander Kennedy is advising the Corporation.

The Battersea (London) Borough Council has on the table a scheme under which its electricity department will undertake wiring and installation work almost entirely through contractors, but will itself be responsible for maintenance and for the supply of apparatus. Speaking generally, I think it may be said that there is a growing desire among municipal undertakings to mete out more consideration to the contractor. Borough electrical engineers have a great deal of influence in deciding the course of policy in this connection. Those who have taken much trouble in trying to encourage friendly feelings between their departments and local contracting firms have often expressed themselves fully satisfied with the result. A number of towns are now working, in some cases perhaps experimentally, along these lines, and possibly experience will prevent a renewal of the old controversy. Another example of the willingness of councils to work through contractors is found in the case of Willesden, where the council has just agreed to make a specially low charge of 1½d. per unit for all energy used by its electrical contractors purely for advertisement purposes. The wisdom of taking full advantage of opportunities of public demonstrations of electrical applications is more generously recognised in some places: certainly the Department, generally, may expect to gain consumers where its local contractors benefit from a brillant and attractive display. Both stand to gain, and such consideration to contractors is good business policy, and bound to bring about results justifying the concession.

It is announced that the Institution of Electrical Engineers is to undertake the formation of the National Committee for Great Britain to co-operate with national committees from other countries in the carrying out of wireless telegraph research and experiment. The committees will jointly constitute an International Commission, and their work will comprise the carrying out of experiments on the propagation of electiric waves, the making of wireless measurements, and the study of related problems. Mr. W. Duddell, the president of the I.E.E., will be first president of the Commission. Mr. R. Goldschmidt, who will act as the Commission secretary, has presented £2000 for working expenses in the first instance, and further money will be provided, as required, by the committees themselves. Measurements will be made in different countries and at different distances, and in different directions, of the strength of signals leaving a Brussels station; the measurements will be repeated daily or hourly, as necessary, so as to determine the variation of strength with time, distance, and direction. The study of wave length and decrement effects is also in the Commission's programme for a later stage. Near the transmitting station at Brussels, already mentioned, there will also be a receiving station controlling the strength of the waves sent out, so that, in preparing the final results, allowance can be made for unavoidable variation. The sending out of the signals will commence on January 1. It will be remembered that the I.E.E. announced its scheme for the organisation and encouragement of electrical research, nearly a year ago, and it is under this arrangement that it is now acting in the matter of this Commission.

## WEST AUSTRALIAN RAILWAYS.

### The Government and the Ultimatum.

A report of what transpired when a deputation from the Perth Railway Employees' Association waited on the Railway Commissioner recently has been issued by the West Australian Minister of Railways, Mr. Collier, in which the Minister refutes the men's charge that the Commissioner has not enforced the Arbitration Court's decision on the railway agreement. This shows that the major offence was the men's demand that it should be made a common rule that every railway repairing gang should have a foreman and chief repairer, paid at special rates. The commissioner held that as there were over 160 repairing gangs, some of which comprised three men only, he could not accept a common rule on this matter. With respect to complaints that the Minister of Railways and the Premier had paid no attention to the appeals of the men, Mr. Collier and Mr. Scaddan stated that no appeals of any kind were made to them. The Commissioner has issued a full schedule of railway wages under the old agreement and under the new agreement, to which objection is now being taken by the men. The schedule shows that there have been material increases, both in the minimum and maximum pay in all departments of railway work. The minimum rates have increased by 6d. to 2s. per day, while the maximum rates have risen by 2s., 1s., and 6d. per day.

The Amalgamated Railway Society has decided to do nothing in connection with the Perth branch's ultimatum, until the determinations of the other branches have been received. It is explained that although the Perth branch has 800 members, only 161 voted on the ultimatum.

## LAUNCESTON (T.) ELECTRIC UNDERTAKINGS.

In the annual report of the city of Launceston (T.) for 1912-13, the City Treasurer and Accountant, Mr. Claude James, shows that the capital expenditure to date on electric lighting has been £187,416, which sum, however, has been reduced to £164,440 by transfers from the electric lighting reserve fund to capital account. During the year ended July 31, 1913, £3874 was spent, the principal item being the balance of cost of the auxiliary steam plant. The revenue from the service amounted to £21,665, as compared with £20,076 for the previous year, and the net profit, after making all necessary allowances, was £5676, as compared with £4087 last year. The reserve fund amounts to £8359, the same as last year. The system was inaugurated in February, 1896, the capital cost at the end of that year being £67,548, and for that year there was a surplus of £100 12s. 2d. on the venture. During the three following years the capital cost was increased year by year until it reached £91,639, and each of those three years showed a deficit, the total for the three years being £1616 13s. 8d. Each year since 1899 has also seen the capital cost added to considerably, but each year has also showed a surplus. The amount of borrowed money charged against the scheme is now £169,448. A reserve fund was established in 1903, and has been increased annually, though for the last four years the custom has been adopted of transferring considerable sums from the reserve to capital account.

The total expenditure on the municipal tramways has reached £68,177, including the extensions to Trevallyn and Windmill Hill, the expenditure for the year being £8840, of which £5420 was for the Windmill Hill extension and £2211 for "holiday" cars. The revenue for the year was £17,126, as against £14,783 for 1911-12, showing an increase of £2343, but working expenses were increased by £2181, the total being £10,383, so that the surplus was £809, from which £113 has to be deducted for excess of repairs over the estimated amount, which leaves a net surplus of £696. The reserve fund has been increased by £737 from revenue, and £65 12s. for interest, and now stands at £2442 14s. 4d.

## ADVANCE OF ELECTRICITY.

### Address by Mr. C. Vernier.

(From Our Correspondent.)

London, October 24.

The Institution of Electrical Engineers has made an excellent start for the session, so far as its Newcastle-on-Tyne section is concerned. Mr. C. Vernier, the chairman, delivered an excellent address on Monday at Newcastle, and yesterday he repeated it at Middlesborough for the benefit of members there. He covered a very wide field in his survey of electrical affairs. He took the subject of public electric supply undertakings, because Newcastle was an early pioneer, and still maintained a leading position in this branch of electrical work. He said that the advantages claimed for large power supply undertakings dealing with large areas were no longer open to question, namely:—(1) Low capital cost per kw. of generating stations and the increased economy in running charges obtained by the use of very large generating units; (2) the development of high load and diversity factors resulting from the varied uses which are made of the electrical energy supplied; (3) low fuel costs obtained by the favourable location of generating stations and the opportunities afforded for the utilisation of waste heat and other forms of waste fuel. The reduction of capital cost per kw. of power stations was an important matter, and in view of the steadily increasing price of coal it would continue to receive earnest attention; but of even greater importance was the development of high load and diversity factors, both of which effected a reduction of the capital charges per unit by enabling the same plant capacity to deal with a greater annual output. Maximum economy in coal consumption could only be attained by the use of large generating units, which further lent themselves to the lowest capital cost of installation, while, on the other hand, where fuel was cheaply obtained, as for instance in the case of waste heat or gas, the installation of smaller units at a higher capital cost per kw. might be quite justified. In general, the higher the price of fuel, or the poorer the load factor, the less the high capital cost could be defended on economical grounds. Further, in a large scheme, the cheaper the fuel the more desirable it was to run the plants at a high-load factor, therefore, any stations operating with cheap fuel such as cheap coal, waste heat, or water power, must be run as nearly as possible continuously at 100 per cent. load factor, the ordinary coal-fired stations dealing only with the fluctuations of load. This was where the producer of waste heat found it to his advantage to co-operate with the power company. The multiplicity of small generating stations, some 40 per cent. of which were of a capacity under 1000kw. supplying small districts, inevitably resulted in high capital charges, poor load factors, and high fuel and running costs. Experience on Tyneside with the extraordinary developments that had taken place there enabled one to judge pretty clearly under what a disadvantage the greater part of the United Kingdom continued to be placed by this sub-division of the means of production and distribution. The use of electricity from public supply sources in that portion of the North-East coast served by the power companies had increased by over 3200 per cent. within the last ten years. In that portion not served by the power companies, which included many large towns, the corresponding increase was under 450 per cent., which was also about the average for the whole country for the same period.

Mr. Vernier asked what the country was doing towards the realisation of the ideal set out by Dr. Ferranti in his inspiring address to the I.E.E. three years ago. The first step must inevitably be in the direction of centralisation of all coal-fired generating plants into large power stations supplying in bulk over very large districts so as to obtain the benefit of large outputs and increased load and diversity factors. These stations would have as far as possible to be interconnected together while all available sources of waste fuel must be fully utilised. On Tyneside they had proceeded a tolerably long way towards the solution of the problem. The chief obstacle to the centralisation policy was largely the opposition which was almost invariably offered by municipal authorities, and particularly the more important of them to the exercise of private enterprise within their borders. It might be argued that the centralisation of power supply was not necessarily a matter to be undertaken by private enterprise, and the Electric Lighting Act of 1909 provided for combination of local authorities, but the jealousy of control between neighbouring authorities appeared to be an even greater obstacle than those already mentioned. The only instance of a municipal joint scheme was the Stalybridge and Hyde one, dating back to 1901! Mr. Vernier went on to refer to the demand for electricity that was bound to arise as railway electrification progressed. This load municipalities could hardly hope to secure, and it was for the electric supply industry to place itself in a position to meet all the railway companies' requirements at a rate which would induce them to undertake electrical working, for the ability to meet the demand would largely create such a demand. Railway companies would not put down generating stations of their own if they could find a sufficiently cheap supply already available. This was already recognised in America and on the Continent and on Tyneside. Here, said Mr. Vernier, was the key to the future position of the electric supply industry. If railway companies put down their own stations, at a certain stage of their electrification developments, they would inevitably seek to supply other undertakings in bulk. The compelling agency would be that of larger outputs and the better load and diversity factors to be obtained by co-operation. The balance of advantage should obviously lie with those who were first in the field and who ought to be in a position to supply railway demand better and more cheaply than it could supply itself having regard to all the economies rendered possible by a joint load. The speaker went on to refer to the disadvantageous position in which English electric supply industry stood in comparison with other industrial countries, and he referred to the movement which is in progress in Germany, where municipalities and private companies are acting in co-operation, the municipalities holding a financial interest in power companies. In the United States, where the centralisation of electric power production and distribution was making greatest progress, the supply of electrical energy was chiefly in the hands of private enterprise. England had nothing to compare with the electric service in Chicago with its maximum load of 230,000 kw. (compared with 20,000 kw. ten years ago), or with more urban supplies, such as the public service corporation of Northern Illinois, supplying 46,000 consumers in 150 communities, whose combined population was only half a million distributed over a tract 150 miles long, and working on a system load factor approaching 70 per cent. This load factor in itself was a striking example of what could be done by supplying various demands over very large areas. Extensive schemes could not have been developed in America but for the extended use of overhead wires for transmission and distribution purposes. The legislative and other difficulties in the way of such in England were referred to. The use of overhead wires for transmission purposes was at present to a large extent at the mercy of the land owners. The Electric Lighting Acts, too, had done much to discourage their use. Amendment of the Acts was necessary, and the veto of local autnorities should be curtailed. Mr. Vernier did not advocate a general use of overhead wires in place of underground cables. Both had their uses, and he thought the more legitimate use for overhead wires in this country in the future would be for transmission lines across private land, and at very much higher pressures than were used at present. In order to obtain the best results for wide areas, it was of no small importance that the capital cost of transmission systems be kept as small as possible, and the use of overhead lines at high pressure enabled this to be achieved in a marked degree. Later, Mr. Vernier said that he apprehended no serious difficulty in increasing English overhead line pressures to anything between 60,000 and 80,000 volts if required. After referring to the question of conserving our coal supplies, and other matters, he said that the hindrances to our progress in connection with the centralisation of power supply were by no means technical in character. He added:—"When we learn from the States of 30,000kw. turbo-alternators, seven of which are already under construction; the daily operation of high voltage overhead transmission up to 140,000 volts, and covering distances up to 240 miles; of 300,000h.p. central station developments; and the electrification of some hundreds of miles of main line railway, we need have no fear as to the ability of engineers to keep pace with the world's industrial demands. But for ourselves (in England), can we ever hope to maintain our position in the electrical engineering world if we are content to allow our electric supply industry to develop along its narrow way: indeed, have we not already lost too much ground?"

## ELECTRIC LIGHTING AMALGAMATION.

It is announced that a scheme is being promoted for the amalgamation of the fifteen electric lighting companies now operating in London. The first electric lighting company to be formed in London was the London Electric Corporation, which commenced operations in 1885, followed in January, 1887, by the Kensington and Knightsbridge Electric Lighting Co., and since that date several other companies have sprung up, and still exist, though not always under their original names. The following are the principal companies now engaged in the business in London:—Brompton and Kensington Electricity Supply Co., capital, authorised, £300,000, paid up, £200,000; Charing Cross and Strand Electricity Supply Corporation, authorised, £2,100,000, paid up, £1,550,000; Chelsea Electricity Supply Co., authorised, £400,000, paid up, £277,180; City of London Electric Lighting Co., authorised, £1,200,000, paid up, £1,105,950; County of London Electric Supply Co., authorised, £1,600,000, paid up, £950,000; Kensington and Knightsbridge Electric Lighting Co., authorised, £350,000, paid up, £205,000; London Electric Supply Corporation, authorised, £1,050,000, paid up, £782,200; Metropolitan Electric Supply Co., authorised, £1,500,000, paid up, £1,380,605; Notting Hill Electric Lighting Co., authorised, £200,000, paid up, £144,000; St. James' and Pall Mall Electric Light Co., authorised and paid up, £300,000; South London Electric Supply Corporation, authorised and paid up, £260,000; Westminster Electric Supply Corporation, authorised, £2,000,000, paid up, £956,395. There are also the Blackheath and Greenwich and the Woolwich District companies, but of these no particulars are available. The total capital of the above enumerated companies is:—Authorised, £11,260,000; paid up, £8,111,330.

## MELBOURNE TRAMWAYS.

Last Thursday the Victorian Legislative Assembly passed through all their stages four Bills authorising the constructing of as many new electric tramways in the suburbs of Melbourne, viz., the Brunswick and Coburg, the South Melbourne (Middle Park), the Camberwell, Hawthorn, and Richmond, and the Kew proposals. The first of these will be 2½ miles long, the cost of construction £20,938, and the total capital cost £36,638, six cars costing £1150 each; the power will be supplied by the Melbourne City Council or the Melbourne Electric Supply Co. The South Melbourne line, which has already been described in these pages, is estimated to cost £60,000, and the earnings at £14,000 a year at an annual cost of £13,500. The Camberwell line, which, after passing through Hawthorn, replacing the present horse-trams along Burwood-road, will find its way through Richmond, along Swan-street to Prince's Bridge, will be 3¼ miles long, and the estimated capital expenditure will be about £63,000. The Kew line, which involves the taking over of the present horse-tram from the Victoria-street bridge, will, ultimately, be three miles, though at present it is proposed to build only about half of it, and the total cost is put down at £70,000.

The Premier was asked to submit for the approval of the Railways Standing Committee a proposal to make another electric tramway along Burwood-road, Hawthorn, from Power-street eastward, then along Camberwell-road to Burke-road, where it would link up with lines already authorised, the total length being two miles. Mr. Watt, although objecting to "hasty" tramway construction, admitted that the proposal was a reasonable one, and promised to ask the Cabinet to refer it to the Standing Committee, although there would be some competition with the railway between Hawthorn and Camberwell.

The Ministry shows no inclination to depart from the position already taken up by the Premier with respect to the provisions made in the Metropolitan Council Bill for the control of the whole of the tramways by that body. This being so, the municipal tramways' conference has requested Mr. Beckett to introduce a private Bill in the Legislative Council, and last week that gentleman gave notice that on the next day of meeting he would move for leave to introduce a bill entitled "A Bill to Incorporate the Municipal Tramways Trust." The Bill, as drafted, corresponds with the draft submitted to the Premier by the conference early in the session. Provision is made for the formation of a trust comprised of representatives of all the municipal bodies in the metropolitan area, and empowering them to control all the tramways in Melbourne and the suburbs. Full powers are given for the construction of tramways and for the taking over of all the existing lines, it being provided that negotiations can be entered upon and completed with the Melbourne Tramway and Omnibus Company for the purchase of the present cable system, that it may be taken over prior to the expiration of the company's lease in 1916. Mr. Watt declines to be "drawn" on the subject, but it is certain that, even if the Bill succeeds in passing the Council, the Government will oppose it in the Legislative Assembly, besides which it must be opposed by the advocates of State ownership in the lower Chamber.

The Melbourne Motor Omnibus Co. has once more submitted requests to the hackney carriage committee of the Melbourne City Council for permits to run its vehicles along a number of routes and into the city, the right, in some cases, including a Sunday morning service. The requests were considered at last Thursday's meeting, but the matter was postponed in order that legal opinion may be taken on certain points.

The Williamstown council has carried a resolution to spend £8000 for a motor 'bus service between that suburb and the city. This, it is claimed, would be the full capital cost, whereas an electric tramway would cost more like £80,000, the distances being 5¾ miles. The following resolution also was carried at last week's meeting of the council:—"That the Parliamentary representative for the district be asked to have a clause inserted in the Amending Local Government Bill to enable municipalities to borrow money for the purchase of motor 'buses."

## MONOLITE HOUSES.

Probably the speediest and most effective process of house-building yet introduced is that known as the monolite, of which Mr. S. B. Marchant, of Adelaide, is the inventor. Mr. Marchant has thoroughly demonstrated the efficiency of the process by subjecting it to the practical test of contracting, and has made money out of it. The process is simple, the chief difficulty which presents itself to the casual observer being the securing of a uniform settlement of the concrete. No such trouble is experienced, however. After the foundations are laid, moulds are reared and secured together with clips, somewhat resembling hinges. The structure thus raised forms the casing of the walls, into which concrete in the form of a slurry is poured. To secure uniformity of distribution the dry material is raised by means of a bucket elevator to a mixer, consisting of a long trough in which revolves an archimedean screw. In the trough the water is added, the screw thoroughly mixing the concrete into a slurry and distributing it through holes in the trough. The building thus becomes one piece, and is reinforced throughout, a feature being the method by which the reinforcing is effected. Mr. E. D. Crellin, who has secured the rights for Victoria, states that the saving in the cost of an ordinary suburban dwelling is at least 12 per cent., while, with terraces, the saving is much greater, probably reaching 25 per cent. These dwellings can be constructed complete in 96 hours, very little skilled labour being required, except for foundations and supervision.

## INDUSTRIAL.

Messrs. Fairfax and Roberts, Ltd., Sydney, have forwarded a new illustrated and very timely catalogue of jewellery, silver and plated ware, which should be of great service to those who desire a varied stock from which to select Christmas presents, and are precluded by distance and other considerations from personally visiting the company's extensive premises. As the catalogue extends to 160 pages, and every page contains numerous designs, ranging from richly jewelled personal ornaments to coffee-pots and butter knives, clocks and watches, the convenience of having it on hand at all seasons of the year will be appreciated.

* * *

Messrs. Willans and Robinson Ltd. (Rugby, England) have forwarded Pamphlet 50, which describes the Willans Rotary Air Pump system, of which there are alternative patterns, both of which have been thoroughly tested. Condensing plant of this type, built and building for turbines, have a total output of approximately 100,000kw., including an 8500 kw. plant for the Sheffield Corporation; besides which orders have lately been received from the Glasgow Corporation Tramways for a 5000 kw. plant, and from the London and South-Western Railway Co. for plant totalling 25,800 kw.

* * *

The Australian Metal Company, as agents for the A.E.G., have forwarded an illustrated and priced catalogue of electrically operated fans and ozonators. Of the former, three forms are offered according as they are for desk or ceiling attachment, or for exhaust purposes. The ozonators are intended as deodorising and sterilising machines, suitable for hospitals, offices, factories, lavatories, etc., wherever the air is liable to become stuffy or permeated with dust or moisture, and are made for either direct or alternating current.

## INSTITUTE OF INVENTORS OF NEW SOUTH WALES.

Up to the present time, persons who have brought out inventions, and those interested in securing protection for such inventions by patents, have not had behind them an institution which would assist them to overcome the initial difficulties and expense of demonstrating the utility of their ideas to the public, and thus many promising inventions have had to be abandoned, and, in many instances, the original inventors have been exploited by others more favourably situated taking up and securing patent rights over ideas really not their own. To fill this want, the Institute of Patents of New South Wales was formed in May, 1913, and a council appointed, but nothing seems to have been done, owing, it is said, to the lack of a sufficient number of influential scientific men actively interesting themselves in the scheme. To endeavour to overcome this difficulty, a meeting was held in the Lord Mayor's room, Town Hall, Sydney, on the 21st November, the Lord Mayor of Sydney, Alderman A. A. C. Cocks, M.L.A., being in the chair. The secretary, pro tem, of the Institute, Mr. E. H. W. Crossley, explained that the meeting was called to bring together scientists and inventors interested in the manufacture and production of commercial commodities, and explain the advantages of such an institution. The objects of the Institution are:—

1. The protection of the rights and liberties of inventors and patentees.
2. The furtherance of their interests by procuring the passing of suitable Acts of Parliament for removing existing hardships and anomalies.
3. The provision of lectures and discussion on matters or controversies of interest.
4. The assistance of members who may be in difficulties.
5. The provision of funds for presecuting or defending actions by or against members.
6. The granting to members of legal aid and advice.
7. The provision of premises in the nature of a club, containing library, convenient and useful accommodation.
8. Such other or further objects as may from time to time be determined by the members of the Institute in general meeting.

It is proposed that the institution should affiliate with the London institution, and co-operate with branches in different parts of the Empire, with the object of bringing into line the Patents Laws of the Empire.

The following gentlemen were proposed as members of the council:—G. A. Julius, Chas. Ludowici, Messrs. Fisk and Payne (Australasian Wireless Ltd.), E. Bartholomew, A. J. Arnot, Kneeshaw, Colin Smith, E. Perdriau, J. R. Bainton, and Hector (Burroughs, Wellcome and Co.).

Mr. G. A. Julius said that there could not be any doubt in the minds of engineers and people interested in scientific matters that there is urgent need for some such institute, primarily, in his opinion, to protect the public. Here, they are exploited every day of the week by worthless patents, and people possessing patents of considerable merit suffer as a result of this exploitation. Some young inventors have good ideas, but not being associated with business firms, cannot get the necessary financial assistance to carry them through, and in many cases promising patents are dropped, perhaps to be resurrected for the benefit of someone in another part of the world. It is desirable that some institution should be formed to bring about some co-ordination between the Patent Laws of various parts of the British Empire. It is almost hopeless, at present, to try and take out patents in every part of the Empire, and almost ruinous as regards expense, and an inventor is placed in a bad position to secure a sound footing and good advice. An institution, such as is now proposed, could not fail to do good service. He would do anything he could to assist the formation of such a body and in pushing it ahead, and in securing good members. It can be made a benefit both to the public and to the inventor, and is much wanted in the community. The original council has not enough members sufficiently closely connected with scientific matters, and the present proposal is for the purpose of interesting those engaged in scientific and manufacturing pursuits.

The Lord Mayor said that he understood some of those present belonged to the institute and some did not, but if there was a community of interest the first step was to join the institute, and then select a committee to carry forward the objects. Mr. Julius had outlined the necessity for such an institution, and he (the Lord Mayor) could thoroughly endorse the statement he had made that the public are exploited over very useless propositions, and some men have put their money in only to find that it might as well have been thrown down a storm water channel. There is nowhere an inventor can go for sound advice: no association of kindred minds; and the child of his brain is still-born because there is no one to help him forward from the birth of his child. If you want to patent throughout the civilised world, it is going to cost £750, which is a very big proposition. When it is secured, there is the difficulty that it gives you no rights beyond the right to defend your rights. It does not establish the fact that the patent is a good one, and that is a fact that is very detrimental to a patent. United action is practically the keynote of the civilised world to-day, and what an individual cannot do, a number united together can effect. He was quite prepared, as the Lord Mayor for the time being, to have his name used in any legitimate way in association with the institution, as he was in favour of it, and would advise them to make each successive Lord Mayor an ex-officio member. As the outcome of the meeting, he thought another meeting should be held to get members together and form a committee. The Lord Mayor added that, as for himself and other business men, there was no doubt they could call upon them to use their influence.

## LONG DISTANCE ELECTRIC RAILWAYS.

In a paper recently read before the American Institute of Electrical Engineers, Mr. H. M. Hobart contends that, for long distances, electric traction will be found more economical than steam. For the purpose of comparison he takes a typical express passenger service, for which it has been generally considered that steam power is by far the more suitable, assuming that such a service includes non-stop runs of 100 miles in two hours. During such a run maximum speeds of over 60 miles an hour will be attained and the average tractive effort for a train of 10 Pullman coaches, weighing 750 tons, is taken at 9 lb. per ton. The total tractive resistance, including 1670 lb. for the locomotive, would thus be 8420 lb., and on the basis of an efficiency of 85 per cent. from cylinders to crank pins on a steam locomotive, the power required will be 1320 I.H.P. On the basis of a consumption of 3.5 lb. of coal per I.H.P., 9240 lb. of coal will be burnt. But with an electric locomotive hauling the same train, the author estimates that the overall efficiency is from 6 to 6.5 per cent., and that the quantity of coal consumed at the generating station would amount to only 5750 lb. for the two-hour journey, being only 47 per cent. of the quantity required for the steam locomotive. In other words, the amount of coal is 122 lb. and 58 lb. per train mile for the steam and electric locomotives respectively.

The case of a non-stop express, the author points out, has been purposely taken, as it is on such runs that steam is supposed to show to the best advantage, but he states that had occasional stops been assumed, electric traction would have shown up even more favourably as regards low fuel consumption. With regard to the source of power, he is of opinion that, generally speaking, railway companies would do far better to purchase electricity from supply undertakings rather than generate their own.

The figures given are certainly instructive, and strongly support the belief, which is gaining ground, that ultimately there need be no limit to the application of electric traction.

## SMALL ARMS FACTORY.

### Purchase of Rifles in England.

The failure of the Federal Small Arms factory, at Lithgow (N.S.W.), to turn out even a fair proportion of the rifles required to equip the annual increase in our citizen army, is one of those things which demands full inquiry and explanation. Only about a thousand have yet been completed, which is admittedly far below the number that was looked for, and below what should have been put out even if full allowance be made for having to train men for the work. Last week the Minister of Defence, Senator Millen, stated that his predecessor in office, Senator Pearce, had been compelled to order rifles from England, and that he had been advised by cable that 6000 had now been shipped to Australia. Since Senator Millen took office, a further order for 17,000 had been sent home, but it will be autumn in Australia before these arrive. Next July, 17,000 or 18,000 young men will be passing out of the cadet into the adult force, and rifles will be required of service pattern, but they will have to be imported. There appears to be a good deal of friction in connection with the Commonwealth works, and, writing last week our Lithgow correspondent said:—"For some time past, the relations existing between the members of the Amalgamated Society of Engineers employed at the Commonwealth Small Arms factory and the management have not been too harmonious. There have been several matters that required adjustment, from the engineers' point of view, and the last intelligence regarding the matter is that a deputation has waited on a higher authority (presumably in Melbourne), with the result that for the time being things have somewhat adjusted themselves. The manager of the factory, Mr. A. C. Wright, declares that over 1000 rifles and bayonets have been completed, as, also, have 3,000,000 charges. The charges, he states, are being turned out at the rate of 60,000 a week on a plant that was originally designed to make but 50,000. Mr. Wright states, further, that he is not blaming the assemblers for the delay that has taken place in the production of rifles, men in the different departments having to be trained before the work could be expedited. Last year the sum of £43,868 was spent on the factory, and a further amount of £44,158 is on the estimates for the current year. The manager receives £1250 per annum; the assistant manager, £500; chief inspector of factory viewers, £468; chief chemist, £250; accountant and chief clerk, £360; under accountant, £248; while nine other clerks alone receive £1174, in addition to the general workmen, of whom there are, approximately, 300."

## MISCELLANEOUS.

At Hamilton (V.) an agreement has been made by which the local Electric Light Co. will be taken over by and worked in connection with the local gas company. Up-to-date plant is to be put in and both kinds of light will be supplied.

• • •

The auditor's report presented to ratepayers of Perth last week respecting the operations of the municipal gas works for the year ended on October 31st showed a net profit, after paying all working expenses and interest to the end of the year, of £30,758, of which £10,500 had been placed to the loan sinking fund account. The City Council bought the business of the Perth Gas Co. at the end of 1911, and on February 12th, 1912, paid over a cheque for £425,000, the mayor explaining to citizens that the actual investment cost was £350,000, on which £18,000 a year interest would be paid. It was estimated that the annual profit would be about £21,000.

• • •

It was announced by cable from New York last week that news items had been communicated from Scranton, Pennsylvania, by wireless, to railway trains travelling at the rate of 60 miles an hour, and posted in the trains for general information. The further announcement was made that the Delaware, Lackawanna and Western Railway Co., of that State, is so gratified at the result of the trial that it has decided to make this wireless service a feature in all its expresses.

• • •

A month ago Samuel Caudell was sentenced to two months' imprisonment for having caused the railway smash on Aisgill moor, Yorkshire, by failing to observe the signals given, and thus allowing his express train to run into one which had been brought to a stand ahead of him. A jury found him guilty in October; now, at the end of November, Major J. W. Pringle, who has conducted a Board of Trade inquiry, has done the same. Major Pringle, however, is of opinion that the guard of the first express, Whitley, ought to have protected his train when it was pulled up on the incline through lack of steam, and adds that responsibility for the disaster must to a small extent rest with him for having disregarded the rule to that effect. Nicholson, the engine-driver, and Donnelly, the fireman, are held to have abetted Whitley in the neglect. Major Pringle recommends, as further safeguards against such accidents, the use of detonators and coloured flare lights, the substitution of electric lighting for gas-lighting, and passenger carriages built of non-inflammable timber on steel underframes, fitted with shock-absorbing buffers.

* * *

Mr. R. O. Law, who some months ago secured the contract for building the new pier at Port Melbourne, the amount of which was £105,000, has now obtained from the Victorian Public Works Department the work of extending the Warrnambool breakwater for a distance of 300ft., the price stated in the contract being £71,563. The ocean bottom below the sand is a sandstone rock, and when this has been levelled off the foundations of new extension will be laid upon it. The foundations will consist of cement concrete in bags, and will be surmounted by "masonry" of concrete blocks and concrete masswork, with a parapet 12ft. high, on the seaward face, to prevent the waves from sweeping the breakwater during southerly gales. It is estimated that something like £12,000 worth of Australian cement will be required for the work. The work is designed so as to permit of future dredging of the harbour to a depth of 25ft. at low water. When all else is ready a double line of railway will run the full length of the breakwater, which will be used for loading and landing cargoes, while a railed-off footway will be provided for pedestrians between railways and the parapet. This is a portion of the Government's scheme for developing the outer ports, and in pursuance of the same object a contract has been signed for widening and extending the pier at Portland, and investigations are being made into local supplies of suitable material for the construction of a massive rubble breakwater. Works are also in progress at Port Fairy, a contract for cutting off a bend in the River Moyne, to improve the navigation, having been entered into.

* * *

In the New Zealand House of Representatives last week Mr. Fraser, the Minister of Public Works, stated that the Expenditure on public works during the past year was not only in excess of the previous year, but was actually the largest in any single year for over 30 years—namely, £2,711,068, of which £117,703 came out of the consolidated fund. The funds available for public works for the current year were £3,796,739, and the estimated expenditure £2,995,575. In addition, the Government has power to raise £600,000 for aid to water power and irrigation and telegraph and telephone works. Fifty-three miles of new railway were opened for traffic during the year, and other sections are nearing completion. The expenditure on roads totalled £468,972, and the provision for the current year is £751,750. Public buildings expenditure last year was £611,041, and the current year's proposed appropriations amount to £666,889. The expenditure on workers' dwellings was £46,455, while this year's appropriations total £65,000. The demand for workmen's dwellings is increasing rapidly. The estimates for this year include £1,325,000 for railway construction. A public works loan of £1,750,000 has already been authorised this session.

* * *

The Victorian Government being in want of about 27,000 tons of steel rails and fishplates called for tenders, leaving it open to the manufacturers of the world to compete, at the same time notifying G. and C. Hoskins Ltd., of Lithgow (N.S.W.), that a tender from them would be favourably considered provided the difference between their quotation and those of other manufacturers was not too great. The contracts were let last week, the Australian firm securing one-third and an English firm, through Messrs. Elder, Smith and Co., Adelaide, two-thirds of the order. Messrs. G. and C. Hoskins Ltd., will supply 9026 tons of 80 lb. steel rails at £8 15s. a ton, and 738 tons of fishplates at £10 17s. 6d. a ton. Messrs. Balckow, Vaughan and Co. will supply 18,053 tons of 80 lb. steel rails at £8 4s. a ton, and 1477 tons of fishplates at £10 8s. a ton.

* * *

Senator Clemons informed Senator De Largie and the Senate last week that the average rate of construction of the trans-Australian railway was three-quarters of a mile a day at each end, but that the track-layer was capable of more.

* * *

An assistant engineer is required for the electrical engineer's branch of the Postmaster-General's department. (See advertisement elsewhere in this issue.)

• • •

The Brighton (V.) Gas Co. has announced a reduction of 5d. per 1000ft. in its charge for gas. There was a movement on foot to endeavour to secure a reduction from 6s. 4d. to 5s. 8d. per thousand, but the company has forestalled the movers by going a little more than half-way.

* * *

The new Central Telephone Exchange of Melbourne, which three years ago (and less) was expected to be extensive enough to provide all the accommodation needed for 15 years, is already nearly filled, and the work of transferring the old wires has not yet been completed. In order to relieve the pressure at the head station it is now proposed to erect exchanges at Richmond, North Melbourne and South Melbourne, and to operate the services of large suburban areas from these. The authorities attribute the rapid development of telephony during the past two or three years to the introduction of the toll system.

• • •

£100 per station is the estimate of Mr. J. G. Balsillie as the cost of establishing wireless communication in inland towns, the sending range of the stations varying from 50 to 100 miles. It has been decided to at once establish a number of such stations in various parts of New South Wales and Queensland, so that they may be in use early next year. An ordinary battery suffices for such distances as are contemplated in this scheme.

* * *

In the West Australian Legislative Assembly last week a Bill was read the second time providing for an agreement between the Government and the Perth Corporation respecting electric power

**P & O** COMPANY'S ROYAL MAIL STEAMERS
FOR MARSEILLES, PLYMOUTH AND LONDON.

Leave Sydney on the subjoined dates, calling at usual ports.

FIRST AND SECOND SALOON ONLY.

| Steamer, | Tons. | Comman-der. | Noon. | Melb., 3 p.m. |
|---|---|---|---|---|
| MACEDONIA | 10,500 | Bennett | Dec. 13 | Dec. 16 |
| MALWA | 11,000 | Thompson | Dec. 27 | Dec. 30 |
| MOOLTAN | 10,000 | Haddock | Jan. 11 | Jan. 13 |

PASSAGE MONEY TO LONDON—
Single, £41 16s. to £82 10s.
Return, £69 6s. and £123 4s.

Return Tickets between Inter-State Ports are available for return by Orient, Messageries Maritimes, and N.D.L. steamers having room.

SPECIAL HOLIDAY RETURN TICKETS to COLOMBO are now issued, available for two months. Fares from Sydney, £45 2s. first saloon, and £31 18s. second saloon.

A. GORDON WESCHE, Superintendent IN AUSTRALIA, 63 Pitt-street, Sydney.

**The COLONIAL MUTUAL FIRE Insurance Company Limited.**

Principal Office: 60 MARKET-ST., MELBOURNE.

Branches in all the States.
Transacts Fire, Guarantee, Employers' Liability, Marine, Burglary, and Plate Glass, Accident, Workers' Compensation and Live Stock Insurances.
Send for Prospectus.
W. TUCKER, General Manager.

*Harringtons* LTD

**ANALYTICAL & METALLURGICAL DEPT.**

Highest prices given for all gold, silver or platinum residues, etc.
Lowest fees for all kinds of Assay, Analytical, and Metallurgical work.
Expert Advice on Ore Treatment, Bullion Refining, Smelting, etc., etc., Directed by a qualified Analyst from Messrs. Johnson and Sons, London: Assayers and Refiners to Bank of England, H.M. Mint, The Council of India, etc.

**HARRINGTONS LTD.**
**386 George Street, Sydney.**

supply. The Government is to erect a power generation station for the tramway service, and supply the corporation with high-pressure current at ¾d. a unit for lighting. The corporation is to provide all substations, transform the current for use, supply the Government offices at 1½d. a unit instead of 2½d. as at present, and also pay its share of a sinking fund on the cost of the generating station (£200,000), which is to be capable of producing 12,000 kilowatts. It is estimated that £50,000 will be saved by having the joint generating station instead of separate civic and Government stations.

* * *

Our Wollongong (N.S.W.) correspondent, writing on November 29, says:—The Wollongong Municipal Council, which has for some years been endeavouring to decide upon a system of lighting, having made overtures to the Mt. Pleasant Coal Co., which is about to instal an electric plant of great power, for a supply of electric current, has received a reply advising it to have a specification of its needs and estimates of cost prepared by an expert and submitted. The Bellambi Coal Co. has written the Council intimating that they would be prepared to supply current as they do to the Bulli shire. The Council has not yet made up its mind whether it should buy the plant of the Gaslight Co., stated to be in need of renovation, provide a gas plant of its own in a more suitable position, or go in for an electrical installation. As the term of the aldermen is near expiry, they will probably pass the question on.

* * *

It is anticipated that the trunk telephone line which is being erected simultaneously in Victoria and in South Australia to connect Melbourne with Adelaide, will be completed in about three months.

* * *

The convictions recorded by the Federal High Court some months ago against 27 coal companies and several shipping companies in what will be remembered as the Coal Vend case, having been upset on appeal by the shippers to the Privy Council, the fines imposed by the High Court have been remitted. In the case of the coal companies, each was fined £500, making a total of £13,500. Similar fines were imposed upon the shipping firms, but these declined to pay them until the appeal had been decided: these have, therefore, nothing to pay and nothing to receive back.

# *Invited and Accepted Tenders*

It is particularly requested that the information regarding contracts open, and the successfu tenderers, be forwarded to The Editor not later than Monday of each week.

The following contractions are used throughout:—S—supply; D—delivery; M—manufacture; C—construction; E—erection; P—purchase; I—installation; R—removal. Where no contractions appear, supply and delivery is understood. The date at the beginning of each paragraph refers to the closing of tenders.

## INVITED.

### Commonwealth.

Specifications, tender-forms, etc., for tenders invited for the Postmaster-General's Department of the various States under this heading may be had as follows:—Victoria—Various State G.P.O.'s. New South Wales—Departmental Stores, Sydney, and various G.P.O.'s in other States. South Australia—Adelaide, Melbourne, Sydney and Brisbane G.P.O.'s. Western Australia—Departmental Stores, Perth, and various G.P.O.'s in other States. Queensland—Various State G.P.O.'s. All States—Various G.P.O.'s. If the specifications, etc., may be had elsewhere, in addition, the places will be given in parentheses.

POSTMASTER-GENERAL'S DEPARTMENT, Melbourne.—9th December.—S. and D. of 1000 reinforced concrete poles, as per schedule No. 959.

11th December (extended from 11th November). — D. and E. of eight automatic telephone switchboards at the Ascot, Canterbury, Malvern, Cheltenham, Footscray, Oakleigh, Sandringham, and Williamstown Telephone Exchanges, as per schedule No. 953.

16th December.—S. and D. of one common battery multiple switchboard at the Telephone Exchange, Wills-street, Melbourne, as per schedule No. 968.

30th December.—S. and D. of telephone material, as per schedule No. 976.

30th December.—S. and D. of 3 motor cycles, as per stores schedule No. 988.

27th January.—S. and D. of switchboards, telephone, etc., as per schedule No. 990.

3rd February.—S. and D. of 2050 Lineman's safety belts, as per schedule No. 994.

10th February.—S. and D. of 1100 lead earth plates, as per schedule No. 993. (See advertising columns.)

17th February.—S. and D. of cable boxes, as per schedule No. 986.

POSTMASTER-GENERAL'S DEPARTMENT, Sydney.—10th December.—S. and D. of 63,000 insulators, as per stores schedule 296.

17th December.—S. and D. of 11,875 steel galvanised spindles, as per stores schedule 351.

18th March, 1914.—S., D. and E. at the Telephone Exchanges, Epping, Ryde, Hunter's Hill, Drummoyne, Wahroonga, Paddington and Waverley, Sydney, of seven (7) automatic switchboards, with associated equipment, as per schedule No. 179.

POSTMASTER-GENERAL'S DEPARTMENT, Brisbane.—9th December.—S. and D. of all material specified, and workmanship necessary erection 63 miles 200-lb. H.D. copper wires between Blackwall and Tambo.

17th December.—S. and D. of insulators, as per stores schedule No. 280.

31st December.—S. and D. of insulators, as per stores schedule No. 282.

7th January, 1914.—S. and D. of switchboards, as per schedule No. 274.

7th January, 1914.—S. and D. of telephone instruments, as per stores schedules Nos. 275, 276 and 277.

7th January, 1914.—S. and D. of protectors, parts, etc., as per schedule No. 278.

POSTMASTER-GENERAL'S DEPARTMENT, Perth.—10th December.—S. and D. of 60 tons galvanised iron wire.

7th January.—S. and D. of porcelain tube insulators.

21st January, 1914.—S. and D. of switches, telegraph line with plugs.

POSTMASTER-GENERAL'S DEPARTMENT, Adelaide.—17th December.—S. and D. of 5000 protectors, as per schedule No. 309.

11th February.—S. and D. of 50 cable terminals, 26 pair, as per schedule No. 308.

POSTMASTER-GENERAL'S DEPARTMENT, Hobart.—22nd December.—S. and D. of conduits, as per stores schedule 103.

DEPARTMENT OF DEFENCE.—15th December.—S. of buttons, metal badges and numerals.

DEPARTMENT OF DEFENCE.—St. Kilda-road, Melbourne.—8th December.—S. and D. of typewriters.

DEPARTMENT OF DEFENCE—Small Arms Factory, Lithgow, N.S.W.—29th December.—P. of scrap steel, brass, jute bags, whale oil, etc.

12th January.—S. of iron and steel for manufacture of rifles.

DEPARTMENT OF DEFENCE—Naval Branch. —10th December.—S. of hull for motor launch for Brisbane. Open to tenderers, Queensland and New South Wales only.

10th December.—Machinery and accessories for motor launch. Open all States. (See advertising columns.)

12th December.—S. of hull of motor launch for Newcastle. Open to Queensland and New South Wales tenderers only.

12th December.—Machinery and accessories for motor launch. Open all States. (See advertising columns.)

DEPARTMENT OF EXTERNAL AFFAIRS. —15th December.—S. and D. of complete tin dressing plant, Northern Territory, viz., 10 head 1200 lb. stamp battery, concentrating tables, etc., with necessary power plant.

8th December.—S. and D. of galvanised mild steel wire netttng and binding wire, for Canberra.

DEPARTMENT OF TRADE AND CUSTOMS. —9th December.—S. and D. of ketch, fully equipped and in seagoing order.

### States Invited.

### Victoria.

RAILWAY DEPARTMENT.—4th December.—S. and D. of steel channel bars.

4th December.—S. and D. of cast iron sash weights.

4th December.—S. and D. of Yorkshire iron forged billets.

5th December.—4-light cluster fittings, with globes, mild steel rods, mild steel stays.

6th December.—S. of 910 lineal feet 6in. semicircular glazed vitrified stoneware drain pipes.

8th December.—Resilvering mirrors.

10th December.—S. and D. of set screws.

10th December.—M., S. and D. of one 15-ton electric crane for Ballarat.

10th December.—M., S., D., E. and maintenance of one four-dial electric turret clock, Maryborough.

12th December.—S. and D. of copper plates.

12th December.—S. of Warner auto-meter speed recorder.

15th December.—Erection main workshops (steel and iron), Locomotive Depot, North Ballarat.

22nd December.—Erection main workshops (steel and iron), Locomotive Depot, Bendigo.

31st December.—S. and D. of planished mild steel sheets (lead coated or galvanised).

7th January.—S. and D. of 10,000 porous pots for batteries.

7th January.—S. and D. of best steel boiler plates.

7th January.—S. and D. copper rod.

7th January.—S. and D. copper plates.

7th January.—S. and D. of cast steel wheel centres.

7th January.—S. and D. of steel blooms for crank pins.

7th Jan.—S. and D. of locomotive brass boiler tubes.

7th January.—S. and D. of best Yorkshire iron angles.

7th January.—S. and D. of locomotive seamless copper tubes.

7th January.—S. and D. of steel channel bars.

14th January.—S. and D. of five feed lubricators.

14th January.—S. and D. of 100,000 lineal yards tarpaulin canvas.

14th January.—S. and D. of high speed twist drills.

14th January.—S. and D. of one concrete mixer.

21st January.—S. and D. of one high axle speed lathe.

21st January.—S. of hydraulic jacks.

28th January.—S. and D. of 200 forged and rolled steel disc wheels.

28th January.—M., S., D. and E. of one three-phase alternator, complete, at Newport.

4th February.—S. and D. of 1500 felt body blocks.

4th February.—S. and D. of 25 five-feed lubricators.

11th February.—S. and D. 10 tons commercial sodium acetate.

18th February.—S. and D. of pig iron.

25th February.—S. and D. 20 tons galvanised telegraph wire No. 10½.

4th March.—S. and D. of gunmetal switch locks and keys.

VICTORIAN RAILWAYS COMMISSIONERS

STATE COAL MINE.—17th December.—S. of one motor driven ventilating fan.

STATE RIVERS AND WATER SUPPLY COMMISSION.—5th December.—S. and D. of 50 tons cast iron pipes.

9th December.—M. and S. of one centrifugal pump and quick revolution steam engine about 50h.p.

TREASURY DEPARTMENT.—9th December.—S. and D. of iron and steel as per schedule No. 42.

MINES DEPARTMENT.—8th December.—S. of one 25b.h.p. suction gas engine. (See advertising columns.)

PUBLIC WORKS DEPARTMENT.—4th December.—S. and D. of 12 tons muriate of ammonia, Pentridge.

10th December.—S. and E. of portable oil engine, pump, piping, and engine house, Hospital for Insane, Kew.

## New South Wales.

PUBLIC WORKS DEPARTMENT.—8th December.—M., S. and D. of steel bridges for Cooperbung and Piper's Creeks, on fifth section, North Coast Railway, viz., Wauchope to Kempsey.

15th December.—S. and E. of friction hoists in the pork houses, New Public Abattoirs, Homebush. (See advertising columns.)

16th December.—Installing rails and switches in beef houses, etc., New Public Abattoirs, Homebush. (See advertising columns.)

22nd December.—M., S. and D. of twenty 20 ton cart weighbridges, ten 20 cwt., and forty 10 cwt. weighing machines for railway station yards. (See advertising columns.)

22nd December.—E. of electric truck and goods lifts, New Public Abattoirs, Homebush. (See advertising columns.)

27th January.—M., S. and D. of steel bridges for Saltwater and Smith's Creeks; for Christmas, Warrell, and Snaky Creeks, and Lagoon, at 216 miles 60 chains; and for Bucca Creek, on the 5th, 6th and 8th Sections, respectively, North Coast Railway, viz., Wauchope to Kempsey, Kempsey to Macksville, and Coff's Harbour to Glenreagh. (See advertising columns.)

M., S. and D. of 14,000 tons steel rails and 800 tons fishplates for 60 lb. rails.

METROPOLITAN BOARD OF WATER SUPPLY AND SEWERAGE.—8th December.—P. of scrap metals, rubber goods, old tools, electrical fittings, belting, pumps, etc., etc. (Complete schedule obtainable at Board's office.)

15th December.—M. and D. of one turbine centrifugal pumping plant for Crown-street Pumping Station.

SYDNEY HARBOUR TRUST.—8th December.—S. and D. of 920 W.I. welded splice rings for berths Nos. 4 and 5, Dawes Point to Miller's Point. (See advertising columns.)

15th December.—S. and E. of four 3-ton electrically operated freight lifts for berths 6, 7, 8 and 9, Woolloomooloo Bay.

22nd December.—S. and D. of 4 sets of electrically operated freight conveyors for berths 6, 7, 8, and 9, Woolloomooloo Bay.

2nd March.—S. and E. of 3 electrically operated semi-portal travelling cranes for berths 1, 2, and 3, Woolloomooloo Bay.

RAILWAY DEPARTMENT.—17th December.—S. of 28 single phase 50 cycle transformers. (See advertising columns.)

14th January.—S. of two electrically driven turbine pumps, 50 gallons per minute. (See advertising columns.)

25th March.—S. of five 1000kw. sub-station units. (See advertising columns.)

## Queensland.

TREASURY DEPARTMENT.—6th January.—S. and D. of 23 miles steel rails, 28 lb. per lineal yard, with all fastenings, to be delivered at Cairns about July, 1914.

WATER SUPPLY DEPARTMENT.—Tambo Water Works.—15th December.—C. and E. of steel tower surmounted by steel tank.

5th January.—S. and D. of 85 tons cast-iron water pipes, special castings and valves.

HARBOURS AND RIVERS DEPARTMENT.—15th December.—S. of stores at various ports for 2 years.

## South Australia.

SUPPLY AND TENDER BOARD.—9th December.—S. and D. of 200 rubber washers, 4in. dia. x 1⅜in. thick x 1⅝in. dia. hole in centre.

9th December.—S. and D. of 300 india-rubber buffing springs for No. 202 cylinders, 1⅝in. hole; 200 india-rubber draw springs for No. 180 cylinders, 1⅞in. hole to suit 1¾in. dia. draw bars.

9th December.—S. and D. of 550 Wallis patent buffers.

9th December.—S. and D. of 350 volute springs.

9th December.—S. and D. 400 spiral bearing springs, 1¼in. diameter wire; 400 spiral bearing springs 15-16th in. wire; 400 spiral bearing springs ⅝in. wire; 300 nests spiral bearing springs.

9th December.—C. and E. of two corrugated steel tanks, 10,000 gallons capacity each.

9th December.—S. and D. of one 60ft. turntable.

9th December.—S. and D. of 93 tons arsenic.

6th January.—S. and D. of 1500 bars chain iron, various sizes.

6th January.—S. and D. of 2000 tons steel rails, 41 lb., and 33 tons steel fishplates for same.

13th January.—S. and D. of five 30-ton weighbridges for 3ft. 6in. gauge railway.

13th January.—C. of 12 bogie goods break vans, with passenger compartments, 3ft. 6in. gauge.

PUBLIC WORKS DEPARTMENT.—16th December.—S. and E. at Renmark of complete pumping plant.

## Western Australia.

GOVERNMENT TENDER BOARD.—4th December.—S. or 16,000 gallons oil.

18th December.—S. and D. of copper plates, pipes, bars, and sheets, for Railway Department.

18th December.—Mill rolled plate glass for Railway Department.

18th December.—S. and D. of telephone material for P.W. Department.

18th December.—S. and D. of printing machinery, etc., for Lithographic Department.

8th January.—S. and D. 16 steel blooms for Railway Department.

8th January.—S. and D. of 4 tons copper line wire for Railway Department.

8th January.—P. of scrap, consisting of brass tube ends, borings and turnings, mixed white metal and brass borings and turnings, and copper plates, Midland Junction.

## General.

MELBOURNE HARBOUR TRUST COMMISSIONERS.—9th December.—S. and D. of stores for year 1914, consisting of brushes, chains, cordage, ironmongery, oils, paints, engineers' and plumbers' supplies, rope, ship chandlery, tyres, etc. Any single item may be tendered for.

CITY OF MELBOURNE.—5th December.—S. and D. of machine tools.

PRAHRAN AND MALVERN TRAMWAYS TRUST.—5th December.—M.S. and D. of rails, fishplates, fastenings and bonds.

16th December.—Construction of permanent way, Contract No. 46. (See advertising columns.)

6th January.—M., S. and D. of steel poles, Contract No. 41. (See advertising columns.)

GEELONG WATER WORKS AND SEWERAGE TRUST.—8th December.—S. of 100 tons steel sheet piling, 20 to 22 lb. per super foot, in 20ft. lengths.

19th December.—S. of 60,000 lineal feet circular reinforced concrete pipes.

19th December.—S. of 150 cast iron manhole covers.

BALLARAT WATER COMMISSIONERS (V.) (Alex. Fraser, Secretary).—11th December.—C. of reservoir embankment, on the Moorabool River.

BRISBANE METROPOLITAN WATER AND SEWERAGE BOARD.—13th January.—S. and D. of material for aerial ropeway.

10th February.—S. and D. of steam crane excavator.

CITY OF TOOWOOMBA (Q.) (Frank H. Merritt, Town Clerk).—9th February.—1000 water meters. (See advertising columns.)

CHRISTCHURCH CITY COUNCIL (H. R. Smith, town clerk).—5th January, 1914.—S. and D. of series street lighting plant and accessories. Specifications may be seen Town Clerk's office, Melbourne.

SHIRE OF BALMORAL (V.) (J. Riddel, Shire Clerk).—9th December.—Installation of 4 or 6h.p. motor engine for ferry launch, Morningside.

A.U.S.N. Co. Ltd.

*Fast, Regular, and Comfortable Passenger Steamers*

(also carrying cargo) from and to

MELBOURNE, SYDNEY, ADELAIDE, FREMANTLE, BRISBANE, and all QUEENSLAND PORTS.

Passage Tickets interchangeable, with other Inter State Companies, on certain conditions.

Full Particulars at

COMPANY'S OFFICES

at all principal Australian Ports.

The Mount Lyell Mining & Railway

CO. LIMITED.

Purchasers of Ores containing Copper, Gold and Silver. Rates obtainable on application to the Secretary.

Manufacturers of Coke for Smelting and Foundry Purposes, Acids, Etc.

HEAD OFFICE—
30 QUEEN-STREET, MELBOURNE.

D. G. LUMSDEN,
Secretary.

*An "Atlas" Engine runs in the Cheapest Oil Fuel obtainable.*

and runs effectively. An "Atlas" needs no ignition device it is the only true internal combustion Engine.

The highest efficiency is obtained in the extremely low consumption of 0.55 lbs. per B.H.P. per hour.

Any man with ordinary common sense can run the "Atlas"—it starts at the first injection of the Fuel Oil—and what's more it does not require persistent attention.

Cut down your Engine room costs as other mine managers have done. Instal the "Atlas" and benefit from the high efficiency that it will give from the very cheapest of fuel.

Call and see the Engine running or write for all particulars. Also ask for our complete Catalogue of mining and Machinery tools.

*STAWN LTD., Engineers,*
*343 Kent Street - - Sydney.*

SULPHIDE CORPORATION LTD, Central Mine.—6th December.—S. of stores for year 1914.

A1 COMPANY, Gaffney's Creek (V.) (Geo. E. Dickenson, 60 Queen-street, Melbourne).—Sinking shaft 150ft. from present depth of 850ft.

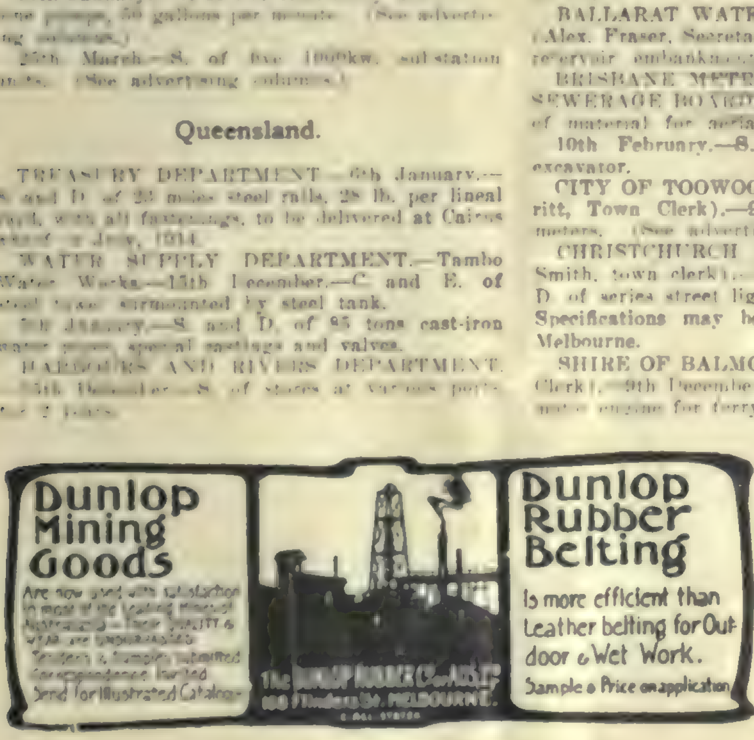
MT. MORGAN G.M. CO. LTD. (Q.).—14th December.—S. and D. of 7000 to 9000 lb. per month Rangoon wax or composite candles.

LORD ROBERTS G.M. CO., Daylesford (Hargreaves and Daggar, 31 Queen-street, Melbourne).—6th December.—Erection and completion of 10-head battery plant.

HOBART CORPORATION (T.) (W. A. Brain, Town Clerk).—15th December.—S. and D. of 62 tons of straight C.I. pipes and sundry special castings.

22nd January.—CONRAD MINES LTD., Howell (N.S.W.), (C. F. W. Lloyd, Official Liquidator, 182 Phillip-street, Sydney).—P. of mining leases, machinery, etc. (See advertising columns.)

MUNICIPAL COUNCIL OF SYDNEY.—8th December.—Annual contracts, electrical accessories, electrical castings (Part I.—cast iron; Part II.—copper, brass, etc.), electrical wires and cables. (See advertising columns.)


Dunlop Mining Goods

Are now used with satisfaction in most of the leading mines of Australasia [illegible]

Send for Illustrated Catalogue

The DUNLOP RUBBER Co. of AUST. LTD.
108 Flinders St. MELBOURNE.

Dunlop Rubber Belting

Is more efficient than Leather belting for Outdoor & Wet Work.

Sample & Price on application

"FIBRO-CEMENT" Fireproofing

Everyone about to build should obtain full particulars of this cool, acid-proof, ant-proof and fire-resisting material. The slates for roofs and the sheets for walls and ceilings are specially suited for the Australian climate. Used by the Federal and State Governments and by all the leading Architects and Builders.

ECONOMICAL AND EVERLASTING.

Full particulars, etc., from Sole Agents and Importers—

JAMES HARDIE & CO. Melbourne & Sydney

8th December.—S. and D. of bare copper cable.

8th December.—P. of scrap copper, lead and cast iron, at Power House store and yard. (See advertising columns.)

9th December.—Annual contracts. (For full particulars, see advertising columns.)

9th December.—S. and D. of wood blocks.

## ACCEPTED.

### Commonwealth.

POSTMASTER GENERAL'S DEPARTMENT, Victoria.—100 bells, magneto, 2⅝in. gong, 8s. each; 1150 magneto bells, 2⅛in. gong, 7s. 3d. each; 30 horseshoe magnets, 2s. 6d. each; 150 micro-telephones, 15s. each; 250 microphones, 5s. each; 160 switches, intermediate, three-position, 15s. 9d. each; 400 microphone mouthpieces, 5½d. each; 400 magneto bells, 2⅝in. gong, 8s. each; 50 magneto bells, 4in. gong, 16s. each; 15 switchboards, wall, 25-line, £14 9s. 6d. each; 10 switchboards, wall, 15 line, £10 1s. each; 300 common battery switchboards, 4-line, £7 9s. 6d. each; 75 switchboards, common battery, 6-line, £9 12s. 6d. each; 25 common battery switchboards, 10-line, £13 10s. 9d.—J. Bartram and Son Pty. Ltd.

200 switchboards, 4-line, £7 11s. each; 125 switchboards, 6 line, £9 13s. 6d. each; 75 switchboards, 10-line, £15 9s. each; 75 switchboards, 10 line, £13 17s. each—Western Electric Co. (Aust.) Ltd.

200 bends, 1¼in., £2 per 100; 2000 bends, 1in., 16s. 6d. per 100; 900 bends, ¾in., 12s. 6d. per 100; 8500 bends, ⅝in., 10s. per 100; 6600 bends, ½in., 8s. per 100; 3000ft. conduit steel, 1¼in., 12s. per 100ft.; 18,000ft. conduit steel, 1in., 7s. 6d. per 100 ft.; 17,000ft. conduit steel, ¾in., 4s. 6d. per 100ft.; 56,000ft. conduit steel, ½in. 3s. 1½d. per 100ft.; 2400 crampets, ¾in., 1s. 3d. per 100; 8000 crampets, ⅝in., 1s. per 100; 9000 crampets, ½in., 10d. per 100; 20,000 elbows, ½in., 7s. 3d. per 100; 200 sockets, reducing 1¼ to ¾in., £1 per 100; 200 reducing sockets, 1¼ to ⅝in., £1 per 100; 1000 reducing sockets, 1 to ¾in., 14s. per 100; 1500 reducing sockets, 1 to ½in., 14s. per 100; 100 unions, steel, 1¼in., 11s. 6d. per 100; 200 steel unions, 1in., 5s. 6d. per 100; 400 steel unions, ¾in., 5s. per 100; 5000 steel unions, ⅝in., 4s. 6d. per 100; 4500 steel unions, ½in., 4s. per 100; 200 clips, 1¼in., 1s. 6d. per 100; 500 clips, ¾in., 1s. per 100—Noyes Bros. (Melb.) Pty. Ltd.

125 trembling bells, 8s. 4d. each; 8000 fuses, 1 amp., 1.95d. each; 50 terminal blocks, 2s. 5d. each; 100 induction coils, 2s. 5½d. each; 2000 diaphragms, carbon, 1⅜d. each—The India Rubber, Gutta Percha and Telegraph Works Co. Ltd.

2 miles cable, switchboard, silk and cotton insulated, light lead covered, not more than 7-16in. in diameter, £62 per mile; 3 miles cable, switchboard, silk and cotton insulated, light lead covered, not exceeding ⅝in. diameter, £112 per mile; 2 miles cable, switchboard, silk and cotton, insulated, light lead covered, not exceeding ⅞in. diameter, £202 per mile; ½ mile cable, switchboard, silk and cotton insulated, light lead taped and braided, oval, 5mm. x 25mm., £112 per mile; 3 miles cable, switchboard, silk and cotton insulated, light lead covered, not exceeding ⅞in. diameter, £198 per mile; ½ mile cable, switchboard, silk and cotton insulated, light lead taped and braided, ⅝in. diameter, £53 5s. per mile; 6 miles cable, paper insulated, lead sheathed, one pair, £15 per mile; 4 tons wire, hard-drawn copper, 100 lb. per mile, braided, £99 per ton—Australian Metal Co. Ltd.

460 coin-collecting devices, mild steel cased, electrically controlled, with Yale lock, £2 17s. 6d. each—Boehme and Owen.

3400 yards cord, 4-conductor, for micro-telephones, 4½d. per yard; 2000 yards cord, 1-conductor, 12s. 7d. per 100 yards; 1000 cords, 2 conductors, about 3ft. 6in., 4½d. each; 100 cords, 3 conductor, 5ft. long, 1s. each; 100 howlers, with funnel, 12s. each; ⅜ mile cable, switchboard, silk and cotton insulated, light lead taped and braided dimensions flat, 11-16in. x ⅜in., £95 per mile; 250,000 sleeves, paper, jointing, internal diameter, 0.120in., 2s. 0½d. per 1000; 750,000 sleeves, paper, jointing, internal diameter, 0.180in., 2s. 0½d. per 1000—Western Electric Co. (Australia) Ltd.

340 bells, trembling, 3in. gong, 3s. 2d. each; 15 lb. carbon, granulated, for microphone, 12s. per lb.; 10 lb. carbon, granulated, for microphone, 12s. 9d. per lb.; 250 cords, 5 conductors, about 4ft. long over all, 1s. 3½d. each; 250 earpieces, ebonite, 2½d. each; 350 earpieces, ebonite, 4½d. each; 350 earpieces, ebonite, 4½d. each; 250 earpieces, ebonite, 4d. each; 90 switches, intermediate, 3 position, with 1000 ohm magneto bell and shutter, 15s. each. The Lawrence and Hanson Electrical Co. Ltd.

POSTMASTER GENERAL'S DEPARTMENT, Queensland.—3000 galvanisel brackets, 2½d. each; 1200 W.I. brackets for angles, 1s. 8½d. each; 8000 stay rods, ⅝in., 1s. 10¾d. each; 2500 galvanised steel spindles, 9½d. each Bullers Ltd., London (Agents: Chamberlain and Co.).

200 gross screws, coach, 2in., 2s. 3d. per gross; 700 gross screws, coach, 2½in., 2s. 6d. per gross; 250 gross screws, coach, 3in., 2s. 9d. per gross—Smellie and Co. Ltd.

400 lb. solder, on reels, 10 lb. each, 1s. 4d. per lb.

POSTMASTER-GENERAL'S DEPARTMENT, South Australia.—100 bells, magneto, 1000 ohms, 2⅝in. gong, 7s. 1d. each; 24 bells, magneto, 2000 ohms, 2⅝in. gong, 7s. 8d. each; 25 bells, magneto, 1000 ohms, 4in. gong, 12s. 2d. each; 1500 diaphragms, receiver, iron tinned, 2 1-16in. diameter, 10 mils thick, 5s. per 100; 500 diaphragms, receiver, tinned, 2 7-32in. diameter, 10 mils thick, 5s. per 100; 1500 diaphragms, ferro type, 2⅛in. diameter, 10 mils thick, 5s. per 100; 2000 diaphragms, ferro type, 2 1-16in. diameter, 10 mils thick, 5s. per 100; 50 microtelephones, with mouthpiece and press button, 16s. each; 200 plugs, three-part, 1s. 5d. each; 18 receivers, head pattern, 10s. each; 12 telephone condensers, complete, 53s. 6d. each; 10 telephone sets for attendants, common battery, 30s. each; 10 telephone sets for attendants, magneto, 30s. each; 100 telephone, common battery, with generator, 48s. each.—J. Bartram and Son Pty. Ltd.

3 calculagraphs for telephone service, £13 17s. 6d. each; 200 yards cord, 4-conductor, 5d. per yard; 900 cords, 2-conductor, 6ft. 6in. long, 9¾d. each; 1000 cords, 2-conductor, receiver, 4½d. each; 1500 cords, 3-conductor, 8ft. long, 1s. 4½d. each; 300 cords, 3-conductor, 6ft. 6in. long, 1s. 5d. each; 10 coils repeating, £2 7s. 6d. each; 30 keys, combined listening and ringing, 6s. each; 50 microphones, Delville, with mouthpiece, 6s. 6d. each; 400 mouthpieces, microphone, 3½d. each; 500 plugs, 2-part, 10½d. each; 200 plugs, 3-part, 1s. 5d. each; 800 telephones, common battery, wall pattern, £1 14s. 11d. each; 200 telephones, common battery, with generator, £2 16s. 5d. each; 18 howlers, with funnel, 12s. 3d. each; 75 indicators, 1000 ohms, 7s. 2d. each; 50 telephonometers, £1 4s. 11d. each; 250 diaphragms, carbon, sealed pattern 272, 8d. each; 300 diaphragms, carbon, sealed pattern 297, 22s. per 100; 50 receivers, double pole, bell pattern, 4s. 9d. each.—Western Electric Co. (Aust.) Ltd.

50 condensers, ¼ m.f., 1s. each; 50 condensers, ½ m.f., 1s. 2d. each; 12 relays, American pattern, 15s. 9d. each.—British Insulated and Helsby Cables Ltd.

50 condensers, 1 m.f., 1s. 5d. each; 200 condensers, 2 m.f., 1s. 9d. each.—John C. Fuller and Son (Agents: Messrs. Jas. Paton and Co.).

520 cords, 4-conductor, about 6ft. 6in., 1s. 11d. each; 200 cords, 3-conductor, 1s. each; 1000 cords, 2-conductor, receiver, 10½d. each; 500 earpieces, ebonite, 2½d. each; 500 rings, metal, for receivers, 5d. each.—The Lawrence and Hanson Electrical Co. Ltd.

6 telephones, magneto, portable, with canvas cover, 65s. 6d. each; 6 galvanometers, differential, 57s. 9d. each; 6 keys, open circuit, Morse, 21s. each; 18 keys, closed circuit, Morse, 21s. each.—The India Rubber, Gutta Percha and Telegraph Works Co. Ltd.

POSTMASTER-GENERAL'S DEPARTMENT, Tasmania.—20 tons galvanised iron wire, 150 lb. per mile, £12 per ton; 15 tons galvanised iron wire, 200 lb. per mile, £11 2s. 6d. per ton.

### Victoria.

RAILWAY DEPARTMENT.—M. (in Vic.), S. and D. of Locomotive parts for 20 "DD" Locomotives; chimney blast pipe and top, £5 12s. 6d. per set.—A. Roberts and Sons.

S. and D. of "Petrolite" kerosene oil for engine cleaning, 8⅞d. per gallon.—Vacuum Oil Co. Pty. Ltd.

M. (iron supplied), S. and D. of ⅝in. dog spikes for 80 and 100 lb. rails, £13 19s. per ton.—McPhersons Pty. Ltd.

M. (in the State of Victoria), S. and D. of locomotive parts for 25 "DD" engines; item No. 11, awning, etc. (not including stanchions), £62 per set; item No. 17, tender bogies (not including wheels and axles), £240 per set; item No. 18, engine brake shaft, £19 per set; item No. 19a, tender hand brake shaft, tender hand brake shaft bracket, tender hand brake handle, tender hand brake spindle, tender hand brake spindle nut, tender hand brake push rod, £8 per set; item No. 25, main reservoir, complete, £15 per set; item No. 26, supplementary reservoir and brackets, £6 15s. per set.—Johnson and Sons Pty. Ltd.

M. (in the State of Victoria), S. and D. of locomotive parts for 20 "DD" engines; item No. 16, engine bogies (not including wheels and axles), £231 4s. per set.—The Austral Otis Engineering Co. Ltd.

C., riveting, etc., on the site of the contract works, of the steel girders, etc., for foot-bridges at Toorak new station (Caulfield line duplication), £386 18s. 6d.—Forman and Co. Pty. Ltd.

E. of station buildings at Hopetoun, £1223 12s. 6d.—John Coate.

M., S., D. and E. of 3 petrol engines and pumps, for fire protection purposes, at Newport workshops; if customs duties of the Commonwealth of Australia be charged, £2735 14s.; if no customs duties be charged, £2293 10s.—Diamond Engineering and Trading Pty. Ltd.

M. (from iron sold to the contractor by the corporation), S. and D. of ⅝in. dogspikes for 80 lb. and 100 lb. rails, at £13 19s. per ton.—M. Ferguson Pty. Ltd.

S. and D. of compressed felt for new motor coaches; item No. 1, compressed felt, ¼in. thick, to sample, as specified, at £1 2s. per square yard; item No. 2, compressed felt, ⅛in. thick, to sample, as specified, at 12s. per square yard.—J. G. Black.

S. and D. of copper tubes for 15 "A2" engines.—Birmingham Battery and Metal Co. Ltd.

S. and D. of steel channel bars for electric motor cars.—Gollin and Co. Pty. Ltd.

M. (in the State of Victoria), S. and D. of locomotive parts for 20 "DD" engines.—G. W. Kelly and Lewis Pty. Ltd.

P. of quantity of cast-iron retorts, £192.—Robison Bros. and Co.

P. of 2 speed recorders, £48.—Mons. Flaman.

PUBLIC WORKS (PORTS AND HARBORS)—21 tons 17 cwt. 2 qrs. 27 lb. of residual oil for Diesel engines, shipyard, £120 7s. 9d.—British Imperial Oil Co.

800 cases gelignite, at £1 per case, £800—Dalgety and Co.

Installation of mechanical exhaust ventilation system, etc., Titles Office, £1028 17s.—Geo. Vincent.

### New South Wales.

PUBLIC WORKS DEPARTMENT.—S. and D. of two Baldwin locomotives, 24in. gauge, for Kiama quarry tramway, £631 each.—R. Towns and Co., Sydney.

---

## CITY OF MELBOURNE.

TENDERS will be received until 12 o'clock noon on Wednesday, January 21, 1914, for Supply and Delivery of Bare Hard Drawn Copper Cables.

Specification may be seen at the office of the City Electrical Engineer, Town Hall.

JOHN CLAYTON,
Town Clerk's Office, Town Clerk.
Town Hall, Melbourne,
December 3, 1913.

---

## CITY OF MELBOURNE.

TENDERS will be received until 12 o'clock noon on Saturday, January 24, 1914, for Supply and Delivery of House Cut-out Boxes.

Specification may be seen at the office of the City Electrical Engineer, Town Hall.

JOHN CLAYTON,
Town Clerk's Office, Town Clerk.
Town Hall, Melbourne,
December 3, 1913.

---

## MOUNT ELLIOTT LIMITED.

Notice is hereby given that a DIVIDEND, the eighth, of 5s. per share (less English income tax of 1s. 2d. in the £1) has been declared, PAYABLE on shares registered in Melbourne at the Company's office, Collins House, 360 Collins-street, Melbourne, on Monday, 22nd December, 1913. The transfer books will be closed from the 15th December to 22nd December, both days inclusive.

F. G. HUGHES, Secretary Melbourne Board.
26th November, 1913.

---

## FOURTH VICTORIA PERMANENT BUILDING SOCIETY.

The Forty-sixth ANNUAL MEETING of the shareholders will be held at the registered office of the Society, 243 Collins-street, Melbourne, on WEDNESDAY, 10th DECEMBER, 1913, at 11 o'clock a.m.

Business:—1. To receive the balance-sheet, directors' and auditors' reports for the year ending 31st October, 1913. 2. To elect a president, two directors, and two auditors. 3. To transact any other business required or authorised by the rules of the Society.

The retiring directors are the president (George Lush, Esq.), Sir Alexander James Peacock, M.L.A., and Arthur Edward Fisher, Esq., and the retiring auditors are Messrs. C. M. Holmes, F.C.P.A., and John Valantine, F.C.P.A., all of whom are eligible for re-election and offer themselves accordingly. By order,

E. RODDA, A.I.A.V., Manager.
Melbourne, 26th November, 1913.

---

## THE NORTH MT. FARRELL CO. NO LIABILITY.

Notice of Dividend.

A DIVIDEND (the 12th) of Sixpence per share has been DECLARED, due and payable at the Company's bankers', the National Bank of Tasmania Limited, Devonport, on Thursday, January 15th, 1914. Transfer-books close from Wednesday, January 7th, 1914, and re-open immediately after payment of the dividend.

W. B. COOKER, Manager.

**Commonwealth of Australia.**

Department of Defence,
Melbourne, November 25, 1913.

## ROYAL AUSTRALIAN NAVY.

### TENDERS FOR CUSTOMS LAUNCHES FOR BRISBANE AND NEWCASTLE.

Separate tenders will be received, subject to the conditions of tendering, for the supply of the following:—

Tenders close at noon on December 10, 1913.
Machinery and Accessories of Motor Launch for Department of Trade and Customs, Brisbane.
Tenders close at noon, December 12, 1913.
Machinery and Accessories of Motor Launch for Department of Trade and Customs, Newcastle.

Tender form, specification, etc., may be seen at the office of the Director of Navy Contracts, Navy Office, Melbourne. Copies may be obtained on payment of a deposit of £5 each, which will be refunded on receipt of a bona fide tender and the return of the documents.

The lowest or any tender will not necessarily be accepted.

Tenders are to be in all cases on the printed form, and endorsed "Tender for Hull (or Machinery) of Motor Launch" on top left hand corner of the envelope, and addressed to the Director of Navy Contracts, Navy Office, Melbourne.

E. D. MILLEN,
Minister of State for Defence.

---

## COMMONWEALTH PUBLIC SERVICE.

### VACANCY FOR ASSISTANT ENGINEER.

Class D, Professional Division. Minimum salary, £336 per annum; maximum salary, £408 per annum. In the Postmaster-General's Department, Victoria.

Applications are invited for the above position. Applicants should have had a sound educational and technical training and practical experience in telegraph and telephone line construction work; including survey and selection of new pole routes, erection and maintenance of poles and fittings, erection and maintenance of wires and aerial cables, method of protecting aerial lines from electric light and power currents, etc.

They should also have had experience in the organisation, supervision, and control of men.

Applications should reach the Commonwealth Public Service Inspector, Gloucester House, Market-street, Melbourne, not later than December 27, 1913.

D. C. McLACHLAN,
Commissioner.
W. J. CLEMENS,
Secretary.

---

## COMMONWEALTH PUBLIC SERVICE.

### VACANCIES (2) FOR ASSISTANT ENGINEERS.

Class E, Professional Division. Minimum salary, £216 per annum; maximum, £312 per annum. In the Postmaster-General's Department, Queensland.

Applications are invited for the above positions.

(1) Headquarters, Brisbane. Applicants should state their educational qualifications and their training in electrical matters generally, particularly with regard to telegraph and telephone equipment and supplies.

(2) Headquarters, Rockhampton.—Applicants should state their educational qualifications and their training in electrical matters generally, and particularly with regard to telegraph and telephone line construction and maintenance, and also their experience in the control of men.

Applications should reach the Commonwealth Public Service Inspector, Customs House, Brisbane, not later than December 27, 1913.

D. C. McLACHLAN,
Commissioner.
W. J. CLEMENS,
Secretary.

---

Postmaster-General's Department,
Melbourne, November 28, 1913.

TENDERS will be received at the office of the Deputy Postmaster-General, Melbourne, until 3 p.m. on February 10, 1914, for the Supply and Delivery of Lead Earth Plates (Sch. 913). See Commonwealth Gazette, November 29.

AGAR WYNNE,
Postmaster-General.

(1279)

---

## WANTED.

### TEN ARMAMENT ARTIFICERS FOR COMMONWEALTH PERMAMENT MILITARY FORCES.

Pay, from 10/- to 13/- per day. Uniform Allowance, £5 per annum. Eighteen days' recreation leave annually. Medical attendance free.

Applicants must be between ages of 21 and 30 years, and competent tradesmen (fitters and turners), with a knowledge of mechanical drawing. Applications close on December 15, 1913. Full particulars and application forms obtainable from Secretary, Department of Defence, Melbourne.

---

## Government Notice (V.).

Department of Mines,
Melbourne, November 27, 1913.

TENDERS are invited up to 12 noon on Monday, December 8, for the Supply of One (1) Gas Engine of about 29 brake horse-power, using suction gas.

Particulars to be obtained at this Department. The lowest or any tender will not necessarily be accepted. Tenders, addressed to the Secretary for Mines, endorsed "Tender for Suction Gas Plant," to be placed in the tender box of the Mines Department, Public Offices, or sent by post.

W. DICKSON,
Secretary for Mines.

---

## Government Notices (N.S.W.).

### N.S.W. GOVERNMENT RAILWAYS.

### EXCURSION TRAINS TO SYDNEY. DECEMBER, 1913.

TICKETS, at the rate of Single Fare for the Double Journey (minimum fares, 7/6 First Class, and 5/- Second Class), will be issued to Sydney and intermediate stations on the undermentioned dates. Such tickets will have a coupon attached, which will require to be exchanged for a single ticket for the return journey within six weeks from date of issue. Excursionists will be allowed to return only by trains specified on handbills.

From the Illawarra Line.—From stations, Nowra to Corrimal, on Friday, December 12.

From the Southern Line and Branches—From the Oaklands, Tumut, Wyalong, Barellan, and Grenfell Branches, and stations, Wattamondara to Kingsvale, on Tuesday, December 16. From Main Line Stations, Albury to Douglas Park, inclusive, and the Germanton, Corowa, Hay, Finley, Crookwell and Nimmitabel Branches, on Wednesday, December 17.

From the Western Line and Branches.—From stations, Dubbo to Maryvale, Orange to Springwood, and Tullamore to Brolgan, the Forbes and Grenfell Branches, and stations, Mudgee to Irondale, inclusive, on Monday, December 15.

From stations, Nyngan to Minore, Wellington to Clergate, the Warren, Peak Hill, Coonamble, and Canowindra Branches, stations, Condobolin to Carlachy, Cowra to Stanfield, and Dunedoo to Munna, inclusive, on Tuesday, December 16.

From stations, Bourke to Summervale, the Brewarrina and Cobar Branches, and stations, Orange to Springwood, inclusive, on Wednesday, December 17.

From the Northern Line and Branches.—From Main Line stations North of Tamworth, and from stations, Collarenebri East to Culgoora, inclusive, on Thursday, December 11. From stations, Tamworth to Woy Woy, from the Barraba, Morpeth and Toronto Branches, and stations, Walgett to Bugilbone, and Narrabri to Gap, inclusive, on Friday, December 12. From stations, Tamworth to Woy Woy, inclusive, from the Garah, Inverell, Morpeth and Toronto Branches, and stations Walgett to Bugilbone, and Moree to Gap, inclusive, on Monday, December 15. From stations, Collarenebri East to Culgoora, Narrabri to Gap, and Taree to Oakhampton, inclusive, on Tuesday, December 18.

For times of trains, availability of tickets, trains by which excursionists may return, etc., see handbills, obtainable from all Station-masters.

By order,
J. S. SPURWAY,
Secretary.

(9d284)

---

## NEW SOUTH WALES GOVERNMENT RAILWAYS AND TRAMWAYS.

Office of the Chief Commissioner,
Sydney, November 29, 1913.

TENDERS will be received at this office until 12 o'clock noon on the dates specified for the undermentioned Supplies, Works, etc., viz.:—

WEDNESDAY, DECEMBER 17, 1913.
The Supply of 28 Single-phase, 50-cycle Transformers, Specification 435, price 2/6.
WEDNESDAY, JANUARY 14, 1914.
The Supply of Two Electrically-driven Turbine Pumps, 50 gallons per minute, to Specification No. 432, price 2/6.
WEDNESDAY, MARCH 25, 1914.
The Supply of Five 1000kw. Substation Units, Specification No. 434, price 10/-.

All specifications are obtainable at the Electrical Engineer's Office, 61 Hunter-street, Sydney.

Tenders to be endorsed, "Tender for Transformers," or as the case may be.

The Chief Commissioner does not bind himself to accept the lowest or any tender.

By order,
J. S. SPURWAY,
Secretary.

---

Department of Public Works,
Sydney, November 29, 1913.

### TENDERS FOR STEEL BRIDGES, ETC.

Tenders, specified below, will be received at this Department until 2 o'clock p.m., on the dates mentioned:—

MONDAY, DECEMBER 15, 1913.
Supply, etc., of Friction Hoists in Pork Houses, New Public Abattoirs, Homebush.
Installing Rails and Switches, etc., in Beef Houses, etc., New Public Abattoirs, Homebush.
MONDAY, DECEMBER 22, 1913.
Supply, etc., of Twenty 20-ton Cart Weighbridges, Ten 20-cwt., and Forty 10-cwt. Weighing Machines, for Railway Station Yards.
Construction of Electric Truck and Goods Lifts, New Public Abattoirs, Homebush.
TUESDAY, JANUARY 27, 1914.
Manufacture, etc., of Steel Bridges for Saltwater and Smith's Creeks; for Christmas, Warrel and Snaky Creeks, etc.; and for Bucca Creek, 5th, 6th and 8th Sections, respectively, North Coast Railway.

Further particulars may be obtained from N.S.W. "Government Gazette."

(6a127) ARTHUR GRIFFITH.

---

Sydney Harbour Trust Office,
Circular Quay, November 27, 1913.

### TENDERS FOR WROUGHT IRON WELDED SPLICE RINGS.

TENDERS will be received at this office up to 2 p.m. on the 8th proximo, for the Supply and Delivery to the Trust of Nine hundred and twenty (920) Wrought Iron Welded Splice Rings, for jetty berths Nos. 4 and 5, Dawes' Point to Miller's Point.

Forms of tender and full particulars may be obtained upon application to the Engineer-in-Chief of the Trust.

HAROLD F. NORRIE,
Secretary.
(7a40)

---

**MELBOURNE ELECTRIC SUPPLY CO. LTD.**

NOTICE is hereby given that the Transfer Books, local share register, of the above-named Company will be Closed in connection with the Consolidated Ordinary Stock from Monday, December 8, to Tuesday, December 16, 1913, both days inclusive. By order.

W. J. MOUNTAIN, Secretary.
19 Queen-st., Melb., November 29, 1913.

---

**CATHCART VICTORY GOLD MINES N.L.**

QUOTATIONS will be received by the undersigned up to 15th inst., for the following, new or secondhand:—Pumping Engine, 20in. cylinder; drawlift, 14in.; 250ft. of columns, with 14in. or 16in. workings; bob and mountings, and all connections complete.

PERCY P. COOK, 360 Collins-st., Melbourne.

---

**CAMPBELL'S CREEK DREDGING CO. N.L.**

NOTICE is hereby given that a Dividend (36th) of 6d. per share has been declared, due and payable at the registered office of the Company, third floor, Broken Hill Chambers, 31 Queen-st., Melbourne, on Friday, December 19, 1913. Transfer books close from December 12 to 19, both days inclusive. A. F. SHOWERS, Manager.

## CITY OF TOOWOOMBA, QUEENSLAND.

TENDERS FOR WATER METERS.

Sealed Tenders will be received up to 12 o'clock noon, on Monday, February 9, 1914, for 1000 Water Meters, to be delivered at the rate of 20 per month. Conditions of tender and further particulars may be obtained from the undersigned.

FRANK H. MERRITT,
Town Hall, Town Clerk.
November 19, 1913.

---

## THE CONRAD MINES LIMITED, HOWELL, Near Inverell, In Liquidation.

TENDERS are hereby invited and will be received at my office up to THURSDAY, the 22nd day of January, 1914, at 12 o'clock noon, for the purchase of the undermentioned Assets, viz.:—

LOT 1.—Mining Leases to the total areas of 407 acres 1 rood 26 perches, situated in the Parish of Mayo, County of Hardinge, about 20 miles by coach road from the township of Inverell.

LOT 2.—Limestone Lease, containing 5 acres, situate in the Parish of Warialda, County of Burnett, having 20 years to run from the sixth day of August, 1912, at a yearly rental of £5 per annum.

LOT 3.—Lease for dam sites of 14 acres 2 roods, dated 6th April, 1905, for a term of 20 years; annual rental £7 10s.

LOT 4.—Machinery, consisting of Winding Engines, Boilers, Pumps, Blowers, Tanks, Scales, Weights, Buckets, Blast Furnaces, Trucks, Winches, Punching Machines, Tangye's Engines, and all the other necessary machinery required to work the mine, together with a quantity of stores, and a small quantity of Furniture. Also the necessary Manager's Residence, Offices, etc.

The rent of the Mining Leases is paid up till the end of December, 1913.

The Mine is situated at easy access from Inverell.

Water is plentiful, the average annual rainfall being 32 inches.

The Mine is situated at an elevation of about 3200ft.

The Ore contains Tin, Silver, Lead, and Copper.

The workings have demonstrated that the lode is very continuous, and contains a succession of rich shoots of ore, the chief of which is nearly 1000ft. long.

Statistics showing the yield of the Mine can be seen in a Special Report that I have obtained.

The Plant is a complete one, and could easily be put in good working order. It is estimated the plant is capable of treating at least 120 tons crude ore per day, without putting any fresh developments into the Mine.

The Mine has been producing large quantities of ARSENIC. I am informed from this source alone a profit of several thousand pounds sterling yearly could be realised.

The Mining Expert that I employed (Mr. W. T. Lee) reports that now the Mine has been so extensively opened up, disclosing vast quantities of payable ore, added to the fact that the treatment of the ore has been successfully solved, and that also taking into consideration the enormous sums paid for other properties not having a tithe of the advantage attaching to this property, the value of the machinery and leases is very considerable.

A copy of the Report of Mr. Lee, together with a list of the machinery, may be seen at my office, or at the mine; and Mr. Barnett, the caretaker in charge, will show prospective buyers over the Mine.

Owing to the want of capital, suspension of the Labour Conditions has been granted.

All information can be obtained at my office.

Lots may be tendered for separately or conjointly.

A deposit of 10 per cent. must accompany each tender.

The highest or any tender not necessarily accepted.

TERMS CASH.
C. F. W. LLOYD,
Official Liquidator.
182 Phillip-street,
Sydney, 26th November, 1913.

---

## NORTH BROKEN HILL LIMITED.

Notice is hereby given that a DIVIDEND (the 32nd) of 2s. per share has been declared, due and PAYABLE on the 19th December, 1913. Transfer Books will Close at tne office of the Company, Collins House, 360 Collins-street, Melbourne, and London, on the 5th day of December, 1913, at 4 o'clock in the afternoon. By order of the Board,

HENRY M. FIEDLER, Secretary.

360 Collins-street, Melbourne, 26th Nov., 1913.

Shareholders are notified that their dividend will be posted direct.

---

## MUNICIPAL COUNCIL OF SYDNEY.

TO CONTRACTORS.

Sealed and Endorsed Tenders will be received by the undersigned until 3 o'clock p.m. on Tuesday, December 9, 1913, for Annual Contracts for the following:—

Brushware.
Blacksmith's Work.
Cement.
Chemicals.
Coal—General.
Castings—General.
Disinfectants.
Engine Packings and Stores, Part 1.
Engine Packings and Stores, Part 2.
Earthenware Pipes.
Glass.
Liquid Soap.
Locksmiths' Work.
Laundry Work.
Oils—General.
Plumbers' Requisites.
Painters' Requisites.
Rubber Hose.
Rubber Tyres.
Repairing Chairs.
Stationery.
Stores (General), Part 1.
Stores (General), Part 2.
Sandstone Kerb and Gutter.
Trachyte Kerb and Gutter.
Timber, Part 1.
Timber, Part 2.
Uniforms.
Also Purchase of Residual Oils from the Tar Plants.

Specifications and full particulars may be seen upon application at the Office of the Comptroller of Assets and Stores, Town Hall, Sydney.

The lowest or any tender not necessarily accepted.

Tenderers, please note that they must pay their cash deposits direct into the City Treasury, and not enclose same with their tenders, otherwise their tenders will be rejected as informal.

THOMAS H. NESBITT,
Town Hall, Sydney, Town Clerk.
November 21, 1913.

---

## MUNICIPAL COUNCIL OF SYDNEY.

TO CONTRACTORS.

Sealed and Endorsed Tenders will be received by the undersigned until 3 o'clock p.m. on Monday, December 8, 1913, for Annual Contracts for the following:—

Electrical Accessories
Electrical Castings—Part I., Cast Iron.
Electrical Castings—Part II., Copper, Brass, etc.
Electrical Wires and Cables.

Specifications and full particulars may be seen upon application at the Office of the Comptroller of Assets, Town Hall, Sydney.

The lowest or any tender not necessarily accepted.

Tenderers, please note that they must pay their cash deposits direct into the City Treasury, and not enclose same with their tenders, otherwise their tenders will be rejected as informal.

THOMAS H. NESBITT,
Town Hall, Sydney, Town Clerk.
November 22, 1913.

---

## MUNICIPAL COUNCIL OF SYDNEY.

TO CONTRACTORS.

SALE OF SCRAP COPPER, LEAD AND CAST IRON.

Sealed and Endorsed Tenders will be received by the undersigned until 3 o'clock p.m. on Monday, December 8, 1913, for the Purchase of a Quantity of Scrap Copper, Lead and Cast Iron, now at the Power-house Store and Yard.

Full particulars may be had upon application at the Office of the Comptroller of Assets and Stores, Town Hall, Sydney.

The highest or any tender not necessarily accepted.

Tenderers, please note that they must pay their cash deposits direct into the City Treasury, and not enclose same with their tenders, otherwise same will be rejected as informal.

THOMAS H. NESBITT,
Town Hall, Sydney, Town Clerk.
November 27, 1913.

---

AGGREGATE BALANCE-SHEET OF THE

# BANK OF NEW SOUTH WALES,

## 30th SEPTEMBER, 1913.

### LIABILITIES.

| | £ | s. | d. | £ | s. | d. |
|---|---|---|---|---|---|---|
| Notes in Circulation | 264,437 | 0 | 0 | | | |
| Deposits, Accrued Interest, and Rebate | 34,001,864 | 12 | 0 | | | |
| | | | | 34,266,301 | 12 | 0 |
| Bills Payable and other Liabilities (which include Reserves held for Doubtful Debts and Amounts at Credit of Investments Fluctuation Account, Officers' Fidelity Guarantee and Provident Fund, The Buckland Fund, and amounts due to Other Banks) | | | | 6,169,543 | 4 | 10 |
| Paid-up Capital bearing | | | | | | |
| 6 months' dividend | £3,257,860 | 0 | 0 | | | |
| 3 " " | 242,140 | 0 | 0 | | | |
| | £3,500,000 | 0 | 0 | | | |
| Reserve Fund | 2,250,000 | 0 | 0 | | | |
| Profit and Loss | 339,355 | 16 | 1 | | | |
| | | | | 6,089,355 | 16 | 1 |
| | | | | £46,525,200 | 12 | 11 |
| Contingent Liabilities—Outstanding Credits, as per Contra | | | | 843,015 | 8 | 2 |
| | | | | £47,368,216 | 1 | 1 |

### ASSETS.

| | £ | s. | d. | £ | s. | d. |
|---|---|---|---|---|---|---|
| Coin, Bullion and Cash Balances | 10,702,510 | 6 | 2 | | | |
| Australian Commonwealth Notes | 1,269,569 | 0 | 0 | | | |
| Queensland Government Notes | 22 | 0 | 0 | | | |
| Notes of other Banks | 4,640 | 0 | 0 | | | |
| Money at short call in London | 1,195,000 | 0 | 0 | | | |
| Investments— | | | | | | |
| British and Colonial Government Securities | 3,098,668 | 18 | 3 | | | |
| Municipal and other Securities | 286,014 | 2 | 11 | | | |
| Due by other Banks | 138,024 | 10 | 1 | | | |
| Bills Receivable in London and Remittances in transit | 3,669,132 | 19 | 5 | | | |
| | | | | 20,363,572 | 16 | 10 |
| Bills Discounted and Loans and Advances to Customers | | | | 25,386,627 | 16 | 1 |
| Bank Premises | | | | 775,000 | 0 | 0 |
| | | | | £46,525,200 | 12 | 11 |
| Liabilities of Customers and others on Letters of Credit as per Contra | | | | 843,015 | 8 | 2 |
| | | | | £47,368,216 | 1 | 1 |

### PROFIT AND LOSS, 30th SEPTEMBER, 1913.

Dr.

| | £ | s. | d. |
|---|---|---|---|
| Balance proposed to be dealt with as follows:— | | | |
| To Dividend at the rate of 10 per cent. per annum | 162,893 | 0 | 0 |
| " Three Months' Dividend on New Capital paid | 6,053 | 10 | 0 |
| " Interest at 5 per cent. per annum to 30th June, 1913, on Capital paid in advance on other than the fixed dates | 1,751 | 1 | 0 |
| " Augmentation of the Reserve Fund | 100,000 | 0 | 0 |
| " Balance carried forward | 68,658 | 5 | 1 |
| | £339,355 | 16 | 1 |

Cr.

| | £ | s. | d. |
|---|---|---|---|
| By Amount from last Account | 87,503 | 17 | 1 |
| " Balance of Half-year's Profits after deducting Rebate on Current Bills, Interest on Deposits, paying Note and Other Taxes, reducing valuation of Bank Premises, providing for Bad and Doubtful Debts, and fluctuations in the value of Investment Securities; and including recoveries from Debts previously written off as bad | 251,851 | 19 | 0 |
| | £339,355 | 16 | 1 |

### RESERVE FUND, 30th SEPTEMBER, 1913.

Dr.

| | £ | s. | d. |
|---|---|---|---|
| To Balance (Of which £750,000 is invested in British Government Securities, and £500,000 in those of States where we are represented—in all, £1,250,000. The balance is employed in the business of the Bank.) | 2,350,000 | 0 | 0 |
| | £2,350,000 | 0 | 0 |

Cr.

| | £ | s. | d. |
|---|---|---|---|
| By Balance | 2,250,000 | 0 | 0 |
| " Amount from Profit and Loss | 100,000 | 0 | 0 |
| | £2,350,000 | 0 | 0 |
| By Balance | £2,350,000 | 0 | 0 |

J. RUSSELL FRENCH, General Manager.
W. E. SOUTHERDEN, Chief Accountant.

S. E. LAIDLEY
ALFRED G. MILSON Auditors.

## PROFESSIONAL CARDS.

**GERALD AHERN, A.O.S.M.,**
MANAGER COMET MINE,
DUNDAS, TASMANIA.
Mines Sampled and Reported On.

Tele. Address—Gerald Ahern, Zeehan, Tasmania.

**G. H. BLAKEMORE,**
CONSULTING METALLURGIST
For Copper and Lead,
MINING ENGINEER,
CASTLEREAGH CHAMBERS, 16 CASTLEREAGH ST
Telegraph Codes Bedford McNeill 1908 Edition
Moreing & Neal.
A.B.C. 5th Edition.
Cable Address. Radgarn. Telephone 7124 City

**MATTHEW C. COATES, A.M.I.E.E.**
CONSULTING MECHANICAL and ELECTRICAL ENGINEER Expert Reports given for Power Generating Plants, Factory Installations, Steam, Gas and Electric.
99 QUEEN STREET, MELBOURNE.

**VALENTINE J. CROWLEY,**
CONSULTING ELECTRICAL ENGINEER.
Hydro-Electric Plants and Transmission Lines Designed and Supervised.
Austral Chambers, Telephone 7736
97-99 QUEEN STREET, MELBOURNE.

**W. A. T. DAVIES,**
M. Amer. Inst. M.E., F.G.S. (Lond.)
CONSULTING ENGINEER ALL METALS.
48 QUEEN STREET, MELBOURNE.
Code Used Moreing and Neal
Telephone 1633 Central.

**T. J. GREENWAY, M.I.M.M., F.I.C.**
MINING AND METALLURGICAL ENGINEER
60 QUEEN STREET, MELBOURNE.

**GOYDER & HALLETT,**
ASSAYERS AND ANALYSTS
110 Gawler Place, Adelaide.
Telephone 169.
Metallurgical and Chemical Processes Investigated
Ores Sampled and Assayed

**HARGRAVES & DAGGAR,**
CONSULTING ENGINEERS & METALLURGISTS.
Broken Hill Chambers, 31 Queen Street, Melbourne, and at Bendigo, Vic., and Sydney, N.S.W.
Consultations, Examinations,
Reports for Investors, Machinery Erection and Supervision.
Tel. Central [illegible] Process Devisors, &c.

**KAY, MACNICOL & CO.,**
Mechanical, Mining & Electrical Engineers.
BROKEN HILL CHAMBERS
31 QUEEN STREET, MELBOURNE.
Cable Address. "Engineer," Melbourne.
Telephone, No. [illegible]

**McCARTY, UNDERWOOD & CO.,**
CONSULTING ELECTRICAL AND MECHANICAL ENGINEERS.
31 QUEEN STREET, MELBOURNE
Telephone, [illegible]

**E. A. WEINBERG,**
MINING AND METALLURGICAL ENGINEER,
19 QUEEN STREET, MELBOURNE.

**J. D. AUDLEY SMITH,**
MINING ENGINEER,
9 Bridge-street, Sydney.
Telegraphic Address—
Audley Smith,
Mining Engineer,
Sydney
Telephone No.—
City 2677

**WALTER F. SMITH,**
MANAGER FLOATER G M
Ravensthorpe, W.A.
Mines Sampled, Valued, and Reported on.
ASSAYS MADE
Code Bedford McNeil.
Reliable Information Furnished on the Phillips River Gold and Copper Field

## PUBLISHERS' ANNOUNCEMENTS.

**Cole's Book Arcade**
Melbourne
Sydney
Adelaide

—BOOKS Advertised—
—by Everybody are—
—SOLD AT COLE'S—

Send for **COLE'S BOOK BUYERS' GUIDE** or Catalogues on your Special Subject.

**MINE MANAGER'S** Book-keeping Manual and Office Companion, by Edwin R. Field. 3/6, postage 1d.

**ROUTLEDGE'S EVERYMAN'S CYCLOPAEDIA,** 50,000 items of literary, historical and useful knowledge. Cole's Price: 2/6, postage 4d.

**HEALTH, STRENGTH and HAPPINESS,** a Book of Practical Advice for Men and Women, by Dr. Saleeby. Cloth 3/6, paper 2/-, postage 3d.

**LIFE AND EVOLUTION,** by F. W. Headley, with 100 illustrations. Now 5/-, postage 4d.

**THE MAN FARTHEST DOWN,** a record of Observation and Study in Europe, by Booker Washington. Cole's Price: 3/6, postage 3d.

**BACKBLOCK BALLADS** and Other Verses, by Den (C. J. Dennis) from the "Bulletin" and other live papers. Paper 1/6, cloth 2/6.

**E. W. COLE, Book Arcade, Melbourne, Etc.**

**SIAM OFFERS**

A splendid new field for Australian Business Enterprise.

**SIAM WANTS**

Mining and Agricultural Machinery, Seeds, Hides, Tallow, Meats, Jams, Butter, Cheese, Potatoes, General Manufactures, also Horses, Cattle and Sheep.

**The Siam Observer (Daily),**
**The Siam Maitri**
**The Siam Weekly Mail** (Weeklies.)

Siam's Leading Newspapers, which, with

**The Siam Directory**

are published at the Siam Observer Offices, Bangkok, will put you in touch with this market.
Rates and Particulars from
***GORDON & GOTCH.***

M. de Lannay, the eminent French metallurgist, has recently formed an estimate that diamonds to the weight of 28 2-5 tons, which would fill a space of 10½ cubic yards, and have a value of nearly £200,000,000, have been taken from the earth from the earliest time to the present day. These figures, however, only concern the stones before cutting, which reduces their weight volume by half, but multiplies their value by five. A box 3ft. high, 6ft. wide, and 8ft. long would thus hold the world's total output of these gems in their finished condition, and would have a market value of £940,000,000, according to present prices.

* * *

The alum mountain near the Gila River, in south-western New Mexico, is 900 feet high, and covers two square miles, and the United States Geological Survey finds it to be so pure that for many uses it can be marketed in the natural state. As a probable future source of aluminium this material has a still greater value. Enormous beds of lignite near-by offer power at one-fourth to one-half the cost of hydro-electric power.

**Critchley Parker Publications**

**Past and Present Metal Markets.** W. E. Figgis. Book and 2 Charts, 15/-. Posted, 16/3; foreign, 16/5.

**Coalfields and Collieries of Australia.** F. Danvers Power. 440 pages, 229 illustrations, demy octavo. 25/- nett. Posted, 25/3; foreign, 26/8. (Size, 9 x 6.)

**High Explosives.** W. R. Quinan. 224 pages, royal octavo, 21/-. Posted, 21/3; foreign, 22/4. (Size, 10 x 7.)

**Power.**
(*Issued under authority Sydney Municipal Council.*)
2/6 nett; post free.

**Australian Mining and Metallurgy.** Donald Clark. 600 pages, royal octavo. 21/- nett. Posted, 21/4; foreign, 22/9. (Size 10 x 7.)

**Gold Refining.** Donald Clark. 134 pages (plates), demy octavo. 12/6 nett. Posted, 12/7; foreign, 13/1. (Size, 9 x 6.)

**West Australian Mining Industry.**
(*By authority W.A. Government.*)
250 pages, crown folio. 10/- nett. Posted, 10/2; foreign, 10/8. (Size, 14½ x 10.)

**New South Wales Mines and Minerals.** 250 pages, crown quarto. 5/- nett. Posted, 5/1; foreign, 5/7. (Size, 10 x 7½.)

**Victoria, and its Mining Resources.**
(*By authority Victorian Government.*)
84 pages, crown quarto. 3/- nett; post free.

**Mining and Railway Map of Australia.** (In preparation.) Cloth, 21/-.

**Ventilation of Mines.** Johann Sarvaas. 60 pages. 2/7 post free.

**Australasian Joint Stock Coy's Year Book.** R. L. Nash (Financial Editor, "Daily Telegraph," Sydney). 600 pages, demy octavo, 10/6 nett. Posted, 10/8; foreign, 11/9. (Size, 9 x 6.)

**Australian Mining Standard.** Issued every Thursday 26/- per annum. British possessions, 32/6; foreign, 34/8; post free.

Size stated in inches.

Order through your Bookseller, or

***AUSTRALIAN MINING STANDARD,***
**Sydney: 12-14 O'Connell-street.**
**Melbourne: 376 Flinders Lane.**
London: Hill Publishing Co., 6 Bouverie St., Fleet St.

*Also published by us, but now out of print.*

**Tasmania and its Mineral Wealth.**
(*By authority Tasmanian Government.*)
**Metallurgy of Tin.** P. J. Thibault. Demy octavo. 12/6.
**Resourceful Queensland.**
(*By authority Queensland Government.*)
**Electrical Progress of Australasia.**

ESTABLISHED 1860.

**BONDHOLDERS' REGISTER**

Publishes the Actual Numbers of all Drawn Bonds Throughout the World.

PUBLISHED FORTNIGHTLY.

**10s. PER ANNUM.**

73 FARRINGTON ST., LONDON, E.C.

Australian Offices,
376 FLINDERS LANE, MELBOURNE.

**"Allen's"**

**IMPERIAL**

**Manganese Steel**

FOR

Dredging Pins and Bushes, and all Wearing Parts of Rock-Crushing Machinery, Points, Crossings, Etc.

SOLE MAKERS OF

**THE "STAG" TUBE MILL**

For Grinding Grit, or Tailings, and Granular Materials, to any degree of Fineness.

THE "STAG" BRAND **OCTAGON MINING DRILL STEEL**

**EDGAR ALLEN & CO., LTD.,**
Imperial Steel Works, SHEFFIELD

Stocks on Hand
of
Mining and High Class Tool Steels.

AUSTRALIAN REPRESENTATIVES:
**P. T. Taylor Ltd., 141 York Street, Sydney.**

THE
**University of Sydney.**

DEPARTMENT OF ENGINEERING.

The course for the degree of Bachelor of Engineering in Mining and Metallurgy extends over a period of four years, during which lectures and practical instruction are given in the following subjects:—

Chemistry, Physics, Mathematics, Descriptive Geometry, Geology, and Economic Geology, Mineralogy, Engineering Construction, Mechanical Engineering Materials and Structures, Electrical Engineering, Surveying, Building Construction, Mining, Metallurgy, Assaying, Engineering Design and Drawing.

The Chemical, Metallurgical, Physical, Geological, Mechanical and Electrical laboratories are thoroughly well equipped with modern plant and machinery.

The Academic year commences in March. The fees are nine guineas per term, or a total cost for graduation of £125 8s., including Matriculation and Degree Fees. Students, whether matriculated or unmatriculated, who do not wish to take up the full course may select individual subjects.

Full particulars will be found in the University Calendar published by Angus and Robertson, Castlereagh-street, and may be obtained upon application.

H. E. BARFF,
Registrar.

**BALLARAT**
**School of Mines**

DEPARTMENTS:
CHEMISTRY and METALLURGY,
ENGINEERING and SURVEYING
ELECTRICAL ENGINEERING,
GEOLOGY and MINING
MATHMATICS and PHYSICS.

Prospectus on Application.
F. J. MARTELL, Director.

All commercial explosives owe their power of doing work to the expansive force of the great volume of gas into which they are converted at the occurrence of the explosion. The pressure exerted by this gas in the drill hole or other confined space in which the explosion is brought about is what makes explosive substances of value in mining or other industries, and is the primary cause of all those manifestations of energy that follow the firing of a charge. Common black blasting powder, or explosion, produces about 390 times its own volume of permanent gases; 40 per cent. dynamite produces about 530 times its own volume of permanent gases; and nitroglycerin produces somewhat more than 747 times its own volume of permanent gases. These proportions of volume of gases to volume of explosive are those that would be found if the gases were measured under normal conditions of temperature and pressure, but at the moment of explosion the gases are highly heated, and therefore tend to occupy a volume much greater than the fixtures given.

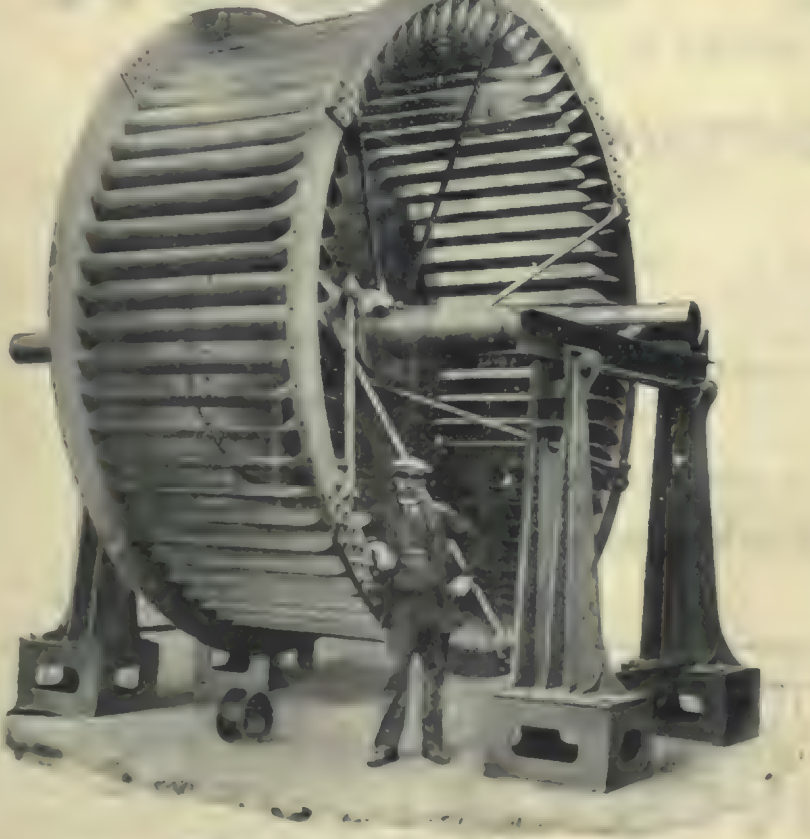
The gross revenue of Tasmanian Government railways for the year ended on June 30 amounted to £327,112, which is £14,327 more than the previous year. Working expenses amounted to £217,357, being a decrease of £3814. The balance of revenue over working expenses was £109,755, an increase of £18,142 on the previous year, and £47,369 in advance of 1910-11, when the Commissioner, Mr. G. W. Smith, took charge.

**GREAT COBAR LIMITED,**
COBAR, N.S.W.

MINE OWNERS, SMELTERS, COLLIERY PROPRIETORS, PURCHASERS OF COPPER ORES AND MATTES.

VACANCIES FOR COMPETENT MACHINE MINERS.

SYDNEY: Australasia Chambers, Martin Place, And at Lithgow and Singleton. LONDON: 65 New Broad Street, E.C.



[illegible] Diameter Single Inlet Sirocco Mine Fan.

TRADE "Sirocco" MARK

MINE FANS

. . . ARE RELIABLE. . . .

Because they are liberally designed and substantially constructed of first-class material.

Our special Mine Fan Bearings have large Bearing Surfaces and Automatic Lubrication, thus ensuring satisfactory running for long periods without attention.

Write to the Sole Agents for Publication No. 1005.
"A Mine Fan in the Making."
It will interest you.
Posted on Request.

DAVIDSON and CO. LTD.
BELFAST, IRELAND.

SOLE AGENTS—

Sydney: Ferrier & Dickinson, 12 Spring Street.
Perth: Saunders & Stuart.
New Zealand: John Chambers & Son Ltd., Wellington.
Adelaide: Unbehaun & Johnstone, 100 Currie Street.
Brisbane: Engineering Supply Co. of Aust. Ltd.
Melbourne: Fyvie & Stewart, 362 Collins Street.

Everything for Mining

SUPPLIED BY US.

- CANDLES,
- EXPLOSIVES,
- CHERSEN ROCK DRILLS,
- WINDING ENGINES,
- STONE CRUSHERS,
- ROAD MAKING PLANT.

Sole Manufacturers

- CARD CONCENTRATOR,
- DORR THICKENER,
- DORR CLASSIFIER,
- B and M TANKS,
- TILGHMAN'S AIR COMPRESSORS.

QUARRY BARS.
WELL BORING PLANTS. BLOW OFF VALVES, ETC.

Agents in all CAPITAL CITIES of Commonwealth and NEW ZEALAND

N. GUTHRIDGE LTD.

Offices and Stores—SYDNEY and MELBOURNE.

A. S. E. A.

MOTORS, POWER PLANTS, ETC.

(GENERAL ELECTRIC CO. OF SWEDEN).

LARGE STOCKS. ESTIMATES FOR PLANTS.

18,600 K.W. Alternator.

S.K.F.
Ball Bearings,
Double Row,
Self Aligning.

DIESEL
POLAR
ENGINES.

AGA Oxy Acetylene Welding with compressed Acetylene.

Jungner Indestructible Accumulators.

Gardner, Wærn & Co.

57 QUEEN ST., MELBOURNE; 334 KENT ST., SYDNEY.
Stores and Showroom, 369 Flinders Street, Melbourne.

**COCKLE CREEK**

**SMELTING WORKS, N.S.W.**

**THE SULPHIDE CORPORATION LIMITED,**

**Purchasers of:**

Ores, Concentrates, and Slags, carrying Gold, Silver or Lead, on specially favourable terms for net cash.

**THE WORKS** are situated only 9 miles from the Port of Newcastle, where the Corporation has every facility for taking delivery of consignments on behalf of shippers.

**Manufacturers of:**

Superphosphates, Sulphate of Ammonia, and other fertilisers, also Tar and Sulphuric Acid.

**Tariff and full particulars can be obtained on application to—**

**THE MANAGER, Cockle Creek, N.S.W.** **GIBBS, BRIGHT & CO., Agents.**

*OBTAINABLE FROM ALL BOOKSELLERS.*

**HIGH EXPLOSIVES**

By W. R. QUINAN.

224 PAGES, ROYAL OCTAVO. PRICE £1-1-0

AUSTRALIAN MINING STANDARD, Melbourne and Sydney.

A new use for radium salt has been discovered. During the process of combing silk, the skeins become highly electrified, and it has been the habit to remedy this condition by maintaining a damp atmosphere in the workroom. This is, however, prejudicial to the health of the workers, and may be avoided, according to a writer in Cosmos, by the very simple expedient of placing near each loom a receptacle containing a weak solution of a radium salt. The electric charges issuing from the radium neutralise the electrostatic charge which the threads of silk acquire by reason of friction. A similar problem in the manufacture of linen has been solved somewhat differently by MM. Paillet, Ducretet, and Roger. To diselectrify linen during the spinning process, or the stretching of the threads, they employ the sparks of high-frequency currents, which are, as is well known, non-injurious to the human body.

**Siegfried Pels,**
26-28 Neuerwall,
**Hamburg - - Germany.**

Argentiferous and Non-Argentiferous
**Copper Ore & Matte.**

Leady Copper Ore and Matte.
Wolfram
Scheelite

A MARKET for all ORES and MATTES

Lead Ore
Lead Bullion
Tin
Vanadium
Tantalite
Bismuth

***Treatment of Complex Ores.***

***Cable Address: — Siegpels.***

CODES:
A.B.C. 4th and 5th Ed., A1, Liebers, Western-Union, Bedford McNeill.

All Australians visiting London should read the "British Australasian," 6d. weekly—an illustrated paper containing mail and cable news from Australia, and news of Australians in Europe and at home.

Australians are cordially invited to visit the "British Australasian" Reading Room at the offices, 115 High Holborn, London, W.C., where they can see the home papers, meet their friends, use the telephone, and obtain information without charge.

**H. B. Silberberg & Co.,**
*443 Bourke St.,*
Cor. Bourke and Queen Sts.,
*MELBOURNE.*
Tel. 1377.
8 O'CONNELL STREET, SYDNEY.

Large Stocks of—
Ainsworth's Balances, Morgan's Crucibles.
Braun's Laboratory Ore Crushers. Gasolene Furnaces.
Fluxes. Assayers' Requisites.
Jena Chemical Glassware, Etc., Etc.

**FRANCIS H. SNOW,**
Buyer of
ORES, MATTES, METALS, CONCENTRATES, & MINERALS
——of every description——

Australasian Representative of:
ELECTROLYTIC R. & SMELT'G Coy. of A'LIA Ltd., Pt. KEMBLA, N.S.W.
ARON HIRSCH & SOHN, HALBERSTADT, GERMANY.
L. VOGELSTEIN & Co., NEW YORK.

Head Office—KING WILLIAM-ST., ADELAIDE.
Sydney Office:—8 BRIDGE STREET.
Perth Office:—ST. GEORGE'S TERRACE.
Broken Hill:—F. G WHITE, P.O. Box 78.
Zeehan:—A. J. SPOTSWOOD.

**JOHN A. ROEBLING'S SONS CO.**
New York,
ELECTRICAL COPPER WIRE AND CABLES.
HIGH QUALITY FLEXIBLE
**WIRE ROPES**
STOCKS ON HAND.
ANY LENGTH CUT.
Representative:
**ALEX. FRASER PTY. LTD.** Cobden Buildings, 368 Flinders-street, Melbourne.
FOR MINES, HAULAGE, ELEVATORS, ETC.

**COALFIELDS AND COLLIERIES OF AUSTRALIA.**
440 pages, 229 illustrations. 25/- nett. Posted, 25/3. Foreign, 26/8.

***LIQUID FUEL for Diesel & all Crude Oil Engines.***
"SHELL" SPIRIT, "SHELL" BENZINE, LUBRICATING OILS AND GREASES.
Prices and particulars on application to
**THE BRITISH IMPERIAL OIL CO. LTD.** Adelaide, Brisbane, Fremantle, Melbourne, Sydney and New Zealand

## CONTENTS

### THURSDAY, DECEMBER 11.

EDITORIAL—

How Not to Set Examination Papers 523
Leaderettes 524
News and Notes 525
Personal 525
Metal Quotations 525
Investor's Column 526
New South Wales Mining 529
Victorian Mining Activities 529
Brief Comments 527
The Coal Mining Industry 528
Tasmanian Mining 530
Westralian Mining 530
Mining in Queensland 531
Central R., W. and Blue (V.) 531
Great Extended Hustler's (V.) 531
Hampden Cloncurry (Q.) 532
Our Big Mines 533
Northern Territory Railways 534
Sydney Tramway Fares 534
The Defence Department 534
Melbourne Tramways 535
Victorian Railways 535
Victorian Inst. of Engineers 535
Carbon Filament Lamps 535
British and European Developments 535
Industrial 536
Miscellaneous 536
Invited and Accepted Tenders 537

BACK NUMBERS OF THE "MINING STANDARD."

The following is the rate for back copies more than a month old. Applications by post must be accompanied with cash and postage added. In no case can we guarantee to supply copies, as our storage accommodation is limited.

A postcard will be sent if the number required is out of print.

For copies three months old, ninepence; six months, one shilling; and beyond that period, one penny per month per copy.

As there is a regular demand for back copies of the "Mining Standard," newsagents are requested to send back all returns [illegible] and in good condition, otherwise they will not be accepted.

All Returns from Newsagents must reach us by the end of each month (the whole paper must be sent). No credit will be allowed beyond this term.

Postage—British 1d.; Foreign 1½d.; Australasia, ½d. per copy.

Stamps will be accepted as pre-payment.

Address communications Publishing Department "Mining Standard."

FIRE . .
BRICK

Our Products have proved their Superiority.

FIRE CLAY GOODS For Every Purpose.

Darley Fire Bricks will withstand the most intense heat, and will not shrink. Our bricks are made near Bacchus Marsh, Victoria, and we supply all the States.

Specialities—
High-Grade Firebricks and Retorts.

*Prompt Delivery. For Prices, etc., write to—*
DARLEY F. B. CO.,
Oliver's Lane, Flinders St., Melbourne.

MINING STANDARD.
PUBLISHED EVERY THURSDAY.
Forwarded Post Free to any Address.

| | Per annum |
|---|---|
| Australasia | 26/- |
| British Possessions | 32/6 |
| Foreign | 34/8 |

Payable half-yearly or yearly, in advance.
All amounts should be made payable to order of "CRITCHLEY PARKER, Bank of Australasia."

12 O'Connell-street,
Sydney.
Tel. City 8103
P.O. Box 331.

376 Flinders-lane,
Melbourne.
Central 7931 & 1838
P.O. Box 253.

CASUAL ADVERTISEMENTS.

The rate for this class of advertisement is governed by the position it occupies.

If it appears on leader page or amongst or next to reading matter, the rate is 15s. per inch (nonpareil) per insertion.

Towards end of reading section—
Brevier, 16 ems width, 6s. per inch per insertion.
Nonpareil, 8s. per inch per insertion.

For the convenience of advertisers, we might state that—Brevier has approximately 7 words to a line, and 8 lines to the inch—6s. Nonpareil has approximately 8 words to the line, and 11 lines to the inch—8s.

ALTERATION TO ADVERTISEMENTS.

As our publishing arrangements necessitate the "Mining Standard" being issued simultaneously in Sydney, Melbourne and Adelaide on the same day each week, advertisers wishing to change their advertising matter must supply same ten days in advance of publication.

ADVERTISEMENT PROOFS.

Proofs are submitted to advertisers in order to give them an opportunity of going over the advertisements before printing.

Advertising Copy must be typed and so arranged as to clearly indicate the display required for the more important features of the advertisement.

Any departure from the original copy will be charged for. Advertisers are specially requested to instruct their publicity departments to give us clear and definite instructions respecting changes of matter or new copy in order to avoid incurring unnecessary charges.

## NOTICE.

*The Christmas issue of the "Mining Standard" will appear on Wednesday, December 24, instead of Thursday, December 25.*

AUSTRALIAN
MINING STANDARD.
PUBLISHED EVERY THURSDAY.
ESTABLISHED 1885

It is requested that all business communications be Addressed to Critchley Parker

THURSDAY, DECEMBER 11, 1913.

## HOW NOT TO SET EXAMINATION PAPERS.

In our issue of January 23rd we dealt, in a leading article, with the conduct of examinations in connection mainly with the Melbourne University. In the course of that article we remarked that many of those who set the papers appeared to be temperamentally unable to realise the degree of proficiency that it was reasonable to expect from those they were examining, that in many of the papers questions were asked which did not properly appertain to the subjects in question, and that frequently the papers were disgraced by blunders that not only reflected discredit on the superior persons who asked the questions, but also put the examinees in the invidious position of either being unable to answer or of having to correct the mistakes of the examiners. Things do not seem to have bettered since we wrote that article. Another series of examinations is now in course of being held, and one of these papers which has come under our notice fully bears out all we said concerning last year's examinations. This paper is the pass paper for the Senior Public examination in British History. It is a paper utterly beyond the capacity of average candidates for such an examination. It is much more suited for first year students at the University. It contains no less than 12 questions, of which candidates are called upon to answer 10. With a total of 3 hours allowed for the purpose, one finds that a maximum of 18 minutes and a minimum of 15 minutes is allowed for each question, and some of these questions, it is fair to say, could not reasonably be answered in half-an-hour. The paper, in fact, is not only an unreasonably difficult one, but it is also unreasonably long. In fact, although the number of questions is nominally 12, it is actually greater because of the habit the examiner has of putting two or three different questions under a single heading. However, regarding them as only 12, and taking at a quarter of an hour the average time given for the answering of each, how much is the average for ten of the questions to be reduced by the time taken for the answering of these two?—

"(1) Trace carefully the growth of the English nation from 449 A.D. to 1042 A.D., so as to bring into prominence those elements which made for—(a) unity, (b) division.

(5) Give a full account of those circumstances and events which contributed to the greatness of England in the 16th century. Show clearly the scope and variety of the achievements of Elizabethan England."

They would be marvellous girls and boys indeed who could answer these two questions satisfactorily in less than a hour and a half, which would leave 9 minutes apiece for the remaining ten questions.

But, apart from this, we have a most woful lack of clearness in the way in which the questions are put. The second question runs thus:—"What do you consider were the most important changes brought about by the Norman Conquest?" and then, in another paragraph, "What were the differences of administration under Edward the Confessor and William I.?" These are nominally one question; they are also actually one question, and yet they are put in such a way as to imply that the examiner expects two replies. Question 8 says, "Examine the causes of the Revolution of 1689; show clearly in what sense it was a Revolution, and explain the limitations of the changes." If such a question were put to the examiner one can quite imagine that he (or she) would ask for the precise meaning of the words, "the limitations of the changes." The first of the two questions comprised under No. 7 is quite clear; the second is not. It asks, "What do you understand by the Puritan Revolution?" The term may mean different things to different individuals. But anyway, how is the examinee supposed to reply to such a question? Is he to give a mere definition of the term, or is he expected to deal with the revolution at some length from its inception to its final triumph? Beside the lack of clearness shown in the putting of these questions the stupid blunder made by the examiner in referring the bloodless Revolution to the year 1689, when probably 99 per cent. of the candidates could have told him (or her) that it occurred in the year 1688, is really trivial; but it certainly helps to make one very doubtful of the sufficiency of the education of this person who calls for so high a standard of knowledge on the part of girls and boys of an average age of probably sixteen or seventeen years. But we have left till the last the most serious of the many wrongs done to the candidates in this most unreasonable paper. It is a paper, it should be remembered, on British History, and yet question 6 asks the candidate to "Trace the connection between the general progress of the counter-reformation in Europe and the change in policy of Elizabeth with regard to—(a) Church questions, (b) Spain." Is that a fair question to give in a paper on British History?

Now, what is going to happen in regard to this paper? If the usual standard of percentage of answers to ensure a pass be adhered to, the proportion of passes will doubtless be ludicrously small. If the standard be lowered, so as to bring the percentage of passes up to the usual average, then the whole purpose of setting such a preposterous paper is nullified. But, even if that be done, as probably will be done, a tremendous injustice will still have been perpetrated, for doubtless many of the examinees who could have passed quite satisfactorily a paper of ordinary calibre were so utterly disheartened by a contemplation of this remarkable example of the examiner's genius as to have made no serious attempt to cope with the difficulties it presented, and it can hardly be expected that those who go through the papers can so far reduce the standard as to atone to these young people for the injustice done them. In any case, it is not the part of the University to act in this way. It ought to see that the examiners it appoints are people capable of setting reasonable papers—papers suited to the normal intelligence of those they are examining. A University should not put itself on the level of a dissipated medico, who makes his friends drunk and pretends to atone for the mischief by undertaking to put them on their legs again afterwards. It is not the duty of a University to do wrong, and then administer pick-me-up remedies.

The only other paper on which we are in a position to comment is one on a science subject. To this less serious exception is to be taken; but it suffers from this grave fault, that it seems to have been set principally with the object of confusing the candidates. This, it may be remarked, is hardly the purpose for which papers are supposed to be set, and the University would do well to force upon those whom it employs for the work the fact that their object should be not to puzzle examinees, but to ascertain the extent of their acquaintance with the subjects in which they are endeavouring to prove their efficiency. Too many of those who set the Melbourne University papers seem to imagine that it is themselves whose ability is being tested, and that it behoves them to show how tremendously clever they are in setting papers beyond the intelligence of young people. They should be made to understand that they will best display their own cleverness by obtruding it as little as possible.

The Warrnambool (V.) Town Council cannot afford to pay the salary necessary to secure the services of a qualified surveyor and engineer for the Waterworks Trust; it has therefore decided to employ a clerk of works at £4 per week, and engage a consulting engineer at a retainer of £50 per annum and 6½ per cent. commission on loan works. Probably there is nothing which the Town Council would resent more warmly that a suggestion that the town is unprosperous, neither would such a suggestion be a true one. Taking the figures supplied in the last two municipal directories, we find that the population in 1911-12 was 6700, but in 1912-13 it was 7400; in the former year the dwellings numbered 1598, in the latter, 1650; the valuation in 1911-12 was £48,701, in 1912-13 it was £53,714; the revenue in 1910-11 was £17,492, while that of 1911-12 was £18,925, and in 1912-13 there was an increase of 2d. in the pound to the general rate, giving an addition equal to over 9 per cent. to the revenue, even without considering the increase in the number of ratepayers. These figures do not suggest a decline in prosperity, and, moreover, a large sum is being spent by the Government on harbour improvements, which will greatly enhance the progress of the port. Until last year the council had an engineer for the Water Trust, though for many months now the position has been vacant. Turning to particulars of the Trust, it is clear that the position is an important one and no sinecure. Its authority extends over 3262 acres, or well over 5 square miles; it supplies a population of over 6000, and naturally the water-supply scheme is a somewhat elaborate one, on which a large sum of money was expended. That it should be necessary to either underpay a qualified engineer, or leave the actual work of the Trust in the hands of a clerk of works, is at once deplorable and astonishing; and, if such a state of affairs be at all customary in the municipalities, it is high time for attention to be drawn to it.

* * *

Figures were advanced at the meeting of the Bendigo (V.) Miners' Association last week, which, as the speaker said, suggested that Victorian miners would be better off if they broke away from the federation. The amounts paid in the various States towards the Federal defence levy, as given in the report of the general secretary, were as follows:—New South Wales obligations, £1700, paid £200; South Australia, obligations £238, paid £70; Tasmania, obligations £850, paid £600; Victoria, obligations £1700, paid £1328. The president, Mr. W. Harris, said that at the time of the last executive meeting the federation had a credit balance of about £350 only, and of that £200 was owing. The federal general secretary was drawing £300 per annum, and they had been informed that he was allowed 10s. per day expenses during his visit to Western Australia. It would thus be seen that if New South Wales and other States did not soon meet their liabilities the federation would fall to pieces. Mr. A. Trewartha, the previous speaker, returned to the attack. Victoria, which had borne the brunt of the expense, he said, received the most abuse, and he was disgusted with the federal council. Mr. J. McDonald (federal president) and Mr. Little (general secretary) had asked the State executive to go to Beaufort and inform that branch that the federal body had no money to finance the strike there. Those officers had also suggested that Tasmania and Victoria should co-operate in financing the Beaufort trouble. Those proposals, however, had not been entertained by the State executive. The position is certainly not creditable to the unions in some of the States, but may it not be that, in the case of New South Wales, so many of the men are continually on strike that distraint is the only possible way of getting a levy paid? It may be noted that the two unions which were invited to finance the non-unionist strike at Beaufort (V.) were identical with those who had already responded most promptly when the levy was made. Apparently it was another case of the willing horse having to do the work.

* * *

To acknowledge that the proposed reorganisation of technical education in New South Wales is characterised by discernment and wisdom would be tantamount to acknowledging that a king can do no wrong. Curiously enough, many labour leaders, themselves blatant and noisy advocates for the freedom of the individual, and introduce, when they have the power, measures which are coercive in the extreme and in direct opposition to the doctrines they preach. In the case of this organisation scheme the liberty of the subject is seriously interfered with, and some of the proposals savour very much of imparting education with a club. All of the benefits which future generations will enjoy will undoubtedly come from that one great source—education. It will not, and never can, make all men equal, because on that point nature has spoken the final word, but it will give all men equal opportunity. Not so this profound scheme, because what merit it may otherwise possess is utterly destroyed by one provision which is fatal to the liberty of the subject, and is, therefore, wholly bad. In making public the report of the Director of Education upon the reorganisation proposals, Mr. Carmichael, Minister of Education, summed up their coercive nature in a few words. Here they are: "There was a student in the tailors' cutting class who earned his living during the day as a bricklayer. Under the new scheme, the bootmaker will stick to his last and the tailor to his shears." In blunt, plain language, only men or youths who are following a certain trade will be allowed to enter the classes devoted to that trade. Truly, we are progressing, and surely the bones of our forbears rattle uneasily in witness of this abuse of the privileges they bought for us, and bought dearly. There is, apparently, to be no liberty, no choice, in this new scheme of things. The youth who, in order not to starve, elects to carry a hod, perforce must continue to carry a hod. In course of time, no doubt, he will become a bricklayer, may even become a foreman. But, because fate, or circumstance, or the devil, drove him to carry a hod, all other channels are to be closed to him. If, under dire necessity, he accepted a job striking in a foundry, and found himself physically unfit for the job, he may not fashion himself for something more in keeping with his physical endowments and his natural inclination. Probably, this possibility has been anticipated, and with far-seeing wisdom the proposal contains some provision whereby it is left to the Minister's discretion to make an exception in a case like this, and thus save the individual from perdition; but why should this be left to any Minister's discretion?

* * *

The New Zealand Government has by now regretted, doubtless, that for some reason or other the drastic legislation announced at the end of August as about to be introduced for the prevention of strikes and lock-outs, was postponed so long. We do not wish to unduly blame the Government in the matter, not being fully acquainted with the possible difficulties which stood in the way. The people of New Zealand, however, are seized of all the facts, and should it be that the Government's lethargy allowed the taxpayers to be involved in the late ruinous strike, Ministers should be taken severely to task for it. New Zealand and New South Wales, above any other parts of Australasia, exist ever on the brink of an industrial volcanoe, which may burst forth at any moment, and without warning, and as the Government made known its intention over three months ago and the terms of the new Bill were very definitely stated, it is not easy to understand that the "direct action" party should have been given another chance of throwing the trade of the Dominion into confusion without running the heavier risks which the promised legislation would impose. Although particulars of the measure were given in our issue of September 18, it may be interesting at this juncture to recall its main provisions. The Bill applies only to workers and employers not already bound by some award or industrial agreement, and it provides that if ten or more workers intend to strike, they are to give written notice to the Minister for Labour, setting out the grounds of that intention. The Minister may then order a conference of the parties or refer the matter to a labour dispute committee. The committee is to report to the Minister, who will have the recommendations published in the press. If there be no settlement within fourteen days of delivery of the notice to the Minister the registrar is to arrange for a secret ballot, either on the proposal to strike or on the acceptance of the recommendations, and the issue is to be decided by a majority of the persons entitled to vote, whether they actually vote or not.

So far for prevention of strikes. If a strike which is not an unlawful one be in progress, the registrar may take a ballot on the requisition of 10 per cent. of the workers affected. Ten or more workers are to be deemed to be parties to an unlawful strike if they strike without giving the notice described. Similar provisions apply to lockouts. The maximum penalties for persons who incite or abet an unlawful strike or lockout are, for the worker £10, any person other than a worker £500, an industrial union or industrial association £1000 or £10 for every member. Every person who makes a gift of money or other valuable thing for the benefit of a party to an unlawful strike or lock-out is liable to penalties for abetting, unless he prove that he acted without such intention. The Bill also provides for cancellation of the registration of unions as part of the penalty incurred, and a refusal to re-register that union or any substitute for it which includes members of the cancelled one, and should a new union succeed in securing registration, it will be bound by any award or agreement which related to its predecessor.

## NEWS AND NOTES.

Some time ago the Sydney Chamber of Commerce made the following recommendation to the State Government with regard to secret debentures:—"That company debentures should be registered as Bills of Sale, as in the Queensland law; and that the Bills of Sale Act of New South Wales should be brought up to date, largely on the lines of the Victorian model." A clause providing for the registration of debentures was included in a Bill to amend the Act relating to companies introduced in the State Parliament last session, which, however, was not proceeded with. Last week at a council meeting of the Sydney Chamber of Commerce a communication was received from the Minister to the effect that the recommendation was receiving consideration, and it is the intention of the Sydney Chamber to keep the matter prominently before the proper authorities in order that this much needed reform may be effected.

In connection with the approaching visit of members of the British Association for the Advancement of Science, at a recent meeting of the Federal Council the organising secretary suggested that a special invitation be sent to past presidents of the association to visit Australia, which would include Lord Rayleigh, Sir Henry Roscoe, Sir Archibald Geikie, Sir William Crookes, Sir William Turner, Sir Arthur Rucker, Sir James Dewar, Sir Norman Lockyer, Mr. Arthur Balfour, Sir Ray Lankester, Sir David Gill, Dr. Francis Darwin, Sir J. J. Thomson, Professor Bonney, Sir William Ramsay, Sir Edward Schafer, and Sir Oliver Lodge. The suggestion was approved, and a cablegram was despatched accordingly. It was proposed by Dr. Rivers that the Government should grant facilities to Prof. Haddon, his daughter, and an assistant to visit Papua. Dr. Haddon being one of the leading anthropologists of the day, it was believed the visit would be productive of valuable information. To this the Prime Minister has agreed.

The pioneer Tin Mining Co., Bradshaw's Creek (T.), will pay its 25th dividend, 1s. 6d. per share, on the 22nd inst., the distribution amounting to £12,000.

Mr. Geo. D. Meudell, one of the directors of the South Australian Oil Wells Co., has been on a visit to Adelaide and the Mt. Gambier district in connection with the flotation of the company. For the time being, Mr. Meudell states, it is intended to devote attention exclusively to the South Australian properties, which comprise about 10 square miles in the south-east, 658 acres at Kingston, 6400 acres on the Coorong, 398 acres at Mt. Schank, 1800 acres at Millicent and Tantanoola, 8000 acres at Beachport, 15 square miles in the Lake Bonney district, and 640 acres at Cape Spencer. Over these properties the Australian Oil Wells company, of Melbourne, has acquired options, licences, leases and rights, but will hand over to the South Australian company all their interests for a substantial consideration. It is intended to put down a number of bores on the properties, by means of rotary drills, five or six of which will be imported. A modern drilling plant to go 4000ft. can be erected for £4000. The areas in the south-east have been favourably reported upon by Mr. T. J. Whaley.

The jury in an inquest held at Broken Hill (N.S.W.) last week touching the death of William H. Argue, shift boss, who was killed by falling down a shoot at the British mine on November 6, added a rider to its verdict to the effect that the company or its management was at fault in not having provided a hand-rail round the pass or shoot.

The directors of the Lake View and Oroya Exploration Ltd. (W.A.) have declared a dividend on ordinary shares of 6d. per share (less income tax), payable January 14, 1914, to shareholders on the register on December 10.

Three miners employed at the Victorian State coal-mine were proceeded against at the Wonthaggi police court last week for breaches of the Coal Mines Regulations Act in not taking precautions to make safe the places in which they worked. The inspector of mines who had initiated the proceedings stated that he took action in these cases to impress upon the men that the rules framed for their own safety must be observed. Defendants pleaded guilty, and two of them were each fined 20s., with £1 1s. each professional costs, while the third, who had used a prop, but had placed it so badly that he had increased the risk of accident, was fined 10s., with £1 1s. costs.

During November the Great Cobar Ltd. produced 555 tons of copper, containing by estimation—Gold, 1972 oz.; silver, 8836 oz.; concentrates on hand are estimated to contain: copper, 65 tons; gold, 106 o.; silver, 572 oz.

## PERSONAL.

Mr. Stanley Northey Rodda, mining engineer, has been appointed by a unanimous vote of the council of the Working Men's College, Melbourne, as director of that institution, and entered upon his duties there on the 1st inst. Mr. Rodda is a native of California and was educated there, but later on he studied the practical work of mining at the Nevada Metallurgical Works. Although still only 36 years of age he has had a good deal of experience in responsible positions in the United States, South Africa and Asia Minor, as well as in Western Australia, New South Wales and Queensland. Some years ago, while practising as a mining engineer in London, Mr. Rodda gave a good deal of attention to general business management, although he claims that no man has more demands made upon his business capacity than a mining engineer, and he was engaged by several large business houses to report on economical methods which could be suitably introduced to their establishments. It was this turn for organisation and management upon which he relied mainly in making application for the directorship to which he is now appointed, and those of his friends whose recollections of him are associated with his work at the Associated Northern Blocks, Kalgoorlie, at the Mungana Chillagoe mine, Queensland, and at the Block 14 Torrington mines, New South Wales, will watch his career in his new sphere with interest.

Mr. John Green, ex-manager of the North Frenchman's Reef mine, Daylesford (V.), has been appointed to the New Cornish mine in the same district, now in process of flotation.

Mr. Percy P. Cook, well known in Melbourne commercial circles as an accountant and legal manager of companies, met with a painful accident at the intersection of Toorak-road and Chapel-street, Prahran, last Saturday evening, through a collision of motor cars, Mr. Cook being thrown out of one of them and sustaining concussion of the brain, besides injuries to an arm and shoulder.

Mr. Franklin White, who has recently been associated with the Eleanora Mines Ltd., Hillgrove (N.S.W.), as consulting engineer, is leaving this month for London. The management of the mine is being undertaken by Mr. A. F. Mixner.

Mr. Murdoch Irvine, C.E., secretary, engineer, valuer and collector to the Yarrawonga (V.) Shire Council, was the successful candidate for a similar position under the Ballarat Shire Council in succession to Mr. G. T. Jones, C.E. The salary is £400 a year.

Mr. John Barr, managing director of the Scottish engineering firm of Glenfield and Kennedy Ltd., Kilmarnock, is now in Australia, and proposes visiting all the States before returning to Scotland. At present he is in Melbourne.

Mr. R. H. Garvie, the engineer appointed by the Launceston (T.) Marine Board to carry out the new harbour works, left London on the 5th inst. by the R.M.S. Omrah for Melbourne, and expects to be in Launceston by the middle of January.

Mr. C. Pulot, manager of the French Rare Metals Co., Wolfram (Q.), is at present in Sydney, where he proposes to remain for a few months.

## METAL QUOTATIONS.

(From Our Correspondent.)

### By Cable.

London, Tuesday.

The copper market was again very low, opening, as in the previous week, with a fall of 25/-, and on only one day reaching and excelling by 2s. 6d. the falling rate of the previous Friday. Electrolytic copper shared in the general decline, and went to as low as £67 15s. on Friday. Producers, however, have the consolation of reflecting that if prices during the past year have not equalled those of 1912 they have been a good deal better than in the previous three years, when the average prices were: 1911, £56 1s. 9d.; 1910, £57 3s. 2d.; 1909, £58 17s. 3d. Tin also was at a low ebb, compared with the rates lately prevailing, though still good as compared with 1910 and previous years. Last week's sales opened with a fall of 35s. for spot and 37s. 6d. for deferred, and with the exception of Wednesday, each day saw a further fall, Friday's quotation for spot being £6 per ton lower than that of the previous Friday. Lead also went back; but spelter maintained the previous week's advance. The demand for silver was slack on Monday, the fall of ⅛d. being attributed to the failure of the Indian Specie Bank, and the huge purchase of silver from there. The effect of this transaction was, however, to all appearances quite insignificant, for rates rose steadily after Monday.

COPPER.—Monday's quotations for spot was £65 10s., followed by £65 12s. 6d., £65 15s., and £66 17s. 6d., a fall of £65 7s. 6d. occurring on Friday.

The rates for three months' delivery were £64 7s. 6d. (2 days), £64 8s. 9d., £64 15s., and £64 7s. 6d.

Electrolytic, which began the week at £68 5s., rose to £68 10s., then went back to £68 5s. and declined to £67 15s. Yesterday opened the new week at £67 10s.

TIN.—Spot lots brought £178 15s. on Monday, £175 15s. next day, and then rose to £177, followed by £175 and £174 10s.

Three months' orders were booked at £179 15s., £176 15s., £178, £176, and £175 12s. 6d.

LEAD opened at £18, then fell to £17 15s., £17 11s. 3d., £17 10s., and £17 12s. 6d.

SPELTER was stationary at £21 5s.

SILVER brought successively 25 15-16d., 26½d., 26⅜d., 26 11-16d., 27d., and 27¼d.

ANTIMONY.—The quotation for Star antimony was again £28, and 50 per cent. ore was firm at £6 5s. per ton.

WOLFRAM (70 per cent. ore) was unchanged at 32s. 6d. per unit, or £115 10s. per ton.

MOLYBDENITE remained at 3s. per lb., equal to £336 per ton.

MANGANESE (50 per cent. ore) again brought 9d. per unit, or £1 17s. 6d. per ton.

The British Chamber of Commerce, Paris, the official commercial representative of the Commonwealth in France, reported on November 3:—"The following are the latest prices quoted for minerals on the French markets:—Tin (Havre), £198 8s.; copper (Havre), £75; lead (Rouen and Havre), £23 8s., (Paris) £23 12s.; zinc (Paris), £23 19s.; nickel (Paris), £165 to £175.

Elder's Metal and Mercantile Prop. Ltd. (Melbourne) have supplied the following cabled average metal prices for November: Spelter, ordinary brands, £20 14s. 3½d.; foreign soft lead, £18 13s. 8½d.; silver, fine 2s. 5¾d., standard 2s. 3¼d.; copper, standard, spot £68 8s. 9d., best selected, £73 12s. 6d.

# THE INVESTOR'S COLUMN.

## Some Companies Attracting Attention To-day.

(By our Sydney and Melbourne Exchange Reporters.)

### Sydney.

November proved almost a record month for dulness amongst mining stocks on the Sydney Stock Exchange, and prices consistently sagged. Of course, the depreciation which has taken place in industrial metals, especially in copper, has been the main contributing factor in affecting share values both on the London side and in Sydney, but it has not been the sole cause of the utter lack of vitality amongst operators. Usually after a period of weakening values some speculators are to be found willing to gamble for a rise. But at the present time they are an unknown quantity on the Sydney Exchange, and the stockbroker has found time hang heavily on his hands. Doubtless from now on until after the turn of the new year there will be little life in the mining market, unless some unforeseen development occurs. With an increased wool clip and good prices, a record harvest in sight, and enlarged production on all sides, there should be more money floating about than has been the case of late. Of course, the increases in capital made by so many of our large companies has been a strain upon the purse of the investor. The aftermath of the Ardlethan debacle has likewise tended to check speculation; and pre-election nervousness has probably helped to keep matters quiet. It is to be hoped that there are more active times ahead. Especially if there be a change of Government. The dividends paid during the month on officially listed shares have been well maintained.

During the week the dulness in mining circles has been accentuated, and values have continued to fall. The actual leeway in quotations themselves has not been as material as the pessimistic talk of the brokers would have led one to imagine. In the copper section Mount Elliott shares have lost about 1s., Mt. Morgan practically the same amount, Hampden-Cloncurry and Wallaroo and Moonta about 6d. The market for these shares has fluctuated irregularly day by day, and at the time of writing were some points higher than the lowest levels touched during the week. London operators have displayed more confidence according to the latest quotations cabled. Stocks of copper in America are not heavy, and the value of the red metal should improve. The tendency of the market for silver-lead shares has likewise been most distinctly "bearish," and it has been the buyer who has scored in the matter of price. But then lead has depreciated over £1 per ton in London on the week. Tin ventures have ruled out of favour. In Ardlethan stocks, Carpathia shares have come back a bit. The "paids" have sold down to 14s. 3d., and the "contribs." at 17s. 3d. Some belated transactions have been recorded in Southern Cross, and Wild Cherry "contrib." shares, mostly in buyers' favour, but White Crystals have improved. Vegetable Creek shares have remained stationary; the announcement of the little dividend has not lifted them any.

Among the investment stocks the position has been just the contrary. A very firm market has prevailed for all leading investments, with buyers anxious to purchase. Banks, Gas, Sugar, Insurance and Brewery shares have been in keen request, but holders have displayed no inclination to part with their scrip and transfer their interests into less certain dividend producing ventures. Of course, there have been some irregular movements, but on the whole prices have ruled extremely firm.

The conditions attaching to the issue of preference shares in Forth and Co. have called forth adverse criticism. The dividends which may be declared in the future upon either preference or ordinary shares depend entirely upon the profits which may be earned by the company, as the following resolution sets forth:—

> "(d) Whenever in the opinion of the directors the profits of the company in respect of any year shall be more than sufficient to pay the fixed preferential dividend aforesaid to the close of such year, and also a dividend for such year at the rate of £10 per centum per annum on the ordinary shares, the directors may increase the dividend on the preference and/or ordinary shares to such a rate as they determine."

That "the dividends which may be declared in future upon either preference or ordinary shares depend entirely upon the profits which may be earned by the company," to our way of thinking, mean that the minimum dividends depend upon the profit of the company; but, as the profits are in excess of 10 per cent. on the ordinary and 6 per cent. on the preference, the distribution of such excess profits rests entirely with the directors. According to the resolution, the directors have it in their power, after each section of shareholders has received a certain share of the profits, to allocate any surplus entirely to one or the other class of shares or divide it. The net profits of the company are more than ample to pay 10 per cent. on both classes of shares. The first dividnd on the preference was 6 per cent., the next 8 per cent., and the shareholders are evidently on the qui-vive for a 10 per cent. distribution, and are speculating in those shares to that end. That has been clearly shown in the fluctuations on the Sydney Stock Exchange in the preference shares. But the ordinary shares have kept stationary. There is no reason that 10 per cent. should not be paid on the "pref." shares as well as on the ordinary, but such a payment entirely rests with the board, not with the profits, for they are ample. Upon such payment will depend whether quotations advance or depreciate in the near future.

### Melbourne.

Hercules (T.).—One of the most pronounced features of the silver-lead section of the market has been the strong support accorded to the shares in this company, the result being a substantial gain in price. The Hercules is not a new venture—far from it—and it has made a fairly respectable showing on the dividend list, some £35,000 having been returned to the shareholders; nevertheless it has so far been a disappointing venture. This has not been the fault of the mine, for very large bodies of mineral deposits, probably amounting to six or seven hundred thousand tons, have been proved or opened up, but rather because scientific knowledge and research have so far failed to discover a suitable method of extracting the contents. As these metal contents are estimatd as worth about £8 per ton, it is easy to see that large profit in the future is waiting to be made by the shareholders.

Mainly owing to want of capital the company has struggled on in a hand-to-mouth fashion for years, but recently a change in policy has been determined on, and one of the first steps taken has been an endeavour to consolidate the property and that of the Primrose, a similar adjoining mine, into one holding to be worked by a company with a substantial working capital. The proposal was on the following lines:—Capital, £300,000 in 300,000 shares, of which the Hercules would receive 120,000 and the Primrose 40,000; £50,000 would be provided for installing smelters, and there would be working funds of £90,000. Mr. Weinberg, the well-known mining authority, was entrusted with the task of carrying through these proposals, but probably owing to the financial dulness now prevailing in London he was unable to do so. Under the influence of this disappointment there was a slight reaction in the shares, and the subsequent recovery was somewhat unexpected. Some of those well acquainted with the position of the company's affairs are of opinion that the reason for the market improvement is not a resumption of negotiations in London, but the fact that for some time experiments on the ore, which is very close in character, have been made by means of the De Bavay's Minerals Separation process, and that very satisfactory results have been obtained. If the success of this method of treatment may be regarded as established—and the market movement is very significant—then the necessity and expense of erecting smelting plant would be obviated, and the slags which have accumulated in large quantities might be left alone.

No announcement has yet been made of the nature of the terms upon which the different interests in a comprehensive and merging company would be allocated, but it will be waited with interest by the market. It should be mentioned that in addition to the Hercules ore reserves there are probably 100,000 tons of very similar material either proved or opened up in the Primrose mine. Under these circumstances it is plain that there are big possibilities in connection with the proposition. Sales of the shares took place up to 16s. 3d., but the movement appeared to be somewhat speculative, and the rise was not maintained. It will probably be found, however, that the speculator who buys will sleep better than he who sells "forward."

Deebook Dredging.—During the last ten weeks or so there has been a very pronounced increase in the value of shares in this company, for whereas they had been stationary (and little noticed) in the vicinity of 20s., a few brisk purchases lifted them to 36s. or 37s. This improvement was not the result of particularly strong support, nor was it accompanied by numerous transactions. On the contrary, the sales in the call room were rather limited, and the rise in price may be said to have been caused by a few buying orders at best in a market bare of supplies. Under these circumstances, it is not surprising that the subsequent business was on an even more limited scale, for the reason that any shareholders who might be inclined to sell would naturally assume that they should get the same high rates; while, on the other hand, no one seemed anxious to buy after such a sudden rise in value had taken place. The logical sequence of such a condition of affairs became apparent on Friday, when a seller who was evidently determined to find out what the shares were really worth, offered them down from 35s. to 30s. without eliciting a better buying offer than 26/-—a drop of 9s. on the last sale. There has evidently been, to some extent, an unreliable market in the stock, and as this fact may operate as a deterrent to investment the following statement of its prospects and constitution may not be out of season. The vendor to the company was the Timah syndicate of twenty-three members, some of whom are resident in Australia and some in Siam. Captain Miles, well known in connection with the Tongkah Harbor and other tin dredging companies in the Malay Peninsular, had been instrumental in securing the property for the syndicate, and he acted as its representative in connection with the sale. The area of the property is 375 acres, and it is situated in the Bangnon Valley, about three miles from the harbor of Renong, in Siam. This valley lies between two hills rising to a height of about 1000ft., and the company's holding, which is at the northern end, is traversed by the Bangnon river. Captain Miles, who personally supervised the prospecting operations, describes the property as an ideal dredging proposition, inasmuch as the depth of the wash is very suitable for economical working, the values (of which more later) are good; the oxide is also of good quality and of a coarseness which enables it to be easily saved. The overburden is mostly loam, and the bottom, on which the buckets will work, is of gravelly clay. The water supply is excellent, both for the boilers and for dressing the tin, and can be carried by gravitation to any part of the property. A good metal road runs close to the site selected for the erection of the machinery. Other mining operations are being carried on in adjoining areas. Basing an opinion upon the information available, it may be said that the property seems to be well furnished with those conditions which are necessary for successful mining operations. The most important requirement, however, yet remains to be more fully dealt with, and that is the tin bearing value of the ground. Taking the boring operations as reliable evidence upon this point, it appears fairly well established that the material to be treated is of a quality which should ensure substantial profits to the shareholders, when treated under modern methods and with up-to-date machinery. Altogether 60 bores have been put down over an area of 300 acres, and the average value disclosed is just a fraction under 2 lb. to the cubic yard. Forty-five acres in the vicinity of the site chosen for the installation of the first dredge were worth on the average a little over 3 lb. to the cubic yard, from which it may be inferred that the returns for the first three years or so will be of an exceptionally payable character. The following figures, which are calculated on a conservative basis, will give an idea of the estimated output and profit. The dredge is on similar lines to that of the Tongkah Compound Company, and should be capable of treating 200 cubic yards per hour; but, taking the output of material treated at 2000 cubic yards per day, say 60,000 for the month, the yield from ground worth 2 lb. per yard may be put down at 50 tons of tin oxide per month. Such a return with smelted tin at £170 per ton would be worth £5250, the value of the company's product being taken at £105 per ton. Making a deduction of £1250 for working expenses, which is at the rate of 5d. per cubic yard, there would be a net profit of £4000, or £48,000 per annum, say £45,000, after deducting costs of administration and other probable expenses. The capital of the company is £100,000 in £1 shares, of which 80,000 have been issued, and 20,000 are in reserve. Of the 80,000 issued shares, 42,000 fully paid-up went to the vendors, and 38,000 were subscribed for by the public, 5s. being payable on application and 5s. on allotment, the balance to be called up as required in monthly payments of 1s. per share.

These contributing shares are now paid up to 14s. Out of the £10,000 received from the sale of these shares £3000 went to three members of the vendor syndicate as a commission for having underwritten the issue. It is expected that a further sum not exceeding £2000 will be required in order to settle claims for surface rights, consisting mainly of paddy fields upon the property. These deductions will reduce the money in hand by £5000, and as the cost of the dredge will probably be £16,500 and that of forwarding and erecting it another £5000, the working capital of £38,000 will have been drawn upon to the extent of £26,500. As other unexpected expenses will probably have to be provided for, it would not be safe to estimate the amount to credit when the first dredger gets to work as more than £10,000, and that is assuming the whole of the amount of the shares has been called up. There are, however, in hand the 20,000 unissued shares, so that if further money is required for the installation of a second dredge it will easily be made available, and in any case the company before that date should be in a position to earn money, so that it may be unnecessary to further increase the share issue. When the second dredge is going the profits will naturally be much greater than the estimate already given, and it is quite within the bounds of probability that they may eventually be at the rate of £75,000 per annum—that is provided the price of tin is maintained. As to the life of the company, it can safely be regarded as 12 or 13 years, as the two dredges will not be able to turn over more than 25 or 26 acres of ground per annum.

Although the fluctuations in the prices of these shares have been, as already stated, rather pronounced, and for that reason some judgment would be required in buying them, yet the stock on its prospects must be regarded as a decidedly promising mining investment. The present quotation is buyer 30s., seller 35s., the market having again improved.

A photograph of the company's No. 1 dredger appeared in a recent issue of the "Mining Standard."

## BRIEF COMMENT.

At the half-yearly meeting of the Federal Ore Co. held at Adelaide last week, the chairman stated that the company had so far been unable to obtain a subsidy from the Federal Government which would enable the company's Northern Territory leases to be worked. This company, which is under the managing directorship of Mr. J. H. Niermann, has that gentleman's process for the treatment of selenite ores, and will probably have to work out its own salvation as far as the Northern Territory leases are concerned. Mr. Niemann, has that gentleman's process for the had been constantly engaged in testing the applicability of his process to refractory ores of various types, and had been very successful, especially with gold-copper and gold-bismuth ores. As a result the Broken Hill Gold and Copper Co. had been floated with an available capital of £10,000 to work certain mines north of Broken Hill with his process. This property is said to have 20,000 tons of ore in sight, and the Federal Ore Co. will receive 5 per cent. royalty on all gold recovered. Mr Niemann has undertaken to supervise the erection of plant for the Broken Hill Gold and Copper Co., and the treatment of the first 1000 tons of ore. It is very evident that the process will now be subjected to a thoroughly practical test, and if this results satisfactorily the Federal Ore Company is not likely to require the assistance of the Federal Government to develop its Northern Territory leases.

The outlook for the Edna May G.M. Co., Westons (W.A.), has undoubtedly improved as the result of recent developments. At the half yearly meeting of shareholders held at 31 Queen street, Melbourne, on the 3rd inst., a sense of gratified well-being characterised the attitude of all present, in rather striking contrast to the tendency of several shareholders, at the meeting called recently to discuss the acquisition of Duff's leases, to oppose the directors' policy on that score. Fortune favours the brave, and with all previous experience dead against the prospect the Edna May reef has improved in value in depth. At the meeting, at which the manager, Mr. M. T. Williams, was present, shareholders were notified that prior to his departure from the mine the crosscut at 150ft. had proved the value of the reef to be 2½ oz. per ton and the width 14ft., while drives on the lode for a distance of 6ft. in both directions had proved the same value. The length thus proved provides very little to go on; but the improvement is highly gratifying, and augurs well for the future of the Edna May and the Central mine. Mr. Williams, upon the question of geological features, stated that in his opinion the reef was a true contact between the granite and greenstones. If that is the case, Mr. Williams was hardly explicit enough in his explanation, as all along it has been vigorously denied that granite occurs on the property at all, for what reason it is difficult to see. Circumstances, however, alter cases, and it is not improbable that the reef lies in a lode channel between the granite and greenstones, or what Mr. Montgomery, the State mining engineer, describes as a shear zone, in which case the outlook is good. It is proposed to convert the present plant into an all-slime one, which is what should have been done long ago. The manager estimates that with the increased capacity of plant the profit should reach £6000 monthly. Until ore reserves below the 73ft. level are proved the mine can just about run for twelve months on this basis, and to make sure of the position the sooner the lode at 150ft. is opened up the better.

After years of hope deferred, the shareholders of the Chaffers G.M. Co. (W.A.) have been cheered by developments of a most satisfactory character. The Chaffers mine presents the uncommon record of developing well at a point where most other mines leave off. At the last statutory meeting of the company held in London the chairman explained to shareholders the nature of the developments at and below 1600ft. It was hoped that in view of the amount of ore which may now be opened up the erection of a plant of greater capacity than that originally provided for would be justified. By fixing the capacity of this at 7000 tons instead of 5000 tons per month it was estimated that the saving would be about 2s. 6d. per ton, a profit in itself. Therefore the Board did not feel warranted in deciding the question of plant until the extent of ore had been proved. So far as can be seen now, by the time all the reserves in the mine are averaged the extractable value is not likely to exceed 30s. per ton in spite of the excellent values recorded recently. The Chaffers Co. has all the metallurgical practice of 20 years past to guide it, and if it can't make a fair showing with its present opportunity it won't be because the opportunity is not there.

The report of the Tongkah Harbour Tin Dredging Company, Siam, to 30th September last shows that another profitable year was experienced. A notable feature is that although the yardage treated (3,336,180) was greater than for the previous year (3,157,549), the total output of tin oxide (1339 tons) was lower by 46 tons. This means, of course, that poorer ground was worked during the term, although the fall is comparatively slight. Costs per yard also show a slight increase; the net result of these variations being a profit of £81,524, which, in round figures, is £3000 less than for last year in spite of a higher average price being realised for the year's output. Added to the amount of £53,543 brought forward the company had available during the term a total cash surplus of £134,977, out of which dividends aggregating £61,500 were paid, leaving the sum of £73,477 to credit of profit and loss account at 30th September. As this amount is £20,000 in excess of the amount brought forward last year, the directors purpose redeeming the debentures due on 24th June, 1915, paying cash for No. 6 dredge, and continuing the regular quarterly dividends. Of the total consideration of £35,000 to the Government of Siam the company has only a balance of £10,500 to pay during the next eighteen months. It will thus be seen that the company is in a very strong position; and, taking into consideration its immense area, it should have a long and prosperous career, all conditions being equal.

At the meeting of shareholders of the Mt. Cuthbert Co., Cloncurry (N.Q.), held at 39 Queen-street, Melbourne, last week, the chairman (Mr. Percy Pigott) stated that although the cost of development is shown in the accounts at £3487, the total expenditure which has been charged to profit and loss account should have been included, as the whole of the work being done is exclusively in connection with developing the mines. Seemingly, only certain items of expenditure are charged to this account, chiefly wages, and the total expenditure on development stands in the accounts at £19,597. If the debit to profit and loss account should go to development also the total expenditure on this account to date is £47,345. However, in whatever way the company chooses to adjust its accounts, at this juncture it is all capital expenditure, and must be redeemed ultimately. This company has been snatched like a brand from the burning, due to the untiring and self-sacrificial energy of the chairman (Mr. Pigott), to whom eulogistic references were made by all shareholders present. At the present moment the company has a lively prospect of making good, as developments generally have been excellent. Backed up by ample capital assured by the debenture issue, the practical certainty of the railway being completed before the end of next year, if substantial profits are not ultimately returned to shareholders it will be the fault of neither the mine nor Mr. Pigott. In this connection Mr. Thos. Power took the chair, and moved that Mr. Pigott be awarded the sum of £4000 in recognition of his services. It was pointed out that that gentleman had devoted his entire time and service to the company to the sacrifice of other interests, and that through his energy the debenture capital had been secured and the railway constructed, the last section of which remained to be authorised by the Queensland Government. On the suggestion of a shareholder Mr. Power amended his proposal, and Mr. Pigott was awarded £4000 of the unissued debentures. Financially the debenture deal is a good one. The issue of 70,000 has made that number of pounds available for development and other preliminary work, while 60,000 remain to be issued to provide funds for smelter. The total debenture liability will therefore be £140,000, but the holders thereof have the right to convert into ordinary shares of £1 each, which, if exercised, will make the total capital of the companly £300,000, or correspondingly less in proportion to the number of debentures converted.

At the half-yearly meeting of the Great Langi Logan Co., Ararat (V.), held at 125 Queen-street, Melbourne, last week, the chairman (Mr. J. L. Reilly) notified shareholders that the temporary plant now on the mine would be adequate to continue the sinking of the main shaft to completion provided the volume of water did not materially increase. If trouble were experienced with water, however, it might be necessary to suspend sinking pending completion of the new plant, which was now on the ground and for the erection of which tenders were being invited. Before the next half-yearly meeting he hoped to be able to report that th shaft had been completed. With reference to the prospects of the mine, the chairman stated that the bores put down on the Government road (which intersected the property) had proved a width of about 25 chains of lead, which was believed to be a tributary from the old field. Financially, this company follows the same procedure as nearly all Victorian companies, and as funds are required calls are made. In this connection the chairman was of opinion that the necessary work could be carried on with monthly calls of 3d. per share. At a ballot taken for the election of directors, the personnel of the Board was altered by Messrs. C. H. Bryant and H. F. C. Keats being appointed, together with three of the retiring directors—Messrs. J. L. Reilly, T. H. Turner and H. E. Connolly.

It is probable that Melbourne speculators will shortly be invited to try their hands at the Meredith-Mareeba Gold Mines (Q.) if they feel that way inclined. Captain Joliffe, of the steamer "Kadina," at Cairns recently unburdened himself of the opinion that W.A. and Victorian gold mining ventures are not making too good a showing on the market, and that Melbourne speculators are therefore leaning towards Queensland propositions. On the strength of this it is stated that Mr. Meredith will make his appearance in Melbourne at an early date with the object of submitting the proposition to promotors who have already seen the usual specimens.

The first half-yearly report of the directors of the Oswald Gold Mines, Maldon (V.), shows that as the result of about five months' actual operations 4007 tons of ore were treated for a yield of 3392 oz. gold. On this a profit of £6603 was made, out of which two dividends of 1s. per share, aggregating £5000, were paid, and £1000 placed to reserve, including which the company has on hand gold and cash to the value of £5212. With regard to future policy, the directors are of opinion that portion of the proceeds of gold won should be devoted to exploratory work. The wisdom of adopting this policy (or rather the unwisdom of not adopting it) has been demonstrated so often that it is a wonder the procedure is not more commonly followed. In connection with this proposal the extension south of the 1100ft. level crosscutting at the 800ft. level is now in progress. Further additions are to be made to the plant, estimated to cost £1300, whereby it is anticipated that from 20 to 25 per cent. more ore will be treated, enabling the inclusion of lower grade ore and probably effecting a reduction in working costs.

One Wooster, a Gippsland settler, who claims to have found an outcrop of coal near Fish Creek, near Waratah Bay (V.), is no doubt a much aggrieved person on account of the Mines Department notifying him that he could not secure a lease of his find. As a matter of fact, the officials of the department are well aware of the existence of small coal seams in the vicinity of Fish Creek, but the exposure of these seams has to be relegated to its proper place in the scheme of things. Wooster was informed, however, that if he could introduce an 18-in. seam of coal to the department a bore would be made available at once to test it. It has been the intention of the department for some time to bore in the neighbourhood of Fish Creek, but the time is not yet, and Wooster may be consoled by the reflection that when this work is undertaken, if his discovery be not already well known, he will receive first consideration if it prove to be of value. There can be very little doubt, however, that the policy of the department in not granting leases for coal is ill-advised, as nobody has any incentive to prosecute a search for this useful commodity.

The statement of Mr. Tyquin, member of the Government survey party engaged on the projected Pine Creek-Katherine River railway (N.T.), that the value of the Maranboy tin field may be gauged from the fact that one parcel of 6 tons of stone yielded 2.60 tons of 70 per cent. concentrate, was obviously made without reflection. The value of any field cannot be gauged by isolated results; and, in the case of the Maranboy field, too little work has been done to warrant any definite assumptions being made regarding it, although all the evidence available so far supports the belief that it will become important. According to Mr. Jensen, the ore occurrences are inclined to be bunchy, but he points out that the junction of the two classes of country between which the lodes occur is well defined, the underlie of the granite probably being such as to warrant the assumption that the lodes will penetrate to depths of from some hundreds to some thousands of feet. The installation of a battery, which has now been authorised, will be of more benefit to the field now than any amount of money spent subsequently, as it will save this locality from the fate that has overtaken nearly all the districts in the Northern Territory.

The Hargraves Consolidated G.M. Co. Ltd. (N.S.W.) is another of the several New South

Wales companies which have for their objects the resurrection of supposedly worked-out properties. Up to the present we have not been warmed by the spectacle of a great mine grown from the ashes of former greatness. Usually it is ashes, then more ashes. The ashes of this property, however, are hardly cold, and what the present company hopes to do with the property it is difficult to see. After being worked extensively, it was finally closed down about six years ago. There can be no doubt that the prospects of many properties in Australia are ruined through indifferent management, and it is not improbable that it was on this account that the former company closed down. In this connection the chairman of the present company, in his report (dated 20th November last) to shar holders, states that the downward continuation of the reef worked at the 90ft. level has probably been missed, and crosscutting west at 200ft. is now in progress, and vertical development is contemplated, whereby it may be located. This method of procedure is not always a sound one. The individual who has had bitter experience in this connection sticks to the ore and does not take a chance of finding it at a given point at depth. Most ore bodies have an unhappy knack of getting displaced, and it is safer to follow them down, however difficult the job may be. If they cut out it is often worth while doing a lot of work in the vicinity to ascertain what has happened. This saves endless trouble afterwards. However, this is not all the company has in view. At 47ft., in the east crosscut at 200ft. level, a reef has been exposed for a total length of 150ft., and is said to give good prospects. A new reef was found outcropping on the north-west end of the leases, and in the workings an of old shaft, which has been cleaned out and inspected, several reefs have been exposed. Either the previous management was utterly bad or these reefs are unpayable. The present company is being helped by a grant of £5500 from the Government prospecting vote, and with calls due should just about worry through if there be anything left in the mine worth having.

Whatever shortcomings the Victorian Mines Department may suffer from, it certainly does not suffer from a lack of able and far-seeing officials. In a report by Mr. S. Hunter, of the Geological Survey, on the Ararat field, attention was directed to the advisability of boring in the locality eastward of the New Langi Logan mine to determine if another lead existed east of that being driven for by that company. The result of this work, which was undertaken, is now well known. A well-defined auriferous lead has been proved, which, it is anticipated, will prove payable when opened up, as it passes over the zone of auriferous strata. The eastern side of the lead, according to Mr. Hunter, is the steeper of the two, and the bedrock strata there appears to be of moderate hardness only, which, combined with the evidence provided by No. 14 bore not being in drift, indicates that the eastern slopes of the lead would be the best for shaft sinking.

# THE COAL MINING INDUSTRY.

## New South Wales.

### Northern District.

(From Our Corrspondent.)

Newcastle, December 6.

Interest has been centered this week in the action of the coal trimmers and other waterside workers in the port of Newcastle, in refusing to trim or otherwise handle coal intended for New Zealand. Not only has this embargo applied to cargoes of coal, but has included bunker coal for steamers going to the Dominion, and also for steamers of the Union S.S. Company running in the Tasmanian trade. The first men to take a hand in the squabble were the coal trimmers, and it was significant that this followed quickly upon the visit of two representatives of the New Zealand unionists to Newcastle last week. The trimmers said they would trim no bunker or cargo coal for the Union company. To put it into their own words, they said: "We do not want any work from the Union company at present." One shipping representative said, upon hearing this reply from the men, that if he had the power he would make all these boats self-trimming, and the men who thus contemptously refused to bunker boats that had nothing to do with the New Zealand trade would never again get work on board them. However, the boats then under the cranes were able to take in all the coal they needed, without trimming; but when the men on the cranes found that this was being done, and that in one case a little trimming was being carried out by the officers and men and the clerical staff of the company in Newcastle, they stopped shipping coal, and said they would tip no waggons into any vessel that was not trimmed by union labour. This further difficulty was surmounted by putting the boats under the M'Myler hoist. Then, on Thursday, when the Melbourne Steamship Co.'s boat "Brisbane" was loading for Lyttelton, the trimmers refused to trim the coal, and when the seamen found that the vessel was still taking in her cargo, they gave 24 hours' notice of the termination of their engagement. This was not accepted, and efforts are being made to get the men to take the vessel out of port. If they refuse to do so, the company will endeavour to get another crew. It is feared that if the trouble is not quickly settled in New Zealand the incidents of the past week may be but the prelude to general interference with the trade of the port of Newcastle.

Claims for the Lambton B miners have been placed before the Wages Board. The mine was idle for a considerable portion of the year, owing to the dispute between the men and the management, but it is working again, and the claims of the men are being considered by the Board. The chief claims are that when the selling price of the coal is 11s. per ton, they shall receive 1s. 5½d. per ton for shooting and filling coal undercut by machine. (This is for filling the coal all away together.) That the minimum selling price shall be 9s. per ton for Lambton B coal, and that the shooting and filling rate shall rise ¼d. for every 3d. that the coal increases in price. This would mean a minimum shooting and filling rate of 1s. 3½d. per ton.

The coal trade for the past week shows a falling off of about 15,000 tons, the total quantity exported being 86,000 tons. Managers round the district complain that they cannot get enough men to work their pits full-handed, and that in some cases the men do not work eight hours for a shift, otherwise the output of coal would be much larger than it is.

The Whitburn dispute will come before the Wages Board next week, alternately with the hearing of the Lambton B. claims. It is stated that the Whitburn matter will take only two or three days, and that the Lambton B claims will then be quickly disposed of, leaving the Board free to take up the afternoon shift question by about Monday week. The Board has been sitting at night lately, in order to get through the work, and so reach the afternoon shift question before vacation. His Honour Judge Edmunds has also intimated that the Board is ready to sit on Saturdays, if by that means they can deal with this very important matter before adjourning over the Christmas holidays. This is good news for the district, for if the afternoon shift question were put off, anything might happen at the end of the year. It has been the experience of men in the coal trade for a third of a century, that men are more likely to kick over the traces at the beginning of a new year than at any other time, and the afternoon shift might be a fruitful source of trouble if it is not settled, or practically so, before the year closes.

During the hearing of the Lambton B case this week, Mr. Lewis, the miners' advocate, wished to bring out something that had taken place in conference, but Mr. Kelynack, counsel for the proprietors, objected. His Honour upheld the objection, and pointed out that much of the value of conferences would be lost if it were known that anything said there might be made use of in open court later.

Mr. D. Watson, miners' president, has just returned from Sydney, where he has been taking part in the conference of union delegates over the trouble in New Zealand, and the possibility of its extension to this State. He says that the danger of a serious industrial upheaval is not altogether past, but the men who have the guiding of affairs are doing all they can to prevent this, and that the position is hopeful. Among the seamen and waterside workers here, it is freely stated that the trouble may yet be more serious than the maritime strike of 1890.

### Southern District.

(From Our Correspondent.)

Wollongong, December 6.

The increases asked for in the claims now being heard by the Wages Board are so numerous that if approximately granted the cost of production would be materially increased. At the present rate of progress, it will be well on in the next year before the Board's award is ready. Having finished with the case of the mine employees, the Board will have to hear that of the colliery mechanics. Of these the great majority are members of the blacksmiths' society, who lodged a separate claim.

The appointment of an industrial inspector, a miner, specially to attend to or at least to give a large part of his time to disputes in this district (mostly disputed claims for payment for place deficiency), does not seem to have disposed of this very difficult question. The advantage of the inspector was to be prompt and expert attention. There is reported by union officials to be dissatisfaction with the working out in practice of this means, chiefly on the ground of delay. There is stated to be a somewhat lengthy list of claims in arrears. Mr. Waugh, the inspector, does not seem to have yet been forgiven by everybody for offering himself for the position, and he has not been without difficulties to contend with. It is the opinion of some on the employers' side that the only means of dealing at all effectually with the deficient place trouble is to work those parts in which causes of deficiency are present with coal cutting machines worked by day labour. The employees oppose this; they want the machines worked on tonnage rates, in which event, of course, there would be places which did not make the standard wage, as there were before. At the wages board hearing now proceeding miner witnesses have said they opposed day labour at machines because it introduced a class of casual and inexpert labour, including sailors of all nationalities, etc., into the mine, and if there were no limits to it this would oust the miner class. They wanted all the coal got to be got by miners. One witness, an old miner, said on this point that the miner, if ousted from the mine, would be in a bad position, as he did not as a rule care for any other work. The chairman remarked that he was pleased to hear that, as he had heard that miners had a tendency to get away from mining, but here they had it that once a miner was to be always a miner.

## Victoria.

### Powlett River District.

(From Our Wonthaggi Correspondent.)

The wheelers' trouble at the State mine has been got over for the time being, but is likely to crop up again with or without the slightest provocation. Only one of the wheelers who were put on the night shift, and over whom the trouble arose, went to work on the Sunday night as ordered by the union meeting. Two lifted the money due to them and left the mine. The threat of Mr. Broome, general manager, to cancel the wheelers' contracts because they stopped the mine, did not trouble the men in the least. They instructed the union officials to inform Mr. Broome that they were indifferent on the matter, as they would as soon have shift rates as contract. Mr. Broome, when this was conveyed to him, stated that he also was indifferent as to whether the wheelers worked on contract or shift rates. He and representatives of the wheelers are, however, to have a further conference on the matter. There is nothing surer than that if shift rates for wheelers are to rule in the future there will be a reduction in the output, and the average earnings of the miners will suffer to a considerable extent.

Another special meeting of the V.C.M.A. was held on Sunday to deal with the report of the scrutineers on their inspection of the places to be cavilled for for the ensuing three months. Exception was taken to the definition of wet places put forward by the management, and the opinion was expressed that if there was water, either on the floor or in the roof, it was a wet place. The scrutineers said that the men were afraid to complain. The splitting of the seam was objected to as it was regarded as an attempt to work a point to avoid paying water money. The special rules, they contended, gave the management power to make a man a "scab" by sending him into a disputed place. The president remarked that this had been brought under the notice of the management, and the union officers told them that when they did a thing like that they were in for trouble and would get it. Complaints were made of the miners losing time through no coal being cut for them by the machines. As to the No. 9 section, it was reported that the management would not pay for crossing faults, as they contended it was not provided for in the agreement. This matter, it was agreed, ought to be fought to a finish. A motion was carried that the miners do not take up the bottoms left in a cut through, without being paid for it, as they have been doing. As to No. 10 section, strong objections were made to working the coal with the pick for the same rate as is paid in other sections, it being contended that the pick rates provided for in the agreement did not apply to No. 10. It was stated that the management was doing all the defining of the agreement, and it was all on their side. The discussion lasted for nearly four hours, and it could be seen that a great deal of discontent existed. Eventually it was decided that the agreement committee should be called together, so that the various matters could be laid before them, and they could give their interpretation of the agreement in relation to them. A further motion was carried that in the opinion of the meeting the rates for pick work in the agreement did not apply to Nos. 9 and 10, and that if the management required pick work done there the men should be paid shift rates, or special rates should be fixed.

# NEW SOUTH WALES MINING.

## Broken Hill.

(From Our Correspondent.)

Broken Hill, December 5.

Everyone who has read the daily papers will readily recognise that nothing much has happened on the Broken Hill mines lately, except stoppages for want of water. Most of the mines and treatment plants have been idle again most of this week, not that there is a water famine, but because for some unaccountable reason sufficient water will not come through the pipes to supply both the town and the mines. The water company is to blame. The mains from the Stephen's Creek reservoir to the city are very old, and will not stand any pressure. Had the N.S.W. Government some while ago extended the company's privileges new pipes would have been laid down; because the Government would not, and chose to instal the Umberumberka scheme, the company is trying to make the old pipes last for the three years or so longer of their tenure. Result, of late, either the town or the mines has been short.

Unluckily for Broken Hill a severe stretch of heat has made life on the Barrier almost unbearable. Heat and dust, dust and heat—climatic conditions have been as they were 15 or 20 years ago. Yet for a whole week portions of the city were absolutely without water. Many men had to go to the public baths to have a shower. Water for gardens was impossible, and in numerous cases the work of years in the horticultural line has been ruined.

It was not until the Mining Managers' Association took a firm stand that anything was agreed to to alleviate the disaster—no other word well describes the position. Mr. Geo. Weir, general manager of the North mine, and president of the Mining Managers' Association, submitted a scheme for placing a pump at the northern end of line of lode to take the water from the Stephen's Creek mains and boost it along to the service reservoir, This, it was pointed out, would greatly relieve the pressure on the old mains and would allow for a larger supply. This the Water directors have accepted, and a formal start with the proposal was made to-day.

Meantime, the town supply has been made normal, and the water has been again turned on to the mines. Some of the mines restarted to-day, others will wait until their reserve tanks are all full.

The excessive heat, of course, has made a greater demand for water; but hitherto, no matter what the temperature, while the reservoir has held water, the pumping plant has been able to cope with demands.

The Broken Hill public hopes that the water problem has now been solved, because the mines shut down is a serious thing for the city. Broken Hill depends wholly and solely on the mines, and any stoppage of work means a paralysis of business.

The Sulphide Corporation dividend for the December half-year is disappointing to many, 2s. on preference shares and 1s. 6d. on ordinaries. This equals £96,250, making £192,500 for the year (4s and 3s.). For 1912 the distribution was 6s and 4s 6d. Australia does not know yet how much cash has been carried forward, but it is certain to be a large sum.

During the four weeks ending November 29 the South mine output was somewhat abbreviated owing to the water troubles, but 28,095 tons of crudes treated for 4731 tons of concentrates is not too bad. Still, the monthly figures have been better. The crudes were worth 15.3 lead, 8.5 silver and 15.7 zinc, the concentrates proving a recovery of 74.2 per cent. lead and 52.3 per cent. silver.

The crudes at the other end of the field, in the North mine, went 16.4 per cent. lead, 7.5 oz. silver, and 12.9 per cent. zinc. Concentrates compared:—

| | Lead. | Silver. | Zinc. |
|---|---|---|---|
| South .. .. .. | 67.2 | 20.3 | 6.0. |
| North .. .. .. | 69.3 | 22.4 | 6.1. |

The Zinc Corporation found the benefit of the South Extended water during the "famine," and was able to struggle along. The South Blocks (the mining section of the proposition) still shapes fairly well. On the 1050ft. level, in the main lode, the ore in the north drive (at 426ft.) averaged 16.4 per cent. lead, 1.9 oz. silver and 11.7 per cent. zinc. The figures at the end of the south drive (in 140ft.) were 9.0 per cent., 1.4 oz. and 7.5 per cent. A 705ft. level west drive is progressing in good values. The zinc lode, however, does not shape as well as was expected.

One may continue to congratulate the North mine on its fine lode at depth, and also speak well of the South and the Central, but for the moment developements are stagnant.

## Bathurst District.

(From Our Correspondent.)

Bathurst, December 5.

The Last Chance gold mine at King's Plains are getting ready for another start after re-construction.

Golden Springs, at Brown's Creek, formerly owned by a French company (Mines d'or), is giving promise of opening up into a big payable concern. The former owners installed a new milling plant of 50 head of stamps, with power to drive a further 50 head. This was before cyaniding was known, and they had much difficulty in saving the fine gold. A large area of sail-cloth was laid down, and the tailings ran over this, and boys with naked feet and brooms swept them off the sail-cloth, but that did not work too well, as the gold got down into the creek, and the first flood waters washed everything away, or those sands to-day would be worth treating. The present company is getting a good swing on, and is likely to make a payable concern of it, as it has an immense body of ore to operate on.

Carcoar iron mines are vigorously working and turning out a big tonnage, whilst new drives are going in to determine the width and extent of the ore bodies.

Caloola Creek gold mine is adopting a more extensive development policy. A new shaft is going down, and a steam pump to cope with the water has just been installed. A winch and rails are on the way, and when all is completed a big saving should be shown in handling the large ore-body that has been proved to exist. Values, too, are improving, and things on the whole appear to be on the healthy side.

The Mt. Conqueror mine, at Peel, after a chequered career, is taking a back seat. When Dr. Mechattie had the mine it was worked at a profit, although the ore in a crude state was sent direct to the Dapto works, entailing heavy carriage and freight charges. Then the Mt. Conqueror Gold and Arsenical Recovery Co. got hold of it, and erected a substantial treatment plant, but all to no purpose, and had to wind up. The late owner, Mr. Waterhouse, carried on for a while, losing money all the time, until tired out and disheartened.

Finality is now reached, it would appear, as Cameron and Sutherland have just purchased the whole plant and machinery, which will doubtless be dismantled and removed in due course. 'Tis a sorry ending to what promised to become a profitable mining venture.

Amalgamated Hill End, in their northern drive from the Consolidated tunnel, have struck Mathewson's old shaft, and this will furnish water for crushing purposes for the time being, and will enable the company to put through some rich ore from the mine vein. This is said to be opening up real well, and all sorts of reports of values are talked about; but nowadays there is only one thing that has weight with the public, and that is the battery yield. Shareholders are pretty certain to hear of a decent-sized cake being panned out for Christmas, and the bigger it is the better they will like it.

Hawkins' Hill Reward mine is doing solid work, and a big tonnage may now be looked for each month, as any amount of payable stone is available. The northern drive is getting pretty close to the Robert Emmett cross-course, and when cut through, will liberate the sea of water that is held back by it. Then the Golden Key, and the Golden Mile mines can get to work on highly payable stone, known to exist, and worked down to water level. Prospects for the old field have not looked as good for the past 40 years, and a new era of prosperity is undoubtedly looming in the near future.

## South Coast.

(From Our Correspondent.)

Wollongong, December 6.

A good yield by working on a workingman scale is reported from Nerrigundah, on the Far South Coast. Motby Brothers and Noble brought to town from a reef at Quart Pot, on the Tuross River, a cake of 96½ oz., the yield of 10½ tons put through Fraser's battery. The reef was worked some years ago by Walter Motby, on whose farm it is. Some good crushings were got out of it, but the shoot of gold disappeared, and the mine was abandoned. The present working party started to drive in a direction opposite to that previously taken, and have picked up the gold-bearing stone again. At date of this report they had driven 22ft. on ore showing the precious metal in the face and underfoot. The former party had put a shaft down to a depth of about 50ft., following what was evidently a portion that had fallen away from the main line, and which at the depth mentioned petered out; a drive had also been put in the footwall about 5ft. The party, which began about three months ago, have struck the good ore at a depth of 70ft. The reef at the bottom of the working is from five inches to a foot wide, and its direction is N.E. and S.W. The party, it is stated, intend putting down a main shaft.

---

# VICTORIAN MINING ACTIVITIES.

## Bendigo and District.

(From Our Correspondent.)

The gold production for the week ending December 6-13 amounted to 3330 oz. 18 dwt. The principal contributors were Golden Pyke, 265 oz. 9 dwt.; Central R., W. and Blue, 261 oz. 8 dwt.; Johnson's Reef, 200 oz.; Great Extended Hustler's, 172 oz. 17 dwt.; Ironbark, 167 oz. 11 dwt.; Great Northern, 164 oz. 1 dwt.; Virginia, 150 oz. 12 dwt.; New Chum Goldfields, 139 oz. 14 dwt.; Carlisle, 119 oz. 11 dwt.; South New Moon, 99 oz. 11 dwt.; North Bendigo, 99 oz. 2 dwt. Two dividends were declared, totalling £2200, viz.:—Golden Pyke, 1s., £1400—total to date, £86,347 17s.; New Chum Goldfields, 6d., £800—total, £23,600.

Sea opened up 2ft. to 3ft. 6in. of good payable stone with the last couple of firings in the 1544ft. south level. Driving is along an east wall, and the quartz is what would have formed the east leg of the rich Garden Gully reef had the east back of the latter continued southward. The enrichment has occurred in the vicinity of the same faulting that exercised such a favourable influence on the gold deposition in the overlying reef, and gives some promise of permanency. The improvement was gradual after passing through a south pitching slide, and the conditions generally favourable. The company have a second good chance in the South Garden 2030ft. and 2080ft. reefs, both being profitable where squared to on the boundary from the latter mine. These reefs are being driven on from the main shaft southward, and will also be opened up from the next property in the new year. With the prospect of payable stone at two ends, and about 800ft. of ground available, the outlook is more promising than for the past five years.

Johnson's Reef crushing included 209 tons from the Collmann reef on the Paddy's Gully line for the improved yield of 153 oz. There is about 900ft. of this formation yet to extract, but its quality is very irregular. This is the reef that the Golden Age are sinking their eastern shaft for, and may get within the next 100ft. On the Derby line the Johnson's Reef new formation above 1225ft. continues to show gold, but is not as profitable as during last month.

Virginia, in following the spurs higher on the McDuff back than the system formerly worked above 1300ft., are revealing a good sample of gold. These stopes are above 1237ft. and parallel with the top of the big centre reef. Their position favours the theory that the spurs are not the continuation of those yielding well in the Great Northern 1184ft. stopes, though the 1300ft. system probably was. It is this circumstance that has created a stronger demand for scrip in both companies of late. Should the theory prove correct the Great Northern will probably find other spurs overhead and nearer the McDuff cap, while the Virginia should have a greatly extended lease of life in the 1237ft. south stopes. To determine whether this system continues south, a main level is being driven off the 1200ft. crosscut, all the workings on the old centre reef having been conducted from intermediate levels below this depth.

## Malmsbury and District.

(From Our Correspondent.)

The Malmsbury alluvial mine is not affording the directors such a cheerful outlook as was the case in the earlier stages of its development. Not much information is made available, but the experienced miners of the locality are not impressed with the appearances. The results of operations for the past half-year have not been what was expected or hoped for. Borings from the main reef drive have given indications of the existence of two district channels of wash, with a high bar reef separating them. Good prospects of gold have been reported from the bores, the width of the wash so far proved being about 180ft. Both channels of wash are, however, comparatively dry. It is thus probable that the main body of wash comprised in the Drummond lead has not yet been met with. The directors suggest that there is a junction of the tributaries with the main gutter in the vicinity of the workings. The main reef drive is still being extended to the east, and bores will be put up at intervals. Drives north and south were carried from the rise put up to first channel, and a strong body of wash was disclosed in the latter direction. The balance-sheet shows that liabilities to sundry creditors and bills payable represent £1325, while calls outstanding were £569.

Hubber's claim at Belltopper Hill still yields well with small parcels. From 9 tons 25oz. 9 dwt. was received.

Hanover (Drummond North) and New Galatea (Malmsbury) are both working with indifferent prospects. The former has advertised an extraordinary meeting to make some alterations in the rules with regard to the power of shareholders.

The Rainbow mine, at South Kyneton, which was the subject of litigation a few weeks ago, has been floated into a company. It will hereafter be known as the Pioneer, and the 20,000 shares offered to the public were over-subscribed for. In about a fortnight's time Trickey and party will have run out their contract time, and a vigorous breaking out of stone will continue by the company. It goes without saying that the tribute party has bent its best energies to the task of getting out stone. They reckon to crush at least 100 tons at the finisn of their term, and all sorts of extravagant estimates of their resultant Christmas box are being named. Anything up to 800 oz. has been mentioned.

Trickey and Co. have pegged out a lease northward of the Pioneer, late Rainbow.

Mr. Thomas Welch has applied for the lease immediately north, close to the Pioneer workings, and it also includes the old Treasure Trove mine. There is a possibility of a company acquiring this ground.

Mr. B. H. Beer, the late holder of the Chief mine, has applied for a lease south of the latter. He has stone from 2ft. to 3ft. wide, showing fine prospects.

### Maldon.

(From Our Correspondent.)

Oswald's Gold Mine Co. continues to give fine prospects and corresponding yields. Stoping is being done above the 400ft. level on stone 4ft. wide, worth 5 dwt. Stone is also being taken off the intermediate stope worth from 10 dwt. to an ounce, while stone from 5ft. to 8ft. wide is being taken from the stopes at 600ft., and of the same value. At 500ft. level the stope on the reef above the floor carries 5ft. of stone worth 1 oz. In the 600ft. level, after driving 11ft., payable stone wider than the drive was met with, and reckoned to be a continuation of the shoot at 500ft. The 1100ft. level has been extended to 682ft. on a good wall, but no stone is showing. The board has issued a report for the period covered by the life of the company, beginning on June 9 last, up to the end of October. In that time 4007 tons of stone gave a gross yield of 3392 oz. gold, and there was in hand then 30 tons of concentrates worth 13¾ oz. per ton, while there is also about 3500 tons of slimes and sand fit for treatment. The five months under review gave a profit of £6603. Out of this £1000 has been banked as a reserve fund, and two 1s. dividends were paid, worth £2500. In addition, another 1s. dividend and 1s. bonus will be paid on the 15th inst. The slimes, worth £400, which were stolen about a fortnight ago, have been found hidden in the bush, not far from the mine itself.

The South German Co. have extended the intermediate drive north off the bottom of the winze below 1750ft. for a distance of 243ft. The stone is wider than the drive, with value unchanged. The rise over the back of the 2000ft. level, 845ft. north of the shaft, has been advanced to 33ft. The stone is 4ft. wide, and at latest is estimated to be worth 14 dwt. per ton, although it was given as worth at least an ounce in the previous report. Baxter and party, the chief tributers, are stoping both north and south of the winze below 1750ft. on good stone, the last firing out to the north showing gold rather freely. Grigg and party are crushing with ten stamps. The company treated 780 tons of sand by cyanide for 68 oz. 5 dwt., and Best and party (tributers) crushed 104 tons for 7 oz. 5 dwt.

Derby United are stoping over the back of the 825ft. level on half-ounce dirt, and the reef in the intermediate level south of the rise is 5ft. wide and worth 2 dwt. The battery has been running eight days, and crushed 140 tons for 44 oz. 10 dwt.; 300 tons of sand were cyanided for 43 oz.

Payable prospects are said to be maintained in the north drive off the prospecting shaft at the New Day Dawn. Plat spurs carrying gold are showing in the No. 1 main level north, which is in 138ft. The north drive on Cricketer's reef is in 18ft.; lode mixture; heavily mineralised flat makes of stone are pitching north.

At Newstead the Uncle Sam Co. has closed down. By the time the ground above the water level had been tested the money had run out, and developments were not such as to cause any great hopes to spring in the breasts of the bulk of the shareholders. What will be the ultimate decision of the directors is not yet known.

Blow Reef is concentrating most of its energies on the extension of the 380ft. level northward. Out 27ft., the reef is 2ft. wide on the east side of a pug seam.

Laner Bros., working on the old North Nuggety, crushed 20 tons for 5 oz. gold.

## TASMANIAN MINING.

### Mount Lyell District.

(From Our Correspondent.)

Queenstown, November 28.

Barring the interference with opencut operations by the rough weather, all underground and surface work at the North Lyell and Mount Lyell mines has been proceeding as usual. At the North mine they are keeping up an output of approximately 10,000 tons of ore a month, and the mine is now in such excellent condition that it is practically certain this tonnage will be permanently maintained, even if it is not increased. The 850ft., 1000ft. and 1100ft. continue to provide the greater portion of the output, and will do so for a long time to come. The opening up and extension of intermediate levels at 925ft. and 1050ft., which is now well in hand, will tend to facilitate the extraction of ore and threby increase the productive capacity of the mine to an appreciable extent. At the 1100ft. level the extension of No. 1 north drive, which has recently been restarted from the northern end of No. 41 stope ore-body, has gone through ore of excellent grade, and is being continued along the contact of the ore and schist. On September 30 last the face of this ore-body from where the drive was restarted was only about 40ft. from the Comstock boundry, and as over 20ft. has been driven during the last four weeks, they should know by this whether the ore-body extends into the Comstock lease or not. And although it has not been officially stated, it is generally understood that it has been proved beyond doubt to do so.

At the Mount Lyell mine the extraction of pyrites is being kept up to somewhere about 5000 tons a week, and one day lately 800 tons was won from the underground workings alone. This is excellent work, and proves the good productive order which the mine is in, and in the near future, when the South Lyell mine is thoroughly opened up and stoping on comprehensive lines started, they should be able to put out 1000 tons daily without any difficulty.

At the reduction works three furnaces were in regular operation for the full four weekly period closing on November 26, and the smelting campaign for the month was highly satisfactory—in fact, the best for a very long time past. Although the official figures giving the actual smelting return will not be available till the 4th or 5th of December, it is pretty certain that nearly 30,000 tons of ore was furnaced during the four weeks, and it is just as certain that the output of copper will exceed 600 tons. This is a most gratifying feature in regard to the company's metal production, as reckoning that the output will be only 600 tons, it will be the highest for any similar period since the July-August month of 1912, when the output was 618 tons. But it is quite on the cards that for the four weeks under review the returns when published will also show an increase over the figures for the July-August period mentioned.

---

For the month of November the Baker's Creek G.M., Hillgrove (N.S.W.), crushed 409 tons for 535 oz. 8 dwt. smelted gold. The shaft reef continued to supply the main bulk of the battery stone. Stoping work on the middle reef, above No. 11 level, and on the shaft reef at Nos. 14 and 15 levels, also supplied pay ore for the battery. The development of the shaft reef and middle reef at an increased depth was started at No. 16 level. A winze on the shaft reef went down to 26ft. At No. 11 level a winze on the middle reef, the width of which is 1ft., was sunk a further 7ft.

For the month of November the Tasmania Gold Mining Co. (T.) crushed 4253 tons for 881 ozs.; cyanided 1860 tons for 51 oz., and treated 318 tons of concentrates and 1121 tons of tailings for 441 oz., or a total yield of 1373 oz. gold, valued at £5825.

During November the Commodore G.M. Co., Meekatharra (W.A.), milled 750 tons of stone for bullion valued at £1293, and cyanided 390 tons of material for a return of £340, making a total of £1633, besides which 360 tons of slimes were produced having an assay value of 29s. per ton. The month's expenditure on working was £811, while £300 was spent on development and £20 on capital account, making a total of £1131. The working profit was therefore £822, and the net balance, after the other charges have been deducted, is £502.

Without being able to say what work is being done by the Government staff in Papua in connection with the development of the oil industry there, Mr. J. S. Craig, who is well acquainted with the country, says there is no doubt as to the existence of extensive deposits. In places the oil can be seen bubbling up in the water, and water taken from the river miles away is undrinkable, owing to the presence of oil.

## WESTERN AUSTRALIAN MINING.

(From Our Correspondent.)

Kalgoorlie, Dec. 1.

The Westralia Mt. Morgans mine, which was closed down in 1911, has been re-started, and should be a steady producer in future. The old 60-head mill has been dismantled, and most of it sold, and only 20-head of stamps are now at work. The mill has been removed from the cap of the lode to enable the ore from the 200ft. to the surface to be mined. The treatment plant now consists of 20 stamps, six grinding pans, and a vacuum filter, driven by two gas producer plants, and has a capacity of 4000 tons monthly. The ore in sight above 200ft. is estimated at 48,000 tons. The mine is opened up to the 600ft. level, but no continuous pipes or ore shoots were ever located below 200ft. The mine has produced 597,600 tons for a yield of £1,293,500, or 43s. per ton, and £226,822 were distributed in dividends. Unless fresh ore bodies can be located in deeper ground, of which Mr. Gibb Maitland, Government Geologist, holds out very slight hope, the life of the mine will be very short.

The internal shaft in the Great Fingall, which was started in the north drive at No. 13 level, is now down below No. 18 level—the deepest in the mine. At No. 15 level an ore shoot worth 43s. 7d. for a distance of 144ft. has been opened up; at No. 16 level it has been proved to assay 39s. 6d. per ton for a length of 350ft.; at 17 level it is 300ft. long of an assay value of 40s. per ton, and at No. 18 level a length of 406ft. has been exposed, assaying 46s. 6d. per ton. These levels are all connected by rises and winzes, and an enormous lot of ore is blocked out ready for stoping. There is some very rich ore in some parts of the mine. For instance, in No. 7 rise above No. 18 level the average assay value for 116ft. up was 168s. per ton, and in No. 7 winze below No. 18 level the average assay value for 49ft. sunk is 134s. per ton. The width of the lode is usually 5ft. to 6ft., but in many places it bulges very much wider. Hauling from these lower levels is expected to start immediately after the holidays, and the output and profit next year should show a marked improvement.

The directors of the Golden Ridge Co. have finally decided to abandon the option on the Yerilla King. The reef on the property is far too small to be of any good to a company, as in seven years, from 1905 to 1912, the mine produced only 2600 tons for £11,500. During this year three parcels, aggregating 1084 tons, returned £4210, which is no good to a company like the Ridge, which has been treating 2800 tons monthly, and, so recently as 1910, was producing £6500 of gold per month at a profit of £3000, and even during 1911 and 1912 won £5200 monthly for a profit of £1750. The old Ridge mine is still yielding £4000 monthly for a profit of £500, but the mine is becoming depleted, and cannot last much longer. Unless a new winze is found within the next few months the company will have to go into liquidation.

The board of the North Kalgurli have, on the advice of Dr. MacLaren, decided to spend no more money on the property, and whenever tributers finally leave the show, which they are gradually doing, the mine will have to be sold or abandoned. For the first ten months of his year tributers have treated at Customs mills 6511 tons for a gross return of £14,174, the bulk of the parcels treated being too low grade to cover cost of carting, crushing and wages, until which is done no royalty can be claimed by the company. It is rumoured that the mine will be bought by the Kalgurli Co. during Mr. R. S. Black's visit to London, and if this eventuates holders of scrip may recover 1s. to 1s. 6d. per share besides what the property realises. If this sale is not effected, the money in hand—some £20,000—will be frittered away in management, office expenses and directors' fees, and shareholders will get nothing.

The south drive at No. 16 level in Chaffers, after going 176ft. in ore assaying 116s. 8d. per ton, has, apparently, come to the end of the ore shoot. From 176 to 181ft. the grade fell to 52s. 3d. per ton, and from 181 to 187ft. to 23s. 6d. only. The north drive on No. 4 lode is still in unpayable ore, and the crosscuts at No. 15 and No. 17 level still show nothing of value. The purchase of a new treatment plant still hangs fire.

The Young Australia mine at Mulline is offered for sale by public tender. This mine was first pegged in 1899, and has since produced £41,000 from 3300 tons. The mine is equipped with two 8 h.p. oil engines and two winches, and has been opened up at four levels, the deepest being 360ft. on the underlay, but only 130ft. vertical. The reef varies from 3in. to 30in. in thickness, and is for the most part a mere leader. All the mines at Mulline are of the same flat nature, and, although they have produced a lot of gold, none of them has been proved to reach any depth.

# MINING IN QUEENSLAND.

## North Queensland Fields.

(From Our Correspondent.)

Mareeba, November 26.

Some very good crushings were put through the Loudon mill, Irvinebank, for the period October 23 to November 10. The Vulcan tin mine crushed 1121¼ tons of stone for 50¾ tons of concentrates, value £4377 12s. This mine is looking better than ever, and I can only repeat my previous advice to investors, that is, "buy shares as an investment." On mine values shares are worth more now than in the boom time. Regular dividends will be forthcoming during the ensuing year, and it is safe to predict that during the next 12 months 2s. per share will be paid. Ninety tons of stone from the Lass O'Gowrie mine returned 20 tons 12¾ cwt. of concentrates, valued at £1080 3s.

Mr. J. T. Watson, manaer Mt. Mulligan coal mine, left for the South last week on holidays and business. It is expected that the No. 2 seam of coal will be cut before Christmas. Work is progressing favourably, and it is all being carried out on the contract system.

Mr. Alexander Macdonald, M.E., F.R.G.S., managing director of the Mammoth Copper Mines, Cardross, who has been on a visit to England and Scotland, to confer with his co-directors, returned to Cardross on Monday. It is his intention to hasten along development work at the mines. The further sinking of the shaft at the Chieftain mine will be pushed on, and a vigorous policy will be pursued at the Clansman mine. Mr. Macdonald said he was very pleased with the mine developments up to date, and he hoped soon to be sending daily 100 tons of ore to the smelters. Cardross badly needs railway communication, and in view of the very favourable mine developments, it should not be very long before this is an accomplished fact. There is no doubt but that the Cardross field has proved itself worthy of a railway service. Latest reports from the manager of "The Oaks No Liability," Kidston, states that the water lodgment at the river has been completed, and the necessary work round the main shaft is finished and in order to land the trucks of ore at the surface. The erection of the overhead tramway from the mine to the mill was started on the 11th inst., and 150ft. of trestles have been erected. The balance of this work will be slower, owing to the height of the trestles as they approach the mill. The total length in a straight line will be 408ft. Skid timber for the installation of cages at the main shaft is now at Einasleigh. At the battery the old boxes have been removed, also three of the old columns. The Wilfley table has been overhauled and adjusted, and as soon as the new linoleum has been fitted on the top, will be in good order. The foundations of the battery are all in good order. Mr. Chappel, of the Einasleigh Co., has made his report on the electrical plant, and it has been decided to instal a steam pumping plant for the water supply, which will take a big load off the gas engine, besides being more economical in regard to wages. The Apex Extended claim, over which the company held an option, has been purchased outright at a satisfactory price.

Nothing much is being done by the management of the Thompson Oaks G.M. Co. A few tributers are at work, and getting fair results. Floyd and party are still breaking out ore from the Oak Apple lease, and have about 12 to 14 tons at grass. They are taking it over a width of 12 to 15in. at present, and values are about 30 to 35 dwt. per ton. They have broken through into old workings in the west, which comes through to the surface. They have also broken into old workings going east, which do not go to the surface. They are also prospecting on the big 30ft. formation. On the Peg Leg claim the tributers are cutting a small tunnel in from the lower side of the hill into the ore body.

Very latest reports from the Vulcan tin mine state that the mine is improving every day. Large quantities of rich ore are going forward to the battery, and the next four weeks' returns should see a much higher figure. The fact that local buyers are absorbing the shares is sufficient to confirm the optimistic report sent forward to you during the past few months. The erection of the aerial tramway is now nearly completed, and same should be working before Christmas.

Mr. F. Carman, of Orient Camp, near Irvinebank, is at present developing a large low-grade proposition, which promises to be one of the big things of the district.

Mr. P. F. Meredith, who has secured an option over the Mareeba Goldfield leases, leaves for the South next Saturday in order to place the balance of the shares. A good number of shares have been applied for locally, and the flotation is practically assured. This will mean a big thing for Mareeba. Old miners who worked in the goldfield in its early days have every confidence in the scheme.

Good rains have fallen in the Hodgkinson district, and thunderstorms have made their appearance in several of the tin mining townships, so consequently there will be greater activity among the alluvial tin-miners. At the New Minnie Moxham gold mine the erection of the dam is proceeding very satisfactorily, and has so far progressed that storms can do it no injury. The dam is constructed of reinforced concrete, and has been well and faithfully built. The company's engineer, Mr. G. R. Gordon, is proceeding to Melbourne shortly to inspect a battery plant.

## Anakie Sapphire Field.

(From Our Correspondent.)

Sapphiretown, November 26.

An inquiry has reached Sapphiretown (through the Rockhampton Chamber of Commerce, to whom it was forwarded by the Agent-General for Queensland, Sir Thomas Robinson) from a manufacturer of clocks and watches in Switzerland, who wishes to get into direct touch with Australian exporters of sapphires instead of buying them through "London brokers." As some of the product of this field goes direct to Switzerland, and the great bulk to Idar (Germany), the reference to London brokers is a surprise to the people here.

---

# CENTRAL R., W. AND BLUE (V.).

## New Saddle Reef at 880ft.

(From Our Bendigo Correspondent.)

Somewhat unexpectedly the 880ft. west crosscut has entered the cap of a new saddle formation, at 24ft. from the shaft. As the reef channel is at the 720ft. plat, and the anticline's usual trend eastward in depth, it was not generally anticipated that this crosscut would reveal anything of interest apart from the west backs of the 670ft. and 720ft. centre reefs. The Sheepshead line, however, has shown a greater inclination to gain westward at intervals than any other reef channel yet explored. The first indication of a pronounced westerly trend was from 318ft. to 400ft., centre coming back in the shaft at the latter depth, though the fold is over 30ft. east of the 318ft. plat. From 400ft. to 640ft. there is only a slight list in that direction, the reef channel again appearing in the shaft at 670ft. and 720ft., where the upper limits of two reefs were passed through in sinking. At 800ft. there is evidence of centre being over 25ft. west, corresponding with the position of the anticline at 880ft. The new reef at the latter depth has been penetrated up to 8ft. in boring. The first 4ft. of quartz dislodged contained a little mineral, but no gold was found. The second firing would take place before this appeared in print. As yet neither the saddle nor the top of the cap have been disclosed, and the reef is evidently of good dimensions. As it is not an infrequent occurrence to find the cap stone of a saddle reef of very low grade and the legs profitable, better results may attend further exploration. In contrast to the reefs seen in the shaft at 670 and 720ft., the new formation has only a slight north pitch, a feature that seems to assure greater regularity and permanency. To work the stone to any advantage it will be necessary to sink the shaft about 80ft., operations that may lead to the discovery of another reef, as there are a couple of faults below the bottom plat underlying toward centre. At the 880ft. plat there is a back of reef yet unexplored between this depth and 800ft. It is evidently located under a strong slide that crosses the 800ft. plat and will be tested shortly by rising on the west leg from 880ft. and sinking a centre winze from the crosscut above, where the lava is exposed in the end. At the latter level a crosscut is going out to the east back of the 720ft. reef, which should be intersected shortly between the fault at the plat and those below 880ft., a rather interesting position. The cap of the 720ft. reef shows a little gold, and somewhat better prospects were seen in the east leg near the turnover. The formation, however, appears to be small. At 670ft. there is an irregular deposition of quartz, probably due to the intrusive dyke, carrying some gold. This formation does not promise any permanency near the shaft, where the reef channel has a very steep pitch north, similar conditions in the latter respect prevailing at 720ft. On the old reef above 400ft. the outlook is anything but favourable, and the discovery of a profitable shoot of stone in the deeper ground would be most opportune at present. The most disappointing portion of the formation has been the section north of the No. 5 winze to Lansell's Little No. 180 boundary. From the excellent prospects disclosed in the latter winze it was anticipated that a good reserve of very profitable stone would be opened up in the 220ft. of ground intervening to the end of the lease. As stated last week, the 400ft. rise and last winze from 318ft. at 20ft. from the boundary has failed to disclose anything of value. Added to this damper, the good stone near the No. 5 winze has been proved to be much more limited than expected. In these circumstances it is evident that the company will have to face a substantial reduction in the weekly returns at a very early date, unless there is a turn up in the new reef at 880ft. There are still hundreds of thousands of tons of the 318ft. reef intact, chiefly south of the shaft; but it has proved exceedingly low value. Pending the deepening of the shaft the new reef may be prospected southward by driving off the bottom crosscut.

---

# GREAT EXTENDED HUSTLER'S (V.).

(From Our Bendigo Correspondent.)

Some remarkable features are being presented by this company's exploratory work in the strata to eastward of what is known as the Hustler's main reef channel. This centre is uniform to the depth of 3430ft., but is accompanied by another anticline after leaving the shallow levels, the reef channel double-folding with a steep north pitch. In the trough thus formed inverted saddle reefs have occasionally been found productive in the deep ground, but it was considered unlikely that such deposits existed above the 1500ft. level. The recent workings at 1053ft., 1226ft. and 1326ft. have, however, demonstrated otherwise, well-defined backs of a trough reef existing in the 1226ft. and 1326ft. levels, though they have not yet been officially reported. Associated with these backs at 1326ft. is a large deposit of auriferous quartz in the trough, forming an inverted cap. A close examination of these workings revealed the fact that the cap owes it dimensions to the trough being ruptured by an east-dipping fault. This break traverses the eastern beds of the western centre diagonally, carrying a large quartz deposit. There has been a free infilling of the silica along the inverted bedding plane at its intersection with the syncline, most of the quartz extending upward from the break. In this way the trough has been well filled to above the 1226ft. crosscut, but the cap appears to be smaller below 1326ft. The east and west backs are uniform at the latter depth, the latter being associated with 9in. to 2ft. of good quality stone in the north level. Owing to the exceptionally steep pitch of the beds this level is half a rise, and if continued for a short distance will disclose the same stone in the form of a miniature cap, where the sandstone hanging wall folds over the smaller eastern anticline. An unusual feature is observable in this level, the softer footwall beds folding up, while sandstone continues upward with a steady west dip. As operations are 500ft. north of the shaft, and there is no other level within striking distance lower down, it will be necessary to follow the reef underfoot with an underlie winze if prospects warrant it. Above 1326ft. the company are stoping this west leg and cap, both showing very fair gold, as last week's average of well up to an ounce indicates. The top stope is about 30ft. over the level, in 8ft. of cap stone. A similar width of crushing material is exposed in the 1226ft. crosscut, of payable quality. A level is here going north, and should shortly leave the cap owing to the extraordinary north pitch. As the level is along the east back, and the west leg will be getting further away, the value of the latter will have to be proved by a separate level. At 1053ft. the conditions are different, the upward continuation of the reef being along the intersection of the east back and a diagonal fault, which may be identical with that seen at 1326ft. The trough is smaller and ill-defined, in addition to being located further east. This position is the top, or rather, end of the payable shoot at present, and the quality of the stone is much inferior to that at the deeper levels. On the whole the prospects are encouraging, and there is a strong probability of the heavy overdraft being liquidated during the first few months of the new year from this new reef. The old eastern formation, known as the Little reef, is further out. It was worked to 220ft. below the 777ft. level on the underlie, following the course of a bend in the wall and a couple of steep pitching faults. Though not previously suspected, this bend represents the warping of the upper beds towards the forming of the syncline of the double-folding. The quartz allied to the bending of the back is 10in. to 3ft. thick and reefy, and averages of 10 dwt. to 2 oz. have been obtained, but the stone is limited. It is now being sought for by driving north off the 1053ft. crosscut, and may be reached in another month.

---

The carbides of molybdenum and tungsten can be obtained by heating the finely-powdered metals, or their tri-oxides, in a current of carbon monoxides or of a mixture of methane and hydrogen (1 : 1 by volume). By the action of carbon monoxide on molybdenum at 600 deg. and 1000 deg. C., $Mo_2C$ is obtained; at 800 deg. C. products ranging from MoC to $Mo_2C_3$ are obtained. Tungsten yields $W_3C_4$ by the action of carbon monoxide at 1000 deg. C., and WC by the action of methane and hydrogen at 800 deg. C.

## HAMPDEN CLONCURRY.

The annual general meeting of the Hampden Cloncurry Copper Mines Limited was held at the registered office of the company, Collins House, 360-366 Collins-street, Melbourne, on Thursday, 4th December.

The chairman, in moving the adoption of the report and balance-sheet, said:—

Before formally moving the adoption of the report and balance-sheet, I propose to follow our usual custom of traversing the main operations of the company during the period under review, and since the close of the half-year to date.

It will be recognised that our work was curtailed to the extent of some two months, due to industrial troubles at Cloncurry. This may be regarded as the direct stoppage, but incidentally, and owing to conditions that developed consequent upon the cessation of work, much of our development was retarded for periods varying from three to four months, particularly our operations in the No. 1 shaft. At date of closing down, the shaft had reached a depth of 467ft., but with the stoppage the water rose, and only by continuous pumping were we enabled to again resume sinking at the beginning of October. At a depth of 494ft. a further heavy volume of water was struck. The water is still making, and notwithstanding the fact that we are baling at the rate of 100,000 gallons of water per twenty-four hours, little or no impression has been made. We are hopeful that a lode of importance will be developed at this point, the indications pointing to there being a recurrence of the ore on the western wall of the main ore channel.

I am sure that you will have noted with considerable satisfaction the development that has taken place at the No. 2 shaft, 350ft. level, where the main drive from co-ordinate 815 N. 22 E. has entered a pyritic body. This lode has now been proved for a total length of 208ft., and has assayed from 6½ per cent. to 21 per cent. of copper, the average grade probably being about 10 per cent. At the present time the ore at both north and south extremities of this lense assays 12 per cent. This ore is largely pyrites, with splashes of bornite. Apart from its high grade, its fuel value to this company is very great.

In connection with this disclosure, I would point out that when sinking the No. 1 shaft, which is some 600ft. south of the development above referred to, we went through a well-defined lode 6ft. 6in. wide, and assaying 11½ per cent. I do not wish to infer that the lense will maintain its continuity between these points. Indications rather suggest the probability of the occurrence of lenses of varying lengths, with intervals in the channel of low-grade filling. It is well to remember, however, that the lense now operated on has been so far proved for 208ft., and from appearances we may certainly expect a further continuance north and south.

At the Duchess mine, No. 1 winze was sunk to a total depth of 126ft., and a crosscut at the bottom proved the ore to be 10ft. wide, of an average value of 20 per cent. The second winze at this level, at 140ft. further north, has attained a depth of 95ft.—to 62ft., through ore averaging 20 per cent., and from this point to 87ft. through low-grade formation. Advices are just to hand that high-grade ore, assaying 27½ per cent., has again come into this winze. I might mention that in sinking the No. 1 winze we passed out of values at approximately 70ft., and the high-grade ore was not again encountered until a depth of 89ft. was attained. The features prevailing in the No. 2 winze indicate a similar occurrence. Generally, the stoping at this mine confirms the accuracy of our estimate of the reserves, and indications point to a very satisfactory accession when the development work now in progress is completed. This work was unfortunately delayed, pending the delivery of the larger compressor plant, as owing to the extended stoping operations, we had not air available for the extra development work.

By the last report it will be noted that the Duchess main shaft has attained a depth of 610ft., and is being sunk at the rate of about 12ft. per week. It is intended to open out at 700ft. Concurrently with this work the No. 2 winze will be sunk as deep as conditions allow, and we hope to get same down to 125 or 130ft. before the crosscut intersects the lode. The depth to which these winzes have been sunk will enable the ore developed by means of the bottom drive to be quickly available. With the completion of the sinking to 700ft., it is intended to further actively continue the shaft to 850ft., as we will have ample air for this and other development work which will be also in progress.

The Trekelano main shaft has been sunk to 211ft., and a crosscut started at 200ft. to intersect the lode. I am just in receipt of advices stating that a small vein of low-grade pyrites has been struck which may prove to be the hanging wall of the lode, but it is yet too early to make any definite statement on this head.

The option of purchase over the Answer mine has been exercised, and work done has disclosed a fair tonnage of high-grade ore. With a view to the better exploitation of same, it has been decided to sink a main shaft, and this work has been put in hand. The depth of this shaft is now 129ft. We hope to maintain average footage, consequently we should be opening out to ascertain the character of the lode at 200ft. some time within the next three months. The outcrop on this mine is a very continuous one, and our manager is hopeful that the extension of exploratory work will prove the existence of a considerable tonnage of high-grade ore.

Operations at the Macgregor mines have been mainly confined to the Wallaroo lease, where 96ft. of driving north and south, at the 155ft. level, has been in low-grade formation. In the Wattle lease, however, the winze from the 85ft. level has been sunk to 56ft. in fair-grade ore assaying 12 per cent. copper.

At the Pindora group of mines we are sinking three shafts—on the Esmond North, the Sevastopol, and Bismarck leases. These shafts have penetrated low-grade formations of varying values. I am pleased, however, to state that since the issue of the half-yearly report a crosscut from the Esmond North shaft, at a depth of 120ft., has proved the lode some 20ft. wide, of which 12ft. averages 7 per cent. copper. This ore occurs as a high-grade chalcopyrite in quartz schist, and consequently can be very easily concentrated to a high grade. I would remind you that the ore outcrops very persistently for some 3000ft. in chutes of from 300ft. to over 1000ft. in length, and our general manager is very definite in his opinion that a large tonnage of similar grade ore will be ultimately available. It may be here remarked that the lode, where pierced at points approximately 300 or 400ft. apart in three places, have disclosed features similar to those which occur in the Esmond North, but for lack of necessary development we are not claiming any tonnage in respect of these mines, and in fact no tonnage will be taken into our reserves until such time as the ore is definitely proved on at least three sides.

At the Salmon mine the limestone lodes continue to open up very satisfactorily, and the disclosure of this material amounts to at least 100,000 tons of excellent fluxing quality. This mine has now been connected up with the railway by a siding 1 mile and 50 chains in length, and it is intended to draw from this source from 35 to 40 tons of flux per day. The traction engine which was formerly employed in carrying the flux from this mine has been transferred to the Trekelano mine, and is hauling from that property at the rate of 10 to 12 tons of ore per day.

No work has been done on the Mascotte and Scalper properties, as it was felt desirable at this juncture to more actively develop those mines which are most accessible to our present means of communication.

The construction of the Macgregor Tramway has made satisfactory progress, and all surveys and plans are completed in connection with same as far as the 22 mile 52 chain peg, which has been fixed as the terminus of our 3ft. gauge line. From this point on we propose to construct a 2ft. gauge tramway, as it has been found that the country between this point and our mines is exceedingly rough, and suitable grades could only be obtained at what may be regarded as an excessive cost. All classes of earthworks are in progress to 22 miles, and have been completed to 17 miles. All bridges to the 18 mile 50 chain peg have been completed, and are in course of construction to the terminus. A survey is in progress to the Pindora group, and I am pleased to advise that this passes over very easy country. The furthest point of this extension from the main line is approximately 5 miles.

Whilst on the subject of our railway construction, I have to advise the completion of the Dolomite tramway, and would state that the facilities afforded by this line will completely insure a good supply of flux from the Salmon mine at a much cheaper rate than was possible with our old system of traction.

Expenditure on capital account during the period under review has been very heavy, totalling in all the sum of £102,475. Of the above, the expenditure in respect of the Macgregor tramway construction amounts to some £30,900. Writing at a recent date with regard to the outlay on this work, our manager advised that he anticipated the total cost would amount to approximately £46,840 to the terminus at the Lady Flat leases (22 miles 52 chains). As previously mentioned, for the balance of the distance we propose laying a light 2ft. gauge tramway. This, with sidings to the Wallaroo, Wattle and Macgregor, will cost approximately £11,055. All the rails and sleepers for this work are ordered, and we anticipate delivery in the course of the next three months.

You will appreciate from the foregoing that our expenditure has been very heavy, and also that we will not be free of this condition for some little time. It may be suggested that we are pushing the construction of the Macgregor line unnecessarily quickly, but I would state that whilst the question of connecting with these mines is not one of urgency, still, the opening up of this part of the country, and the making available of the large tonnages of ore for our smelter has been an integral part of our developmental policy, and we have felt that considerable saving would be effected in the final cost by maintaining progress at the highest possible rate consistent with proper efficiency.

I had the opportunity of going over a large portion of the line as recently as last August, and was greatly impressed with the solidity of the work. A recent inspection has been made by the Chief Commissioner, and he has expressed himself as well satisfied with the line generally. Personally, I feel that the opening up of this country will be the means of securing quite an important tonnage of ore to our smelters, irrespective of that which we will have from the mines controlled by us.

Smelting has continued satisfactorily, and save for the interruptions due to labour troubles, we have only had such stoppages as are incidental to any smelting equipment. It will be observed that the total tonnage of material put through the furnace was 28,726 tons, made up of 20,912 tons of Hampden and Duchess ores, 3832 tons of Salmon, Iron Duke and Customs ore, 2546 tons of ironstone, and 1436 tons of limestone. The net production was 2596.34 tons copper, 818.28 oz. fine gold, and 24,457.12 oz. of fine silver. The furnace ran 124 days, the average production per day being 21 tons of fine copper, and I think we may regard this as a very satisfactory result.

As I have previously indicated, we are mining our respective ores in order to secure an average of the claimed reserves, namely, 10 per cent. As is incidental to all mining work, we cannot absolutely maintain these figures week in and week out, but over periods you may rely that a reasonable average will be preserved. I make mention of this fact because it will be noticed that in some months our yields may average, say, 10½ per cent., and in others, say, 9½, but this condition will only arise from the fact that at periods stoping may be in richer or poorer areas.

The total profit on working account was £72,231 14s. 2d., and this was reduced by administration and other charges to £66,397 14s. 2d. I would emphasise the fact that the figures really cover only four months' work, and the final results are affected by the fact that, during the two months in which there was no production, certain necessary maintenance charges were incurred at our various mines.

Since the close of the half-year we have had stoppages totalling eleven days, owing to leaky jackets due primarily to the use of highly mineralised mine water causing deposition of scale. Luckily, we had a battery of jackets for our standby furnace in stock, and we decided to instal these. Since they have been put in we have had no stoppages, and advices from the mine report that everything is running quite smoothly.

We have not yet had the advantage of the Farley Creek Water Supply, as the dry conditions previously reported still continue. We hope, however, that the rainy season will shortly set in, and with its advent I am quite satisfied that we will be able to rely on a good supply of completely suitable water free from any deleterious ingredients.

Shareholders will appreciate that our developmental programme calls for very heavy expenditure, and I am sure they will affirm the policy of this Board in pushing with vigour the development of the properties we own. It will be understood that the establishment of a long and enduring career can only be obtained by a vigorous policy such as is now being given effect to. With the completion of the Macgregor line and the Pindora siding, our expenditure will be largely in the direction of developing our various outlying mines. For this purpose we are hypothecating approximately £3000 per month of our profits. The Macgregor line and extension has been calling for some £5000 per month, but this latter expenditure will cease in a short time.

That we have been able to spend this money, and at the same time make substantial disbursements by way of dividend, is the best evidence we can furnish of the profitable character of your mines. I would point out that our profits and consequent distributions are dependent on the price of copper, and whilst it remains at about current prices we can see no reason why we cannot maintain our present dividends, but for the reasons previously enumerated, I would urge that you do not become unduly impatient if we do not keep to a strict schedule in our distributions. I mention this, not that I have any idea that there will be any need to defer the declaration of dividends, but that the maintenance of our developmental programme may call for an extension in the dates of their payment. Shareholders, I am sure, will understand that a business such as this requires a fair amount of capital to carry it on, inasmuch as we have tied up in stores, coke and copper, anything from £70,000 to £80,000. My desire would be to have a cash reserve of approximately £100,000, but we cannot in the earlier period of our career spend large moneys in developing properties, and at the same time accumulate large reserves, and I think the better policy is to put our money into the development of copper; and when we feel that we have done enough in this direction, we can then look to establishing the cash position.

Notwithstanding the extraction during the half-year of 18,857 tons of ore, containing 2430 tons of copper, our reserves at the 31st August were estimated at 255,000 tons, containing 25,640 tons of fine copper. The ore reserves do not include any portion of the metalliferous flux in the Salmon or Iron Duke lodes. In the Salmon mine upwards of 100,000 tons are available to a depth of 60ft., and the evidences point to further quantities below this depth. In the period very little new ore has been added, as development work, for the reasons already enumerated, has been retarded. The shaft sinking and crosscutting at the Duchess, Trekelano, Pindora and Hampden mines will, I am quite sure, when completed to the respective objectives, disclose substantial additions.

I have, I think, dealt with the main features in connection with our operations, but should any shareholder require further information, I will be glad to supply it.

A Shareholder: Can you give us an idea why, in spite of the reported depletion of stocks of copper in Europe, the price is going down?

The Chairman: I can only offer an opinion in this matter, which may be of little value. The position is one of the most extraordinary that have developed in recent times, according to the industrial records. Statistically, copper ought to be at a very high price indeed. The direct reason for the present low price may be the fact that conditions of trade in Europe are very bad, and it is generally thought that such will continue for some considerable time. If this is so, statistically the position of copper would alter. I think it is the fear of this possible condition that is causing copper to be sold at the present low price. It is very hard to know whether the industrial position is the result of retarded progress or the swing of the pendulum to leaner times. The Balkan trouble and the displacement of trade arising therefrom has been very serious, and may be a direct contributor to the industrial and financial curtailment that has taken place. My own feeling is that we have seen the worst under present conditions, and may hope to see the price of copper maintained at something like current rates.

Mr. H. F. C. Keats seconded the motion for the adoption of the report and balance-sheet, which was carried unanimously.

The retiring directors, Messrs. W. L. Baillieu and J. L. Wharton, were declared re-elected, there being no other nominations.

The retiring auditors, Messrs. Richard E. Tweddell and George S. Anderson, were re-appointed.

## OUR BIG MINES.

## Examinations of their Yearly and Half-Yearly Reports.

(By a Mining Accountant.)

### Junction North Broken Hill.

The report issued by this company is an excellent example of how not to do things. It is a poor production, presented without even the semblance of an apology. The old company once did deserve a word of praise for the many good features to be found in its report, but its successor has sadly fallen from grace. Thus, for instance, throughout the pages of the last three half-yearly reports, there is not a single assay of the ore mined or of any of the material delivered to the mill. Nor is there any mention of that important factor, the recovery of the metals. As for the presentation of the costs, the less said the better. Shareholders who are content with this sort of thing are easily satisfied, or can have no knowledge of the essentials. The two are really one. The report under review indicates a happier state of affairs than has existed for many a day. How far this state is only temporary, however, can only be guessed at. Starting the half-year with a credit balance of £5902, the balance carried forward was £21,678. This in a time of a high price for lead is nothing remarkable, but it contrasts favourably with the disasters of recent periods. The financial position, also, is now much sounder, the balance sheet testifying to a surplus of £106,502 in liquid assets.

The mine report contains nothing of especial interest. The Junction North for some time has appeared to be a dying proposition as a mine. However, the Broken Hill lode has such a wondrous capacity for stultifying gloomy forecasts, that this statement is as far as it is safe to go. The reserve of ore in the Junction North is estimated at 230,000 tons, above No. 12 level and below No. 8 level. This, at the present rate of extraction, is equal to two and a half years' supply. The mine will most probably continue to provide pickings for a longer period than that. The Junction North is now as much a treatment as a mining company. It has a reserve of 300,000 tons of slime, once the millman's nightmare, but in these days of improved metallurgical processes an asset of value. The purchase of this product when at a severe discount was a good stroke of business standing to the credit of those in control. For there can be little doubt that the company could to-day sell this reserve at a price considerably in advance of the purchase cost. Whether it would not pay the company better to sell outright at such profit rather than treat the slime at its own mill is an interesting speculation. The directors claim that handsome profits from this source are being made, but they offer no figures to substantiate the claim. As a general rule, the deliberate concealment of figures, that once were offered freely, points to a reality that is less flattering than people are invited to believe. As a sidelight upon what is really happening may be taken the fact that though nearly 46,000 tons of the company's ore was treated, in addition to purchased products amounting to 59,000 tons, the profit on the working account was less than £37,000. This is equal to a working profit of about 16s. per ton of ore mined. In the olden days when only the ore from the company's own mine was treated, the rate of profit compared favourably with this. With an improved plant, the ore now being mined and treated should give equal or better results than formerly, and if, as claimed, substantial profits are being earned from the treatment of the purchased products, the combined result should be more impressive than it is.

Turning to the meagre details that are to be found, it will be noticed that the amount of purchased product treated is becoming greater in proportion to the ore mined and milled. Thus:—

Table A.

| | Half-year ended. Sept., 1912 tons. | Mar., 1913 tons. | Sept., 1913 tons. |
|---|---|---|---|
| Crude ore, Junction North Mine .. .. | 51,244 | 43,213 | 45,668 |
| Crude ore, purchased .. | 2,169 | 9,707 | 17,280 |
| Slime and Tailing from Dumps .. .. .. .. .. .. | 17,501 | 28,717 | 32,675 |
| Slimey Zinc Middling (Re-treated) .. .. .. .. | 118 | 2,610 | 1,968 |
| | 71,032 | 84,247 | 97,531 |

Truly, there is not much information in the above, but, such as it is, it is the best to be found. Were it not for one word in the fourth line, a stranger would not be able to tell what was the metal being sought. It might be zinc, lead, copper, or tin. Curiously enough, the assays of the concentrates produced are published. Why such inconsistency? The publication of the following figures rather spoils than otherwise, for thoroughness in any undertaking commands at least some measure of respect. Here is the table:—

Table B.

| | Half-year ended. Sept. 1912 | Mar. 1913 | Sept. 1913 |
|---|---|---|---|
| Lead concentrate produced, tons .. .. .. | 10,640 | 12,910 | 16,036 |
| Average assay— | | | |
| Lead, per cent. .. .. | 59.3 | 56.3 | 53.8 |
| Silver, oz. .. .. .. | 33.4 | 33.5 | 32.6 |
| Zinc, per cent. .. .. | 11.4 | 14.1 | 14.4 |
| Zinc concentrate produced, tons .. .. .. | 7,762 | 9,053 | 8,344 |
| Average assay— | | | |
| Lead, per cent. .. .. | 8.4 | 7.7 | 8.2 |
| Silver, oz. .. .. .. | 16.4 | 15.1 | 15.3 |
| Zinc, per cent. .. .. | 41.3 | 42.0 | 42.0 |

The grade of lead concentrate is becoming lower each period. A simple calculation on the information in Tables A and B can be made showing that the ratio of lead concentrate to mill feed is increasing, but whether this is due to better work, or to higher-grade feed, or merely to the concentrate being less clean than formerly, is a question that must remain unanswered. That is, unless the enquirer has a friend at court. The answer to the question should be patent to all—not a privilege to few. The same considerations apply to the zinc concentrate. This concentrate, as can be seen, is becoming higher in zinc—a most desirable feature. On the other hand, it takes considerably more of the material originally supplied to the mill to produce a ton of zinc concentrate than formerly. Whereas 9.1 tons of mill-feed a year ago yielded one ton of zinc concentrate, 11.6 tons are now required to give much the same yield. These figures may not have much of positive value about them, but they at least indicate that the metallurgical improvement has not been vast. And as for that very important subject, that of metal recoveries, it is a most carefully-guarded secret. One can only surmise as to the reason why the means of investigation is denied.

The faith, or credulity, of shareholders is largely drawn upon in the following revelation:—"Considerable advance was made likewise in the efficiency of the treatment as indicated by improved recoveries, higher grade products, and reduced operating costs." Another paragraph that inspires interest runs thus:—"Disposal of Products.—Satisfactory contracts have been arranged for the sale of slime products of lead and zinc, and regular despatches of accumulations and current output are being made." What does this really mean? Is it intended that slime products of lead and zinc refer to the concentrates produced from the treatment of slime, or is the company in reality selling some of its accumulated slime—purchased or otherwise? The latter step may, as suggested, be good policy. On the other hand, of course, it may not. It is useless to consult the report.

The costs are, doubtless, very interesting, but this subject also cannot be enticed from its murky obscurity. Once upon a time the costs at this mine were shown as a model of how costs should be allocated and presented. That day has passed. Now that mill treatment has become more complex, or, rather, more varied, a retrogression has been made in the method of showing how each individual operation contributes to the final desideratum, the profit as represented by the difference in cost and revenue. The present method is to compound in one item the cost of mine development, ore extraction, and the various metallurgical processes now in use at the mine. Here again the enquirer must do his own surmising as to the reason of the change.

Before dismissing the costs, represented by the collection of items to be found in the working account, the profit and loss account, the law suit against the Junction Company deserves some mention. P. and L. account is debited with £1518 cost of suit, also with £6000 provision for Court fees and legal costs. Add the previously-incurred sum of £5125 in this connection, and its total becomes £12,643—a goodly sum. What has been gained? To the lay mind, it would seem that a sensible method of determining the influence of the "ventilation" afforded the Junction mine by the Junction North would have been to have demonstrated the matter in an actual trial, comparing the ventilation complained of with no ventilation at all. But, to the legal mind, this would never, never do. However regarded, the squabble between these two companies was ill-conceived.

Revenue is the next matter to claim attention. The working account briefly and succinctly supplies the information thus:—"By concentrates, £179,711." No more, no less. But there is some considerable doubt whether this sum will be realised when the final accounts come to hand. A reserve of £10,000 has been created to meet decline in metal prices, and the directors state that this sum is ample for any possible depreciation in metals. How this £179,711 was made up, and what were the metal prices realised or credited to production are matters that are left untold. The report would certainly not be overburdened if it contained a few particulars—not the mere generalities that have taken up more than their due space—concerning the revenue from each class of concentrate, the average metal prices realised, the amount of the unsold production, and the basis of valuing this latter. But such particulars are also among the missing. Finally, the balance sheet alone remains. The date, or dates, for the redemption of the £35,240 bonds is not given, so reference must be had elsewhere. On the credit side of the balance sheet is £80,403 paid under contracts for material not yet treated. This sum is at a safe figure, as one or two of the Broken Hill companies would like to have the products it represents. Possibly, double the price might be now realised. Unfortunately, the Junction North can not depend on securing further bargains, such as this one was. To conclude the examination of this most unsatisfactory chain of missing links, the following table is offered for review:—

Table C.

Financial Results.

| | Half-year ended. Sept., 1912. | Mar., 1913. | Sept., 1913. |
|---|---|---|---|
| Revenue .. .. .. .. | £139,459 | 116,403 | 179,711 |
| Expenditure .. .. .. | 104,877 | 122,146 | 139,597† |
| Written-off .. .. .. .. | 20,008 | 2,928 | 6,339 |
| Net Profit .. .. .. .. | 14,574 | — | 33,776 |
| Deficit .. .. .. .. .. | — | 8,672 | — |
| To Reserves .. .. .. | 14,574 | 5,902 | 37,678‡ |
| Paid Capital .. .. .. | 114,489 | 142,814 | 152,832 |
| Liquid Assets .. .. .. | 125,289 | 132,611 | 176,064 |
| Liabilities .. .. .. .. | 73,519 | 62,563 | 69,561 |
| Surplus of liquid assets | 125,283 | 70,048 | 106,503 |

†Does not include £6000 provision for law suit.

‡Includes £6000 provision for law suit, and £10,000 for fluctuation in metal prices on unfinalised deliveries. Both doubtful reserves.

# ENGINEERING AND ELECTRICAL SECTION

Australian
General Electric Co.
217 Clarence Street, Sydney.
Tel.—Central, 3495, 4397; City, 2381
"Penfold House," Cr. Queen and Little
Collins Sts., Melbourne.
Tel.—Central, 2647.
Representing—
GENERAL ELECTRIC CO., U.S.A.
The
BRITISH THOMSON-HOUSTON
CO. LTD., of Rugby, England.
The GUARANTEE of EXCELLENCE on GOODS ELECTRICAL

## NORTHERN TERRITORY RAILWAYS.

By nine votes to eight, the Senate last Friday rejected the item allocating £400,000 for the construction of the Northern Territory railway from Pine Creek to the Katherine River and southwards. Senator Clemons, as the Government's representative, said the Territory must be populated, and that would never be accomplished unless the settlers were given reasonable facilities. The first step was the railway now proposed. The line to Pine Creek was practically worthless, but extending it southwards would make it a possible asset to the Commonwealth in helping the development of the Territory. Some Senators objected to the railway on the ground that it would only benefit wealthy cattle breeders and the wealthy company which is contemplating the erection of freezing works at Darwin; fears of the octopus beef trust haunted them. Others thought it preferable to continue the line from Oodnadatta northwards, but an amendment which would leave it open to the Government to decide next year which line should have precedence, met with an even worse fate than the item itself, being rejected by 15 votes to 5. The division indicates that the vote was not on strictly party lines. The vote of £60,000 for railways in Papua was agreed to without a division.

The commission which was appointed by the last Federal Government at the instigation of the Minister for External Affairs (Mr. Josiah Thomas) for the purpose of collecting information to guide the Government in the work of administering the Territory, and was specially deputed to inquire into the best railway routes and the most advantageous ports, but which was recalled by the present Minister and asked to prepare its report forthwith, reached Melbourne last week by the steamer "Aldenham," though Mr. A. Coombes came overland from Sydney and arrived a week earlier. Accommodation has been been provided for its members at the Department of External Affairs, and they are now engaged in drafting a report as to the railway requirements of the Territory, in view of their recent explorations and inquiries over the various districts. It is expected that the report will be handed to the Minister for External Affairs (Mr. Glynn) before the end of the month. Mr. Frank Clarke is the chairman, and in addition to Mr. Coombes, the commission comprises Mr. David Lindsay, with Mr. J. Gilbert as secretary. The Minister expects to receive their report by end of the month. Their recall is interpreted in some quarters as a preliminary step towards an important movement which the Prime Minister (Mr. Cook) has in view for pushing ahead with the settlement of the Territory. Since the Commonwealth took control very little substantial progress has been made, but Mr. Cook recently declared in Sydney that the place must be developed at all hazards. On that occasion Mr. Cook said that the system of leasehold tenure would have to go, and something more calculated to attract white settlers substituted in its place. But he declines to make any definite statement of his proposals until he has the commissioners' report.

## MELBOURNE TRAMWAYS.

On the 3rd inst. Mr. Beckett moved the second reading of his Municipal Tramways Trust Bill; he spoke for over two hours in support of it, and stated that in bringing it forward in opposition to the Government's Metropolitan Council Bill, he did so at the request of the 26 municipalities within the metropolitan area. A large portion of his speech was an historical sketch of the career of the Melbourne Tramway and Omnibus Company, whose lease of the lines expires in about 2½ years. The second portion dealt with the municipal consideration of the position during the past three years, which resulted in the presentation to the Premier of a draft Bill which it was hoped he would lay before Parliament, the object of which was the creation of a Municipal Tramways Trust. Mr. Watt replied that he could not accept the Bill as it was; it would require alteration in at least three respects. To meet his wishes the Bill had been modified, and then the Premier turned it down altogether and proposed to make a common control of tramways conditional on the acceptance of several other provisions covered by his Metropolitan Council Bill, which might be hung up indefinitely. On the motion of the Attorney-General, Mr. Drysdale Brown, the debate was postponed for a week to afford him an opportunity of consulting with his colleagues. Two days later Mr. Watt was defeated on the Electoral Districts Bill, and Mr. Brown had no colleagues to submit it to.

Several other tramway Bills, which had passed the Assembly and reached the Council, are similarly hung up, and those interested will have to await developments outside the House before they can hope to hear anything more of them. And the same thing applies to the request of the Prahran-Malvern Tramways Trust for increased borrowing powers. With the accession of a Labour Ministry in a house strongly Liberal it is difficult to foresee what may happen.

The Malvern Council was informed last week that tenders had been called for the construction of the High-street extension, which would mean that the cars would run to the boundary of the municipality. Councillor Roger Thomson then reported that the increased borrowing powers which the trust were asking for, from £500,000 to £700,000, were necessary for expected work, and not for the work the trust were committed to. They had borrowed £370,000, which would complete their contracts, while the £130,000 balance would build the Malvern-road, duplicate the Glenhuntly-road line, and build the Point Ormond extension. The Malvern-road would cost £65,000, and the Glenhuntly and Point Ormond line £32,000, leaving a balance of £33,000 for new cars and incidentals. They had also agreed to the electrification of the High-street, Kew, line, which could not be built unless they (the Trust) obtained the extra borrowing powers, as £40,000 was involved, in addition to which they would have to provide another depot, and more cars, which meant a further £50,000. Malvern-road line would be built under the present conditions.

## SYDNEY TRAMWAY FARES.

The N.S.W. Minister for Railways has received from the Chief Commissioner a minute regarding the increases in tram fares it is proposed to impose as from 1st January. These increases involve additional charges for Sunday and holiday traffic on all lines, and other increases for week days. In this way the Commissioner hopes to make up the loss which is being shown on the working of the tramways. The occurrence of the general election necessarily postponed any determination being come to. Mr. Willis, the ex-Speaker of the Legislative Assembly, has spoken very plainly upon the loss which is being sustained, and which, as mentioned in our last issue, is even increasing. Speaking at Randwick recently, Mr. Willis said:—"It is scandalous that these trams, capable of carrying the 600,000 residents of the city and suburbs, cannot be worked profitably without this unfair raising of fares. Rather than an advance of charges, there should be reduction. What is the cause of it, anyhow? Simply, this raising of fares has been found necessary to meet the interest on the outlay caused by the construction of railways which do not pay, and which have been constructed merely for political purposes—to pay interest on money that has been squandered. Your fares and freights must be reduced, not raised, if the country is to blossom like the rose."

It is stated that the whole deficit is due to the altered working conditions and increased wages, following upon wages boards awards. The tramway employees number 9170, and during the past three years their wages have risen 1s. to 2s. per day. The hours of duty have been limited to 96 hours per fortnight. These awards have converted what was a profitable undertaking into a public service which is being run at a serious loss. In his last annual report, Mr. Johnson pointed out the serious position created by these awards, in regard to both the railway and tramway services. It is understood that the Chief Commissioner suggests that if he be allowed to charge a minimum fare of 2d. for the first section on all trams running on holidays and Sundays, and slight increased fares on week days, he will be able to make up the tramway deficit. Of the railway deficit it is proposed to make up £18,000 from suburban travellers. The season tickets will be increased to the rates ruling in 1907, while the price of workmen's weekly tickets will be also advanced.

## THE DEFENCE DEPARTMENT.

### Unprofitable Factories—Missing Stores.

Amongst the infinite variety of topics touched upon in resumed debate on the Treasurer's Budget Speech in the House of Representatives last week, the Defence Scheme and various aspects of Northern Territory administration came in for a large share of discussion, and some fearful and wonder legislation would be produced should some of the principles mooted be acted upon. Yet, apparently, the suggestions were made in all seriousness. For example, Mr. Arthur (V.) said that neither the needs of Australia nor its financial capacity justified the position in which defence stood to-day. The Commonwealth wanted a navy of a certain strength for certain purposes. But Australia was an isolated country, far removed from storm centres; yet we were attempting to build up a navy and army proportionately greater, according to population, than those nations which were in the midst of the storm centre. In the first of these sentences two fundamental considerations are linked, but the real difficulty which has to be faced is to make them coincide as nearly as possible. The needs of Australia from a defence standpoint are enormous; the cost of making defence effective and maintaining it in efficiency, even with a citizen army such as now in process of formation, must be prodigious. But to even suggest that defence should be on a population basis is rank absurdity. No one ever doubted the costliness of Admiral Henderson and Lord Kitchener's schemes, nor did anyone ever dream of carrying them out in the course of a few years. With a wisely-directed immigration policy, the problem of populating the Australian continent will be partially solved, as that will mean recruits for the defence force as well as tax-payers to provide the sinews of defence. When Mr. McWilliams (T.) attacked certain branches of the department he was on more reasonable ground. "Apart," he said, "from capital cost of the small arms factory, the rifles produced had cost £80 apiece, whereas they could be bought for £4. The cordite factory cost annually £42,126, and he had not yet been able to discover what it had turned out. He had tried to get certain information as to other factories and failed—and he did not think the Minister had been able to either." There is no doubt that the expenditure on these two factories has been altogether out of proportion to their productiveness, and as the Senate is particularly fond of select committees just now, and shows an amazing interest in anatomising the creations of late Government and laying the blame of their ineffectiveness upon the shoulders of the present one, few things would be more surprising than the appointment of another committee to investigate the affairs of the small arms factory, the tailoring factory, and the other non-paying Governmental industrial undertakings. The approaching end of the session may, however, spare the country that vexatious proceeding. Yet something should be done. Men had to be trained specially for the small arms factory, and that could not have been done before the new machinery, with which their work was to be done, had been set up. To say that men should have been trained in anticipation is to lose sight of the fact that there was no machinery here for them to train on. But that they should get their training and then leave the service, necessitating a repetition of the process, is highly unsatisfactory, and not very creditable to the trainees. Another matter which came into the very discursive discussion was the deficiencies from the ordnance stores. The list of these which has been made public, and which Mr. Mathews (V.) read to the House, is appalling. Thousands of pouches, brushes, capes, buff boots, water bottles, belts, fur hats, etc., were missing from the stores, according to the stock sheets; 6815 khakee shirts were missing and 1542 targets. He only heard of this a few months ago, and got the particulars from papers placed on the library table; 4099 yards of hessian were also missing, as were 107 cartridge cases, and many other articles. Sensation. The officials knew twelve months ago of the deficiencies, and neither the previous nor the present Minister of Defence knew anything about it. All these allegations demand a thorough investigation, and, if possible, a complete disproof. At present, they can only indicate to the public gross mismanagement, to give it no worse name, and if the expenditure on defence, necessarily heavy, is being increased by wholesale pilfering in the stores, and by inefficient management in the cordite and arms factories, the necessary changes should be made without hesitation.

---

## VICTORIAN RAILWAYS.

Preliminary work in connection with the establishment of railway workshops at Ballarat and Bendigo is well forward, and tenders are about to be invited for the erection of the buildings. Plans and specifications for the plant and machinery are being prepared in the hope that these necessaries will be ready by the time the shops are built. The following particulars are supplied by officers of the Department. The main workshop buildings at both places, covering an area of 337ft. by 200ft., will consist of two boiler makers' shops, including riveting tower, blacksmith's shop, machine shop, and two erecting shops, the whole being covered by roofs of saw tooth design, in three spans of 66ft. each, to ensure ample diffused light and ventilation. Three main railway tracks will run through these shops, supplemented by two cross tracks, and pits will be provided in the erecting shop for the examination and adjustment of under gear and working parts of locomotives. The boiler makers' and erecting shops will be equipped with 50 ton overhead electric cranes. The riveting tower will be equipped with a 30 ton electric crane operating at a height of 45ft. above floor, to facilitate the riveting by machinery of large boilers, etc. The machine shop and blacksmiths' shop will have 10 ton overhead lifting cranes, and will be provided with the most up-to-date furnaces and machinery for the manufacture of various parts to be assembled and put together in the erecting shops. The overhead cranes will run on tracks, supported by steel latticed columns, which will also carry the roof and external wall of timber framing, covered with galvanised corrugated iron. Detached buildings will contain the melting down shop, coppersmiths' shop, and paint shop, all of construction similar to the main buildings. A brick office will accommodate the administrative and office staff. Adjoining the offices will be the stores building, and next to that will be a meal room, lavatory and shower bath accommodation for employees. Electricity will be employed for both lighting and motive power.

The report of the Victorian Railways Standing Committee on the extension of the Brighton-Sandringham line to Black Rock is nearing completion, and will be ready for presentation to Parliament this week. In 1910 the committee recommended the construction of the line, subject to the condition that, as in the opinion of the Crown Solicitor it was a country district, the Moorabbin shire council should hand over to the Government, free of charge, the land required for the railway and the stations. The cost was estimated at £20,000, and the shire council and residents asked the Minister of Railways that the condition respecting the land should be altered, by having the district treated as urban instead of country. The effect would be that the Government would have to purchase the land required, and the local council would only be responsible for so much of the interest on that expenditure as the surplus revenue of the railway was unable to meet. The Ministry considered the request, but did not accede to it, and sent the whole question of constructing a railway or a tramway back to the committee for further consideration.

In developing the system of cross country railways and extensions sanctioned by Parliament for the purpose of opening up areas hitherto denied railway facilities, the construction branch has now somewhere near 1900 men employed, and it is expected that by the end of the year the number will be 2000, or more. Several of the new lines will be available for the transport of this year's harvest, though not for general traffic.

---

## VICTORIAN INSTITUTE OF ENGINEERS.

At the usual monthly meeting of the Victorian Institute of Engineers, held on the 3rd inst. (Colonel J. Monash being in the chair), matters of vital interest to the Institute and to the profession were dealt with. Before entering upon this, however, Colonel Monash moved a resolution expressing the sympathy of the Institute with the family and relatives of the late Mr. A. W. Craven, M.L.A., who had been for 20 years on the council of the Institute, and had also occupied the president's chair. He had been held in such high esteem (added Col. Monash) that there was no doubt that, had it not been for his Parliamentary duties, he would again have occupied the chair.

Mr. Jas. Alex. Smith moved:—"That the Institute adopt the scheme of incorporation, submitted by the mover, in lieu of Presidential address in 1912, and that the President and the mover be given full authority to give effect to this resolution." The motion was seconded by Mr. E. Clarke and carried unanimously, all the proxies received being also in favour.

It was explained that the scheme was based upon the experience of the great institutions of the world, whose officers had given valuable hints to the author of the draft submitted. Also that local experience, local conditions, and, so far as they could be foreseen, Australian future requirements had been given due weight. The memorandum of incorporation and the articles are very lengthy, since by reason of their permanency and stability when passed, it is necessary that every predictable contingency should be provided for. The matter will be again submitted at a special meeting, and, if confirmed, will be submitted to the Attorney-General, who has power to grant the incorporation sought. It was pointed out that incorporation would give a definite legal status not hitherto possessed by the Institute, and that it would be productive of the best results to the profession and to the interests of the public.

The discussion on Mr. J. A. Smith's paper on "The European-American Frontier in the Pacific in relation to Panama and Australia" (which appeared in our issue of November 27th) was further discussed. Colonel Monash, Mr. J. T. N. Anderson and others dealt with the issues, chiefly those of international policy, arising as a consequence to the issues defined in the paper. The author, in replying to the discussion, exhibited a number of lantern views of the progress of the work at Panama.

The meeting and the session closed with the expression of mutual good wishes by the president and members.

---

## CARBON FILAMENT LAMPS.

At the meeting of the Melbourne City Council held last week, the question of cost of carbon filament lamps was discussed as the outcome of a recommendation made by the Electric Supply Committee, that the tender of the Pope Electric Lamp Co. for supply and delivery of 33,300 carbon filament lamps at £565, be accepted. Alderman Brenan moved the adoption of the recommendation.

Alderman Jeffries, however, argued that these lamps were large consumers of current, and on that account it was time their use was discontinued. In supplying lamps to consumers he was of opinion that the council was acting wrongly, and that if it were intended to supply lamps they should be of greater efficiency. He would move as an amendment that the question be referred back to the electric supply committee for further consideration, with the object of not having lamps supplied to consumers.

Councillor Parrit, in seconding the motion, stated that if it was desirable the council should supply electric lamps an Act of Parliament should be obtained for the purpose.

Councillor Aikman urged that it was daylight robbery to give lamps to consumers free. Really, the consumers were at a disadvantage in taking the carbon filament lamps, as they paid heavily for the extra consumption of current.

Alderman Brenan, chairman of the electric supply committee, said that, although the council supplied carbon filament lamps free, the consumers could provide themselves with metal filament lamps. Provision had been made in a Bill which had been drafted for presentation to Parliament this session giving the council power to sell lamps. When this power was obtained the council would be able to retail metal filament lamps at a moderate rate to consumers. Carbon filament lamps should be supplied until the council could sell metal filament lamps.

The amendment was negatived on a division by 19 votes to 9. The recommendation of the electric supply committee was agreed to.

---

## BRITISH AND EUROPEAN DEVELOPMENTS.

(From Our Correspondent.)

London, Nov. 7th.

An electrically-equipped kitchen which has been in operation at the Old Ship Hotel at Brighton for the past fortnight possesses unusual interest by reason of the kitchen having been specially built for electric cooking service. The equipment is doing the entire cooking for the hotel, including banquets, and it has been carried out under the direction of the Brighton Corporation Electricity Department. The apparatus comprises the following:—One range of four ovens, each measuring inside 24in. x 20½in. x 20½in., with a hot cupboard separately heated above the ovens. Each oven has a 5 kw. loading, and the hot cupboards approximately 2 kw. each, the aggregate being 24 kw. One grill 36in. x 12in. is fitted with a hot cupboard above (grill 7 kw., hot cupboard 1 kw. —8 kw.). The fish fryer consists of two oval pans measuring 18in. x 12in., each pan being fitted with draining rack and having a maximum consumption of 2½ kw. (total 5 kw.). There is also a hot plate for boiling purposes, 4ft. x 2ft. 2in.; it contains four 12in. boiling rings, each with a loading of 2·5 kw. (total 10 kw.). Further, there are two large vegetable steamers, with a loading of 10 kw. All the equipment was made by the Jackson Electric Stove Co., Ltd., of London.

In his paper on "Large Prime Movers and Boilers for Power Houses," read at the joint meeting of the Kent Branch of the National Association of Colliery Managers and the London Branch of the Association of Mining Electrical Engineers, held at Dover, Mr. E. K. Scott stated his conclusions as under:—"The prosperity of the United Kingdom is so intimately bound up with the proper utilisation of our coal resources that any improvemenet in plant and design of power stations, etc., should be encouraged. In electric power supply the pace is being set by water power countries, and the only way in which we can compete with them is to manufacture electric energy in very large power stations equipped with the very latest and most efficient plant. Electric power supply must inevitably centralise in the colliery districts, and its generation will be carried on in electric power stations, which will make stations of to-day seem quite small. In America the standard steam turbine unit is 20,000 kw., whilst the tendency is to go still higher. Manchester is installing a 15,000 kw. unit, and C. A. Parsons and Co. are building a turbo generator of 25,000 kw. In New York 30,000 kw. turbines are being installed. An ideal electric power station would be one to give, say, 100,000 kw. in four or five steam turbine units supplied with steam from gas fired boilers, the gas being produced by a by-product plant using coal direct from the pit. For an electro-chemical or metallurgical base load such a power station should be able to sell electric energy at less than $\frac{1}{10}$d. per unit. Cheap electric power supply depends largely on the load factor and the best load factors are given by electro-chemical and metallurgical processes. At present such processes are principally carried on abroad. They are an exceptionally profitable branch of electrical work, and we ought to establish them here. To do so requires cheap power generated on a much larger scale than that to which we are now accustomed. The question of the design of large power houses is one that concerns colliery people intimately, because there can be no doubt that most power houses of the future will be situated on the coalfields, and many present power plants, municipal and otherwise, will become sub-stations. Mr. Scott says that the sixty odd power houses of the Greater London area, for example, should be sub-stations deriving electric energy from master power houses on the Leicestershire, Warwickshire, Forest of Dean and East Kent Coalfields. The transmission line could be along the railway routes, for, of course, it goes without saying that the railways will be electrified.

The address delivered on November 4th by Prof. E. W. Marchant, as chairman of the Manchester Local Section of the Institution of Electrical Engineers, was a study of the vocation of the electrical engineer with a view to seeing what he had accomplished, and to attempt to determine the place he should fill in the industrial world; it also considered the steps that appeared possible to improve his status, and the reward he should receive for the long and arduous training through which he had to pass before he could be regarded as a fully qualified member of his profession. The central station engineer was destined in the future to take a still more important place in the life of the community than he occupied at present, but the remuneration offered to those taking up this work was quite inadequate to its responsibility. In all but the largest cities, successful central station engineers had in many cases forsaken their positions, to take up consulting work, and they were retained by their former employers as consultants. Prof. Marchant said it would surely be better for central station authorities to have at the head of affairs men of experience, who would render the calling in of outsiders unnecessary, and if this was to be, it must be made worth the central station engineer's while. The supply of men who wished to enter the employ of the power companies had fallen off, and the salary offered had in consequence risen to a most marked extent. A West country engineer who years ago had dozens of men on his books anxious to get into central station work, now had none! To attract the right men to fill the post of electrical engineer to a town or city these positions must be made financially remunerative. ''One cannot expect a man of promise to be content to spend 10 years of his life preparing for a profession which in the end will yield no adequate return.'' Speaking of the electrification of railways, Professor Marchant said that the electrical engineer who intended to go in for railway work had apparently a great opportunity, but he must equip himself with a thorough knowledge of railway conditions. For example, the arrangement of a schedule of trains for a suburban line was a problem of some mathematical complexity, and the estimation of the power taken by an electric locomotive on a given line of road entailed a large amount of detailed calculation and a thorough knowledge of mechanical principles. The necessity for a good general engineering training was obvious. As electric railways progressed, it seemed certain that the position of mechanical engineer to a railway would be filled by an electrical engineer—indeed, he might legitimately even have an aspiration to fill the great administrative position of general manager of a railway. The speaker next discussed the question of salaries paid to technical men entering manufacturing works. In order to attract the best type of men into the profession in this department, the standard of remuneration for technical men must be advanced. It was to people of this type that a manufacturer must look far more than to any other for the progress and advance of his business. To-day, manufacturers' prospects in England were better than at any time during the past decade, and it was, therefore, right to urge this matter at the present moment, laying stress on the necessity of ensuring that the prospects of those entering an electrical engineering works shall be at least as good as those in any other branch of engineering practice. Prof. Marchant later in his most interesting address, referred to the unsatisfactory position of engineers in the Government telegraph and telephone service, to the prospects for electrical engineers entering the field of electro-chemistry, to the future position of the consulting engineer, and finally he urged the electrical engineer to make use of his opportunities now that the outlook for the industry was so good. He should see to it, as far as lay in his power, that there might be great difficulty in obtaining really competent and well-trained electrical engineers at too low a rate of salary. Considering the importance of their work, most electrical engineers' incomes were not high enough. ''The matter is one of supply and demand; the supply hitherto has been ample, the demand meagre; now, demand is overtaking supply, and the necessary consequence to an increased demand is either a worse quality of product, or a higher price.''

The inaugural address to the Yorkshire Local Section, delivered yesterday, by Mr. W. B. Woodhouse, dealt with such matters as the more profitable utilisation of our coal supplies, the centralisation of electric supply—a matter upon which it will be remembered Mr. Vernier dwelt in his address to the Newcastle Section last week—and the repressive effect of local restrictions and State control. He took the line that he had advocated years ago, and one that many authorities are urging just now, the co-operation of the State, municipalities, and private enterprise in securing the full efficiency of electric supply in the United Kingdom, the lastnamed being allowed to continue to develop improved methods, the two former taking a financial interest if they desired to exercise control.

The London meetings of the I.E.E. will begin next Thursday, with an address by the president (second year), Mr. W. Duddell, F.R.S., on ''Pressure Rises.'' The session promises to be one of exceptional interest, especially in the new year, when between February 12 and April 23 there are to be as many as eight meetings devoted to a series of papers on the electrification of railways. Between now and then the arrangements announced are:—November 27, ''Characteristics of Insulation Resistance,'' by S. Evershed; December 4th, an address by Dr. G. Klingenberg on ''Electricity Supply in Large Cities'' (this address to be given at provincial sections also); December 18th, ''Employment of Power in H.M. Post Office,'' by Mr. H. C. Gunton; January 8th, ''Development of Electric Power for Industrial Purposes in India,'' by H. R. Speyer, and on January 22nd, the fifth Kelvin lecture by Sir Oliver Lodge.

The Edison and Swan United Electric Light Co. Ltd. has just issued a report showing a loss of £4752 for the year ended at June last. In addition to this, drastic measures have been taken, such as the closing of the Benwell factory, and the London printing works, and the depreciation that has had to be allowed for these matters, and the writing-off of obsolete plant and stocks and so on, has used up the reserve of £45,000 as well as £3014 of the amount brought forward from the previous year. It is understood that the whole of the lamp manufacture has now been concentrated at Ponder's End, and the stocks transferred there from South Benwell. The London premises that have been held for so long in Queen-street, E.C., are being given up, and others taken. All of these and other moves have been made to secure economies without loss of efficiency, and it is hoped that earnings this year will materially benefit in consequence. The sales department and advertising arrangements are also being re-organised under new management. So far as the loss on the year's working is concerned, it is stated that this is principally due to the fact that the manufacture and sale of metal lamps during the whole of last winter was to a great extent suspended in consequence of difficulties between the company and the owners of the patents for drawn-wire lamps. The dispute has been arranged, and the company is now manufacturing and selling all classes of metal lamps. One of the company's unfortunate experiences in this connection is described in the following words:—''Since the company commenced the manufacture of this type of lamps some few years ago, the cost at which they can be produced has been very materially reduced, and the board have, therefore, had made a careful valuation of the whole of the lamp stocks, and have written them down to approximately present manufacturing cost price.''

While writing these notes, I learn that the electrical industry has lost one of its leading veterans by the death of Sir William Preece, formerly engineer-in-chief for so many years to the General Post Office, and so prominently associated with so many branches of electrical endeavour. Sir William was in his eightieth year. He had been in failing health for a long time, and was in retirement at Penrhos, in Carnarvonshire.

## INDUSTRIAL.

The attention of those requiring electric lamps of high lighting power is directed to the A.E.G. half-watt lamp, which is furnished with a drawn tungsten wire of special form, which burns a globe charged with nitrogen. It is claimed that the new lamp has a useful life of 800 hours, and it is at present made for from 600 to 3000 candlepower, and pressures of 50 to 240 volts. The consumption is only half a watt per candlepower, and even this can be reduced by the use of a suitable external reflector. The Australian Metal Co. will advertise the new lamp in our next issue.

* * *

Electricity has again demonstrated its domestic utility in a novel and compact invention for the electrocution of that annoying and omnipresent pest, the house-fly. The article has been designated "Kingsway fly-killer." It is easily attachable to any existing electric-light socket, and should prove a boon to housewives, food purveyors and restaurant-keepers, as it kills flies, mosquitoes and all other insects outright, and is so constructed as to retain the dead insects, thus preventing them falling about. The British General Electric Co. Ltd., of 257 Clarence-street, Sydney, have stocks of this invention, and will be pleased to supply any further particulars. The contrivance is illustrated in our advertising pages.

## MISCELLANEOUS.

The Senate last Friday agreed, without a division, to the allocation of £175,000 in the new Loan Bill, for machinery at the shipyard at Cockatoo Island, Sydney.

* * *

Three claims, each for £2000, have been made against the Queensland Government by widows whose husbands were killed in the railway disaster at Murphy's Creek last January, and last week writs were issued in the Supreme Court, Brisbane, against the Commissioner of Railways, on behalf of Anna C. Freese, as administratrix of John F. Freese, deceased; Jane McCarthy, as administratrix of Patrick J. McCarthy, deceased, and Barbara Little, as executrix of the will of James Little, deceased.

* * *

Mr. Agar Wynne, the Postmaster-General, has been to Sydney, accompanied by Mr. Oxenham, the secretary of his Department, and amongst other matters to which attention was given was the deficit on the working of the telephone and telegraph services in New South Wales, as compared with Victoria and other States. Mr. Wynne thinks that the provision of more up-to-date appliances and better facilities in various directions will improve matters in this respect. He is, at all events, looking into the whole matter with the officials. Mr. Young, the Deputy Postmaster-General, mentioned that one reason for the higher cost of working the telephone system in Sydney is the configuration of the city, there being no fewer than 29 sub-exchanges in Sydney, as compared with 12 in Melbourne. Mr. Wynne is greatly in hope that the opening of two automatic telephone stations during this month at Newtown and Balmain, and another early next year at Glebe, will indicate a means by which the deficit may at least be reduced. He is satisfied that the automatic system as installed at Geelong (V.) has given considerably increased efficiency. The question of further decentralisation is also being considered.

* * *

The Victorian Railways Commissioners are inviting tenders for the erection of engineer workshops at Ballarat North.

* * *

The Provincial Electric Development Co. Ltd., Melbourne, has obtained an Order-in-Council to supply lighting and power to the township of Maryborough (V.). The following rates have been fixed per quarter:—For lighting, any amount up to 5 units, 7d. per unit, and for each successive unit 6d.; for power purposes, any amount up to 50 units, 4d. per unit, and for each successive unit 3d.

* * *

The secretary of the Hydro-Electric Power and Metallurgical Co. Ltd., Tasmania (Mr. John Ditchburn) reports, under date 28th November:—Good progress has been made in placing the steel pipes in position on the pipe line. The power house and transformer house have been completed by the contractor. The concrete foundations in the transformer house are ready for the machinery. On the transmission line, clearing has been finished from the power house to Bridgewater, close to Hobart.

* * *

The Melbourne Tramway and Omnibus Company's traffic returns for November show receipts £63,525, or a decrease of £2559 as compared with November, 1912. The month this year included five Sundays and five Saturdays, against four Sundays and five Saturdays last year. Total receipts for the five months since July 1st were £307,618, against £304,953 for the corresponding period of last year, or an increase of £2665. The average fare for the five months was 2.0012d., against 2.0047d. The total number of passengers for the five months was 36,891,573, against 36,507,319; and the tram mileage 5,078,411 miles, against 4,934,147 miles.

* * *

The Prahran-Malvern (V.) Tramways Trust's November returns of traffic show the revenue to have been £8271 10s. 7d., as compared with £3913 1s. 10d. for November, 1912; passengers 1,222,048, against 611,075; car miles run 140,821, against 62,917. The increases were £4358 8s. 9d. in fares, 610,973 in passengers, and 77,904 in car miles, but it has to be remembered that during the twelve months to which these figures refer several miles of new tramways have commenced running.

* * *

The Heidelberg (V.) Shire Council decided at last week's meeting to adopt a report, submitted by Mr. Murray, for an electric light scheme in Heidelberg shire. A sum of £10,000 is to be scheduled for the undertaking.

* * *

The receipts on the Hobart tramways for November amounted to £3172, as compared with £2803 for the same month last year, but this year there were two bank holidays in the month, instead of one, and on the new holiday the receipts amounted to £216 as against the daily average of £93, so that the increased revenue of that day was £123 Deducting this from the total increase for the month (£369), the normal increase would be £246.

* * *

In the S.A. Legislative Assembly last week the Chief Secretary stated that it was the intention of the Commissioner for Railways to run the Caldwell Valo railway motor car between Goolwa and Victor Harbour during the summer months if the car proved satisfactory on final test.

* * *

A profit of £45,015 was made by the Melbourne Electric Supply Co. Ltd. for the year ended on August 31st last. The directors have now declared a final dividend for the year at the rate of 6 per cent. on consolidated ordinary stock, making a total of 10 per cent. for the year; and a balance of £4515 is carried forward.

# Invited and Accepted Tenders

It is particularly requested that the information regarding contracts open, and the successful tenderers, be forwarded to The Editor not later than Monday of each week.

The following contractions are used throughout:—S—supply; D—delivery; M—manufacture; C—construction; E—erection; P—purchase; I—installation; R—removal. Where no contractions appear, supply and delivery is understood. The date at the beginning of each paragraph refers to the closing of tenders.

## INVITED.

### Commonwealth.

Specifications, tender-forms, etc., for tenders invited for the Postmaster-General's Department of the various States under this heading may be had as follows:—Victoria—Various State G.P.O.'s. New South Wales—Departmental Stores, Sydney, and various G.P.O.'s in other States. South Australia—Adelaide, Melbourne, Sydney and Brisbane G.P.O.'s. Western Australia—Departmental Stores, Perth, and various G.P.O.'s in other States. Queensland—Various State G.P.O.'s. All States—Various G.P.O.'s. If the specifications, etc., may be had elsewhere, in addition, the places will be given in parentheses.

POSTMASTER-GENERAL'S DEPARTMENT, Melbourne.—11th December (extended from 11th November).—D. and E. of eight automatic telephone switchboards at the Ascot, Canterbury, Malvern, Cheltenham, Footscray, Oakleigh, Sandringham, and Williamstown Telephone Exchanges, as per schedule No. 953.

16th December.—S. and D. of one common battery multiple switchboard at the Telephone Exchange, Wills-street, Melbourne, as per schedule No. 968.

30th December.—S. and D. of telephone material, as per schedule No. 976.

30th December.—S. and D. of 3 motor cycles, as per stores schedule No. 988.

27th January.—S. and D. of switchboards, telephone, etc., as per schedule No. 990.

3rd February.—S. and D. of 2050 Lineman's safety belts, as per schedule No. 994.

10th February.—S. and D. of 1100 lead earth plates, as per schedule No. 993.

17th February.—S. and D. of cable boxes, as per schedule No. 986.

7th April.—S. and D. of 60 non-polarized relays, as per schedule No. 996. (See advertising columns.)

POSTMASTER-GENERAL'S DEPARTMENT, Sydney.—17th December.—S. and D. of 11,875 steel galvanised spindles, as per stores schedule 351.

7th January.—Laying about 1909 lineal feet 4 way E.W. conduit.

7th January.—Laying about 1978 lineal feet E.W. conduit.

18th March, 1914.—S., D. and E. at the Telephone Exchanges, Epping, Ryde, Hunter's Hill, Drummoyne, Wahroonga, Paddington and Waverley, Sydney, of seven (7) automatic switchboards, with associated equipment, as per schedule No. 179.

POSTMASTER-GENERAL'S DEPARTMENT, Brisbane.—17th December.—S. and D. of insulators, as per stores schedule No. 280.

31st December.—S. and D. of insulators, as per stores schedule No. 282.

7th January, 1914.—S. and D. of switchboards, as per schedule No. 274.

7th January, 1914.—S. and D. of telephone instruments, as per stores schedules Nos. 275, 276 and 277.

7th January, 1914.—S. and D. of protectors, parts, etc., as per schedule No. 278.

7th January.—S. and D. of protectors and parts, as per stores schedule No. 284.

POSTMASTER-GENERAL'S DEPARTMENT, Perth.—7th January.—S. and D. of porcelain tube insulators.

21st January, 1914.—S. and D. of switches, telegraph line with plugs.

POSTMASTER-GENERAL'S DEPARTMENT, Adelaide.—17th December.—S. and D. of 5000 protectors, as per schedule No. 309.

11th February.—S. and D. of 50 cable terminals, 26 pair, as per schedule No. 308.

POSTMASTER-GENERAL'S DEPARTMENT, Hobart.—22nd December.—S. and D. of conduits, as per stores schedule 103.

2nd March.—S. and D. of telephones, as per stores schedule No. T104.

DEPARTMENT OF DEFENCE.—Melbourne.—S. of buttons, metal badges and numerals.

DEPARTMENT OF DEFENCE.—Sydney.—12th December.—S. and D. of hull of motor launch for Newcastle. Open to N.S.W. and Queensland tenderers only.

12th December.—S. of machinery and accessories for motor launch. Open all States.

DEPARTMENT OF DEFENCE—Small Arms Factory, Lithgow, N.S.W.—29th December.—P. of scrap steel, brass, jute bags, whale oil, etc.

12th January.—S. of iron and steel for manufacture of rifles.

DEPARTMENT OF EXTERNAL AFFAIRS.—15th December.—S. and D. of complete tin dressing plant, Northern Territory, viz., 10 head 1200 lb. stamp battery, concentrating tables, etc., with necessary power plant.

DEPARTMENT OF HOME AFFAIRS.—30th December.—S. and D. of 75 tarpaulins 26 x 15ft. 5in. (50 to be delivered at Port Augusta and 25 at Kalgoorlie) for Kalgoorlie-Port Augusta railway.

19th December.—S. and D. of 1 oil-driven road roller at Fremantle or Port Augusta. (See advertising columns.)

7th January.—Excavation and concrete lining of reservoir, capacity 3,000,000 gallons, Federal capital site. (See advertising columns.)

### States Invited.

### Victoria.

RAILWAY DEPARTMENT.—11th December.—S. and D. of navvy barrow wheels, jim crow, and spanner.

11th December.—S. and D. of cutters for joiner machine.

12th December.—S. and D. of galvanised iron rubbish bins.

12th December.—S. and D. of flat spring steel.

12th December.—S. and D. of carriage door locks.

12th December.—S. and D. of copper plates.

12th December.—S. and D. of Warner autometer speed recorder.

15th December.—M., S. and D. of engine buffers.

15th December.—M., S. and D. of hat nets and backs.

15th December.—M., S. and D. of iron safes.

15th December.—M., S. and D. of mild steel and wrought-iron forgings.

15th December.—M., S. and D. of truck buffers.

15th December.—M., S. and D. of steel bar forgings.

15th December.—Erection main workshops (steel and iron), Locomotive Depot, North Ballarat.

17th December.—S. and D. of 1000 cast steel blooms for axles and electric motor bogies.

17th December.—S. and D. of signal motor machines.

17th December.—M., S. and D. of steel spring washers.

17th December.—S. and D. of steel castings.

17th December.—S. and D. of kerosene oil for Lux lamps.

22nd December.—Erection main workshops (steel and iron), Locomotive Depot, Bendigo.

31st December.—S. and D. of planished mild steel sheets (lead coated or galvanised).

7th January.—S. and D. of 10,000 porous pots for batteries.

7th January.—S. and D. of best steel boiler plates.

7th January.—S. and D. copper rod.

7th January.—S. and D. copper plates.

7th January.—S. and D. of cast steel wheel centres.

7th January.—S. and D. of steel blooms for crank pins.

7th Jan.—S. and D. of locomotive brass boiler tubes.

7th January.—S. and D. of best Yorkshire iron angles.

7th January.—S. and D. of locomotive seamless copper tubes.

7th January.—S. and D. of steel channel bars.

14th January.—S. and D. of five feed lubricators.

14th January.—S. and D. of 100,000 lineal yards tarpaulin canvas.

14th January.—S. and D. of high speed twist drills.

14th January.—S. and D. of one concrete mixer.

21st January.—S. and D. of one high axle speed lathe.

21st January.—S. of hydraulic jacks.

28th January.—S. and D. of 200 forged and rolled steel disc wheels.

28th January.—M., S., D. and E. of one three-phase alternator, complete, at Newport.

4th February.—S. and D. of 1500 felt body blocks.

4th February.—S. and D. of 25 five-feed lubricators.

11th February.—S. and D. 10 tons commercial sodium acetate.

18th February.—S. and D. of pig iron.

25th February.—S. and D. 20 tons galvanised telegraph wire No. 10½.

4th March.—S. and D. of gunmetal switch locks and keys.

4th March.—S. and D. of Yorkshire iron forged billets.

11th March.—S. and D. of transformers and fuses.

VICTORIAN RAILWAY COMMISSIONERS, STATE COAL MINE.—15th December.—S. and D. of cast steel rollers, chain block, rubber glass, cloth pinion.

17th December.—S. and D. of one motor-driven ventilating fan.

7th January.—S. and D. of one motor-driven air compressor. (See advertising columns.)

PUBLIC WORKS DEPARTMENT.—18th December.—Refrigerating machinery. (See advertising columns.)

P. & O. COMPANY'S ROYAL MAIL STEAMERS
FOR MARSEILLES, PLYMOUTH AND LONDON.

Leave Sydney on the subjoined dates, calling at usual ports.

FIRST AND SECOND SALOON ONLY.

| Steamer, | Tons. | Commander. | Noon. | Melb., 3 p.m. |
|---|---|---|---|---|
| MACEDONIA | 10,500 | Bennett | Dec. 13 | Dec. 16 |
| MALWA | 11,000 | Thompson | Dec. 27 | Dec. 30 |
| MOOLTAN | 10,000 | Haddock | Jan. 11 | Jan. 13 |

PASSAGE MONEY TO LONDON—
Single, £41 16s. to £82 10s.
Return, £69 6s. and £123 4s.

Return Tickets between Inter-State Ports are available for return by Orient, Messageries Maritimes, and N.D.L. steamers having room.

SPECIAL HOLIDAY RETURN TICKETS to COLOMBO are now issued, available for two months. Fares from Sydney, £45 2s. first saloon, and £31 18s. second saloon.

A. GORDON WESCHE, Superintendent IN AUSTRALIA, 63 Pitt-street, Sydney.

The COLONIAL MUTUAL FIRE Insurance Company Limited.

Principal Office: 60 MARKET-ST., MELBOURNE.

Branches in all the States.
Transacts Fire, Guarantee, Employers' Liability, Marine, Burglary, and Plate Glass, Accident, Workers' Compensation and Live Stock Insurances.
Send for Prospectus.
W. TUCKER, General Manager.

Harringtons LTD.

ANALYTICAL & METALLURGICAL DEPT.

Highest prices given for all gold, silver or platinum residues, etc.
Lowest fees for all kinds of Assay, Analytical, and Metallurgical work.
Expert Advice on Ore Treatment, Bullion Refining, Smelting, etc., etc., Directed by a qualified Analyst from Messrs. Johnson and Sons, London: Assayers and Refiners to Bank of England, H.M. Mint, The Council of India, etc.

HARRINGTONS LTD.
386 George Street, Sydney.

SPECIAL NOTICE!

The Mount Morgan Gold Mining Co. Ltd.

ARE PREPARED TO PURCHASE Ores, Concentrates and Furnace Products, containing Gold and Copper, at most favourable rates.

ALSO TO INSPECT MINING PROPERTIES with a view to Developing, Financing, or Purchasing same.

Address:—MR. B. MAGNUS, GENERAL MANAGER, MOUNT MORGAN, QUEENSLAND.

A.U.S.N. Co. Ltd.

*Fast, Regular, and Comfortable Passenger Steamers*

(also carrying cargo) from and to

MELBOURNE, SYDNEY, ADELAIDE, FREMANTLE, BRISBANE, and all QUEENSLAND PORTS.

Passage Tickets interchangeable, with other Inter State Companies, on certain conditions.

Full Particulars at

COMPANY'S OFFICES

at all principal Australian Ports.

---

The Mount Lyell Mining & Railway

CO. LIMITED.

Purchasers of Ores containing Copper, Gold and Silver. Rates obtainable on application to the Secretary.

Manufacturers of Coke for Smelting and Foundry Purposes, Acids, Etc.

HEAD OFFICE—

39 QUEEN-STREET, MELBOURNE.

D. G. LUMSDEN,
Secretary.

---

THE

-PACIFIC CABLE BOARD-

Best route to Great Britain, Canada, New Zealand, Germany, etc.

New Direct Cable to Auckland from Board's Sydney Office opened December, 1912.

A Week End rate is now available between Great Britain and Australasia.—Rate 9d. per word, with minimum of 18/- (24 words). Week End Cable Letters are accepted up to midnight on Saturday for delivery in Great Britain on the following Tuesday morning.

TARIFF PER WORD "VIA PACIFIC."

| | Ordinary. | Daily Deferred. |
|---|---|---|
| GREAT BRITAIN .. .. .. .. | 3/- | 1/6 |
| GERMANY .. .. .. .. .. .. .. | 3/- | 1/6 |
| NEW ZEALAND .. .. .. .. .. | 4½d. | — |
| CANADA .. .. .. .. .. .. .. | 2/4 | 1/2 |
| U.S.A. .. .. .. .. .. .. .. .. .. | 2/4 to 2/8 | 1/2 to 1/4 |
| ARGENTINE, BRAZIL, CHILI and PERU .. .. .. .. | 5/8½ | 2/10¼ |

West Indies, Central America, and other rates, on application.

Cable forms, Deferred and Week End Regulations, may be obtained at—

THE PACIFIC CABLE BOARD,

77 Pitt Street, Sydney. Tel., City 1346 (3 Lines).
408 Collins Street, Melbourne. Tel., 2588.

J. Milward, Manager in the Pacific, 77 Pitt Street, Sydney.

## New South Wales.

PUBLIC WORKS DEPARTMENT.—15th December.—S. and E. of friction hoists in the pork houses, New Public Abattoirs, Homebush.

15th December.—Installing rails and switches in beef houses, etc., New Public Abattoirs, Homebush.

15th December.—S. and D. of tested cement during 1914.

22nd December.—M., S. and D. of twenty 20-ton cart weighbridges, ten 20-cwt., and forty 10-cwt. weighing machines for railway station yards.

22nd December.—C. of electric truck and goods lifts, New Public Abattoirs, Homebush.

M., S. and D. of 14,000 tons steel rails and 800 tons fishplates for 60 lb. rails.

METROPOLITAN BOARD OF WATER SUPPLY AND SEWERAGE.—22nd December.—C. and E. of a mild steel reservoir at Momm's Hill.

15th December.—M. and D. of one turbine centrifugal pumping plant for Crown-street Pumping Station.

SYDNEY HARBOUR TRUST.—15th December.—S. and E. of four 3-ton electrically operated freight lifts for berths 6, 7, 8, and 9, Woolloomooloo Bay.

15th December.—P. and removal of two Cornish boilers, 14ft. x 5ft., 55 lbs. pressure; 2 horizontal engines, 14in. x 18in., and 2 hydraulic pumps.

22nd December.—S. and D. of 4 sets of electrically operated freight conveyors for berths 6, 7, 8, and 9, Woolloomooloo Bay.

2nd March.—S. and E. of 3 electrically operated semi-portal travelling cranes for berths 1, 2, and 3, Woolloomooloo Bay.

RAILWAY DEPARTMENT.—17th December.—S. of 28 single-phase 50-cycle transformers. (See advertising columns.)

14th January.—S. of two electrically driven turbine pumps, 50 gallons per minute. (See advertising columns.)

25th March.—S. of five 1000kw. substation units. (See advertising columns.)

WATER CONSERVATION AND IRRIGATION COMMISSION, 29 Elizabeth-street, Sydney.—29th December.—M., S. and D. of 250 Dethridge meter wheels.

## Queensland.

TREASURY DEPARTMENT.—6th January.—S. and D. of 23 miles steel rails, 28 lb. per lineal yard, with all fastenings, to be delivered at Cairns wharf in July, 1914.

WATER SUPPLY DEPARTMENT.—Tambo Water Works.—15th December.—C. and E. of steel tower surmounted by steel tank.

5th January.—S. and D. of 85 tons cast-iron water pipes, special castings and valves.

HARBOURS AND RIVERS DEPARTMENT.—15th December.—S. of stores at various ports, for 2 years.

## South Australia.

SUPPLY AND TENDER BOARD.—16th December.—S. and D. of fire tanks and buckets.

16th December.—S. and D. of mild steel bars.

16th December.—S. and D. of drawhooks, drawhook pins and drawhook bridles.

6th January.—S. and D. of chain iron, 1500 bars, various sizes.

6th January.—S. and D. of 2000 tons steel rails, 41 lb., and 33 tons steel fishplates for same.

13th January.—S. and D. of five 30-ton weighbridges for 3ft. 6in. gauge railway.

13th January.—C. of 12 bogie goods break vans, with passenger compartments, 3ft. 6in. gauge.

3rd February.—S. and D. of 10,000ft. swelled-joint bore casing.

10th February.—S. and D. of one testing machine.

PUBLIC WORKS DEPARTMENT.—16th December.—S. and E. at Renmark of complete pumping plant.

## Western Australia.

GOVERNMENT TENDER BOARD.—18th December.—S. and D. of copper plates, pipes, bars, and sheets, for Railway Department.

18th December.—Mill rolled plate glass for Railway Department.

18th December.—S. and D. of telephone material for P.W. Department.

18th December.—S. and D. of printing machinery, etc., for Lithographic Department.

8th January.—S. and D. 16 steel blooms for Railway Department.

8th January.—S. and D. of 4 tons copper line wire for Railway Department.

8th January.—P. of scrap, consisting of brass tube ends, borings and turnings, mixed white metal and brass borings and turnings, and copper plates, Midland Junction.

8th January.—S. and D. of 80 lb. steel rails and dog spikes.

## New Zealand.

TENDER BOARD.—Wellington.—12th January.—2 miles cable, D.C.L.C., air-space, 624 pairs; 3 miles cable, D.C.L.C., air-space, 520 pairs; 3 miles cable, D.C.L.C., air-space, 416 pairs; 6 miles cable, D.C.L.C., air-space, 312 pairs; 4 miles cable, D.C.L.C., air-space, 208 pairs; 18 miles cable, D.C.L.C., air-space, 104 pairs; 11½ miles cable, D.C.L.C., air-space, 78 pairs; 8 miles cable, D.C.L.C., air-space, 52 pairs.

## General.

PRAHRAN AND MALVERN TRAMWAYS TRUST.—13th January.—M., S. and D. of steel poles, contract No. 41.

GEELONG WATER WORKS AND SEWERAGE TRUST.—19th December.—S. of 60,000 lineal feet circular reinforced concrete pipes.

19th December.—S. of 150 cast iron manhole covers.

BALLARAT WATER COMMISSIONERS (V.) (Alex. Fraser, Secretary).—11th December.—C. of reservoir embankment, on the Moorabool River.

BRISBANE METROPOLITAN WATER AND SEWERAGE BOARD.—13th January.—S. and D. of material for aerial ropeway.

10th February.—S. and D. of steam crane excavator.

CITY OF TOOWOOMBA (Q.) (Frank H. Merritt, Town Clerk).—9th February.—1000 water meters. (See advertising columns.)

CHRISTCHURCH CITY COUNCIL (H. R. Smith, town clerk).—5th January, 1914.—S. and D. of series street lighting plant and accessories. Specifications may be seen Town Clerk's office, Melbourne.

MT. MORGAN G.M. CO. LTD. (Q.).—14th December.—S. and D. of 7000 to 9000 lb. per month Rangoon wax or composite candles.

HOBART CORPORATION (T.) (W. A. Brain, Town Clerk).—15th December.—S. and D. of 62 tons of straight C.I. pipes and sundry special castings. (See advertising columns.)

22nd January.—CONRAD MINES LTD., Howell (N.S.W.), (C. F. W. Lloyd, Official Liquidator, 182 Phillip-street, Sydney).—P. of mining leases, machinery, etc. (See advertising columns 4th December.)

MUNICIPAL COUNCIL OF SYDNEY.—22nd December (extended from 8th December).—S. and D. of electrical castings (Part I.—cast-iron; Part II.—copper, brass). (See advertising columns.)

2nd February.—S. and D. of transformers and weatherproof switch fuses. (See advertising columns.)

CITY OF MELBOURNE.—12th December.—S. and D. of Portland cement.

16th December.—S. and D. of air compressor plant.

21st January.—S. and D. of bare hard-drawn copper cables.

24th January.—S. and D. of house cut-out boxes.

SHIRE OF MILDURA (G. B. Lincolne and J. K. McDougall, consulting engineers, Melbourne).—15th December.—P. of lead plates, scrap aluminium, copper and brass.

15th December.—S. and D. of one second-hand screw cutting lathe, about 6in. centres.

15th December.—S. and D. of ampere hour meters.

SHIRE OF STAWELL (A. B. Clemes, secretary).—11th December.—S. and D. of one 15-ton Fairbanks weighbridge, to be erected Glenorchy station.

BROKEN HILL PROPY. CO. LTD.—10th January.—S. and D. of annual stores and mining requisites.

CATHCART VICTORY G.M., N.L. (P. P. Cook, Collins-street, Melbourne).—S. and D. of pumping engine, 20in. cylinder, drawing 14in.; 250ft. columns, with 14in. or 16in. workings, complete, new or secondhand.

THE METROPOLITAN WATER AND SEWERAGE BOARD, Brisbane (Q.).—23rd December.—10,000 tons of best steam coal.

ST. ARNAUD NORTH GOLD MINE (P. P. Cook, Collins-street, Melbourne).—18th December.—S. and D. of new or secondhand 38h.p. suction gas engine (48 h.p. producer), two Wilfley tables, 10-head battery (1000 lb. stamps). (See advertising columns.)

GT. CARPENTARIA COPPER MINING CO. (N.T.) (30 Queen-street, Melbourne).—S. of pumping plant.

WANTED TO BUY.—Engine and boiler, about 45 h.p., sand pump (6 to 8in.), rock drill and compressor, light rails and side tipping trucks.—French and Moran, Footscray.

## ACCEPTED.

### Commonwealth.

POSTMASTER-GENERAL'S DEPARTMENT, Melbourne.—75 boxes, cable distributing, 26-pairs,

Dunlop Mining Goods

Are now used with satisfaction in most of the Leading Mines of Australasia – Their QUALITY & WEAR are UNSURPASSED

Tenders & Samples submitted
Correspondence invited
Send for Illustrated Catalogue

The DUNLOP RUBBER Co. of AUST. Ltd.
108 Flinders St. MELBOURNE

Dunlop Rubber Belting

Is more efficient than Leather belting for Outdoor & Wet Work.

Sample & Price on application

TRADE MARK

Note this on every belt.

Be sure you get

"DICK'S"

We know there are numerous imitations. Dick's maintains its high reputation for strength and efficiency. Every belt guaranteed. Sole agents:

JAMES HARDIE & CO.

Melbourne and Sydney.

24s. each; 25 boxes, cable distributing, 52-pairs, 40s. each—W. T. Henley's Telegraph Works Company Limited.

300 signs, enamel, Post Office, 1s. 9d. each; 200 signs, enamel, Post and Telegraph Office, 3s. 4d. each; 100 signs, enamel, Post, Telegraph, and Money Order Office, 5s. each; 300 signs, enamel, Public Telephone, 1s. 1d. each—James Robertson.

1000 letter box fronts, with locks and keys, 5s. 2¼d. each—Briscoe and Co. Ltd.

1000 protectors, £3 3s. per strip—J. Bartram and Sons Pty. Ltd.

156,000 insulators, porcelain (N.S.W., 1913-14), $5\frac{13}{16}$d. each; 78,000 porcelain insulators (Queensland, 1913-14), $5\frac{23}{32}$d. each; 162,000 porcelain insulators (N.S.W., 1914-15), $5\frac{13}{16}$d. each; 78,000 porcelain insulators (Queensland, 1914-15), $5\frac{21}{32}$d. each; 27,000 porcelain insulators (S.A., 1914-15), $5\frac{21}{32}$d. each; 1200 porcelain insulators (Tasmania, 1914-15), $5\frac{15}{16}$d. each—Dalgety and Co. Ltd.

POSTMASTER GENERAL'S DEPARTMENT, New South Wales.—150 cable boxes, 26-pair, £1 3s. 11d. each; 25 cable boxes, 39 pair, £1 5s. 10d. each; 120 cable boxes 52-pair, £1 7s. 9d. each; 25 cable boxes, 78-pair, £1 15s. each; 60 cable boxes, 104-pair, £2 4s. each—Charles Glasson.

About 150 ladders, wooden, 22ft., £1 13s. 6d. each; about 32 ladders, wooden, 26ft., £2 each; about 44 ladders, wooden, 29ft. 6in., £2 6s. each; about 104 ladders, wooden, extension, 22ft., £1 7s. 6d. each; about 13 ladders, wooden, extension, 26ft., £1 12s. 6d. each—The Mote Patent Extension Ladder Co.

POSTMASTER GENERAL'S DEPARTMENT, West Australia.—30 telephones, common battery, with generator, £2 16s. 5d. each; 150 translators, single, 8s. 11d. each; 25 telephones, common battery, adjustable, bracket sets, wall pattern, £2 5s. each; 25 telephones, common battery, adjustable bracket sets, £2 12s. each—Western Electric Co. (Australia) Ltd.

20 switchboards, magneto, cordless, 10-line, fully equipped, £8 10s. each—J. Bartram and Son Pty. Ltd.

1 motor car, "Overland," £400 each—The Wittman Motor Supply Co. Ltd.

3000 gallons white ant exterminator, 6s. 8d. per drum of 5 gals.—Taylor Bros.

7000 plugs, screw, for use with white ant exterminator, tube to be galvanised, £1 9s. 2d.—A. M. Bryan.

1 mile cable, switchboard, silk and cotton insulated, light lead covered, 52 pairs of conductors, round in section, and not exceeding ¾in. diameter, £193 15s. 6d. per mile; 1 mile cable, switchboard, silk and cotton insulated, light lead covered, 26 pairs of conductors, round in section, and not exceeding ⅝in. diameter, £109 5s. 6d. per mile; 1 mile cable, switchboard, silk and cotton insulated, light lead covered, 13 pairs of conductors, round in section, and not exceding 7/16in. diameter, £63 3s. 6d. per mile; 1 mile cable, switchboard, silk and cotton insulated, light lead covered, 7 pairs of conductors, round in section, and not exceeding ⅜in. diameter, £40 15s. per mile—Malloch Bros.

POSTMASTER GENERAL'S DEPARTMENT, New South Wales.—One Wheatstone transmitter and two Wheatstone receivers, £103 10s.—India Rubber, Gutta Percha, and Telegraph Works Co. Ltd.

12,500 insulators, £273 8s. 9d.—Western Electric Co. (Aust.) Ltd.

DEPARTMENT OF EXTERNAL AFFAIRS.—Fencing material for Northern Territory, £342—Chas. Marshall.

DEPARTMENT OF DEFENCE, Melbourne.—Two H.P. and A.C. motors and starters, with slide rails, 1450 revs. per minute, £52 10s. each; shafting, wall brackets, etc., £16 18s. 1d.; plate forgings, 5s. 6d.—G. Weymouth Pty. Ltd.

## States Accepted.

### New South Wales.

PUBLIC WORKS DEPARTMENT.—S., D. and E. of structural steel and ironwork required in the remodelling of the Registrar General's old building, Sydney, £240—Structural Engineering Co., Erskineville.

C. and I. of an electric passenger lift, with automatic control, at On Choug's premises, George-street, North Sydney, £647—Standard Waygood Hercules Ltd., Sydney.

### Victoria.

VICTORIAN RAILWAYS.—S. and D. of copper rod for 15 "A2" engines—Item No. 1, copper rod, ½in. round, at £86 7s. per ton; item No. 2, copper rod, 1 1/16in. round, at £86 7s. per ton; item No. 3, copper rod, 1¼in. round, at £86 7s. per ton—W. Adams and Co. Ltd.

S. and D. of mild steel flat bars for "A2" engines and new trucks—E. Duckett and Sons.

Erection of station buildings at Ultima, £1224 17s. 8d.—S. M. [illegible].

M. (in the State of Victoria), S. and D. of locomotive parts for 20 "DD" engines—The Atlas Co. of Engineers Pty. Ltd.

M. (in the State of Victoria), S. and D. of locomotive parts for 20 "DD" engines—item No. 1, bogie centre, C.I., at £30 per set; item No. 9, boiler and mountings (complete), at £1118 10s. per set—Thompson and Co. (Castlemaine) Pty. Ltd.

S. of steel sheet piles required for bridge over Nicholson River, £987 9s. 6d.—Mailler and Querean.

### Western Australia.

TENDER BOARD.—S. of steel piping—Item 1, 1s. 0⅝d. per foot; item 2, 10⅜d. per foot; item 3, 7⅜d. per foot.

### General.

MELBOURNE AND METROPOLITAN BOARD OF WORKS.—S. of 250 tons engine coal, 20s. 6d.—McIlwraith, McEacharn and Co. Pty. Ltd.

250 tons engine coal, 20s. 6d.—Huddart Parker Ltd.

250 tons of engine coal, 20s. 6d.—Melbourne Steamship Co. Ltd.

250 tons engine coal, 20s. 6d. per ton—Adelaide Steamship Co. Ltd.

S. of one 2-ton Thornycroft motor wagon, £630—Tarrant Motors Pty. Ltd.

MUNICIPAL COUNCIL OF SYDNEY.—Radial drilling machine, £77 15s.—R. L. Scrutton and Co. Ltd., Sydney.

High pressure feed piping, £223—Morts Dock and Engineering Co. Ltd., Sydney.

Curve drawing ammeters and accessories, £58—Australian General Electric Co., £84.

Firebricks, estimated cost £275—Illawarra Fireclay and Brick Co.

Spare parts for Beck arc lamps, £74—Dick, Kerr and Co. Ltd.

Twenty-four pole expulsion fuse holders, with disconnecting switches, £19 10s. each—Australian General Electric Co.

## ROYAL MINT RETURNS.

### Sydney Branch.

| Particulars. | November. | Since the 1st Jan. |
|---|---|---|
| Gold received for coinage— | | |
| | Fine oz. | Fine oz. |
| New South Wales | 6,732.98 | 92,691 |
| Queensland | 24,562.66 | 216,572.08 |
| New Zealand | — | 165,590.88 |
| Victoria | — | 166.12 |
| Northern Territory | 3.32 | 396.59 |
| Tasmania | — | 178.97 |
| Western Australia | — | 267.95 |
| Papua | 796.48 | 13,429.33 |
| Other countries | — | 181.01 |
| Coin | 39.66 | 391.18 |
| Total | 32,135.10 | 489,865.11 |
| Gross value of the above | £136,501 | £2,080.813 |

### Melbourne Branch.

| Particulars. | November. Fine oz. | Since Jan. 1. Fine oz. |
|---|---|---|
| Gold received for coinage | | |
| Victoria | 32,874.43 | 416,986.09 |
| New South Wales | 1,896.30 | 6,319.03 |
| New Zealand | 2,583.88 | 58,273.15 |
| Queensland | 268.07 | 2,404.39 |
| South Australia* | 216.64 | 7,228.92 |
| Tasmania | 1,658.82 | 20,008.61 |
| Western Australia | 289.97 | 5,881.25 |
| Other countries | — | 7.34 |
| Light gold coin | — | 1,141.55 |
| Unknown | 336.43 | 3,140.26 |
| Total | 40,124.54 | 521,390.59 |
| Gross value of the above | £170,438 | £2,214,725 |

* Including Northern Territory.

### Perth Branch.

| Particulars. | November. Ozs. | Since Jan. 1. Ozs. |
|---|---|---|
| Gold received for coinage— | | |
| Western Australia | 132,565.80 | 1,355,958.97 |
| Other Australian States | — | 14.73 |
| Unknown origin | 2.88 | 587.74 |
| Total weight | 132,568.68 | 1,356,561.44 |
| Value of gold (calculated at an average of £3 9s. 5d. per gross oz.) | £460,124 | £4,753,216 |

The quantity of Victorian gold actually received at the Melbourne branch of the Royal Mint during November was 34,858.36 oz. gross, or 32,874.43 oz. fine, as compared with 37,162.03 oz. fine for November, 1912.

## DIVIDENDS.

The following dividends and bonuses of mining companies in Australia have been declared, and are payable on the dates noted.

December.

12th.—Black Range G.M. Co. (W.A.), 1s., £3625.

15th.—Oswald's Gold Mines, Maldon (V.), 1s., and bonus 1s., £2500.

15th.—Mt. Lyell M. and R. Co. (T.), 1s. 3d., £80,424.

16th.—Cathcart G.M. Co., Ararat (V.), 1/-, £4000.

17th.—Broken Hill Propty. Block 10 (N.S.W.), 1s. and bonus 3s., £20,000.

18th.—Ajax Central Co., Daylesford (V.), 2s., £3000.

18th.—Mararoa G.M. Co., Norseman (W.A.), 1/-, £5000.

18th.—Wandiligong G.D. Co., Bright (V.), 1/-, £300.

19th.—Campbell's Creek G.D. Co., Campbell's Creek (V.), 6d., £800.

19th.—North Broken Hill S.M. Co. (N.S.W.), 2s., £60,000.

19th.—Tongkah Compound, Siam, 1s. and bonus 1s., £5000.

19th.—Great Boulder Proprietary, Kalgoorlie (W.A.), 9d., £5625.

19th.—Broken Hill South S.M. Co., Broken Hill (N.S.W.), 8s., £80,000.

20th.—Sons of Gwalia Ltd., Mt. Leonora (W.A.), 1s., less income tax, £17,500.

22nd.—Hampden Cloncurry Copper Mines (Q.), 2s., £35,000.

22nd.—Mt. Elliott Ltd. (Q.), 5s., less English income tax, £37,500.

22nd.—Pioneer Tin Co., Bradshaw's Creek (T.), 1/6, £12,093.

23rd.—Sulphide Corporation, Broken Hill (N.S.W.), preference 2/- and ordinary 1/6, less English income tax, £96,250 (£90,635 net).

29th.—Mt. Bischoff T.M. Co. (T.), 10s., £6000.

29th.—Zinc Corporation, Broken Hill (N.S.W.), 1s. 6d., less English income tax, all shares, £67,400.

30th.—Yuanmi G.M. Co., Mt. Magnet (W.A.), 1s., £17,500.

January, 1914.

6th.—Broken Hill Water Supply (N.S.W.), 1s. 6d. and bonus 6d., £20,000.

6th.—Kalgurli G.M. Ltd., Kalgoorlie (W.A.), 4s., less English income tax, £24,000.

14th.—Lake View and Oroya G.M. Co., Kalgoorlie (W.A.), 6d., less English income tax, £22,500 (£21,187 10s. net).

15th.—North Mt. Farrell S.L.M. Co. (T.), 6d., £2000.

## BANK CLEARINGS.

The report of the Melbourne Clearing House for the week ended 24th November was:—

| | | |
|---|---|---|
| Total clearance | | £5,912,101 |
| Balances— | | |
| Settled by certificates | 346,000 | |
| Settled in coin | 267,653 | |
| | | 613,653 |
| Total clearance for the corresponding week 1912 | | £6,021,163 |

The report of the Melbourne Clearing House for the week ended December 1 was:—

| | | |
|---|---|---|
| Total clearance | | £7,078,692 |
| Balances— | | |
| Settled by certificates | £460,000 | |
| Settled in coin | 227,481 | |
| | | 687,481 |
| Total clearance for the corresponding week, 1912 | | 6,665,040 |

The report of the Melbourne Clearing House for the week ended December 8 was:—

| | | |
|---|---|---|
| Total Clearance | | £6,325,337 |
| Balances— | | |
| Settled by certificates | £605,500 | |
| Settled in coin | 114,669 | |
| | | 720,169 |
| Total clearance for the corresponding week, 1912 | | 6,621,437 |

The syndicate operating at Wood's Point (V.) under the name of the Little Comet Syndicate has been at work for 18 months and has received assistance from the Government to the extent of £150. A good deal of development work has been done with good results, enabling the men to refund the Government loan and to continue working in comfort. A little while ago a crushing of 9 tons of rich stone gave the owners a return of 119 oz. of gold, but a continuance of such stone was not expected. The latest crushing gave 53¼ oz. of retorted gold from 36 tons.

## FROM FOREIGN SOURCES.

(Translated Specially for the "Mining Standard.")

During the Anthropological Congress, recently held at Nuremberg, something like a sensation was created by a technical invention submitted to the members present at the meeting, and which is due to Herr Christoph Wirth, a teacher, and the inventor of the boat steered by wireless telegraphy. Herr Wirth has discovered a method which permits of trains being stopped, and the brakes applied from a distance. The officer in charge of a station, as well as every fettler or other employee who notices on the line any irregularity, such as the faulty position of points, breaking of rails, damage to the permanent way, etc., will now be in a position to stop a train in motion without regard to the distance. The air brakes will be applied by means of electric waves, and this is done whether the engine-driver is at his post or whether he has already left the engine. The apparatus designed by Herr Wirth is built into the train, for instance, into the luggage van. It consists of the receiver, the transmitting device for distant braking and a special apparatus for the brakes and signals, and it can be applied from any station or gatekeeper's cabin. By simply turning there a crank, an accumulator battery belonging to the special apparatus is switched on in the train. This battery acts upon small electromotors, which in turn operate the brakes. Wireless communication between the train in motion and a station or gatekeeper's cabin is effected somewhat similarly to wireless telegraphy, only no special antennae are required, as the telephone or telegraph wires along the line act as such without interfering with the ordinary telephone or telegraph business. In perfecting his invention, Herr Wirth's principal task was to render impossible all danger from atmosphere disturbances, such as electric discharges. That he succeeded in doing this, he considers his most important achievement. In connection with a large railway system, the introduction of the invention will necessarily cost a good deal. It is explained, however, that the wave transmitters to be fitted up in stations are not expensive, and that the equipment of every train will not be of much consequence when compared with the total cost of a train in motion. If the expense is taken into consideration, which has to be borne by railway administrations in consequence of accidents, the adoption of the invention would still mean a great saving to them, not to speak of the preservation of human life and health which would result from the prevention of accidents. Herr Wirth claims that it will be possible to stop trains in danger within 20 or 60 yards. In the case of goods trains having no automatic brakes, bell or light signals may be transmitted to the engine-driver as a warning. So far, the apparatus has only been tried on the section from Nuremberg to Graefenberg, but these experiments have proved such an undoubted success that it is announced that the administration of the Bavarian Government railways is already contemplating its gradual general introduction.

A new electric horn for motor cars and motor boats, called the Escha-Roland horn, has been designed by Messrs. Siemens and Halske Ltd. In this horn a diaphragm fitted before the poles of an electro-magnet positively controls an interrupter by which the current circuit of the electro-magnet is opened and closed, so that the diaphragm makes rapid vibrations. Both diaphragm and interrupter must necessarily vibrate synchronously, and consequently produce a pure, musical tone of a fixed number of vibrations. The tone produced is increased by cornets, which are in accord with the natural tone of the diaphragm, that is, in acoustic resonance with the same. An adjustment of the interrupter will only become necessary after long use, because the wear on the platinum-iridium contacts is but insignificant and due to purely mechanical causes, sparking being suppressed by a small condenser fitted in the box. The adjustment can easily be made by any inexperienced person, without removing the apparatus from its place. Both interrupter and connection terminals are easily accessible.

---

Of the total West Australian gold received at the Perth branch of the Royal Mint during November (132,565 gross oz.), Kalgoorlie accounts for considerably more than half, the amount from that district being 68,515 gross oz. The four districts comprised in the Murchison field, viz., Cue, Day Dawn, Mt. Magnet and Meekatharra, together supplied 13,756 oz.; the Mt. Margaret field produced 10,635 oz., of which 7256 was from the Mt. Malcolm district. The only other field which approached ten thousand ounces was Yilgarn, with 9453 oz.

The export of coal from Newcastle (N.S.W.) for November amounted to 443,820 tons, as against 457,455 tons for the same month of 1912. The interstate and New Zealand markets continue brisk, and during the month Victoria took 88,100 tons and South Australia 67,625 tons. The foreign trade was also very active, Chili, Java, and the Straits Settlements taking between them 150,000 tons. The total quantity sent abroad was 199,057 tons, and to Interstate and New Zealand ports 244,763 tons. If no trouble further occurs as the outcome of the New Zealand strike, the year will end well, and the total quantity exported during the twelve months will exceed that sent away last year.

The gold purchased during November by the banks at Bendigo and Eaglehawk (V.) amounted to 14,946 oz. 7 dwt 4 gr., as compared with 13,179 oz. in October, and with 15,146 oz. in November, 1912. The total purchases since the beginning of the year amount to 151,671 oz. as compared with 159,035 oz. for the first 11 months of last year.

The manager of the Occidental Consolidated mine, Thames, reported recently that he had crushed 90 lb. of picked stone for 123 oz. of smelted gold, which was found to be worth 50s. an ounce, making a total of £309, equal to about 72¾ fine oz.

---

**Commonwealth of Australia.**

### COMMONWEALTH PUBLIC SERVICE.

### VACANCY FOR WORKS SUPERINTENDENT.

Class D, Professional Division. Minimum Salary, £336; Maximum Salary, £408 per annum. Lighthouse Branch, Department of Trade and Customs.

Applications are invited for the above position. Applicants must be tradesmen, have had experience in handling men, have a sound knowledge of constructional steel work, erection in timber and steel work, of brickwork, masonry, ferro-concrete, and the making of base concrete, be accustomed to rigging, reading of drawings, and the setting out of work, and be able to supervise painting. A knowledge of lighthouse apparatus and mechanical work is also desirable.

The appointee will be required to superintend construction and maintenance work in any part of Australia.

Applications should reach the Commonwealth Public Service Inspector, Gloucester House, Market-street, Melbourne, not later than December 27, 1913.

D. C. McLACHLAN,
Commissioner.
W. J. CLEMENS,
Secretary.

---

Department of Home Affairs,
Melbourne, Dec. 2, 1913.

### KALGOORLIE TO PORT AUGUSTA RAILWAY

### OIL DRIVEN ROAD ROLLERS.

Separate quotations, addressed to the Engineer-in-Chief for Commonwealth Railways, 84-88 William-street, Melbourne, will be received up to 11 a.m. on Friday, December 19, 1913, for the Supply and Delivery of—

1 Oil Driven Road Roller, 2½ to 4 tons, in ship's slings, Fremantle; and another in ship's slings, Port Augusta.

Persons quoting will be required to supply drawing and specification of the roller.

Quotations are to be endorsed "Quotation for Oil Driven Road Roller."

JOSEPH COOK,
Minister of State for Home Affairs.

---

Department of Home Affairs,
Melbourne, December 1, 1913.

### FEDERAL TERRITORY RESERVOIR.

TENDERS will be received until 11 a.m. on Wednesday, January 7, 1914, for the Excavation and Concrete Lining necessary for the Construction of a Pipe Head Reservoir, having a capacity of about three million (3,000,000) gallons, in the Federal Capital Site Territory, at a site near Mount Stromlo.

Specification and plans may be seen at the following offices:—

(a) Administrative Offices, Canberra.

(b) Works Director for New South Wales, 4th floor, Custom House, Sydney, N.S.W.

(c) Works Director, Victoria, 151 Collins-street, Melbourne, Victoria.

Tenders are to be addressed to "The Secretary, Department of Home Affairs, Melbourne," and endorsed as above, and are to be accompanied by the necessary deposit as prescribed on back of official tender form.

The lowest or any tender will not necessarily be accepted.

W. H. KELLY,
For Minister for Home Affairs.

---

Postmaster-General's Department,
Melbourne, December 5, 1913.

TENDERS will be received at the office of the Deputy Postmaster-General, Melbourne, until 3 p.m. on April 7, 1914, for the Supply and Delivery of 60 Non-Polarised Relays (Sch. 996). See Commonwealth Gazette, December 6.

AGAR WYNNE,
(1281) Postmaster-General.

---

### VACANCY IN POSTMASTER-GENERAL'S DEPARTMENT, SYDNEY, FOR EXPERT IN PRESERVATIVE TREATMENT OF TIMBERS.

Applications are invited for the above-mentioned temporary position. Rate of pay, £6 per week. Term of engagement, twelve months, with extension, if necessary.

Applicants should have had experience in the preservative treatment of timber, and be competent to undertake practical work in treatment of telegraph and telephone poles, and should state their experience in both pressure and open tank systems.

Applications, stating age, and accompanied by copies of testimonials, certificates, etc., should reach the Commonwealth Public Service Inspector, Banking House, 228 Pitt-street, Sydney, not later than December 27, 1913.

D. C. McLACHLAN,
Commissioner.
W. J. CLEMENS,
Secretary.

---

**Government Notice (V.).**

### VICTORIAN RAILWAYS COMMISSIONERS.

### STATE COAL MINES.

### MOTOR DRIVEN AIR COMPRESSOR.

TENDERS (endorsed "Tender for Air Compressor") to be addressed to the General Manager, State Coal Mines, Wonthaggi, and delivered at his office at Wonthaggi, not later than 12 noon on January 7, are invited for the Supply of One (1) Motor Driven Air Compressor. P.D., £2.

Particulars and forms of tender, at the Melbourne office of the State Coal Mines, Robb's Buildings, Collins-street, and at the office of the General Manager, Wonthaggi.

No tender will necessarily be accepted.

G. H. BROOME,
General Manager.

---

Department of Public Works,
Melbourne, December 5, 1913.

TENDERS will be received until 12 o'clock on Thursday, December 18, for Refrigerating Machinery, Cool Stores, Tyabb. Deposit, £10; security, £5. Particulars and conditions may be learnt at this office. The lowest or any tender not necessarily accepted.

F. HAGELTHORN,
Commissioner of Public Works.

---

**Government Notice (T.).**

State Mining Engineer's Office,
Zeehan, December 5, 1913.

### STATE PROSPECTING, TASMANIA.

Depots will be established by the Tasmanian Government during the coming summer from January 1 to April 30, at Point Hibbs and at Corinna, on the Pieman River.

Any persons desirous of working from these centres are requested to communicate with the State Mining Engineer, Zeehan, when arrangements may be made for the supply of stores at cost price, and the establishment of frequent communications.

Free assays will be made of minerals discovered, and all possible assistance given.

---

FURTHER NOTICE is hereby given that the Patentee of Australian Letters Patent No. 16808, dated January 10, 1910, for "Improvements in the Attachment of Telegraph and Similar Line Wires to Insulators," is prepared to satisfy any demands and all requirements of the public respecting said invention. Fuller information and particulars obtainable from Edward Waters & Sons, Patent Attorneys, 414-418 Collins-st., Melbourne, and 7 Moore-st., Sydney.

## Government Notices (N.S.W.).

### METROPOLITAN BOARD OF WATER SUPPLY AND SEWERAGE.

TENDERS for the works specified below will be received up to 2 p.m. on the dates mentioned, addressed to the President:—

DECEMBER 15, 1913.

Contract No. 930.—Manufacture, Supply and Delivery of One Turbine Centrifugal Pumping Plant for Crown-street Pumping Station. Deposit, £20; security, £90.

DECEMBER 22, 1913.

Contract No. 940.—Construction and Erection of a Mild Steel Service Reservoir at Mobbs' Hill, parish of Field of Mars. Deposit, £20; security, £100.

WILLIAM HOLMES,
Secretary.
341 Pitt-st., Sydney,
November 29, 1913.

---

### PROCLAMATION.

New South Wales, to wit.
(L.S.)
G. Strickland, Governor.

By His Excellency Sir Gerald Strickland, Count della Catena, Knight Grand Cross of the Most Distinguished Order of Saint Michael and Saint George, Governor of the State of New South Wales and its Dependencies, in the Commonwealth of Australia.

In pursuance of the provisions of section 19 of the "Fisheries (Amendment) Act 1910," I, Sir Gerald Strickland, Count della Catena, with the advice of the Executive Council, do, by this my Proclamation, prohibit the use of any fishing-net, fixed engine, fish trap, or other implement for the purpose of catching fish in the waters specified in the appended Schedule for a period of five years from the 1st day of October, 1913.

Given under my Hand and Seal, at Sydney, this twentieth day of November, one thousand nine hundred and thirteen, and in the fourth year of His Majesty's Reign.

By His Excellency's Command,
FRED. FLOWERS.

GOD SAVE THE KING!

Schedule.

County of Murray: The whole of the waters of Ballallaba Creek, together with all of its lagoons, inlets, and tributaries upwards from its junction with Molonglo River.

Counties of Murray and Beresford: The whole of the waters of Sherlock or Adjenbilly Creek and Tinderry Creek, together with all of their lagoons, inlets, and tributaries upwards from their junctions with Queanbeyan River.

County of Beresford: The whole of the waters of Roberts' Creek and Towney's Creek, together with all of their lagoons, inlets, and tributaries upwards from their junctions with Queanbeyan River.

County of Buccleuch: The whole of the waters of Jounama Creek, together with all of its lagoons, inlets, and tributaries upwards from its junction with Tumut River.

(1h 87)

---

### HOBART CORPORATION.

### TENDERS FOR CAST IRON PIPES.

Sealed tenders, addressed to the Mayor and Aldermen, and superscribed "Tenders for Cast Iron Pipes," will be received at my office until 4 p.m. on Monday, December 15, for the Supply and Delivery of sixty-two (62) tons of straight cast-iron pipes, and sundry special castings.

No tender will be entertained unless sent in on printed form to be supplied, and accompanied by a deposit of Fifty (50) pounds in bank draft or marked cheque.

Further particulars can be obtained on application at the office of the Director of Waterworks.

The lowest or any tender not necessarily accepted.

W. A. BRAIN,
Town Clerk.
Town Clerk's Office,
Town Hall, Hobart, Nov. 28, 1913.

---

NOTICE is hereby given that the patentees of Australian Letters Patent No. 3570/1912, dated January 12, 1911, for "Improvements in or relating to Magnetic Separators," are prepared to satisfy any demands and all requirements of the public respecting the said invention. Offers will also be received for the issuance of licenses. Further information and particulars obtainable from Edward Waters & Sons, Patent Attorneys, 414-418 Collins-st., Melbourne, and 7 Moore-st., Sydney.

---

### MUNICIPAL COUNCIL OF SYDNEY.

### ELECTRICAL CASTINGS.

### ANNUAL CONTRACT.

Sealed and Endorsed Tenders will be received by the undersigned until 3 o'clock p.m. on Monday, December 22 instant, for the Supply and Delivery of—

Electrical Castings—Part I., Cast Iron.
Electrical Castings—Part II., Copper, Brass, etc.

Copies of specifications, etc., may be seen upon application at the Office of the Comptroller of Assets, Town Hall, Sydney.

The lowest or any tender not necessarily accepted.

Tenderers, please note that they must pay their cash deposits direct into the City Treasury, and not enclose same with their tenders, otherwise their tenders will be rejected as informal.

THOMAS H. NESBITT,
Town Clerk.
Town Hall, Sydney,
December 5, 1913.

---

### MUNICIPAL COUNCIL OF SYDNEY.

### TO CONTRACTORS.

Sealed and Endorsed Tenders will be received by the undersigned until 3 o'clock p.m. on Monday, February 2, 1914, for the Supply and Delivery of the following:—

(a) Transformers.
(b) Weatherproof Switch Fuses.

Copies of Specifications in respect of (a) and (b) may be seen, or obtained upon application, at the Office of the City Electrical Engineer, Town Hall, Sydney, upon the payment of the sum of 10/6 in each case.

The lowest or any tender not necessarily accepted.

Tenderers, please note that they must pay their cash deposits direct into the City Treasury, and not enclose same with their tenders, otherwise their tenders will be rejected as informal.

THOMAS H. NESBITT,
Town Clerk.
Town Hall, Sydney,
December 5, 1913.

---

### CITY OF MELBOURNE.

TENDERS will be received until 12 o'clock noon on Wednesday, January 21, 1914, for Supply and Delivery of Bare Hard Drawn Copper Cables.

Specification may be seen at the office of the City Electrical Engineer, Town Hall.

JOHN CLAYTON,
Town Clerk.
Town Clerk's Office,
Town Hall, Melbourne,
December 3, 1913.

---

### CITY OF MELBOURNE.

TENDERS will be received until 12 o'clock noon on Saturday, January 24, 1914, for Supply and Delivery of House Cut-out Boxes.

Specification may be seen at the office of the City Electrical Engineer, Town Hall.

JOHN CLAYTON,
Town Clerk.
Town Clerk's Office,
Town Hall, Melbourne,
December 3, 1913.

---

### CITY OF MELBOURNE.

TENDERS will be received until 12 o'clock noon on Tuesday, December 16, 1913, for Supply and Delivery of Air Compressor Plant, etc., for the City Council Quarries, Clifton Hill.

Specification may be seen at the office of the City Surveyor, Town Hall.

JOHN CLAYTON,
Town Clerk.
Town Clerk's Office,
Hown Hall, Melbourne,
December 6, 1913.

---

### CITY OF TOOWOOMBA, QUEENSLAND.

### TENDERS FOR WATER METERS.

Sealed Tenders will be received up to 12 o'clock noon, on Monday, February 9, 1914, for 1000 Water Meters, to be delivered at the rate of 20 per month. Conditions of tender and further particulars may be obtained from the undersigned.

FRANK H. MERRITT,
Town Clerk.
Town Hall,
November 19, 1913.

---

### TONGKAH HARBOUR TIN DREDGING CO.
No Liability.

NOTICE is hereby given that a General Meeting of Shareholders in the abovenamed Company will be held at the Masonic Hall, Murray-street, Hobart, on Friday, December 12, 1913, at 3 p.m., for the purpose of transacting the following

Business:

1. To receive the directors' seventh annual report and balance-sheet, which will be presented for adoption.
2. To elect two directors. Messrs. H. G. Gray and Malcolm Kennedy retire, but are eligible, and offer themselves for re-election.
3. To reduce the number of directors from seven to six in accordance with regulation No. 81, and, in consequence, the vacancy caused by the resignation of Captain E. T. Miles shall not be filled.
4. To appoint auditors.
5. To transact any other business that may be legally brought forward.

By order of the Board,
H. J. WISE, Manager.
Hobart, November 25, 1913.

---

TENDERS are invited for the Purchase or Working on Royalty of Louis Lheure's "Improvements in Detonators and their Manufacture," covered by Commonwealth Letters Patent No. 2396, January 27, 1905. The inventor will dispose of the whole or part interest in the patent, or will grant licences to work the same to fulfil the full requirements of the public. Address—C/o Phillips, Ormonde & Co., Patent Attorneys and Consulting Engineers, 17 Queen-street, Melbourne.

---

### THE PIONEER TIN MINING CO. LTD.

Notice is hereby given that a Dividend (the twenty-fifth), of one shilling and sixpence per share has been declared, Payable on Monday, December 22, 1913. Transfer Books will be closed on Saturday, the thirteenth day of December, 1913, for purposes of this dividend. By order of the Board,

JOHN F. WAY, Secretary.
34 Queen-st., Melbourne, December 5, 1913.

---

### ST. ARNAUD NORTH GOLD MINE N.L.

Quotations are invited for the following Machinery, new or secondhand, F.O.R., and will be received by the undersigned up to Dec. 18, 1913:—

38 h.p. Suction Gas Engine (48 h.p. producer).
Two Wilfley Tables.
10-head Battery (1000 lb. stampers).

PERCY P. COOK.
360 Collins-st., Melbourne.

---

### EDNA MAY G.M. COMPANY NO LIABILITY.
Westons, West Australia.

Notice is hereby given that a Dividend (the second) of two shillings per share has been declared, Payable at the registered office of the company, 31 Queen-street, Melbourne, on Friday, January 9, 1914. Transfer books close from January 3 at noon till January 10.

FRED TRICKS, Manager.

---

### THE MELBOURNE AND METROPOLITAN BOARD OF WORKS.

### FURTHER ISSUE OF 4 PER CENT. DEBENTURES.

A further issue of Debentures will be made as follows:—

1. Loan "AA," bearing interest at 4 per cent., due 1st July, 1931, at £99 per £100.
2. Loan "BB," bearing interest at 4 per cent., due 1st July, 1918, at £99 10s per £100.

Principal and interest will be payable at the Board's Offices, in Melbourne.

Interest will be payable half-yearly on the 1st January and 1st July. Coupons representing interest from 1st July to 31st December, 1913, will be removed from debentures before delivery, but successful applicants will be entitled to interest at 4 per cent. per annum on all money paid by them from the date of payment up to the 31st December, 1913.

Applications must be made on forms attached to the prospectus, and will be received by the Treasurer, at the Board's Offices, 110 Spencer-street, Melbourne. Allotments will be made in accordance with priority of application.

Only members of recognised Stock Exchanges of Australasia will be allowed brokerage of ½ per cent. upon their accepted applications.

Debentures will be issued by the Board as soon as available, and interim receipts for money received will be furnished by the Board's Treasurer.

Further particulars and prospectus may be obtained upon application at the Office of the Board.

W. J. CARRE RIDDELL, Chairman.
GEO. A. GIBBS, Secretary.
Offices of The Melbourne and Metropolitan Board of Works,
110 Spencer-street, Melbourne.
10th December, 1913.

## ECUADOR OIL CONCESSIONS.

In our issue of September 11th there appeared an article having reference to the concessions just then obtained by Lord Murray, of Elibank, from the Ecuadorian Government, wtih respect to rights of boring for oil and carrying on the work of refining and marketing it. "The Times" (London) of September 12th made the following comments, supplying at the same time fuller particulars of the agreement, from which it concludes that the bargain promises a very substantial benefit to Ecuador, although it was primarily sought and obtained by the British investors for their own profit. The article is as follows:—

"There was published last Saturday morning in the financial section of 'The Times' an article dealing with the contract which Lord Murray of Elibank has succeeded in concluding with the Government of Ecuador for the development of the oil resources of the republic. Under this contract Lord Murray or his assigns—practically S. Pearson and Son Ltd. or any companies they may form—undertake to spend £100,000 within 10 years in exploring for oil in Ecuador. Work is to begin within a year of the publication of the proposed law and competent geologists and engineers are to be employed, who are to supply the Government with detailed maps of the country they survey and to keep the Government specially informed as to discoveries of artesian water. Lord Murray receives the right to lay pipe-lines, build quays and refineries, make canals and railways, set up telegraphs and telephones, and so on, which are destined for the use of the enterprise. The Government is to make a free grant of public lands required for the purpose and to expropriate private owners whose property may be required, the indemnity to be paid by Lord Murray. Defined royalties on the oil are to be paid to the Government, these covering all taxes and imposts, national and municipal.

"Lord Murray will have the right of exploiting the whole of Ecuador in sections, without competition; in the case of sections designated the Government will suspend the right of others to make discoveries upon them for three years. The contract lapses if assigned to any foreign Government or State, and in case of violation redress is not to be sought in diplomatic channels. The Government will have the right to use the quays, canals, roads, railways, telegraphs, power stations, and so on in the case of war or civil disturbance; and after 40 years, which is the period covered by the contract, they will become its absolute property.

"There can be no doubt that Lord Murray has obtained a very favourable contract, or will obtain it, if it is ratified by the Congress. It by no means follows, as excitable patriots suppose, that it is unfavourable to Ecuador. To argue that because the republic gets for the moment nothing but a paltry £2000 caution money that therefore it has 'given away' its wealth is ridiculous. If the enterprise fails, it has given away nothing; if it succeeds, it will mean a steady inflow of revenue into the national and municipal coffers, oil becoming for Ecuador what nitrate is for Chile. But this is not all. It may seem a small thing that the country will at last be properly surveyed and mapped, but the importance of this is very real. But, apart from this, the subsidiary enterprises stipulated will be no mean assets to the country, which has need of quays, canals, roads, railways, telegraphs, telephones, and power stations. The contract stipulates that the Government shall have the use of these in times of war or civil disturbance; and after 40 years, the period covered by the contract, they will become its absolute property. The contract, then, would seem to be a good thing for Ecuador, and, in our opinion, the Congress of Quito would be ill-advised in rejecting it. It may be added that, in view of the keen competition of American oil interests in Latin America, the obtaining of the contract would also be a notable victory of British enterprise. Ecuadorian patriotism may well be content that their undeveloped wealth is to be exploited for them by subjects of a Power which cannot be suspected of those political 'arrieres pensees' which they so much dread."

---

In accordance with the grant of £466 made by the Queensland Government for the establishment of a modern science laboratory at the Toowoomba Grammar School, upon condition that the Trustees find a like sum, an appeal was made to the residents of Toowoomba to augment the sum already in the hands of the trustees. Subscriptions are apparently being willingly made, and it is anticipated that the whole amount necessary will be available at an early date.

**SIAM OFFERS**

A splendid new field for Australian Business Enterprise.

**SIAM WANTS**

Mining and Agricultural Machinery, Seeds, Hides, Tallow, Meats, Jams, Butter, Cheese, Potatoes, General Manufactures, also Horses, Cattle and Sheep.

**The Siam Observer (Daily),**
**The Siam Maitri** | **The Siam Weekly Mail** | **(Weeklies.)**

Siam's Leading Newspapers, which, with

**The Siam Directory**

are published at the Siam Observer Offices, Bangkok, will put you in touch with this market.
Rates and Particulars from
***GORDON & GOTCH.***

***CARL WERNER & CO.,*** ***OPHTHALMIC - OPTICIANS—***

**The Finest Illustrated Catalogue of Scientific Instruments in Australia mailed on request—comprising**

**THEODOLITES, LEVELS, LEVELLING STAVES, BRUNTON'S AND VERSCHOYLE TRANSITS, ETC., ETC.**

All the Requirements for the Drawing Office in Stock.

***336 COLLINS STREET - - MELBOURNE.***

**Telephone—5866 Central.** **Cable Address—"PORPHYRY."**

***Edward Dyason and Co.***

***MINING ENGINEERS AND METALLURGISTS,***

Examine, Report on, and Value Mining and Metallurgical Properties.
Consulting Engineers.

***60 QUEEN STREET - - - MELBOURNE,***

Codes A.B.C. 5th Edition. Moreing and Neal. Bedford McNeill.

**SOUTH** **THE AUSTRALIAN GAS RETORT & FIRE BRICK MANUFACTURING CO., TOORAK ROAD, SOUTH YARRA—**
**For Fire Clay goods for all purposes.**
**Send for Catalogue.** **YARRA**

***SHAW'S Steel Wire Ropes***

***FOR ALL MINING PURPOSES.***

Large Stocks always on hand at HEAD AUSTRALASIAN DEPOT

**JOHN SHAW Australia, Limited,**
**445 KENT STREET, SYDNEY.**

*Victorian Agents: Welch, Perrin and Co., and Inglis, Smith and Co.*
*Brisbane: Engineering Supply Co. of Australia Ltd.*

**GREAT COBAR LIMITED,**

**COBAR, N.S.W.**

**MINE OWNERS, SMELTERS, COLLIERY PROPRIETORS, PURCHASERS OF COPPER ORES AND MATTES.**

**VACANCIES FOR COMPETENT MACHINE MINERS.**

**SYDNEY:** Australasia Chambers, Martin Place, And at Lithgow and Singleton. **LONDON:** 65 New Broad Street, E.C.

**W. H. ALLEN, SON and CO. LTD.,**

**Queen's Engineering Works, Bedford.**

**Queen Anne's Chambers, Westminster, London, S. W., ENGLAND.**

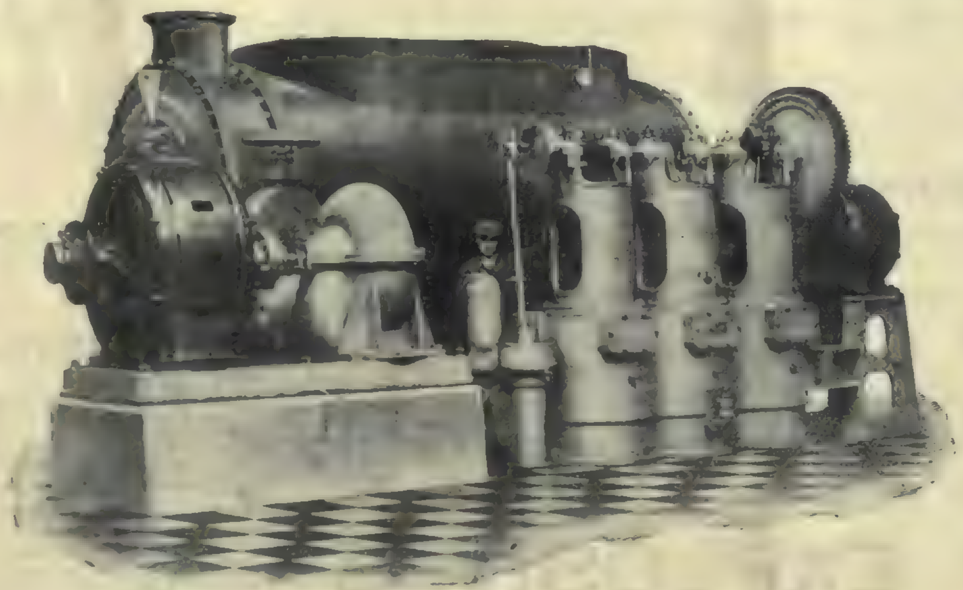
The 'Conqueror' Surface Condensing Plant

High Efficiency :

Counter - current

Surface or Jet

Condensers : :



'Allen - Edwards'

Air Pumps : :

"Conqueror"

: Centrifugal :

: Pumps :

PARTICULARS and PRICES may be obtained from the above or their Representatives:—

**FYVIE & STEWART,**

Collins House, 360-366 Collins Street, Melbourne.

Australasia Chambers, 2 Martin Place Sydney.

**Everything for Mining**

SUPPLIED BY US.

CANDLES,

EXPLOSIVES,

GHERSEN ROCK DRILLS,

WINDING ENGINES,

STONE CRUSHERS,

ROAD MAKING PLANT.

CARD CONCENTRATOR, Sole Manufacturers—

DORR THICKENER,

DORR CLASSIFIER,

B and M TANKS,

TILGHMAN'S AIR COMPRESSORS.

QUARRY BARS.

WELL BORING PLANTS. BLOW OFF VALVES, ETC.

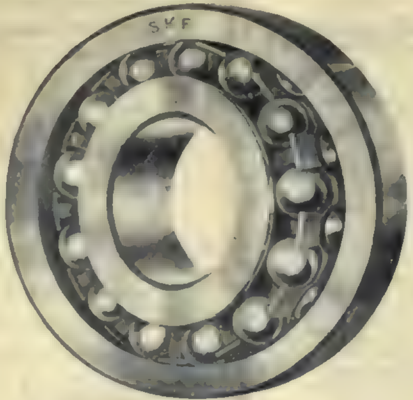
Agents in all CAPITAL CITIES of Commonwealth and NEW ZEALAND

**N. GUTHRIDGE LTD.**

Offices and Stores—SYDNEY and MELBOURNE.

**S. K. F. BALL BEARINGS.**

A new system, being adopted by many factories and engineers for shafting, machines, fans, pumps, etc.



Saves up to 70 per cent. power, and use practically no lubricant.

Radial, Thrust, Double Thrust.

S. K. F. are self-aligning, thus overcoming the worst features of other bearings.

Swedish Diesel "Polar" Motors—the coming power.

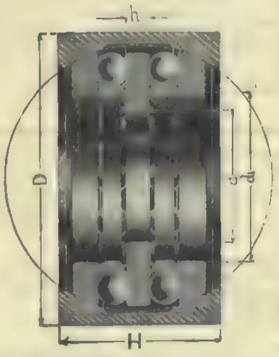
General Electric Mfg. Co. of Sweden: Power Plants.

Motors, Dynamos, Transformers, Etc.

Dissolved Compressed Acetylene for Welding, Light, etc.

Rewinding and all Electrical Repairs a speciality.

Jungner Indestructable Accumulators.



**GARDNER, WAERN and CO.,**

57 Queen St., Melbourne; 334 Kent St., Sydney,

*Stores and Showroom, 369 Flinders Street, Melbourne.*

**COCKLE CREEK**

**SMELTING WORKS, N.S.W.**

**THE SULPHIDE CORPORATION LIMITED,**

**Purchasers of:**

Ores, Concentrates, and Slags, carrying Gold, Silver or Lead, on specially favourable terms for net cash.

**THE WORKS** are situated only 9 miles from the Port of Newcastle, where the Corporation has every facility for taking delivery of consignments on behalf of shippers.

**Manufacturers of:**

Superphosphates, Sulphate of Ammonia, and other fertilisers, also Tar and Sulphuric Acid.

**Tariff and full particulars can be obtained on application to—**

**THE MANAGER, Cockle Creek, N.S.W.** **GIBBS, BRIGHT & CO., Agents.**

*OBTAINABLE FROM ALL BOOKSELLERS.*

**HIGH EXPLOSIVES**

**By W. R. QUINAN.**

224 PAGES, ROYAL OCTAVO. **PRICE -£1-1-0**

**AUSTRALIAN MINING STANDARD, Melbourne and Sydney.**

From three series of experiments on natural, annealed, and chilled irons, the known phosphorus content of which varied in twelve samples from 0.012 to 1.242 per cent., it was found that the hardness increased nearly in proportion to the phosphorus content, about 12 Brinell units per 0.1 per cent. increase. Elasticity is increased by about 2.7 kilos per square millimetre per 0.1 per cent. Tensile strength increases until 0.5 per cent. phosphorus is reached, beyond which it decreases. Expansion and contraction decrease as the tensile strength increases with low phosphorus contents; but with high phosphorus they are practically nil. Above 0.24 per cent. phosphorus the metal is very brittle. The electric conductivity is lowered, but the magnetic properties are influenced only by a high phosphorus content, the latter counteracting the effect of the preliminary treatment of the material.

**Siegfried Pels,**
26-28 Neuerwall,
**Hamburg - - Germany.**

**Wolfram-Scheelite**

Bismuth Tin.
Tantalite. Lead.

A
MARKET
for all
—ORES—
and
MINERALS

Molybdenite Copper.
Vanadium. Silver.

Argentiferous — Auriferous.

**ASHES and SWEEPS.**

***Cable Address: — Siegpels.***

CODES:
**A.B.C. 4th and 5th Ed., A1, Liebers, Western-Union, Bedford McNeill.**

All Australians visiting London should read the **"British Australasian," 6d. weekly**—an illustrated paper containing mail and cable news from Australia, and news of Australians in Europe and at home.

Australians are cordially invited to visit the **"British Australasian" Reading Room at the offices, 115 High Holborn, London, W.C.,** where they can see the home papers, meet their friends, use the telephone, and obtain information without charge.

**H. B. Silberberg & Co.,**
*443 Bourke St.,*
Cor. Bourke and Queen Sts.,
*MELBOURNE.*
Tel. 1377. **8 O'CONNELL STREET, SYDNEY.**

Large Stocks of—
**Ainsworth's Balances, Morgan's Crucibles.**
**Braun's Laboratory Ore Crushers. Gasolene Furnaces.**
**Fluxes. Assayers' Requisites.**
**Jena Chemical Glassware, Etc., Etc.**

**FRANCIS H. SNOW,**

**Buyer of**

ORES. MATTES. METALS. CONCENTRATES. & MINERALS

——of every description——

Australasian Representative of:
**ELECTROLYTIC R. & SMELT'G Coy. of A'LIA Ltd.,**
**Pt. KEMBLA, N.S.W.**
**ARON HIRSCH & SOHN,**
**HALBERSTADT, GERMANY.**
**L. VOGELSTEIN & Co.,**
**NEW YORK.**

**Head Office—KING WILLIAM-ST., ADELAIDE.**
**Sydney Office:—8 BRIDGE STREET.**
**Perth Office:—ST. GEORGE'S TERRACE.**
**Broken Hill:—F. G WHITE, P.O. Box 78.**
**Zeehan:—A. J. SPOTSWOOD.**

**JOHN A. ROEBLING'S SONS CO.**
**New York,**

ELECTRICAL COPPER WIRE AND CABLES.

HIGH QUALITY FLEXIBLE

**WIRE ROPES**

STOCKS ON HAND.
ANY LENGTH CUT.

**Representative:**

**ALEX. FRASER PTY. LTD.**
Cobden Buildings,
368 Flinders-street,
**Melbourne.**

FOR MINES, HAULAGE, ELEVATORS, ETC.

**COALFIELDS AND COLLIERIES OF AUSTRALIA.**

440 pages, 229 illustrations. 25/- nett. Posted, 25/3. Foreign, 26/8.

***LIQUID FUEL for Diesel & all Crude Oil Engines.***

**"SHELL" SPIRIT, "SHELL" BENZINE, LUBRICATING OILS AND GREASES.**

Prices and particulars on application to

**THE BRITISH IMPERIAL OIL CO. LTD.** Adelaide, Brisbane, Fremantle, Melbourne, Sydney and New Zealand

## CONTENTS

THURSDAY, DECEMBER 18.

EDITORIAL—

The Chinn Stick and the Govt. Dog .... 543
Bear Gardens and Pothouses .... 544
Leaderettes .... 544
News and Notes .... 545
Personal .... 546
Metal Quotations .... 546
Western Australian Mining .... 546
The Investor's Column .... 547
Brief Comment .... 548
Our Big Mines .... 549
South Australian Mining .... 550
New South Wales Mining .... 551
Victorian Mining Activities .... 551
The Coal Mining Industry .... 552
Johnson's Reef (V.) .... 553
Postal Electricians .... 554
Defence Department Stores .... 554
Enginedrivers' Certificates .... 554
Amalgamated Enginedrivers .... 554
British and European Developments .... 555
Miscellaneous .... 556
Invited and Accepted Tenders .... 557
Tasmanian Mining .... 559
Queensland Mining .... 562

CASUAL ADVERTISEMENTS.

The rate for this class of advertisement is governed by the position it occupies.

If it appears on leader page or amongst or next to reading matter, the rate is 15s per inch (nonpareil) per insertion.

Towards end of reading section—

Brevier 16 ems width 6s per inch per insertion.

Nonpareil 8s per inch per insertion.

For the convenience of advertisers we might state that Brevier has approximately 7 words to a line, and 8 lines to the inch—6s. Nonpareil has approximately 8 words to the line, and 11 lines to the inch—8s.

ALTERATION TO ADVERTISEMENTS.

As our publishing arrangements necessitate the "Mining Standard" being issued simultaneously in Sydney, Melbourne and Adelaide on the same day each week advertisers wishing to change their advertising matter must supply same ten days in advance of publication.

ADVERTISEMENT PROOFS.

Proofs are submitted to advertisers in order to give them an opportunity of going over the advertisements before printing.

Advertising Copy must be typed and so arranged as to clearly indicate the display required for the more important features of the advertisement.

Any departure from the original copy will be charged for. Advertisers are specially requested to instruct their publicity departments to give us clear and definite instructions respecting changes of matter or new copy in order to avoid incurring unnecessary charges.

HENLEY'S
Electric Wires and Cables
AND INSULATING TAPES
ARE THE BEST.
W. T. HENLEY'S Telegraph Works Co. Ltd.
546 COLLINS ST., MELBOURNE.
61 YORK ST., SYDNEY.

BELTING!
Largest stock of all kinds of Machine Belting in the Commonwealth.
Conveyor and Elevator Belting for all purposes.
HOPKINS BROS. & ODLUM PY. LTD.
LEICESTER ST., CARLTON, MELBOURNE.
'Phone, Central 764 and 5202. Box 377 G.P.O.

MINING STANDARD.
PUBLISHED EVERY THURSDAY.
Forwarded Post Free to any Address.

| | Per annum. |
|---|---|
| Australasia | 26/- |
| British Possessions | 32/6 |
| Foreign | 34/8 |

Payable half-yearly or yearly, in advance.
All amounts should be made payable to order of "CRITCHLEY PARKER, Bank of Australasia."

12 O'Connell-street,
Sydney.
Tel. City 8103
P.O. Box 331.

376 Flinders-lane,
Melbourne.
Central 7931 & 1838
P.O. Box 253.

*NOTICE.*

*The Christmas issue of the "Mining Standard" will appear on Wednesday, December 24, instead of Thursday, December 25.*

AUSTRALIAN
MINING STANDARD.
PUBLISHED EVERY THURSDAY.
ESTABLISHED 1888

It is requested that all business communications be Addressed to Critchley Parker.

THURSDAY, DECEMBER 18, 1913.

## THE CHINN STICK AND THE GOVERNMENT DOG.

The Select Committee of the Commonwealth Senate has concluded its trial of Mr. Henry Deane. Nominally it was appointed to enquire into the circumstances attending the dismissal of another Henry who had been employed on the Trans-continental Railway; but the majority of its members seemed to consider that it was the conduct of Mr. Deane, the Engineer-in-Chief, rather than the conduct of Mr. Chinn, who had been dismissed from the position of Supervising Engineer of the line at the Kalgoorlie end, that was to be made the chief object of its enquiry. So, too, it is made the chief feature of the Committee's remarkable finding. This finding resolves itself, not so much into an exoneration of Mr. Chinn, as into a condemnation of Mr. Deane and of the Government; but it is safe to say that the finding will not do either Mr. Deane or the Government twopenny worth of harm in the minds of unprejudiced people, and will leave everybody in Parliament and everybody out of it thinking of Mr. Chinn precisely what they thought before. The sittings of the Committee have been nothing less than a farce. Before it began its labours, its Chairman, Senator de Largie, went out of his way to prejudge the case in Mr. Chinn's favour, and no one ever had the least doubt from that moment onwards what would be the decision of that gentleman, at least. So, too, with all the rest, with one exception: they began their self-imposed duty with a fixed belief, perfectly honest perhaps, that Mr. Chinn had been the victim of a partisan move on the part of a Government to which the Senate is in entire opposition; and the whole conduct of the proceedings by the Chairman accentuated the impression on the part of the public that the Select Committee was nothing but a partisan body, with its mind made up as to its decision before its work was begun.

Whether the decision the majority of this Committee has arrived at is right or wrong in regard to Mr. Chinn is entirely beside the question. That is a matter on which we do not propose to express an opinion; but we can at least say that the attack on Mr. Deane was absolutely unwarranted on the evidence, and that it will only add to the general feeling of the public that the opinion of the Committee on the whole question is as entirely destitute of value as the views ostensibly held by Mr. Chinn regarding the attitude of the railway officials towards himself. Mr. Chinn, indeed, seems to be as ready as, judging by recent newspapers reports, are the mouthpieces of one of the largest Christian Churches in this country to pose as the victims of cruel persecution. He seems to suffer from that complaint of regarding everything as an injury that has made the saying "another injustice to Ireland" a byeword. According to Mr. Chinn, every one of the leading railway officials was actuated by feelings of great hostility towards him. If so, what had he done to arouse that hostility? His assumption that the hand of everyone was against him may only have been a pose or may have been a mania; that it had any justification in fact we see no reason whatever to believe.

The one Government supporter who was a member of the Committee gave a minority report. That also may be regarded as partisan; but the fact remains that it is temperately and reasonably worded, and that it conveys no such sense of partisanship as is conveyed by the majority report, which will appear, even to those unacquainted with the circumstances, to be tinged with onesidedness. Senator Bakhap is more judicial and more judicious, and there can be little doubt that he is right in saying that, on the evidence tendered, no Court of competent jurisdiction "would award Mr. Chinn damages if he instituted an action claiming them for wrongful dismissal." Senator Bakhap thus comments upon the most remarkable of several remarkable transactions of which mention was made during the hearing of this case, and his comment is far more to the point than is the whitewashing paragraph of the majority report dealing with the same matter:—"On his own showing, in one important matter, Mr. Chinn greatly, and it would seem wilfully, misconstrued his authority, and by that act went far beyond it. His authority to purchase materials was substantially increased to the amount of £250. His first account after the increase exceeded the amount, and he purchased about £3000 worth of cement without the authority of the Engineer-in-Chief, and contends that it was done under the £250 authority. He, moreover, gave evidence to the effect that he considered he would have purchased £9000 worth in the same way had he so desired Manifestly such an agent, acting outside expressed authority, would be regarded as dangerous by nineteen private employers out of twenty, and such action and unauthorised commitments on his part would lead in many cases to instant and justifiable dismissal. It is true that the ex-Minister for Home Affairs (Mr. King O'Malley) said that Mr. Chinn misunderstood his authority, and that he (the Minister) would sanction such a bargain as that entered into by Mr. Chinn, if a good one, but not if it seemed to be a bad one. Obviously to endorse Mr. Chinn's bargains in excess of his authority if good ones to shelter behind his exceeding of expressed authority if he made a bad bargain, would savour of the immoral in business, and be unworthy of the Commonwealth, and such a course of action evidently does not meet with the approval of the permanent officers connected with the accountancy affairs of the department."

But, though the public as a whole will be inclined to agree with the remarks of the minority report on this matter, it is not so much for that reason that they will regard as a failure the attempt to rehabilitate the dismissed official, as because the whole attitude of the Chairman of the Committee throughout the proceedings was such as to render it impossible for anyone not blinded by prejudice or folly to suppose that Senator de Largie was prepared to act with the impartiality called for in one dispensing justice. Mr. Chinn may well cry, "Save me from my friends." If Senator de Largie had only not made his partisanship so obvious, the report of himself and his majority would have been valued much more highly than it is likely to be in existing circumstances. The inquiry would seem to have been used mainly as a means of showing the Senate's hatred of the Government. "Any stick is good to beat a dog with."

But there is one other feature of what we have hitherto called "the majority report," which calls for comment. This report begins "We, the members of the Select Committee"; and its recommendation reads, "Your Committee recommend that the terms of Mr. Chinn's contract of engagement be complied with, and that he be compensated for the suffering and loss entailed by the manner in which he was discharged from his position of Supervising Engineer of the Transcontinental Railway"; and then, after all this, one finds that the report is signed only by Hugh de Largie, Chairman. Has one ever before seen a report beginning "We, the members," and concluding with a single signature? Why did the others not sign? Did they not approve? Were they willing to seem to approve, unwilling to seem to dissent, and desirous of being in the position to repudiate a report so one-sided that it might have been drawn up by the gentleman most immediately concerned in the enquiry? If this view be correct, we have a report to one effect by a particular member of the Committee, and a report to the contrary effect by another member of the Committee, and we have five members saying nothing. The fact may be significant.

---

## BEAR GARDENS AND POTHOUSES.

When one reviews last Thursday's proceedings in the Commonwealth Senate, and the proceedings which the same day culminated in a number of very unpleasant accusations in the Victorian Legislative Assembly, it is difficult to determine which was the more disgraceful. Mr. Watt, the Victorian Premier who was and is to be seems to have regarded office as a toy to be flung down only to be snatched for again as soon as it is taken possession of by someone else. His excuses for his action in so soon moving a vote of want of confidence in the new Ministry were: firstly, that the Opposition members greatly outnumberd those on the Ministerial side of the House; and, secondly, that Mr. Elmslie had been guilty either of fraud or of stupidity in assuring the Lieutenant-Governor that he was able to carry on the Government. But, according to the Labour Party, Mr. Elmslie was given certain assurances of support, assurances which have not been redeemed and are, as a matter of fact, denied. The probability is that these assurances were not of a definite character, and Mr. Elmslie certainly acted wrongly in taking office without making absolutely sure of the support he looked for. It may be that he and those who joined him had an eye to the fact that even if they held office for only a few days they would still have certain privileges which appertain to those who have once been members of the State Government; but those who blame the Labour Party on this score ought not to overlook the argument which may be used on the other side, that Mr. Watt was guilty of trickery that was not altogether pardonable, if, as many people suspect, he deliberately rode for a fall in order to be able to get rid of several incompetent colleagues. It is, of course, urged that the Labour members have acted with a very gross breach of faith and decorum in revealing to the House assurances given to them in what were unquestionably private and confidential conversations; but, though it is easy to blame anyone for an action of this sort, the temptation to pay bad faith with bad faith is one which the majority of men find irresistible. The general opinion will, we think, be that both parties have the most thorough reason to be ashamed of themselves.

The incident in the Senate to which we have alluded is of a more farcical character. The Prime Minister was reported to have said that language was sometimes used in Parliament which would not be heard in a pothouse. This was a statement which the Labourites in the Senate took upon themselves to resent. To show that they resented it, and also to show that they had no reason to resent it, they turned the Senate into a bear garden and behaved like a lot of howling hoodlums in order to uphold the dignity of the House. The Minister for Defence, Senator Millen, promised to make enquiries from the Prime Minister and to let the House know the result. He did so. The defendant's plea was one of justification. He quoted language used by Labour members in both Houses during debate—language which fully justified the remarks he had made concerning it. That should have been enough for the Senate; but it was not. Instead, it carried a vote of censure on the Prime Minister for having used the words the justification for which he had proved. The incident will not help to increase the esteem in which the Senate is held. Labour members would have been much wiser to have taken no notice of Mr. Cook's remarks. As it is, they have only made those remarks much more widely known, and have also made known the fact that they were not without justification.

---

A very important Supreme Court decision was given at Wellington (N.Z.) last Friday. The Wellington Typographical Union, being desirous of voting £100 to assist the strike fund of the waterside workers, took the unusual step of bringing an action at law against itself in order to obtain a declaratory judgment as to the legality of such a proceeding. The action was brought by the Secretary, Mr. McDougall, against the Union. The rules of the Union provide for various descriptions of assistance to members, also "to assist other workers in difficulties." The Solicitor-General argued that the Union had no power to spend its funds in maintaining a strike in any district; and unrelated to the industry. An industrial union under the Arbitration Act must limit its activities to a specified industry. The Chief Justice (Sir Robert Stout), and Mr. Justice Chapman, by whom the suit was heard, gave their reserved decision last Friday in the Supreme Court at Wellington. The Chief Justice said:—"It is not lawful for the defendant union to apply any of its funds for the purpose of assisting unions while the members of those unions are engaged in a strike. The union cannot make levies on its members for that purpose." Of course, this decision applies only to New Zealand, but it applies to all unions within the Dominion, and must have a far-reaching effect on industrialism there, and it will, doubtless, have some effect in Australia when the same question is raised here. It is practically on the same lines as the famous "Osborne judgment" delivered in London some years ago, which caused such a ferment in trades union circles.

* * *

Nothing is more agreeable to human nature than to see ourselves as others see us, when others see us favourably. And if, into the bargain, the seer be a man of world-wide reputation, a man of large experience, accustomed to note the trend of events, and well acquainted with the social forces which make for and against progressive evolution in national history, the gratification is all the more acute. Australia has that supreme satisfaction at the present moment, and is not likely to eschew it. Speaking at the National Liberal Club in London last Friday, at a dinner at which Sir Edward Grey, Secretary of State for Foreign Affairs, presided, Mr. James Bryce, formerly British Ambassador at Washington, and who recently visited this quarter of the globe, informed the company that he had found Australia and New Zealand "extraordinarily interesting." He found here two young countries which had undertaken self-development, and undertaken it boldly and confidently, though without any indication of a desire to free themselves from such wholesome restraints as were imposed by their continuance in the British Empire. The fundamental British principle of uniting liberty with orderly control seemed not likely to suffer in these new countries; public life was pure, the judiciary was absolutely above suspicion, and everywhere he travelled he found that "the colonies" had taken England as a model. Within these lines Mr. Bryce noted a tendency which struck him, apparently, as a sign of virility. These oversea dominions, he said, might be called "the laboratories of democracy," for they were trying experiments in legislation that none but countries so favoured by nature could venture to try. For all this recognition of the spirit of Australasian endeavour the people will gratefully remember Mr. Bryce. But we shall do well to note the implication contained in them that there is a considerable element of risk in our chosen path, and that while seeking to broaden the base on which the destinies of these countries are being built up, it is essential that watchfulness be maintained lest liberty degenerate into license, and too hasty progress end in disaster. A feverish desire for personal advancement is very apt to blind people as to the ultimate effect upon the country's prosperity and stability of the measures adopted. In this lies the whole difference between the statesman and the politician. Progress is not less likely to be attained when caution holds its proper place, and is much more likely to be solid and enduring.

* * *

When Agur said that the two daughters of the horseleach cried, "Give, give"; that there were three things that were never satisfied, and four that did not complain of satiety, he made a pretty numerical progression, but was guilty of an anticlimax. What is still more to the point, his experience was limited; he knew nothing of Parliaments and the payment of members. The people of the Commonwealth are likely to find further additions to the cost of Government, as a small sheaf of new requests was presented to the Prime Minister last week by representatives of various Queensland electorates, asking for further privileges, the removal of certain disabilities, a reduction in the hours during which members ought to be in the House (whether they are or not), and so on. The first suggestion came from Mr. Higgs, and was that clerical assistance should be provided to enable members to get through their "voluminous correspondence." It would suffice, at starting, to appoint two or three typists and stenographers, said Mr. Higgs, and, if they were found insufficient, more could be appointed. Not to be robbed of his prior claim to credit for making the suggestion, Mr. Josiah Thomas pointed out that he had made it some time ago, but when the Treasurer, to whom Mr. Thomas had made the proposal, asked why the late Ministry had not carried it out during its three years of power, the member for the Barrier could only reply that that was no reason why it should not be done now. Most people will regret that Mr. Cook half promised that the thing should be done, and the resourceful

Mr. O'Malley pointed out that it could easily be arranged by raising members' salaries to £750 a year. Then Mr. Finlayson came forward with several suggestions. Could not arrangements be made for Federal members to travel free on the tramways as they did on the railways—not the Melbourne tramways alone, but the tramways of all the capital cities; the reason given for this suggestion was that the Departments were so scattered that members found it expensive to go from one to another. There were also unfair deductions made from members' salaries after a dissolution. Lastly, there was no Parliamentary "Who's Who?"; no records showing in concise form the year and place of a member's birth, the date of his entering Parliament, the date when the more fortunate became Ministers, and, as another member put in, "the reason why some did not." If Mr. Cook fulfil his promise to consult the Library Committee, he might consider putting in also "previous occupation" and "average earnings," and other similar questions, which would be of real interest to the people who are not in the House. Mr. McDonald complained that sitting four days a week was too much; no State Parliament sat for more than three days, and, he added without a blush, "they all do as much business as the House of Representatives." It was left to Mr. Bamford to make the boldest bid for enlarged privileges; his suggestion, which met with hearty approval on both sides of the House, was the establishment of a system of pensions for decayed and defeated members. Mr. Bamford supported this, because members, in his opinion, devoted their lives to the service of the people, and ought not to be turned out to starve just because the electors tired of them. Mr. O'Malley again showed how it could be done. Increase the salaries by £200 or £250 a year, and let this additional sum be set aside to provide the pension. As the member for Darwin (T.) had already proposed an increase to £750, he apparently estimates the value of his services and those of every other member at £1000 a year. Mr. Riley (N.S.W.) suggested that there were not enough Ministers; there should be no Honorary Ministers; all Ministers should be paid salaries. When Mr. Cook has conceded this point, it will be time enough to consider whether Mr. Riley ought not to have gone further and asked for higher salaries for Ministers.

* * *

What Mr. Cook, the Prime Minister, describes as the "crude, inefficient and inadequate" method of controlling Federal public works, will, in future, if a Bill laid before Parliament last week become law, be replaced by one in which Parliament itself will directly share responsibility with Ministers. The Bill in question provides for the establishment of a Parliamentary Standing Committee on Public Works, and its appearance at the present juncture may well be the outcome of Ministerial investigation and reflection on the lavish expenditure incurred by the late Government in all directions, which has committed the Commonwealth to a huge sum annually for many years, unless some of the projects commenced be immediately abandoned, in which case there will be a dead loss to a considerable amount. In framing the proposal, the Cabinet had before them the experience of both New South Wales and Victoria, in both of which States public works of more than a stated estimated cost have to be investigated and reported upon by a Parliamentary Committee before being finally submitted to Parliament, thus not only saving time in the House, but securing as far as possible a deliberate consideration free from party feeling and bias. The importance of this departure follows from the fact that Federal expenditure on public works amounts to from three to four millions annually, and from the other fact that already large sums have been spent without Parliament being made fully acquainted with the details of expenditure. The Federal Public Works Committee, it is proposed, will consist of nine members, three from the Senate and six from the House of Representatives; five to form a quorum. No Ministers will sit on the Committee. With the exception of works connected with the Defence Department, all future undertakings, whether continuations, completions, repairs, extensions and entirely new works, of which the estimated cost exceeds £25,000, will be dealt with by the Committee, and will not be put in hand without its recommendation. In the States where such committees have been in existence for some years the result has been that millions of pounds have been saved, and there is ample reason for thinking that the same result will follow in Federal finance. On the motion of the ex-Prime Minister, Mr. Fisher, the debate on the Bill has been postponed.

* * *

That in our last week's leader in the setting of examination papers we did not exhaust the possibilities of fault-finding in connection with the Melbourne University examiners' methods is shown by the following letter to "The Age," on the subject of the Junior Public History paper:—

"In justice to the candidates at the recent history examination, I wish to call attention to a glaring mistake. The Handbook of Public Examinations, issued by the University, prescribes "British History Section (C.) from 1714 to 1846, together with outlines of the exploration of Australia up to and including 1860." In the history paper, question 7, which, by the way, was made compulsory, asks:—'Why were the inhabitants of the Port Phillip settlement anxious for separation from New South Wales?' This question should certainly not have been set, as the separation did not take place till the passing of the Constitution Act of 1850. It is to be hoped that the examiner will bear this in mind in marking the papers; and it is also to be hoped that any future examiner will consult the calendar before setting the history papers.—Yours, etc., TUTOR."

---

## NEWS AND NOTES.

A correspondent writes from Glen Innes (N.S.W.) as follows:—"An inspection was recently made of gold properties owned by Mr. C. A. G. Livingston, of Yulgilbar station, in the Drake and Clarence counties. Rich gold was discovered in the contact between diorite and felsite, some 3 miles from Lionsville, and traced for 10 miles to the contact of serpentine and eruptive granite that intersects the diorite at right angles, not far from Yulgilbar Castle. The occurrence of gold-bearing conglomerates, not unlike those of the Rand, Transvaal, is regarded as a most important feature, pointing to early erosion of the rich matrices named, and their deposition in the Clarence Basin. Assays yielded from 6 dwt. to 11 oz. of gold per ton. The proposition has been placed before capitalists for full investigation."

Something like a boom, reminiscent of the late eighties (says the "Zeehan and Dundas Herald") has set in on the Lefroy field, but this time it is not alluvial gold, but deep leads. The indications found in the gutter in the New Pinafore, on which a shaft is now being sunk, have led to numerous syndicates being formed, with capital, according to their prospectuses, varying from £3000 to £10,000. Many of these have been successfully floated, and large areas have been secured, but, so far, there has been nothing to warrant such a rush. It is not unlikely (adds the journal) that the committee of the Stock Exchange will step in to enquire into the bona fides of many of the propositions put forward. On the 4th inst. the Lefroy Leads Mining Co. was formed, with a capital of £10,000 in 20,000 shares of 10s. each.

Mr. Radcliff, works manager and chemist to the Radium Hill Co., has made the following interesting announcement to the secretary:—"The formation of the bank or working stock of radium is now sufficiently advanced to permit of the regular withdrawal from it at short intervals of material for standardisation. Being now in possession of international substandards, I propose in future to report each month the number of milligrammes of material withdrawn in this way, and available for sale. I have now available 40 milligrammes of standardised bromide. This amount is, of course, only a fraction of the total stock now being worked up in the laboratory. The reports will, therefore, in future, state the exact quantities of bromide available for sale without further treatment, instead of giving an estimate of the radium recovered each month, as formerly." The secretary of the company reports that "the 40 milligrammes radium bromide notified in the report of the 5th inst. as being available, has been sold—10 milligrammes to a local medical gentleman, and the balance to a buyer for the Continent. A further repeat order has been received from one of the local medical gentlemen, which is having attention." The price obtained has not been disclosed.

The Lake View and Star Ltd., Kalgoorlie (W.A.), have declared an interim dividend (the 6th) of 6 per cent. (less income tax of 1s. 2d. in the £1), payable on December 29.

The Edna May G.M. Co., Western (W.A.), will pay a dividend of 2s. per share on January 9, amounting to £4285.

The 16th dividend of the Bourke's Hill Tin Sluicing Co., Emmaville (N.S.W.), 6d. per share, is payable on the 22nd inst.

The South Australian Oil Wells Ltd. has just secured the rights to search for oil by boring over 82,000 acres in the south-west district of that State.

Dr. Grebin, Commonwealth oil expert, left Melbourne for Papua on Monday last. Prior to his departure, he secured one of the Victorian Mines Department's drills, which was put into shipshape order for boring for oil. It appears that some difficulty has been experienced by Dr. Grebin in securing the right class of equipment for this work, and the good offices of the Victorian Mines Department were sought in order that the work might be expedited.

A third call of 6d. per share has been made by the directors of Chillagoe Ltd. (Q.), payable on or before January 5. At present the shares are paid up to 9s. each, and after the present call is in there will remain 6d. per share still payable when required.

According to a telegram from the manager of the Mammoth copper mine (Q.), all the stope faces throughout the Chieftain lease have been bulk sampled for an average value of 9.1 per cent. over an average width of 9ft. In development work the average value of the ore in the bottom of winze from the lowest level is 17.8 per cent. copper.

At last week's conference of the A.E.D.A., in Melbourne, it was stated that some of the men "locked out" at Eaglehawk and Beaufort (V.) because the miners declined to work with non-unionists, had accepted positions as watchmen, working seven days for 37s. 6d. a week. No objection was taken to the men's action in working so long for so little pay; but that was probably because they were "scabbing" in a trade other than their own. The union is making up their earnings to £3 a week each.

The mining registrar at Kanowna, in the north-east Coolgardie goldfield (W.A.), reported last week that three tons of stone from Vallance and Blake's lease, at Mulgabbie, yielded 488½ oz. of gold. Two tons from Clancy and Scholz's claim returned 311 oz. of gold. The Perth Mint averages the W.A. gold brought to it for sale at £3 10s. 2d. per oz., so that the value of these 5 tons of stone will be approximately £2800.

The work of replacing the Elmore plant at the British Broken Hill mine (N.S.W.) by the erection of a Minerals Separation zinc concentration plant, has at last been completed, and the new plant was put into commission on the 5th inst. This is the first instalment of the extensive improvements determined upon by the directors early in the year.

It is announced that the whole of the 24,000 preference shares of the Annan River Co., Cooktown (Q.), offered at a premium of 10s. per share, have been applied for by shareholders. The pumping plant and pipes have been ordered, and will be delivered about March next, and the erection is expected to be completed in July, 1914. The new pumping plant will make available about 6,000,000 gallons of water daily, permitting the treatment of from 35,000 to 40,000 cubic yards of tin-bearing material per month.

The directors of the Mount Morgan G.M. Co. Ltd. (Q.) have declared a quarterly dividend of 1s. per share, payable on January 2, and amounting to £50,000, making £200,000 for the year.

Our Adelaide correspondent writes:—"Mr. J. Bowie Wilson, who was commissioned to report on the Radium Hill (Sydney) Co.'s mine, at Olary

(S. Aus.), recommends that a number of improvements be carried out at the mine. The plant on the mine, he states, has been badly designed, but that certain experiments have been made with the ore it will be unwise to spend money in alterations. Mr. Wilson considers it is quite impossible to carry out concentrating experiments on the mine. After a careful examination of the country held by the company, and consultation with the manager (Mr. Johnson), Mr. Wilson recommended that the company abandon some of its leases, and confine its attention to 160 acres.

A party of prospectors, headed by Benjamin Hassall, who have been working for the past few weeks on the flats along the Beatrice River, not far from Herberton (Q.), have met with encouraging results. Mr. Hassall was at Malanda recently, and in an interview stated that he and his party had struck rich wash on the lower end of their prospecting claim, and that fair average samples yielded coarse gold, at the rate of 22 gr. per 40 lb. dish net weight. After the removal of an obstructing granite bar, the river will be diverted to facilitate sluicing of the deposit, the extent of which is rather limited. The locality of the new find is 31 miles from Herberton, near the old road to Innisfail, and about nine miles from Millaa Millaa, above the junction of Adam's Creek with the Beatrice River. Numerous parties of men have left Malanda, Kureen, and Herberton for the scene.

The National Bank of New Zealand Ltd. has declared an interim dividend at the rate of 12 per cent. per annum.

At the general meeting of the shareholders of the Malaya Tin Corporation, held in Sydney last week, the necessary resolutions vesting in the new corporation the assets, options, and concessions of the Malay Peninsula Syndicate, were adopted. The chairman (Mr. C. H. Kerry) gave a resume of the operations of the syndicate up to the date of its absorption by the corporation. The funds of the present company would be used only for the purpose of meeting the expenses of working staffs and administration, and would be replenished from time to time, as sub-companies were promoted. The corporation, as vendor, would receive from each of these sub-companies blocks of fully-paid shares, and the intention was to lodge and hold these as assets, and not liberate them on the market.

## PERSONAL.

Mr. J. L. Newbigin, well known in electrical circles in Melbourne, yesterday entered into the bonds of matrimony.

After residing at Zeehan (T.) for nearly 22 years, Mr. T. Vincent, general manager of the Mt. Zeehan (Tasmania) Silver-Lead Mines, the Zeehan-Dundas Mines, and the Zeehan Queen Ltd., has decided to reside in Launceston, and took his departure from Zeehan on the 4th inst. Although he took no part in public, Mr. Vincent did a great deal for the town and district, besides taking an enlightened interest of the affairs of the State generally. He declined any public function as a farewell, but the Warden (Mr. Fisher) and a number of other gentlemen met at the railway station, and wished him and his wife health and happiness in their new home. Their eldest son, Mr. T. H. Vincent, succeeds his father in charge of the several mines with which he was connected.

Few announcements made in connection with the approaching visit of representative scientists to Australia next year, have created greater interest than the latest, which is that a hope may be entertained that Madame Curie, who shares with her late husband the distinction of having discovered that romantic metal, radium, will be one of the party. English folk generally have welcomed the advent of the lady scientist, and there was a very widespread feeling of resentment at the refusal of the French Academy to receive Madame Curie to membership, that fact adding something to the warmth of interest taken in that lady's attainments.

The attempted assassination of Sir Lionel Phillips outside the Rand Club, Johannesburg, last Thursday, caused a great sensation in the Transvaal capital, but the injuries inflicted were less serious than his assailant intended. Four shots were fired, but only two took effect, one of which entered the liver and produced unconsciousness. Sir Lionel is a member of the firm of Wernher, Beit and Co., which owns several of those Rand mines at which industrial troubles occurred last June. This is not the first sensational incident in the baronet's career, for he was one of four Uitlanders who were sentenced to death in 1896 by Judge Gregorowski in connection with the historic Jameson raid on Johannesburg. The would be murderer, a Russian named Nissum, was seized in time to prevent his suicide. Later cables stated that Sir Lionel Phillips has escaped unfavourable complications, and that it would not be necessary to operate for several days.

Mr. Walter Donath, of Linda Valley (T.), who has lived in the Mt. Lyell district for about 24 years, and has throughout that period been employed solely by the North Mt. Lyell Copper Co., and subsequently by the Mt. Lyell Mining and Railway Co., has at last severed his connection, and, in conjunction with Mr. Wm. Elkin, has gone to Corinna in connection with the State prospecting operations.

Mr. B. V. Barton has been appointed to succeed Mr. E. A. Whitehead as engineer to the Broken Hill Water Supply Co., at Broken Hill (N.S.W.). Mr. Barton was for a long time with the Zinc Corporation, which he left to assume the management of the Junction mine. This latter position, however, he held for a brief period only.

Mr. J. H. Tonkin has been appointed engineer and valuer to the Karkarooc Shire (V.), in succession to Mr. J. R. Kemp, C.E.

Mr. Ernest S. Usher, formerly contour and underground surveyor for the Victorian Mines Department at Bendigo, has been engaged by the Commonwealth Government to go to Papua in connection with the oil territory survey. The Victorian Mines Department thus loses the services of a very capable man. Mr. Usher was offered his present post at an enhanced salary.

News was received by the Minister of External Affairs, on the 15th inst., that Dr. Gilruth had completed his tour of the Northern Territory and returned to Darwin. From the Queensland railway terminus the Administrator travelled about 1000 miles by motor car, and after a couple of tyres had blown out and left him in the lurch, he completed the journey by travelling 900 miles on horseback.

Mr. John Mitchell, who has held the office of principal of the Newcastle (N.S.W.) Technical College and School of Mines for the past 16 years, will retire at the end of the year. It is understood that Mr. C. Sussmilch, of the Sydney college, will succeed Mr. Mitchell. When Mr. Mitchell came to the college, the attendance of students was small, and the work of the different classes was not taken up in earnest. All that has been changed under his direction, and the 800 students annually enrolled go in for the various courses of study as if with the full intention of applying the knowledge gained in a practical manner. In the same time, the instructional staff has been increased from eight to 21, exclusive of the principal, and amongst the more important classes established are electrical engineering as applied to mining, mechanical engineering, fitting and turning, blacksmithing and pattern-making, and several classes in the higher branches of science. From the assaying and mining departments of the college, students have gone to take up responsible positions at Mt. Bischoff, at Chillagoe, Cockle Creek, and at other mining and metal treating centres throughout the Commonwealth. In this and in other directions, the Newcastle college holds a good reputation in all parts of Australia, and for this much credit is due to Mr. Mitchell and to the staff which has so loyally supported him.

## WESTERN AUSTRALIAN MINING.

Kalgoorlie, Dec. 8, 1913.

Mr. D. L. Doolette, after a visit to the Bullfinch G.M., states that there is no reason for the slump in the price of the scrip, as the mine is opening up beyond expectations in the northern series, where the ore averages 35s. to 40s. per ton. The slump is fully justified even with ore assaying 35s. to 40s. per ton, as past returns prove. From March to October the mill has treated 40,381 tons for £115,202, or 57s. per ton, at a cost of £43,163, or 21s. 4d. per ton, leaving a profit of £72,039, or 35s. 8d. per ton. Out of this profit the bank advance of £26,085 and dividend £23,807 stand to be deducted. The ore reserves before the mill started were estimated at 177,300 short tons of an extractable value of 42s. 2d. per ton, of which 62 per cent. was in the northern series, 22 per cent. in the southern, and only 16 per cent. in the main rich lode, on which the mine was floated. As the ore so far treated has been 14s. 10d. per ton above the estimate, it is apparent that an undue proportion of the rich main lode, which has petered out at the lower levels, has been milled, and that the grade must shortly fall to 35s. to 40s. by assay, or say, 31s. to 36s. recoverable, and the profit decline to 11s. to 16s. per ton. On a monthly output of 6000 tons this means £3300 to £4800, or say, £39,600 to £57,600 a year. After allowing £10,000 for London and Perth office expenses, directors' fees and depreciation, there would remain a net profit of £29,600 to £47,600, or only sufficient to pay a dividend of from 1s. to 2s. per annum. Until it is proved that the lodes live to a greater depth than 300ft., investors will continue cautious in holding the scrip, as they have had a very severe lesson in the past by listening to the prophecies of those at the head of affairs.

A diamond drill bore from the 2870ft. level of the Ivanhoe penetrated the porphyry dyke at a depth of 3067ft., and passed out of it at a depth of 3200ft., and re-entered quartz dolerite. According to geological probabilities the gold contents of the east lode will show a marked improvement in the dolerite, and put the Ivanhoe in a much stronger position. As it is, there are 4½ years' ore reserves in the mine, besides £250,000 invested, and even after the monthly profit next month is reduced from £14,000 to £10,000 dividends of 3s. a quarter, or 12s. per annum, will be paid. At the present price of 55s. for the scrip, this yields 22 per cent. per annum against a more or less doubtful 10 to 20 per cent. on the Bullfinch scrip, even at 10s. apiece.

The Golden Horseshoe is still pushing on developments at 2780ft. After passing through a new lode, 80ft. east of the shaft, worth 42s. 6d. for 48in. wide, the crosscut at 155ft. east has penetrated No. 4 lode, where it is 16ft. wide, worth 59s. 6d. per ton. This same lode was passed through in a crosscut 370ft. north, where it assayed 127s. 6d. for a width of 15ft. The company has recently been earning a profit of £4000 a month on ore returning 25s. per ton. On a monthly output of 28,800 tons 1 dwt., or 4s. 3d. per ton, increases the profit by £6120, so that when ore from No. 4 lode is included in the returns the company's profits are likely to be materially increased. The danger to the Horseshoe is that the porphyry dyke, which impoverished the lodes in the Great Boulder and Ivanhoe, is pitching south and underlying west, and will be found in the Horseshoe before long. However, the ore shoots in Nos. 2 and 3 lodes are found to continue much further south in the No. 14 and deeper levels of the Horseshoe, and this will add materially to the mine's ore reserves.

Diamond drilling is still proceeding at Fraser's group of mines at Southern Cross, but no detailed results are ever published by Government, although £7000 of public money has been spent to date. No. 4 bore, sunk at an angle of 80 deg., has been stopped at a depth of 540ft. This bore passed through the lode, but no assays are available. No. 5 bore has been started 150ft. north of No. 4, and is being sunk at an angle of 60 deg., and is already down 27ft. Mr. W. J. Loring took an option on the property in May, but progress was so slow and the market so dull that he decided to abandon it. Since the end of September the Goldfields Diamond Drilling Co. has been boring on contract, as the work done by the Government was too slow and costly.

## METAL QUOTATIONS.

(From Our Correspondent.)

### By Cable.

London, Tuesday.

There was a slight improvement in the demand for copper, both for spot and deferred delivery, and prices advanced accordingly, but the case was different with electrolytic, which on two days went as low as £66 15s., or £1 below the lowest quotation of the previous week. Tin continued to go down, reaching £170 for spot and £171 5s. for three months' metal. Lead had a fair advance, and spelter remained firm. The previous week's highest quote for silver was not reached, but the week's average was better.

COPPER.—Monday's rate for spot was £65 12s. 6d., showing an advance of 5s.; there was then a fall to £65 7s. 6d., but later prices were £65 10s., £65 15s. and £65 12s. 6d.

For three months' delivery the quotations were £64 12s. 6d. (an advance of 7s. 6d.), £64 6s. 3d., £64 10s., £65 (two days).

Electrolytic, which began the week by falling to £67 10s., fell to £66 15s., rose to £67 10s., and went back again to £66 15s. Yesterday's quotation was £67.

TIN.—A drop of £2 brought the opening quote for spot to £172 10s., after which it went to £170; the price then rose to £171 15s., dropped to £171 12s. 6d., and recovered to £171 15s.

Three months' bookings were made at £173 15s (a fall of £1 17s. 6d.), £171 5s., £173, £172 15s. and £173.

LEAD rose on Monday to £17 11s., then successively to £17 12s. 6d., £17 17s. 6d. and £18, after which there was a drop to £17 12s. 6d.

SPELTER was unchanged at the advanced rate of £21 5s.

SILVER opened with a fall of 3-16 to 27 1-16d., dropped to 26 15-16d. and 26¾d., and then improved to 26 13-16d.

ANTIMONY.—The quotation for Star antimony was again £28, and 50 per cent. ore was firm at £6 5s. per ton.

WOLFRAM (70 per cent. ore) was unchanged at 32s. 6d. per unit, or £115 10s. per ton.

MOLYBDENITE remained at 3s. per lb., equal to £336 per ton.

MANGANESE (50 per cent. ore) again brought 9d. per unit, or £1 17s. 6d. per ton.

# THE INVESTOR'S COLUMN.

## Some Companies Attracting Attention To-day.

(By our Sydney and Melbourne Exchange Reporters.)

### Melbourne.

Madam Berry, Kingston (V.). — Although this famous old company went out of existence 17 years ago and its scrip can now have but a sentimental value for those who were fortunate enough to have been shareholders in it, yet the record of its operations has lately been referred to or sought for very often "On 'Change." The reason for such a recrudesence of interest is not hard to find, and it has had a parallel occurrence on many previous occasions, particularly when some new silver lead proposition has been placed on the market. What mining investor has not heard it frequently stated that some or other outcropping mineral deposit may prove to be another Broken Hill? But unfortunately such a sequel to a great Australian mining romance remains yet to be told; so far no second Silver City has risen from the plain, and the Maroomba, C.S.A., Iodide, Mineral Hill and many others have either ceased to be or are eking out a humble existence. Their wealth is yet to be discovered, and the comparison with the Barrier mines, however moderately it may have been expressed, seems now untimely and quite unjustified. And how will the mines of the Ararat field, which are now attracting in an unusual degree the attention of the public and the Stock Exchange—how will they fare when their records are compared with that of the Madam Berry, the greatest of all Australian deep lead mining companies? This is a question that Time will answer: but it may not be inopportune to give some of the figures from the last balance sheet of the Kingston company in order that the present race of mining investors may see not only how great a task they are setting the New Langi Logan and its sister enterprises, but also what wealth is contained in some of the subterranean rivers of Australia. The number of shares in the company was 18,000, and the length of the lead in the lease was approximately one and a half miles. The first dividend was paid in April, 1881, and thereafter every four weeks for 15 years similar disbursements were made, amounting altogether to £848,700, equal to £47 3s. per share. It should be mentioned also that the sum of £128,342 was paid in royalty, so that the total profits were not far short of a million sterling. The proportion of dividends to the gold won was 53 per cent., and this result shows how high the value of the wash dirt must have been, for as a general rule it is probably not more than 25 per cent. which is so received, and that, too, in what have been good payable mines. For instance, the Chiltern Valley company produced nearly 300,000 oz. of gold, that is, approximately, £1,200,000. The dividends were £237,000. The Great Southern, Rutherglen, has produced gold worth about £600,000, out of which the shareholders have received under £70,000. It will thus be seen that the Madam Berry was not only a great gold winner, but also a remarkable dividend payer, a good example of the latter attribute being shown by the fact that from one block of ground made up of 100ft. in length of the gutter by its width of 1000ft., and which was worked from the No. 1 shaft, dividends to the extent of £100,000 were received by the shareholders. The wages paid during the life of the company came to £429,597, and the directors' fees altogether to £2533 6s. 8d., say £160 per annum, equal to £40 for each director. The above amount, however, includes visiting fees and travelling expenses, £1376 18s. 8d. If these be deducted, the payment is at the rate of about £18 for the year. The shareholders in mining companies nowadays would be glad indeed if their board of administrators would be content with a yearly remuneration on a similar scale to the above, the moderation of which is all the more remarkable when it is remembered that the Madam Berry mine was not only a highly payable concern—a fact which would have justified more generous fees—but it was also of a character which necessitated very expert handling and constant watchfulness. A sufficient evidence of the difficulties consequent upon the working of a great body of water filled alluvial material was well illustrated by the final scene in the history of the old mine, when on January 26th, 1896, a heavy burst of slum and water occurred off one of the rises from a branch reef drive. The water broke away from the blocking done from the No. 1 shaft at a point known as Halleluiah, and found its way through 25ft. of reef, over the back laths in the reef drive, and washed the reef away 75ft. long and 30ft. wide. After the water and slum had eased off, the manager started to clean up the drive with 12 men, but after this had been done for a distance of 1300ft. the water and slum broke in again, and sent them back to the place from which they had started. Seeing then that no progress could be made with cleaning up the slum, it was decided to take out all the available payable wash and discontinue operations. As there had been other similar bursts of water and slum, it may be regarded as a fortunate matter that none of them were accompanied with serious loss of life. The constant possibility of such catastrophes would worry even the most phlegmatic of directors, and the fees already mentioned seem but a poor payment for their responsibility and expert knowledge. When it is remembered that in some modern companies, many of which are not even yet beyond the call-paying stage, the directors are drawing fees five or six and in some cases eight or ten times as great as did their forerunners of the Madam Berry, it is certainly very apparent that a great change has taken place in the minds of shareholders with regard to these matters. Enough has, however, been said here upon this subject, and a question of perhaps more importance from an investor's point of view is that of how will the new mines compare with the old? This much may be said: so far the New Langi Logan mine has satisfactorily answered all the questions which have been put to it. This has been done by means of the very systematic boring operations which have been carried on, and these, together with the results obtained by the companies working on the adjoining gutter, justify a belief that the wash-dirt in the great trunk lead of the district will be of good payable quality. If this be the case, then the reward to the shareholders will be on a scale commensurate with the expenditure and long period of waiting they have had to endure, for both the width and length of the gutter, as proved in the New Langi Logan, are so large that when they are taken in conjunction with the second mine, which is being equipped for the purpose of working the portion of the Cathcart gutter, which is in the company's lease, then there seems little chance of the ground being worked out in the next twenty years. As, both from a commercial and national point of view an addition to the gold reserves of Australia is greatly to be desired, the present operations in the valleys of Ararat will be watched by many persons, whether shareholders in the mines or not, with a hope that they will prove eminently successful.

It may perhaps be advisable to mention that in addition to the Madam Berry several other Kingston alluvial mines achieved a substantial measure of success, for instance, the Berry Consols, an adjoining property. There were 20,000 shares in this company, and the gold produced was worth £927,641, out of which dividends amounting to £373,000 were paid. The Madam Berry West and Berry Consols Extended were also very successful mining enterprizes.

Swallow and Ariell. — The approach of the holidays is generally accompanied with a falling off in the volume of business, although at the last moment there may perhaps be a brief period of briskness, owing to a desire on the part of some of the dealers to settle up any outstanding transactions. This temporary activity is not yet quite due, and the fact, therefore, that during last week a better inquiry set in for a long-established investment stock like Swallows, may be taken as an indication that the company's affairs are in a healthy condition, and there is reliable information that such is the case. The business continues to make good progress, even on the figures of last year, which were of a pleasing character.

It is satisfactory also to know that this improvement, or at any rate, maintenance of good results, is associated with what may be described as a conservative policy, inasmuch as the company is adhering largely to producing and distributing the foodstuffs and lines of goods which it was originally formed to manufacture. Some years ago there seemed to be a good opportunity for large profit-making in connection with fruit pulping, and an experiment in that direction was made.

The subject is perhaps not a pleasant one, but companies, like individuals, are liable to make mistakes, and it will be sufficient to say that the experiment was not a success, and that the management is not taking on many ventures of that sort at present.

About this time last year 20,000 7½ per cent. cumulative preference shares were offered to the existing shareholders in the company, and 38,000 were applied for; these shares are now being dealt in at 19s., while the ordinary shares have risen a shilling, and are now worth 21s. 6d. A further 30,000 cumulative preference shares will probably be offered to the present holders in the company when the directors consider it advisable, and will no doubt be fully subscribed. Such an enlargement of the capital would be of advantage in connection with the increasing business, and, at the same time, would put the company in a strong financial position.

Swallow and Ariells is a well managed concern, and the shares, although subject to ordinary trading fluctuations, seem a sound investment.

### Sydney.

Stagnation has characterised the mining market on the Sydney Stock Exchange during the week. It has been a matter of impossibility to infuse any degree of vitality into the market. London cabled quotations for industrial metals have shown further retrogression, which has necessarily lessened the value of our output. In the face of such circumstances it was not to be wondered at that speculators have held aloof. There are a number of prophetic people on the Stock Exchange, who stoutly aver that metals have "touched bottom," and the new year will see values on the ascendency. That may or may not be the case, but "the wish was father to the thought" in most cases. Some slight improvement has occurred in London quotations for certain copper and silver-lead shares during the week, so that the more robust speculators have been nibbling here and there, but the stockbroker has found his fish a difficult one to hook. December usually is a bad month "On 'Change," anyway. With the future of the metal prices so uncertain, the money market exceedingly tight, and the State in the throes of an election battle, where is the wonder that speculators prefer to wait a more propitious opportunity? There will be practically nothing doing this side of the New Year. Analising the banking profitse for the year just closing one gets substantial reason for their increasing firmness. The paid-up capital of the twenty-three commercial banks operating in Australia amounted to £20,943,552. The net profits for the year totalled £3,220,827, and the amount paid in dividends represented £1,749,723, while £1,066,500 was added to reserve funds. The net profits were the highest earned in any one year in the history of Australian banking, and equalled 15.4 per cent. of the entire capital. The highest dividend paid was 20 per cent., declared by the Bank of Western Australia, the Bank of Australasia coming next with 17 per cent. A great many of our banks could pay higher dividends if they chose, but they prefer the safe policy of adding to reserves. As banking profits are the barometer of good and bad seasons, the record of the year's operations must be accounted most satisfactory and give promise to more activity in business in the future. The Commonwealth Bank, like most of our Governments, is suffering from a lack of funds. That institution never did have a surplus, but now the position, as disclosed by the accounts just published, show liabilities to the extent of £5,611,440, and assets £5,560,860, a debit balance therefore of £50,580. Those figures include the savings bank department, which represents about three-fifths of the bank's resources. The Commonwealth Bank requires a larger capital of its own. Some of these fine days it will doubtless have the conduct of its note issue, which will be beneficial to its welfare. Leading copper interests have met with spasmodic attention "On 'Change" during the week, but movements have favoured the buyer. Brokers' London quotations have indicated pronounced weakness in values on that side, and the continued depreciation in the red metal has aided the depression. Mt. Elliott and Hampden-Cloncurry shares have eased, and Great Cobar shares have dropped down to 15s. 6d. That stock has lost favour and the market is a pronouncedly "bear" one. Ardlethan tin propositions have been more or less neglected. Some dealings have been effected in Carpathia shares, both paids and contribs., and the former have kept steady. Wild Cherry and Southern Cross have also found more favour with some buyers, but the rest of the field has sunk into oblivion. The manager of the Wild Cherry reported that the excavations for the battery foundation have been commenced. It is to be hoped that by the time the battery is ready there will be a large pile of ore waiting. The development work in the mine is going on fairly satisfactorily. The Carpathia likewise continues to grow up well. That mine has despatched another 130 odd tons for crushing. Mt. David shares have recently experienced a periodical boost, the value soaring away into the giddy regions of 1s., but they have commenced to come back. The faith of some of the scrip holders in the mine may be of the description that can move mountains, but it does not seem able to produce gold. Reports from the New Burragorang mine are encouraging. Those supposed to be in "the know" appear confident. Another consignment of ore has been sent to the smelters, and a further lot is awaiting the arrival of the carrier.

---

The official report on the finances of Papua for September, made available last Saturday, gives the revenue as £28,315, an increase of £3308 over that of the corresponding period of 1912, but the Commonwealth grant towards the expenses of administration was greater by £1250, so that the revenue raised locally has increased by £2058. The expenditure for the quarter was £19,760, a decrease of £3181.

## BRIEF COMMENT.

A sequel to the action arising from the objection lodged by G. H. Smith to the application of Cummings (agent for A. E. Langford, of Melbourne) for a certain lease at Cox's Bight (T.) has been found in the proposed liquidation of the Port Davey Tin Mines. At the special meeting of shareholders of this company, held in Melbourne last week, the chairman (Mr. T. Baker) stated that the vendors, with whom Mr. Langford had negotiated for the purchase of the leases, had no title to them. It appears that not until after the company had been formed and Mr. Church had been sent to Cox's Bight to report on a site for plant was it discovered that two of the leases which were supposed to have become the property of the company were actually held by G. H. Smith, with whom the company had had no transactions, either directly or indirectly. The vendors, when informed of the circumstance, stated that one Bryant was the holder of the leases in question, and it was from Bryant they had secured the option. The extraordinary part of the business is that the vendors were never able to produce any document from Bryant to show that he had any right to these leases. And yet without this the company was formed! Surely there is something exceptionally lax and unbusinesslike in the methods which characterised this promotion. In spite of this the chairman was able to find an excuse for Mr. A. E. Langford, who had negotiated for the property, and who, we take it, was therefore responsible for the promotion, by saying the board acknowledged that Mr. Langford could not be in any way held blameable, either legally or morally, for the position which had arisen. On the face of it, it is obvious that no position has arisen; it was always there, and somebody is responsible. The chairman's own statement that the vendors had never been able to hand over substantial evidence of Bryant's right to the leases proves that. In that case there was never any justification for the public being asked to subscribe for shares in the company. The whole affair is very unsavoury, whichever way it is regarded. Then the directors, feeling the position "was most unsatisfactory," after considerable negotiation decided to offer the Eureka syndicate the sum of £200 to cancel the contract. It is very evident that the promotion should never have occurred before the possession of lease instruments had been assured beyond doubt. If, as the chairman stated, the vendors had no documental evidence of Bryant's right to hand over, there was no ground for forming the company, and shareholders in it have been saddled with the cost of a blunder for which they were in no way responsible, and of which they were probably ignorant. Mr. Robinson, legal adviser of the company, further aggravated the enormity of the mistake by tracing its history and informing shareholders that the Tasmanian Mines Department had issued a plan which distinctly showed that these leases were held by G. H. Smith, though this was afterwards corrected, the department expressing willingness to hand back to Smith his application money for the two blocks in question. The upshot is that the company has sufficient funds left with which to return to subscribers £3 10s. per share if no further action be taken. Clearly, then, shareholders are invited to pay for a mistake which was not theirs. If Langford be not responsible, then the vendors would seem to be, and they are offered £200 for their cleverness in making the blunder. If not with either them or Langford, responsibility must rest with Bryant, or with the Tasmanian Mines Department; certainly not with the unfortunate subscribers.

Proceedings at the meeting of the Mt. Balfour Copper Co. (T.) last week were rather inclined to be lively. Generally, things appear to be very mixed, and the uncertainty attached to the possibility of the company being taken over by the Belgians, coupled with the fact that meantime the board is personally liable for the trifling sum of £1000 odd, kept both shareholders and their elect on the ragged edges of debate. The chairman (Mr. J. E. Taylor) pointed out that, notwithstanding assurances from the Australian Guarantee Corporation of Sydney that it had succeeded in raising the necessary capital, the broad fact remained that none had arrived, and meantime the obligation to the Tasmanian Government had to be fulfilled, and the only way to do that was to raise more funds by increasing the capital of the company. This was obviously unpalatable to the bulk of the shareholders, and Mr. E. J. Corr, who was applauded for his remarks, notified the directors that shareholders had very little confidence in them. The chairman's reply to this was that criticism was cheap, and that his resignation was already in the hands of the secretary. The terms of the company alleged to have been registered in Brussels, as briefly outlined in a cablegram, were:—Nominal capital £600,000, in £1 shares, all issued fully paid up. Working capital, £500,000, in debentures issued at £90, and bearing interest at 6 per cent. Funds to be available at the end of January next, and to be provided at the rate of £10,000 monthly. It will thus be seen that Brussels has driven rather a hard bargain, and if the present position of the Mt. Balfour Co. may be taken as a criterion, its shareholders are lucky to get that much. No finality was reached at the meeting, and, on the motion of Mr. Corr, proceedings were adjourned until to-day.

The annual report and balance-sheet of the Yuanmi Gold Mines Ltd. (W.A.) to 30th June last discloses a very dubious state of affairs, as, although the result of the twelve months' run is decidedly satisfactory, the ore reserves stand at a figure which makes the company independent of circumstances for only twelve months. The average value of the ore treated during the period shows considerable falling off, and, like all the other tricks, the same coterie of financial engineers have perpetrated, the amalgamation of two expiring properties was effected as a last desperate attempt to make a good financial showing. The yields were:—Yuanmi mine, £109,927, from 64,530 tons, average value, 34s.; and Oroya Black Range, £107,225, from 59,680 tons, average value, 36s. per ton; total, £217,152, which, with sundry items, swelled the total receipts to £217,958. Of this W.A. expenditure accounted for £135,484; London expenditure, £3197; experimental treatment, £338; exchange, £59; and depreciation, £21,800, leaving a surplus to credit of profit and loss account of £57,080, which was appropriated as follows:—Dividends, £43,750; income-tax and W.A. dividend duty, £4203; preliminary expenses, £1132; and directors' bonus, £500, leaving a balance of £7495 to be carried forward. The ore reserves of both properties, both in tonnage and grade, show a serious decline, and it is quite obvious that development work cannot be carried out at a rate which will keep ore reserves appreciably ahead of the mill. Everything is undesirable in a name if it stands for a mine, the fate of which is uncertain. Hence the disappearance of the Oroya Black Range. Hence, also, the probable disappearance of the Yuanmi when a better mine can be found with which it can be merged and its identity ultimately sunk.

Not every mining proposition is so fortunately situated in regard to valuable ground as the Tongkah Compound Tin Co., Puket, Siam. As the result of eighteen months' hard work this company has rewarded its shareholders with 39s. per share in dividends. This is by no means a difficult thing to do when the hard work is confined to turning over material worth some hundreds per cent. more than the cost of turning it over. Of course, this kind of thing cannot (or rather, it usually does not) go on for ever, and during the six months to 30th September last, the average value of the ground treated was somewhat less than that treated during the preceding six months. Still, the last period gave very satisfactory results, 320,741 cubic yards yielding 364 tons of tin oxide, or an average of slightly over 2½ lb. per yard, which, after deducting the cost of treatment, etc., showed a profit of 26.49d. per yard. The costs, also, do not compare favourably with the previous period, these being 6.08d., as against 4.69d. The increase is accounted for by heavier expenditure for repairs and renewals and prospecting and boring, which latter should constitute a separate vote, anyhow, and be redeemed by the result of that work. The total revenue was £43,500, of which £35,600 was profit. An additional £5000 had to be included to enable the paying of dividends amounting to £40,000. As the result of acquiring additional ground, which is not so good as that which the company now holds, it is anticipated that dredging operations may be carried on continuously for the next six years, without taking into consideration any other ground which may be secured, which shareholders may rest assured is being energetically searched for.

The insecurity of investment in the Latin States of America is exemplified by the present situation of the Oroya Leonesa Ltd. At an extraordinary general meeting of shareholders, held in London on November 11 last, the directors submitted a scheme for reconstructing the company on the basis of the new company having an authorised capital of £150,000 in 600,000 shares of 5s. each, of which 450,007 shares paid up to 3s. are to be offered to shareholders in the present company, being equivalent to share for share held. It was previously announced that on account of the company having to keep the show going in the face of the revolutionary disturbances with which Nicaragua has been rent during the past two years, the funds of the company were exhausted. As these funds were secured by the issue of £35,000 worth of debentures, the plight of the company will readily be seen. When it gets going, if it ever does get going, it must start with the handicap of being a long way behind scratch. A perusal of returns shows further that the company has had a struggle to extract 30s. worth of gold per ton from the ore, so the outlook is not encouraging. This company is one of a number formed with the surplus of gold won from West Australian ventures, about which the local people raised a song some years ago, being very indignant on account of the wealth which they never had the enterprise to secure for themselves being devoted to the exploitation of other than W.A. resources. The reconstruction scheme proposed is one of the countless variations of the style of finance practised by the "Oroya" clique for some years past, and in which the "heads I win and tails you lose" policy is somewhat pronounced.

At the twelfth half-yearly meeting of the Great Britain Sluicing Co. Ltd., held in Sydney last week, the chairman (Mr. R. Sands) stated that a good proportion of the profits made by the company during the period had gone to the equipment of the new plant at Y Creek. As the result of a visit of inspection by the directors, they were assured that the sluicing conditions and water supply for the new area were satisfactory. With commendable caution, the chairman further stated that if the average values proved, viz., 1½ lb. of tin ore per cubic yard, prior to the acquisition of the property, were recovered in actual operations the company would have many years of profitable work ahead of it. The plans, however, show that the company's main lead is by no means worked out, but when it is it is intended to transfer the plant to the Britain back lead.

The announcement made in the South Australian Legislative Assembly last week by Sir Richard Butler that the Government intended to offer a bonus of £5000 to the first person or company who obtained from a bore or a well in South Australia 100,000 gallons of crude petroleum, containing not less than 90 per cent. of products, under certain conditions, will be hailed with much gratification by the legion of Australian oil enthusiasts. It is not so much the value of the bonus which is to be considered, as that the offer shows a decidedly sympathetic attitude on the part of the Government, out of which much capital can be made. No doubt this offer will loom large in a number of oil prospectuses which are yet to see the light of day, and so happily childlike is human nature that many shareholders will paint rosy pictures (in oil) of balance-sheets in which the 100,000 gallons of petroleum will figure side by side with the aforesaid bonus of £5000. However, none of the aspirants have their arrangements sufficiently far advanced to render the early collection of the reward likely.

Mr. D. L. Doolette, managing director of the Bullfinch Proprietary Ltd., Bullfinch (W.A.), has unburdened himself to an interviewer to the effect that developments at the 200 and 300ft. levels have shown the sulphide ore at those points to consistently average from 35s. to 40s. per ton, and further, that at 200ft. a large, new, sulphide formation has been disclosed which averages 42s. 6d. per ton. Sulphide ore of a proportion of from 10 to 12½ per cent. is being milled with the oxidised material, and is actually improving the extraction, which, Mr. Doolette considers, quite disposes of the fear that the plant is incapable of dealing with the sulphide ore—all of which would have been quite unnecessary had Mr. Doolette seen fit to assure shareholders that the mine has still available sufficient of its rich ore (of which some people have recollections) to enable the output to be maintained for some time to come in accordance with the estimate.

An illuminating telegraphic report is that of Mr. W. G. Faul, manager of the Tindall's Gold Mining Co., Coolgardie (W.A.). After announcing that a parcel of 800 tons has been crushed for 173 oz. of gold, valued at about £606, he estimates having 50 tons at grass, and 200 tons broken underground, of the same quality. It is a wonder how the company survives on results like this. This company has the record of a long tussle with just about the lowest grade proposition in W.A., and, it may be added, quite fruitlessly. The humour comes in by reason of the fact that not only are values so low as to make the whole venture look ridiculous, but the manager makes it very evident that ore of the "same quality" is still available.

The work of re-opening the Lacmalac mine, near Tumut (N.S.W.), by the company of that name has apparently progressed satisfactorily, as the reef has now been exposed in the bottom of the shaft, and, according to the manager, is about 1ft. wide and is worth from 5 to 8 oz. per ton. In view of this, it is incomprehensible that with valuable ore underfoot the property should ever have been abandoned. Subsequent work on this property will be watched with considerable interest. The directorate of the company comprises Messrs. Frank Arantz, Sam Solomons, M. E. Pettinger, W. Stokes, and W. A. Stuart, who were elected at the first general meeting of shareholders held on the 3rd inst. in Sydney.

Further light has been thrown on the action of a section of shareholders in the Gt. Cobar Ltd. (N.S.W.), appointing a committee to consider what steps should be taken to effect a change in the directorate and to re-organise the company's policy. Mr. Pellew-Harvey, a director who recently visited the property, has reported on the condition of affairs there, and recommends a complete re-organisation of staff, a change in the general management, and the undertaking of an expert geological examination. The last recommendation is undoubtedly the most significant, because, reading between the lines, the present method of treatment is obviously not considered advisable. The position, then, must become worse before it can improve, because if the bulk of the ore reserves be highly siliceous, the present plant must be scrapped. Just exactly what this means will be realised when the huge indebtedness of the company is taken into consideration. It is hardly likely that any further burdens in this direction will be permissible, and the only thing for it seems to be a reconstruction in which the difficulty will be to satisfy all forces. It must be borne in mind that although the company has been making a profit, this has nearly all been swallowed up in interest, and the situation will not be improved by merely changing the general management. Swiftly following the action of a section of the shareholders and the recommendation of Mr. Pellew-Harvey, came the announcement that Messrs. Bewick, Moreing and Co. had been appointed general managers. Mr. A. H. Moreing, of that firm, and Mr. G. C. Klug, their general manager in Australia, left Melbourne yesterday for the Great Cobar, and the result of the visit of these gentlemen will be awaited with considerable interest.

---

# OUR BIG MINES.

## Examinations of their Yearly and Half-Yearly Reports.

(By a Mining Accountant.)

### The Hampden Cloncurry Copper Mines Ltd.

### Report for Half-Year ended July 31, 1913.

As a basis for estimating the future, the half-year just ended was vitiated on account of the strike during the months of June and July, when practically all operations were suspended. The output from the mines was smaller than it would have been under normal conditions, and the costs no doubt were unfavourably affected thereby. Nevertheless, the report has its value as a guide, but always must due allowance be made for the reduced period of production. With this preliminary notice of warning, the examination may be entered upon. As many of the leading features have already appeared in the "Mining Standard," in the article dealing with the general meeting of shareholders, an exhaustive account of the actual history may be omitted, and attention will be confined here to those facts that have a direct bearing upon the interpretation of the future.

Briefly, the underground operations were concerned with the extraction of ore from the two main mines, the Hampden and the Duchess, and with the development of the subsidiary mines to bring them to the productive stage. The Duchess ore is richer in copper than the Hampden, but the latter provides the basic material that is so indispensable to the smelters. Particularly in the Cloncurry district is basic ore valuable, on account of the preponderance of siliceous ores. The directors state that since the close of the period an important development has taken place at the No. 2 shaft of the Hampden mine, at the 350ft. level, where a drive entered a pyritic ore-body at 220ft. south. The drive has been carried to 361ft. in ore assaying from 6½ to 21 per cent. copper, and estimated to average 10½ per cent. copper. The full width of the lode has not yet been determined, except at one point, where the ore-body proved to be 8ft. wide. Importance is attached to the development, in view of the disclosure in the No. 1 shaft, where at a depth of 113ft. a well defined lode, 6ft. 6in. wide, assaying 11½ per cent. copper, was exposed. No. 1 shaft is 600ft. south of the latest discovery, and it is inferred that the lode fissure is open between these points. Though it may be too much to expect that the ore-body will be continuous for this length, the chances of a recurrence of rich lenses with intervals of low-grade filling are considered good. The supply of this basic ore for future smelting operations is a crucial factor. There are reasons for believing that matters in this respect have already arrived at a critical stage, but the report is silent upon the most vital subject.

The high-grade Duchess ore is siliceous, but contains an appreciable proportion of slime. It is pleasant to record that mine developments are still maintaining a high standard of excellence as depth is obtained. At 126ft. below the 550ft. level a winze shows ore 10ft. wide, assaying 20 per cent. copper. The main shaft is being deepened, and the next level will be opened out at 700ft. At the other mines belonging to the company the development work has not yet reached the stage where full production may be started, but no time is being wasted to bring this about. At the Trekelano mine cross-cutting is in progress at the 200ft. level, and it is anticipated that the lode will be cut at 60-70ft. from the shaft. The option of purchase over the Answer mine has been exercised, and the main shaft is being deepened with the object of proving the lode at the 200ft. level. Hopes are entertained that this mine will supply a considerable tonnage of high-grade ore. No work is at present being done at the Mascotte and Scalper mines. The Salmon mine is developing very satisfactorily. This mine will have an important part to play, and further reference to it will be made later. At the Pindora mines no decisive results have yet been obtained, three shafts being sunk in large but low grade formations of varying values.

The MacGregor mines, though not yet contributing to the output, have already created a large influence on the fortunes of this company. By fortunes it is intended to signify the valuations of the Stock Exchange. And it cannot be said that the influence has been favourable. The material effect upon this company itself has so far been confined to the purchase of the MacGregor bases at a cost of £108,750, and a subsequent expenditure amounting to over £30,000 in opening up the mines and connecting them by railway with the Hampden smelters. Satisfactory progress is being made with this line. All this necessitated a large increase of capital, and the raising of a new debenture debt after the expiration of the old. Whether the purchase will ever be justified time alone can tell, but at the present stage the consensus of opinion is that the step was not advisable. It is remarkable how little the general body of shareholders was consulted in this matter, and how little has been the information imparted with respect to the qualifications of the mine. No detailed reserves are published in the reports, and reference is limited merely to some of the development work now in progress. It is safe to say that the average shareholder knows nothing of the MacGregor mines, nor does he know the reasons leading to the purchase. The insignificant position to which these mines are relegated in the half-yearly reports is certainly not commensurate with the large sums of money that have been involved, and are still being involved. The progress of the railway is given far greater prominence, and the dilation thereupon serves to cloak the fact of how little is imparted regarding the really vital issue.

Passing from this subject, and the train of thought inspired, the next matter to claim attention is the present position of the mines, as determined by their reserves of ore. This exceedingly important factor is expressed in the following terms:—"At the 31st August the ore reserves were estimated at 255,000 tons, containing 25,640 tons of copper. No account is taken in this estimate of the large tonnage already referred to of ore developed at the Salmon mine." This effort in brevity is surpassed by the general manager's "I estimate the ore reserves at 255,000 tons, containing 25,640 tons of copper." One merely wonders why the directors thought it necessary to mention the Salmon mine at all. But the chief business of the inquirer is to discover how many of the mines, and which mines, are included in this estimate. As it stands it may mean every ton of ore that can be legitimately scraped into the reserve, from every mine—excepting, of course, the Salmon mine—belonging to this company. Or it may mean only the ore from the Hampden and the Duchess mines, or from a group of perhaps three or four of the mines. If reference be made to the report for the half-year ended August, 1912, the following information can be obtained:—

Table A.—Ore Reserves a year ago.

| | Ore. Tons. | Copper contained Tons. |
|---|---|---|
| Hampden Mine .. .. | 88,000 | 6,600 |
| Duchess Mine— | | |
| High-grade .. .. | 80,000 | 13,400 |
| Low-grade .. .. | 56,000 | 2,800 |
| Trekelano Mine .. | 12,000 | 1,680 |
| Mascotte Mine .. .. | 2,500 | 400 |
| | 238,500 | 24,880 |

The 56,000 tons of low-grade material at the Duchess cannot be classed as ore. At any rate, not until the conditions at the Cloncurry district are very much otherwise than what they are at present. The mining and treatment of lode-matter that contains 5 per cent. copper certainly will not pay the Hampden company for some time yet to come. So this 56,000 tons may be set aside for the present. The present estimates of ore in reserve shows an increase of about 20,000 tons, but how this increase has been made cannot be determined from the report. Since the date of the estimate in Table A, the output smelted has been about 45,000 tons, so the total ore developed in that period has been 65,000 tons. Which of the mines has contributed most to this increase it would be interesting to know. The sinking of a winze cannot, in itself, strictly be considered to develop ore, otherwise the Duchess mine would probably be the answer. Information of this kind is important, if not essential, but the report is barren of any such. How is the Hampden mine shaping? Whether the ore reserves in this mine are increasing or diminishing is a question that has an important bearing. The report is silent. And just here the MacGregor mines crop up again. Is the ore from these included in the published estimate? Possibly it may account for the increase. No mention of the tonnage of the MacGregor reserves has ever been made in the periodical reports of this company, and reference must be had elsewhere. As a matter of fact, the MacGregor reserves, at the time of the purchase, were in the neighbourhood of 100,000 tons, averaging about 8 per cent. copper. So it seems improbable that they have been included in the estimate under discussion. Before dismissing this unsatisfactory subject, the following details may be of use:—

Table B.—Underground History since Table A was Compiled.

| | | Half-year ended Feb., 1913. | Aug., 1913. |
|---|---|---|---|
| Hampden, ore raised .. | tons | 9,510 | 7,817 |
| Duchess, ore raised .. .. | tons | 12,121 | 11,040 |
| Estimated value— | | | |
| Hampden .. | copper p.c. | 8¼ | 8½ |
| Duchess .. .. | copper p.c. | 17 | 16 |
| Published estimate or ore reserves .. .. .. .. .. | tons | 268,000 | 255,000 |
| Copper contained in the reserves .. .. .. .. .. | tons | 27,600 | 25,640 |
| Footage of development work— | | | |
| Hampden .. .. .. .. .. .. | | 652 | 152 |
| Duchess .. .. .. .. .. .. | | 208 | 200 |
| Trekelano .. .. .. .. .. | | 345 | 178 |
| Answer .. .. .. .. .. .. | | 390 | 9 |
| Pindora .. .. .. .. .. .. | | — | 229 |
| MacGregor .. .. .. .. .. .. | | — | 124 |

It will be seen from the above table that the ore reserves have diminished in the second half-year. Though only 19,000 tons were extracted during this period, the reserves declined by 13,000 tons. So only 6000 tons of fresh ore were developed, and of this amount the Answer mine may have been responsible for the greater part. Last half-year's report stated that as the option over the Answer mine had not been exercised, no reserve of ore had been taken into account. As the option has since been exercised the reserve may perhaps have been included. If so, the meaning is not encouraging. Sufficient has been said to show that the published estimate of ore reserves is entirely inadequate as a means of information, and further, that it is actually misleading.

Turning to the smelting operations, it will be noticed in Table C that a fair proportion of barren fluxes is needed. Formerly it was estimated that the Hampden and the Duchess ores would be self-fluxing, or nearly so, but later experience has not confirmed that estimate. During the latter half-year only half the amount of barren flux was used, though the tonnage of ore fed to the furnace was much the same as in the earlier half-year. This may be due both to more basic ore having been drawn from the Hampden, or to the increased tonnage of Salmon ore-flux treated. Table C is as follows:—

| | | Half-year ended Feb., 1913. Tons. | Aug., 1913. Tons. |
|---|---|---|---|
| Hampden ore .. .. .. .. .. | | 9,487 | 8,783 |
| Duchess ore .. .. .. .. .. | | 13,896 | 12,129 |
| Salmon ore .. .. .. .. .. | | 475 | 2,122 |
| Iron Duke ore .. .. .. .. | | — | 502 |
| Purchased ore .. .. .. .. | | 1,016 | 1,208 |
| Total ore .. .. .. .. | | 24,874 | 24,744 |
| Ironstone flux .. .. .. .. .. | | 6,231 | 2,546 |
| Limestone flux .. .. .. .. | | 1,849 | 1,436 |
| Total material .. .. | | 32,954 | 28,726 |
| Metal contents of blister copper output— | | | |
| Copper .. .. .. .. | tons | 2,790 | 2,596 |
| Gold .. .. .. .. .. .. | oz. | 1,055 | 818 |
| Silver .. .. .. .. .. .. | oz. | 28,701 | 24,457 |

During the earlier half-year there were also treated 2125 tons of previously accumulated matte, estimated to contain 748 tons copper, 631 oz. gold, and 9443 oz. silver. These metals are not included in the above table. It will be remembered that the present plant started in July, 1912. The accumulation of matte was from the small experimental furnace employed before that date. The earlier half-year need not be discussed at length. Suffice to say that unusually high-grade ore was smelted, and that the treatment of the accumulated matte involves a roundabout calculation to arrive at the true results, both as regards extraction and costs. Briefly it may be said that the true extraction grade of the total ore then treated was 11.2 per cent. copper, that the cost per ton of ore was £5 1s. 7d., and of copper £48 per ton. The cost includes depreciation, Turning again to Table C, it is at least questionable whether the copper-bearing material from the Salmon and Iron Duke mines should be classed as ore. The Salmon mine is estimated to contain at least 100,000 tons of limestone flux, averaging about 1 per cent. copper. This material is rightly not included in the estimate of ore reserves. So in dealing with the value of the ore reserves of this company, the extraction-grade of the ore treated and the cost of production should be brought on the same basis. That is, the Salmon material should be eliminated from the output of ore. Eliminating the Salmon and Iron Duke fluxes, the total ore treated was 22,120 tons. After providing for slag losses, the few tons of copper provided by these fluxes may be neglected. Strictly, the purchased ore should also be eliminated, but as there are no data as to the assay value of this ore, such refinement would be incompatible with the degree of accuracy, or inaccuracy, of the calculation. Taking 22,120 tons as the ore treated, the extraction-grade works out at 11.6 per cent. copper. This figure is somewhere about the average assay value of the ore reserves. After deducting the 56,000 tons of low-grade Duchess ore, there remain in the reserves 199,000 tons of ore estimated to contain 22,800 tons of copper. The assay value of this reserve is 11½ per cent. copper. If 90 per cent. extraction be obtained, the extraction-grade would be 10½ per cent. copper. Thus the ore treated last half-year was unduly high-grade. The cost of production during the half-year was £120,077, after deducting expenses in connection with the debenture issue and the fire at the MacGregor mine. The cost per ton of ore treated, neglecting £7817 depreciation, was £5 8s. 6d., and per ton of copper £46 5s. The reason why depreciation is neglected is that this item will not affect the amount of cash to be earned from the present plant, which should be sufficient to treat the present reserves. Now, if the same rate per ton of ore be taken as the basis for the future—though this is doubtful, as the cost is more likely to increase rather than decrease—the cost of obtaining the copper from the true reserves can be worked out as follows:—The average extraction-grade will be 10½ per cent. copper (assuming a recovery of 90 per cent. copper). This means that 9½ tons of ore will be needed to produce one ton of copper; 9½ multiplied by £5 8s. 6d. exceeds £50, which figure will be taken as the future cost of producing copper. After eliminating the 2800 tons of copper in the 56,000 tons of low-grade Duchess material, there remain 22,800 tons of copper, of which 20,500 tons will be recovered. If electrolytic copper be estimated to average £65, a very fair figure, and if the gold and silver contents of each ton of copper be valued at £2 10s., each ton of copper will yield a net return of £17 10s. Total return, £359,000. This works out at slightly over £1 per share, on the 350,000 shares comprising the capital of the company. Despite the claim of the directors, the company was in debt to the extent of £13,447 before the payment of the last dividend of £35,000. Because of the change in the period of dividend payment the accounts show no disbursement in this connection. The debit at the present moment, neglecting any profit made since the close of the half-year, or any capital expenditure, amounts to £46,553. This is after allowing for £60,000 debenture debt, redeemable in 1916. The directors appear to have overlooked this little item altogether. Deducting £46,000 from £359,000 leaves £313,000 as the return to shareholders from the present reserves. This is equal to 17s. 9d. per share. Further deductions must be made for capital expenditure in the future. On the other hand, allowance must be made for the ore not yet proved in the mines, and for the ore that has been proved but not included in the estimate of ore reserves. But these are factors that cannot yet be reduced to an actuarial basis.

The net profit is about £12,000 short of the half-yearly dividend. The leading features are shown in the following table:—

Table D.—Financial Features.

| | |
|---|---|
| Revenue | £187,913 |
| Expenditure | 121,515 |
| Written-off | 7,817 |
| Net profit | 58,581 |
| Dividend | 35,000 |
| Liquid assets | 59,774 |
| Liabilities | 106,328 |
| Debt | 46,554 |

Note.—Half-yearly devidend should be £70,000. Debt allows for payment of last dividend, and for debenture redemption.

## INDUSTRIAL.

Messrs. Kay, Macnicol and Co., consulting engineers and general managers, of Broken Hill Chambers, Melbourne, announce that they have opened a branch office at Challis House, Martin Place, Sydney.

## MINING IN SOUTH AUSTRALIA.

(From Our Correspondent.)

Adelaide, Dec. 13.

Inspector H. Jones, of the South Australian Mines Department, has reported to the Chief Inspector on a number of properties in the Leigh's Creek and Burra Burra districts. A brief summary of his investigations is appended:—

Diamond Jubilee.—The land, consisting of 40 acres, situated nine miles east of Leigh's Creek, is held under a mineral claim. There are strong indications of several copper-bearing lodes traversing the property. Shafts varying from 50 to 130ft. have been put down, and a large quantity of copper ore has been obtained from the different formations. The lode matrix exposed in the different workings is well defined, consisting of quartz and ferruginous calcite and argillaceous slates, containing seams and bunches of cuprite and ferruginous copper glance. Samples have given 26.5 and 21.3 per cent. copper.

Blinman Copper Mine.—This property, situated 18 miles from Parachilna railway station, was inspected on Oct. 24. The lode formation disclosed is from 30 to 35ft. wide, and appears to go down fairly vertically. It consists of crystalline limestone, quartzite, and calcareous limestone, with specks and patches of copper ore disseminated through the rocks, and in places seams of ore one to 12 inches in width run across the formation. These veins, apparently, at different points, open out, forming large bodies of high grade ore. During the last three years 300 tons of 17 per cent. ore have been extracted. A sample taken from a dressed parcel gove 30.8 per cent. of copper, and a sample taken from a 20ft. pit gave 10 per cent.

Other properties inspected included Paull's Consolidated copper mine, New Lyell Consols C.M., Benalack C.M., West Burra C.M., Utica C.M., in all of which developmental work is being carried out.

At Tarcoola Block gold mine, during the week, 14 tons were crushed at the Government battery from the new reef between Fabian's and Ward's reefs for a return of 77 oz. 4 dwt. 4 gr. over the plates.

One or two claims are still being worked on the old Teetulpa goldfields, which boomed way back in the eighties. Traces of gold are met with, but generally speaking, the richest ore appears to have been extracted. Several reefs exposed on the Great Lionel mine vary in width from 6in. to 36in., in which it is considered probable that rich shoots of ore will be met with where the east and west veins intersect the main reef. There are fair prospects of obtaining payable quantities of the yellow metal in several other properties in the Mannahill and Wadnaminga districts. Companies are devoting a good deal of attention to the treatment of old dumps, most of which show traces of gold.

A good deal of support is being accorded the South Australian Oil Wells Co., in the south-eastern districts of South Australia. The launching of the company was at first viewed with a certain amount of distrust. During the past week Mr. Geo. D. Meudell, one of the directors of the company, has been visiting the Mt. Gambier district, with a view to explaining the proposed operations of the company. During his sojourn Mr. Meudell adopted the somewhat novel means of bringing home the importance of the oil industry by delivering several public lectures. It is considered likely that nearly sufficient capital will be forthcoming from residents of the various districts in which the company holds options to test the worth of the theories regarding the existence of oil in these particular districts. Shares are being freely subscribed for.

An amalgamation has been effected between the Wallaroo Phosphate Co. Ltd. and the Mount Lyell Mining and Railway Co., so far as the business and undertaking of the latter company in South Australia are concerned. At an extraordinary general meeting of the Wallaroo Phosphate Co., the amalgamatin was unanimously agreed to, and the company voluntarily wound up. The new company has been registered under the name of the Wallaroo-Mount Lyell Fertilisers Ltd., with a capital of 400,000 shares of £1 each, of which number 336,900 will be issued to the present shareholders of the Wallaroo Phosphate Co. and Mount Lyell Co. The directors of the new company are Messrs. F. H. Snow, G. H. Prosser, F. C. Howard, H. G. Darling, representing the Wallaroo Phosphate Co.'s interests, and Messrs. Bowes Kelly, Colin Templeton, and Lindsay Tulloch, representing Mt. Lyell interests.

## Alunite in South Australia.

Recently it was reported that a rich deposit of alunite had been discovered at Carrickalinga Head, on the south-eastern shore of Spencer's Gulf, South Australia. The Government Geologist (Mr. L. Keith Ward) has just issued an exhaustive report dealing with the occurrence, in which he states that the alunite exposed is of high quality. The success of the enterprise, he observes, will very largely depend upon the quantity of vein matter available, and the proportion of vein stuff to country rock in the stockworks. The alunite is of exceptional purity, and where unaltered by weathering is snow white. It occurs in compact micro-crystalline aggregates, and breaks with a conchoidal fracture. A freshly broken surface has the appearance of unglazed porcelain. The mineral is brittle, and massive specimens are easily broken into fragments. A noticeable feature of the weathering is the fact that it proceeds inwards from the edges and corners of the veins in such a manner that spheroidal blocks of ore are found immediately below the surface. The rounding is due to gradual weathering in situ, not to attrition. A few specimens taken from various exposures was bulked to form an aggregate sample of the picked stuff, and on being analysed by the departmental analyst (Mr. W S. Chapman) was found to contain:—Sulphuric anhydride, 35.81; alumina, 34.90; ferric oxide, 0.64; lime, minute trace; magnesia, minute trace; potash, 10.36; soda, 1.12; water at 100 deg. C., 2.25; water above 100 deg. C., 13.74; silica, 0.66; phosphoric anhydride, 0.28; chlorine, 0.55—100.31; less oxygen equivalent to chlorine, 0.12—100.19. The alunite occurs in complex vein systems, which are only partly exposed in the excavations that have been made. The component veins of the vein systems vary in thickness from an inch or less to an observed maximum of 3ft. The veins strike and dip in all directions, their orientation being dependent upon the fracturing at the immediate place in which they are developed. Each group of veins constitutes what is commonly known as a stockwork, that is to say, an assemblage of veins traversing a shattered rock mass in all directions. In the case of the alunite bearing stockworks under discussion, the veins are small, and the blocks of country rock are so intimately distributed among the veins that both veinstuff and barren country must be mined together. The belt which contains the principal vein system has a course which is nearly meridional. The zone within which the chief prospecting work has been carried out extends for a length of 10 chains, and a width of about two chains. This is the area in which the principal known veins are situated. No other mineral has yet been found immediately associated with the alunite, but two narrow veinlets of calcite were observed occurring separately in the vicinity of the alunite veins.

After considering their verdict for about 5 hours, the jury, at Ballarat (V.) Criminal Court, who heard the charge against Thomas Abrey of attempting to murder Thomas Tyers and John Roberts, at the Beaufort Deep Leads mine last October. found that someone had thrown the shaft door down the shaft after the two refugees, but that they could not determine by whom it was done. Mr. Justice Hood then ordered the discharge of the accused, whereupon the Crown Prosecutor (Mr. J. A. Gurner) announced that the Crown had filed a second presentment against him, to the effect that he threw the door down the shaft with intent to do grievous bodily harm to Roberts and Tyers. On the second charge Abrey was remanded to appear at the February sittings of the Court, and his bail was renewed. The two charges against George Thompson of having (1) feloniously and (2) unlawfully shot at John Tyers on the same occasion were then heard, and on the second day Mr. Justice Hood, addressing the jury, said that a cowardly, disgraceful and illegal thing had been done by somebody. A number of men had started to destroy property and use violence. There was no justification for firing a shot, and it was for the jury to say if they were reasonably satisfied that Thompson fired it. If they were not satisfied, then they must find him not guilty. After a retirement of over two hours, the jury found Thompson not guilty on both counts, and he was discharged.

In connection with the Lacmalac gold mine, near Tumut (N.S.W.), which was recently reopened after many years of idleness, the manager reports the reef in bottom and ends of shaft dollies very well. The prospects are worth 5 oz. to 8 oz. of gold per ton, from about 10 inches to a foot of material. The actual ore should go anything up to 8 oz. gold per ton.

Included in the collection of tin slugs which belongs to the Tasmanian Museum, Hobart, is one which is of special interest, for it is described as the nugget found by "Philosopher" Smith, which led to the discovery of the Mount Bischoff tin mine. Amongst the finest exhibits are some magnificent specimens of crocoisite, or crocoite, from the Adelaide mine at Dundas, lent by the Mines Department. This very rare mineral is a form of chromate of lead, and is made up of masses of reddish crystals.

# NEW SOUTH WALES MINING.

## Broken Hill.

(From Our Correspondent.)

Broken Hill, December 12.

This is the mineral history of Broken Hill for the past four months, revealed through export figures:—

| | |
|---|---|
| August, value .. .. .. .. .. .. | £382,242 |
| September, value .. .. .. .. .. | 402,720 |
| October, value .. .. .. .. .. .. | 410,901 |
| November, value .. .. .. .. .. | 407,694 |

Although values were lower for November, the tonnages were greater, but the lower value of metals became a factor. The tonnages of the chief lines, lead and zinc concentrates, are worth comparing:—

| | Lead Cons. | Zinc Cons. |
|---|---|---|
| August .. .. .. .. .. | 27,982 | 31,265 |
| September .. .. .. .. | 30,158 | 35,881 |
| October .. .. .. .. | 29,404 | 38,818 |
| November .. .. .. .. | 30,795 | 39,557 |

The November figures would have been larger but for the water trouble. This upset all the mines. A couple were glad of relief, so as to effect machinery repairs; and the December upheaval gave the mines generally another chance. If managers were wise, so as to placate the men, they would, during the Christmas vacation, close the mines for actual holidays only. Carrying on production as usual between Christmas and the New Year, the mines would be able to even up their output, and would also give the men a chance to earn the money they lost through the stoppages.

Just here let me mention that the trouble between the miners and the mines which was threatened a little while ago, and which was expected to solidify at the end of the year (the agreement was not to be regarded), is not being seriously considered for the moment. The unions had such a set-back in their latest labour disputes that the crowd who was going to get all they wanted or close the mines had a second thought. Things are now expected to run smoothly, at least for a time. Pinpricks happen daily, but the points so far have quickly been blunted.

To sum up, Broken Hill at the present moment, one can truly say—despite the lower price of metals—it was never so prosperous; the men are making big wages everywhere, but having learnt their lesson, they are for the most part banking their profits. The mines insist on the men working, but the men score by it.

If a few agitators were dead and below ground Broken Hill would not be too bad a place for employee as well as employer. There is no leisured class in Broken Hill—everyone is a worker.

The British Mill figures for the fortnight ending December 6 showed crudes averaging 12.7 per cent. lead, 7.2 oz. silver, 11.6 per cent. zinc.

Results were good, but the tonnage was low owing to the adjustment working of the new tube mill and minerals separation plant—and the water.

I have said to-day very little about the water trouble—it is being overcome, and mines and city for the time being have all the water they want. the water company is apparently striving to do all it should do. Moreover, the erection of the pumping plant at the Umberumberka works has started, and March may see the new service complete.

The Junction has won its case against the Junction North, and may now have a few pounds left to meet some of its debts. Its plant felt the strain of the water trouble, as well as others, and a fortnight's work meant only 1218 tons treated for 158 tons of concentrates. The concentrates were worth 58.1 per cent. lead, 26.0 oz. silver, and 4.4 per cent. zinc. The underground workings are looking well, but even lead at £18 per ton will not pay under present arrangements.

Block 14's work for a week was 330 tons carbonate ore and 270 tons sulphide ore. Small, but the water again.

Zinc Corporation, which has a private supply of water, struggled through the recent worry, and its November tonnages were higher than those of October, and the estimated net profit was only a few pounds less, the result of lower metal values. Still, £14,439 is not too dusty for the month.

Again, the water disturbance—Junction North, But the figures read well:—

Treated.

| | Tons. |
|---|---|
| Mines crudes .. .. .. .. .. .. .. | 1616 |
| Purchases ore .. .. | 920 |
| Slimes .. .. | 790 |
| Sandy tailings .. | 178 |

Produced.

| | Tons. |
|---|---|
| Lead concentrates .. | 600 |
| Zinc concentrates .. | 338 |
| Middlings | 198 |

South Blocks figures main shaft down to 1327ft., values at 1050ft. level:—

| | Lead. | Silver. | Zinc. |
|---|---|---|---|
| South drive .. .. | 14.9 | 2.2 | 9.9 |
| North drive .. .. | 14.0 | 2.2 | 9.0 |

Although no figures are given for the South, North and Central, they still remain about the best three propositions along the line of lode.

## Lithgow and District.

(From Our Correspondent.)

Lithgow, December 11.

News from the direction of the old Cow Flat Copper Workings states that mining operations there are moving along briskly. Messrs. Garbutt's Mountain Run Copper Mine is working satisfactorily, and some very fair ore is being obtained from the deposits. Prospectors on the well-known Belmore property (in the same locality) have ceased operations temporarily. Other mining properties are working along steadily. It is stated on good authority that a wealthy syndicate will shortly commence operations on the limestone deposits in the vicinity of Cow Flat.

The plant on the Macquarie River Hydraulic Sluicing Company's property, situated in the northwestern portion of this district, has been shifted across the river to a spot known as Suttor's Long Nose, and the re-erection of the machinery is proceeding. A good clean-up before Christmas is hoped for.

The Ironclad Mine, at the head of Long Gully, and Tin Ash Gully are to be given another trial. The lode runs north and south, with a dip to the east. The oxidised portion of the main lode was formerly worked by an open cut, and carted to the battery, but the new company intends working it on a different and more modern method. When the sulphide lode was reached, a dry crushing (Krom roll) plant and chlorination plant were erected, but, unfortunately, were not successful in treating the ore, owing to a chemical reaction taking place in the reverberating furnaces. Waterjackets were next obtained, but the ore not being suitable for waterjackets, it had to be despatched to the smelting works at Dapto, where the results obtained have been eminently satisfactory. Contiguous to the main lode are many other reefs, and from these splendid crushings have been obtained. The main shaft, 510ft. deep, has been timbered to the 300ft. level, and in several of the stopes there is payable ore in sight. Down to the 100ft. level the ore is free milling, but below that it is refractory, containing a fair percentage of copper; but the gold contents are well maintained, so that the bulk of it will pay to sell straight away to the smelters.

Messrs. Maris Brothers, who received Government aid some time ago to sink a shaft on the South Star property, are now getting on payable stone.

Messrs. Lougher and Party, who have been hydraulic sluicing on the Turon River, are not able to work at present, as there is not sufficient water in the river. During the last few months, however, nearly 2000 cubic yards of wash-dirt were treated for the satisfactory result of 2s. 6d. per yard. In addition to treating the wash, considerable development work had been carried out. Messrs. W. Baxter and Party are also sluicing on the Turon River with the aid of an oil engine and a centrifugal pump, and are getting payable results. The No. 1 plant of the Turon River Gold Dredging Company, in a run of 130 hours, last week, obtained 48 ounces of refined gold.

The Portland Gold Mining Syndicate have been granted three months' suspension of labour conditions on their prospecting areas at Turpin's Gully.

## South Coast.

(From Our Correspondent.)

Wollongong, December 13.

Gold mining at Mount Momsen, Wulumla, has only one feature of interest just now—the operations of the New Venture Syndicate. A winze is being sunk from the 150ft. level on what, according to local standards, is very good ore. This is the only holding on gold at present.

One hundred tons of molybdenite and bismuth from the mine at Whipstick are now being crushed, results so far reported up to £800.

The Bimbimbi Company, Moga (Moruya district), are applying for a suspension of labour conditions. Local feeling on the question is opposed to the application being granted. The proposition has done no good since a company was formed.

---

The report of the Sulphide Corporation (N.S.W.) for the year ended on June 30 last, made public in London at the end of last week, states that after paying the interim dividend of 10 per cent. the amount to the credit of profit and loss account was £307,684. A further dividend of 10 per cent. was declared for the year on both preference and ordinary shares, and £25,000 was added to the reserve for contingencies, while the balance carried forward was £186,434.

# VICTORIAN MINING ACTIVITIES.

## Ballarat and District.

(From Our Correspondent.)

The Williams Fancy No. 7 drive has apparently got on to the right track at last. There is no doubt that the lode in the face is identical with the lode that gave good dividends in the level above for the greater part of the past year, though the shoot was somewhat late in appearing beyond the break. There is now 3ft. of stone, worth 8 dwt. per ton, in the face, which is in 145ft. from the break. The ore body is a little narrower than it was last week. It is lying between good walls. No. 3 rise is up 73ft. in good solid quartz, and stone is going away on the west side. Here the quality is about 6 dwt. The stopes continue about the same in the No. 6 level, and will just about last until stoping is in full swing in the bottom level, a matter of about three months. There is a good area of unworked country to the south. It is interesting to find that the holders of the southern lease failed to float it within the time stipulated by the last Minister of Mines, and now the lease appears to be neglected, as the Williams' Fancy board, who sought to obtain the lease from the holders on the ground of non-compliance with the labour covenants, apparently intends to do nothing with it for the present. The chief difficulty that faced the promoters of the new company was that of being faced with a sink of from 900 to 1000ft. to reach the line of country now being exploited in the older mine. Anyway, the Fancy company has plenty of ground available for prospecting. A crosscut was put out from the end of the south drive at the No. 6 level to see if the lode had been displaced in that direction, but after going 30ft. in clean country, it was stopped. The company has about 20 tons of pyrites on hand, and the Christmas clean-up of copper plates, etc., should add 180 oz. to the regular output. They will have a general clean-up this week. Allowing for the pyrites, and including £1000 on reserve, the company has nearly £2000 at credit, and the board can, if disposed, comfortably declare a dividend of 1s. for Christmas or New Year.

The Llanberris No. 1 pursues the even tenor of its way. Another dividend of 6d. has been declared, and the credit balance will remain about £1600 or £1800, of which £1000 is on fixed deposit. Operations are chiefly directed to the 1030 and 1130ft. levels, men being engaged repairing the 1230ft. level; when going south a fair body of stone is partially down into the drive. A fair face of payable stone is presented at 1030ft. south, where they are also winzing off on the west side. Here a full face of stone, in which gold is seen. The stopes above show full faces of profit-giving ore, and to the north payable veins are being worked. An inter drive has been started above the 1130ft. level in a fair face of stone, and the stopes and the drives on veins are giving satisfactory returns. They hope to get the downward continuation of this stone at the 1230ft. level.

The Scarsdale board has decided to open out at 275ft. for the No. 3 level. The shaft is down 285ft. in a make of stone giving promising prospects of gold, and discharging a strong stream of water. This is to be driven on northerly at once. The prospects are held to be good, as the 200ft. level proved the existence of fair bodies of payable stone underfoot, as well as overhead, the drive apparently wedging in between the two formations. A crushing will be taken out early in the new year.

A mine prominent in the market of late is the Golden Reef, where they are driving north and south at the No. 2 level on a goodly formation 15ft. in width. The extreme faces are nearly 130ft. apart, and the stone reefs solid and payable in both ends. The best stone ranges from 3 to 5ft. in width. They are now driving north off the east crosscut at the No. 2 level, on a full face of good stone; 20ft. in, and from a second crosscut started 80 or 85ft. further south, they have a drive in 25ft. in good stone 3ft. wide. A crushing of about 90 tons will be cleaned up before the holidays, which should put the company on the right side of the ledger.

The 900ft. south drive at the New Jubilee is in 375ft., and is carrying a fair body of stone, worth 4 dwt. The formation appears to have broken into the hanging wall, where the discharge of water is strong; and on the footwall side there is 2ft. of payable stone. In the stopes they have 3ft. of stone, payable. The No. 3 (Old North New Jubilee) shaft tributers are operating on 2ft. of stone, showing gold.

A healthier aspect is presented at the Birthday Tunnel, where in the No. 5 south drive stone 5ft. wide of better appearance is being opened up. It is now about payable, and it looks as though the downward continuation of the run of payable ore, proved for a length of 270ft. in the level above, beyond the No. 3 break, has been picked up. The importance of this work lies in the fact that a lengthy section of reefing country would be available in the event of the stone continuing payable, as the face of the No. 5 level is not less than 100ft. from the No. 3 break. They have cut a slide in the No. 4 south drive, which came in at 250ft. and is gradually rising. The stone was not cut off, and below the slide is 4ft. wide and prospecting about 3 dwt. per ton. On the eastern leg of the formation the No. 3 north drive is in 60ft., and the old workings have just about been reached. There is a big area of country away to the south, about 1500ft. of unworked country being available, and this is practically virgin to the surface. The month's gold totalled 202 oz. from 1870 tons.

## Bendigo and District.

(From Our Correspondent.)

The gold production for the week ending December, 1913, amounted to 5103 oz. 16 dwt., including 1095 oz. 16 dwt. forwarded from the Lansell Proprietary mines for last month. The principal producers were Lansell's North R., W. and Blue, 482 oz. 15 dwt.; Lansell's Little No. 180, 448 oz. 18 dwt.; Johnson's Reef, 409 oz. 12 dwt.; Carlisle, 323 oz. 6 dwt.; Central R., W. and Blue, 261 oz. 16 dwt.; Golden Pyke, 231 oz.; Great Extd. Hustlers, 220 oz. 14 dwt.; Great Northern, 186 oz. 18 dwt.; Ironbark, 173 oz. 12 dwt.; Virginia, 154 oz.; New Chum Goldfields, 143 oz. 5 dwt.; Williams United, 139 oz. 8 dwt.; South New Moon, 138 oz. 18 dwt.; Victoria Proprietory tributers, 130 oz. 9 dwt.; North Bendigo, 115 oz. 3 dwt. The first instalment of the Christmas disbursements was annouced, six companies declaring dividends, aggregating £6434 13s. 6d., viz.—Great Northern, 1s., £1500—total to date, £172,450; Johnson's Reef, 1s., £1400—total to date, £328,420; Ironbark, 1s., £1239 13s.—total to date, £124,435 4s.; Carlisle, 6d., £895 0s. 6d.—total to date, £61,235 6s. 6d.; New Chum Goldfields, 6d., £800—total to date, £24,000; North Bendigo, 6d., £600—total to date, £9600.

Sea had a very satisfactory trial from the 1544ft. south level, 32 tons yielding 76 oz. 12 dwt. The crushing material was broken solely in driving, and included a good proportion of the centre slates. The average works out at a trifle under 2 oz. 8 dwt. This shoot was entered at 12ft. to 15ft. from the present face, the best prospects showing underfoot in 2ft. to 4ft. of irregular stone. The gold is chiefly contained in 6in. to 9in. of quartz bedded along the hanging wall, which apparently owes its auriferous character to a couple of faults in the hanging wall. Existing directly under the eastern portion of the old Garden Gully reef, the quartz having been deposited along an inner bedding plane close to the folding, there is a prospect of the shoot proving longer, as the deposition is the same as the richer reef and associated with the same faulting. The level is in over 200ft. and about 400ft. from the South Garden Co.'s boundary. With the gold showing under the level there is every inducement to tap the wash lower down, work that will be carried out shortly by crosscutting off an intermediate level, 50ft. deeper. Meanwhile, stopes are being brought along from a rise at 80ft. from the face, in lower grade quartz of a promising character. At 2124ft. there is up to 2ft. of reef stone in the hanging wall of the inner reef, but no gold has yet been seen. Operations are to be started on this and the outer reef from the South Garden end in January, where both formations are payable.

South New Moon put through 30 tons from west of the old stopes off the 1060ft. south level for the fine yield of 111 oz. amalgam. The company formerly rose at 300ft. from the shaft in the vicinity of a strong fault, opening up a lot of well mineralised quartz, but saw very little gold. The recent milling was broken from close to the rise, and, as previously, comparatively little gold was visible. It is proposed to immediately increase the output from this part of the mine. The improved prospects at 1140ft. have not lately been maintained.

Golden Pyke are still breaking very good stone in the stope north of the No. 2 rise over the 543ft. north level, apparently operating on the south end of the rich shoot traversed in the No. 3 rise further north. The stope north of the latter is also of very fair quality, but is not yet high enough on the back to reach the best stone. In the south stope the reef is temporarily small and of lower value. At 643ft. a little gold is visible in the stopes furthest south, between the No. 2 rise and the Golden Age boundary. Closer to the rise a few colours of gold are showing in 15in. of highly mineralised quartz. Levels have been started on the reef at 730ft., the 5ft. of good-looking stone is, however, still of low value. The north stopes at 447ft. are taking from 6in. to 3ft. 6in. of reef, containing fair gold. On the outer formation the outlook is reassuring, the stopes showing fair gold. In order to work this reef to better advantage crosscutting is being resumed from the back of the main formation at 347ft. The crosscut will need to go 120ft., and should tap the stone at a short distance above the 447ft. rise, where gold is showing rather freely.

Great Extended Hustlers are in 27ft. with the level north on the east back of the inverted saddle reef, the leg having a width of 3ft. 6in. where it connects with the cap. Fair gold is seen on this side, the outlook improving in breaking over to the western wall. As yet the west leg is not exposed, but should be revealed with a few more breakings. At 1326ft. the north level is to be resumed on the west leg this week from 70ft. beyond the north crosscut. Gold is visible in 1ft. to 1ft. 4in. of stone here. In driving a few feet on the east back at this depth the stone contracted and was of no value. The north stopes on the west leg are in good payable quartz, 2ft. wide. Southward the inverted cap is being followed overhead at a steep angle. The reef is becoming longer here, and, from recent averages, it is more than likely that the company will wipe off the present deficiency of £2350 before extracting the stone between 1326ft. and 1226ft. The Little reef further east has enlarged to 9in. in the north level, and shows gold.

Central R., W. and Blue opened up 21ft. 6in. of quartz and 4ft. 6in. of lava between the hanging walls of the new reef at 880ft., but no gold was seen. The quartz contains mundic, but little galena. As the crosscut failed to uncover the saddle, the cap has evidently been traversed high up and where it is unusual to see much gold in a saddle formation. Better prospects may consequently be found on getting closer to the turnover of the backs. This it is proposed to do by driving south on the west back, in the opposite direction to the pitch, after the crosscut reaches the west back of another unprospected reef between 800ft. and 880ft.

North Johnson's 1334ft. crosscut has uncovered the top of a new reef in the centre of the Garden Gully eastern anticline. There is up to 2ft. 6in. of favourable looking quartz constituting the neck, but no gold. Later a level will be driven a short distance on the stone and winze put down to ascertain the resources of the cap and legs. Meanwhile, the crosscut is being continued to east backs of two other saddle reefs, the caps existing from 60ft. to 100ft. overhead. With three new reefs to prospect at the main shaft, and some fair-looking quartz in driving the 1065ft. south level off the Johnson's Reef No. 2 boundary, the company hold a stronger hand than for a considerable time past.

Great Northern exposed a few colours of fine gold in extending the 1278ft. north level to over 500ft., in 18in. to 2ft. of stone. This quartz is the bottom of the large centre reef now profitably worked at 850ft. north of the shaft from the 1181ft. level. The auriferous character of the stone at 1278ft. is chiefly of interest owing to this northern portion of the lease having always given the best results. At 1181ft. there is 18ft. of crushing material available. The brightest outlook is along the McDuff east back, at over 300ft. from the Virginia boundary. In the second stope the spurs are of excellent quality, the reef and footwall spurs in the level also revealing gold. Some good stone is also available higher on the back, and these spurs appear to be much below the system from which the Virginia are now getting their best average.

## Castlemaine and District.

(From Our Correspondent.)

Spring Gully has not improved its position during the past fortnight. The respective weekly yields from 170 tons each have been 47 oz. 7 dwt. and 40 oz. 15 dwt., which are not payable. Vigorous prospecting is in progress. In the south stopes at 200ft., practically no gold is showing. A winze is being sunk on the indicator slate from the crosscut off the 240ft. south level. The idea is to reach the rich spur formerly worked nearer to the shaft. The south level is out nearly 200ft., showing 6in. of low grade dirt in the end. Thompson's fault has revealed well-mineralised spurs with fine gold. They are breaking to the east from the old rise. The north intermediate on the same fault is showing a vein of quartz about 12in. thick and spurs up to 6in., the lowest of which shows a fair sample of gold. Driving on these will be done. The manager expects better results from the stopes after the faulting is passed. Nearer to the level a rise is being put up through 6ft. of crushing material on the slide.

Somewhat better prospects have been the outcome of the term's operations in the South Spring Gully. The centre level north at 310ft. is in 14ft., showing 2ft. of solid quartz containing galena and blackjack along the west side. At the end of the week highly-mineralised stone nearly 3ft. wide came in on the west side. It is supposed to be the upper portion of the reef crossed about eight years ago in the winze from the main crosscut. This winze is down about 40ft., and a couple of millings produced 6 oz. 6 dwt. from 24 tons. On reaching a slide the influx of water prevented further operations. The reef channel having a southerly pitch, it is expected to prospect the reef by continuing the same level.

Spring Gully No. 1 continues operations. The north intermediate level above 300ft. is advanced to 34ft. On the slide the stone was smaller underfoot, but it enlarged to 15in. overhead, and has shown colours of gold. The spurs are barren so far.

The Spring Gully Freehold mine is having another trial. Mr. A. Hooper has got together a party of six, and they have been working for a few months cleaning out the old Freehold shaft, which has been in disuse for eight years. It is 63ft. deep, and the present party has put up a rise on the west leg of the saddle. They took out a crushing, and it has gone 10½ dwt. to the ton. In the north level the east leg has been opened out, and stone up to 3ft. wide has been uncovered.

It is regarded as being payable. An air shaft was also sunk to the south, and in it 2ft. of stone was met. It is kindly-looking, and a crushing will be put through before the holidays. When this claim was being worked previously some rich spurs were treated. A lease has been secured, and a good test of the present workings is promised before new ground is broken.

South Wattle Gully machinery and plant is going up rapidly. The boiler has arrived, and the bed and flues are ready, while the engine house is being erected with all speed. The battery boxes are also in position. There are about a dozen men on the job. Down below, the 300ft. level has a crosscut west in hard sandstone. The drive over the No. 1 rise is in 7ft. on an 18in. reef, showing gold in breaking; while the drive on the west leg is 130ft., with gold showing in the solid stone. The main drive at the 350ft. level is in 103ft., showing an 18in. reef, with solid stone on the hanging wall, and of good appearance.

Little Nuggety Co. shaft has been cut down and timbered 25ft. for the fortnight; and is now 115ft. from the surface. The machinery is being carted on to the ground, and a contract has been let for the erection of same

# THE COAL MINING INDUSTRY.

## New South Wales.

### Northern District.

(From Our Correspondent.)

Newcastle, Dec. 13.

Notwithstanding the wish of the chairman of the Miners' Wages Board (His Honor Judge Edmunds) to sit on and get through the work as expeditiously as possible, so as to reach the question of the afternoon shift before the Christmas vacation, the sittings of the Board are being interfered with. On Thursday morning, his Honor said that Mr. Clark, the proprietors' representative, could not sit that night nor the following day, although possibly he might be able to sit on Friday afternoon. Later in the day his Honor said he regretted that Mr. Clark would not be able to sit at all on Friday. He thought an effort should be made to get through more work than they were doing. This would mean that the Whitburn case would have to go over for a week. His Honor added: "I think it is a pity that we cannot press on. I am prepared to sit on Saturday, and until ten o'clock on Saturday evening. I want to see better progress made, and if there is continued resistance to the work of the Board, I shall make inquiries as to where it is. I am not going to stay over if there is no chance of sitting on Saturday." Mr. Clark said he was not prepared to sit on Saturday. His Honor said he would be engaged in Sydney on Monday, and that would mean that the Board would have to adjourn from that (Thursday) afternoon until Tuesday morning next, when the Lambton B case would be resumed. The feeling is that, on the present occasion, the work of the Board is being interrupted by the proprietors, and not by the men; and that some of the owners would like to see the matter of the consideration of the second shift question put over until the new year.

At the meeting of the Wages Board on Thursday, Mr. Kelynack, counsel for the proprietors, referred to the fact that his Honor had admitted, when the award was being made for the Pelaw Main machine men, that the management should have the right to try a certain system that had been suggested for making up parties of machine men and fillers. Now it had come to the ears of the management that the lodge had instructed the machine men and fillers not to volunteer to cavil under these particular conditions. That meant that the employees were taking anything in the award that satisfied them, and rejecting anything which they did not care for. Mr. Lewis, the miners' advocate, said he knew nothing of the matter, but he would have inquiries made. He understood that the cavil would be drawn again next week. His Honor: Then you will have to act promptly.

A little friction has arisen over the operation of the new award for the men in Stockton-Borehole colliery. The men complain that they now get only one safety lamp, whereas formerly they were provided with two each; and also that they have to give certain assistance to the wheelers. This latter affair had been pressed to the point of threatening dismissal of men who refused to do it. The proprietor of the colliery says he knows nothing of the matter. It was mentioned at the Wages Board, and the chairman said the work in the mine was to be continued on the same conditions as had prevailed formerly. The miners' representatives are to make further inquiries, and the point will come before the Board again next week.

The Whitburn colliery case has been opened before the Wages Board. The owners of the mine are asking that the rate for all coal won in the tops shall be 2s. 1½d. per ton. On their part the miners are asking that the rate shall be the same as in the adjoining colliery of Broxburn, namely, 2s. 8d. per ton. Evidence was entered upon this week, but owing to the interruption to the work of the Board, it has been adjourned for a week.

On Tuesday morning waggons were being shunted at Whitburn colliery, Greta, when a labourer named Edward Rice, employed at the mine, was caught between the buffers of two of the waggons and so badly crushed that he was killed almost instantly. He was 64 years of age.

In connection with the strike at Pelaw Main colliery on the 18th of September, Messrs. J. and A. Brown, the owners of the pit, are proceeding against 74 of the men. The matter was mentioned again in the Industrial Court last Friday, and an adjournment was asked for by the prosecution, as it was stated that there is still a possibility of the matter being settled. The application was granted, and the cases were postponed until the 27th of February.

In some of the Newcastle collieries, what is known as the "turn" system is in operation, by means of which the men endeavour to secure for each miner in a pit an equal number of skips. Where this system is not in vogue some of the men get more than a fair number, while others may be idle part of their time. However, in the Elermore Vale colliery the proprietors have found of late that this worked detrimentally to the output of the mine, as the faster men have stood off until the slower men have had their share of skips to fill. They are therefore asking the Wages Board to intervene in the matter in a conciliatory spirit, so as to overcome what is at present a cause of friction.

The export of coal from Newcastle for the past week was 109,381 tons, an increase of about 12,000 tons over the quantity sent away during the corresponding week of last year.

## Southern District.

(From Our Correspondent.)

Wollongong, Dec. 13.

The North Bulli colliery, which during the past three months has extended its workings and is now operating in a new portion of the holding, has been installing plant to meet the extended requirements. This plant will be capable of handling over 2000 tons a day, about double the present output. Electricity is the motive power, as seems now to be a matter of course when plant is being installed.

Dapto coal is now advertised for household purposes at a price 2s. per ton below the price current for coal from the present collieries. Some coal got out in the course of prospecting has from time to time come into the local market from the Dapto propositions, but this is the first time of advertising, and making a bid for the household trade of the district by a Dapto producer.

The building of the coal loading jetty at Port Kembla very slowly approaches completion. The contractors for the appliances are expected to start installation after the holidays. As the contract is about £45,000 in amount, it will certainly be the greater part of a year before the jetty is ready for use. The iron chimney stack for the power house arrived this week; and is of considerable length and girth, and will take some engineering to get into position.

At the Southern Collieries Wages Board sittings during the week the wheeler trouble was much in evidence. At the South Clifton colliery it is acute; so short has the colliery been of wheelers that the miners have been called upon to wheel to an extent which has caused discontent. In his place, under the present award, the miner is assured of his earnings being made up to 11s. if in a deficient place; but if he goes wheeling he has an hour longer to work and only gets 10s. 7d., a shiftman's wage. The union is claiming an advance of wheelers' wages to a standard for seniors of 11s. per day. It is also claimed that two wheelers should be promoted to getting coal every quarter. The union's contention is that if these claims were awarded there would be no scarcity of wheelers, such as prevails at present. As regards ideas of an average earning of miners, one witness thought 14s. fair; another went as high as £1. The union wants a tonnage rate for all the work of getting coal with cutting machines; the employers ask for shift work for what they contend is only ordinary labour with the machines, namely, cleaning and filling the coal. It is admitted that at present any kind of labourer, sailors frequently, gets employment at the machines. The union is averse to that, because it alleges it is displacing the miner class, and they contend that it is not safe for inexperienced persons to be about a coal face. The employers' representatives advocated a lesser rate of pay for driving one class of cutting machines than for others, on account of the less vibration, and consequently less strain on the man holding the machine. It was stated that in this respect there is a considerable difference between the Hardy puncher and the Ingersoll. About two-thirds of the machines in operation in this district were stated to be driven by compressed air.

## Victoria.

## Powlett River District.

(From Our Wonthaggi Correspondent.)

The cavil for places in the State mine for the ensuing quarter was drawn on Monday, and everything passed off satisfactorily. In all 111 places went into the cavil which will give employment to about 460 miners on coal at contract rates. The agreement committee of the V.C.M.A. is to have a conference with Mr. Broome, general manager, in reference to the rates to be paid for pick work in the Nos. 9 and 10 shafts. The miners contend that the rates for pick work provided for in the agreement do not apply to these pits, which have always been regarded as machine propositions. Work in the mine will be discontinued on Tuesday, the 23rd inst., and will not be resumed until the 5th January. The reason for stopping the mine for such a lengthy period is that the applications from the men for extended leave were so numerous that it would not have paid to work the mine with the remainder. The general manager has given notice that he intends to apply to have a new clause added to the special rules of the colliery to the effect that all places shall be properly timbered, and if no timber is available the men shall cease work in the place until the timber is procured. The miners are not opposed to the new rule except so far as it refers to ceasing work. They consider that the timber should be available when wanted, and, if it is not, that they should be paid for any time lost whilst the timber is being obtained. The new rule will be discussed at the next general meeting of the V.C.M.A.

The report of Mr. J. N. Shackleton, the auditor appointed to report on the district financial affairs of the V.C.M.A., was dealt with at a special district meeting held on Sunday. It disclosed a remarkable condition of things. No books of Mr. H. McCulloch, the late acting secretary, were produced for the audit, and it was stated that none existed. The statement of receipts and expenditure left by Mr. McCulloch, setting forth the money received and paid away by him during the four months he was in office, the auditor described as a marvel. The amounts stated did not tally in many instances with either the bank book or the vouchers. It was impossible from the material available to say whether the secretary had paid out more money than he received or less. The full report created a sensation amongst the members. Some of the speakers said they had been robbed and rooked by their officer, and were anxious to see the matter gone into further. By 49 to 37 it was agreed that it was to the best interests of the union to adopt the report and let the matter drop.

The local branch of the V.C.M.A. held a meeting after the district meeting and adopted the branch balance-sheet prepared by the special auditor. The auditor's report showed that Mr. H. McCulloch's shortage when secretary totalled £35 4s. (£20 refunded), and Mr. A. C. Chapman's shortage had been reduced to £14 16s. 2d. The latter had paid in £17, which was the amount the branch auditor said he was short. He is now entitled to a refund of the excess. It was decided to write to Mr. McCulloch demanding the payment of £15 4s. still said to be short.

---

The Adelaide Electric Supply Co. Ltd. has declared a dividend of 5s. per share, free of English income tax, payable on the 16th inst. on ordinary shares, also a bonus of 2s. per share.

The following sanguine cablegram was received last week by the Melbourne office of the Torpedo Submarine Ship Cleaner Co. Ltd. from Mr. John Lawson, manager in London:—"Demonstration held London Docks Wednesday, Thursday; highly successful. Present twelve newspapers, thirty shipping representatives, Japanese and German navy. Latter especially extremely interested. Am requested interview German naval authorities Berlin. Endeavouring arrange contracts leading shipping lines. Interviewing Admiralty next week."

The West Australian Government is seeking authority to float another loan of £2,000,000 for public works, as well as the reappropriation of other loan moneys.

## JOHNSON'S REEF (V.).

(From Our Bendigo Correspondent.)

A very general improvement in the company's prospects was shown last week, three of the four reefs being worked on the Paddy's Gully and Derby lines revealing a good sample of gold much more freely than for some time past. The first development came from the Collmann reef, on the former line, at the No. 2 shaft, the stoping above the 1730ft. south level exposing some rich stone at about 30ft. overhead. The saddle formation, which was followed from the Collmann and Tacchi north boundary by operating from the No. 1 shaft. Values varied considerably over a length of several hundred feet, excellent yields being obtained for a short period after meeting with a strong western slide across the east back. After passing through the fault the reef rose very rapidly, and, eventually becoming almost unpayable, operations were suspended from that end in consequence of the unsatisfactory working conditions. The face of these workings was at a little over 700ft. south of the No. 2 shaft. A connection has since been effected by a south level on the west leg, starting from a crosscut at 300ft. south of the No. 2 shaft. At the outset the level was 60ft. under the cap, where the leg was small. After driving some distance the stone enlarged abruptly and improved in quality, where a strong spur was met in the footwall. Subsequently a number of spurs were opened up on this side of the No. 1 workings. It is along this section of spurry footwall country that the upper limits of the reef have reflected a marked improvement. There is a rise to 40ft. at 520ft. south of the shaft, close to the first large spur, and in stoping north and south from this point from 6in. to 13ft. of quartz is exposed over a length of 120ft. At the south end the fault across the east side is visible, another break showing in the opposite direction, where the rise went up. The east and west legs are uniform, and carry payable gold in highly mineralised stone. The best prospects are, however, above the saddle. Were it not for the faulting the cap stone would be found bedded over the saddle, but instead, a slidy cap has formed between the V-shaped slides, with gold showing very freely in the middle of the reef. Previous to this enlargement above the faulting, which has only lately been observed, work was confined to the smaller stone nearer the saddle and the legs. To ascertain if the larger portion of the reefs exists above the former stopes, it is proposed to rise at about where the connection of the two shafts was effected. In view of this development the direction of former operations at 300ft. south of the No. 2 shaft is of interest. At this point a rise was put up on the east back, and, on reaching the turnover, levels were driven north and south for 75ft. The west leg revealed fair prospects occasionally, but was not good enough to make the cap payable. The cap here is similar to the smaller stone followed in the No. 1 stopes. Overhead there is 2ft. to 3ft. of quartz continuing upward as a neck, with the eastern wall bent back. The conditions indicate a slide existing higher up, but there is no evidence of the opposite slide.

It would be good prospecting to run a rise up on this neck stone at the present juncture. There is a likelihood of better prospects being found, though the upper portion of the reef may not be as extensive as in the present south stopes. From this rise to the north boundary there is well over 700ft. of ground, the reef being intact for a length of about 1000ft. over all.

On the Derby line the 1150ft. south stopes at 300ft. from the No. 3 shaft have produced several good specimens from the east leg of the inner formation. Hardly any of this stone was included in last week's crushing. The quality is stated to be equivalent to that of the Collmann reef. The experience on this inner reef has been that the east leg is erratic in quality, though the quartz along the joint west back of the two reefs was consistently profitable for a long time. There is a good extent of the east leg intact south above 1150ft., and also under the main level. On the new reef between 1150ft. and 1250ft. the company are opening up the west leg north and south from the rise opposite the shaft, and also similarly from a crosscut at 300ft. north of the 1150ft. plat. For the first time payable gold was seen in the south intermediate towards the close of the week, and the shoot will now be searched for further south by crosscutting off the 1225ft. level. Fruther north a new splice of stone has made its appearance in driving north, and shows several colours of gold. After a lapse of a year the company re-appears on the dividend list with a Christmas disbursement of £1400, at 1s. per share.

---

## ANSWER TO CORRESPONDENT.

Whipstick (Queenstown, T.).—The official return of Bendigo's goldfield (quartz and alluvial) in the years 1868, 1869 and 1870 was 255,771 oz., 301,992 oz. and 276,221 oz. respectively.

# ENGINEERING AND ELECTRICAL SECTION

**W. T. GLOVER**
and Co. Ltd., Manchester
Specialists in the Manufacture of All Classes of
**WIRES and CABLES**
for
**MINING WORK.**
Large Stocks kept by the
Sole Agents—
THE
**LAWRENCE & HANSON**
**Electrical Co. Ltd.**
33 YORK ST., SYDNEY.
405 LONSDALE ST., MELBOURNE,
and at WELLINGTON, N.Z.

## POSTAL ELECTRICIANS.

### The Annual Conference.

In anticipation of the conference which was to be opened a few days later the interstate delegates were entertained at the annual smoke night of the Victorian branch of the Australian Postal Electricians' Union, held at St. Patrick's Hall, Melbourne, on the 6th inst., the president, Mr. E. F. Meier, being in the chair. Several members of the Labour party in both Houses of the Federal Parliament were present, and after a number of speeches had been made, Senator Russell, on behalf of members of the branch, made presentations to several officials in recognition of their services to the union. To Mr. J. M. Wrout a gold watch, chain and locket was presented, with an intimation that it was proposed to present him with 200 sovereings in recognition of his successful conduct of the arbitration case. Mr. H. J. Barcello was handed a certificate and a cheque for £20, together with a gold necklet for Mrs. Barcello; Mr. H. Wrout, a cheque for £20 and gold trinkets; and Mr. A. C. Bishop, a certificate for past services as president.

The conference was opened on the 10th inst. by the Postmaster-General, Mr. Agar Wynne, who said he found that he got to know the workings of the department more clearly and fully by direct intercourse with the employees than he would have done had he followed the customary routine of administration from his office. If the men had any grievances, he said, he would be glad to hear what their representatives had to say. After the formal opening the election of officers was the first business, and resulted as follows:—President, Mr. P. F. Power (N.S.W.); vice-presidents, Messrs. E. F. Meier (V.), H. T. Nicholas (S.A.), P. Borrowdale (Q.), and D. L. McWilliams (T.); treasurer, Mr. W. R. Buck (Q.); general secretary, Mr. J. M. Wrout (V.); committee, Messrs. L. T. Nickolds (W.A.), J. Bredemeyer (W.A.), F. G. O'Hara (N.S.W.), W. Halion (T.), and C. Richmond (S.A.); auditors, Messrs. Meier and Bredemeyer.

Last Friday representatives of the conference waited on the Postmaster-General and presented the following resolutions which had been passed:—

"That the Minister exercise his discretion by granting all public holidays proclaimed in each State.

"That the question of compulsory life insurance be reviewed for the purpose of more fairly adjusting the amounts for which officers have to insure under the regulations.

"That where officers continue in the service after the age of 60, the amount of their insurance policy be withdrawn from the insurance office and placed at interest on behalf of the officers under Government control.

"That uniformity of working conditions be established throughout the Commonwealth.

"That all employees in the mechanical branch of each State doing work in accordance with arbitration awards be paid at the award rates.

"That we protest against the provisions of the awards being extended to non-members of the unions in each State.

"That after two years' service in a country town members should have the right, if they so desire, to be retransferred to the metropolitan area of their State.

"That we protest against the delay in paying overtime, travelling allowances, and other claims to members of the union.

"That we protest against work of a high class technical nature being taken from the workshops in the smaller States and centralised in the large States.

"That a comprehensive and uniform system of training junior officers be adopted in each State.

"That we protest against the misinterpretation of the award regarding hours of duty in the State of New South Wales, and ask that a uniform system be adopted throughout the Commonwealth.

"That we protest against the misinterpretation of the clause in the award regarding overtime.

"That junior mechanics for the first two years of service be under the supervision of a mechanic or officer of higher rank.

"That we protest against examinations being held in States where proper appliances are not provided to equip the candidates for examination.

"That copies of all instructions, engineering circulars, public service regulations, and gazette notices be supplied to the branch president and secretary in each State.

"That we protest against officers being forced to attach the departmental badge to their clothing, and ask that a uniform badge be supplied throughout the Commonwealth.

"That we protest against the telephone mechanician of New South Wales being appointed to conduct examinations, as it is deemed that his attitude towards officers in that State is prejudiced, and his method of treating men working under him has already been the subject of departmental inquiry.

"That we protest against exchange foremen in suburban districts being compelled to reside within half-an-hour's journey of the exchange, and being called out at any time after the day's work is completed.

"That a fairer system of medical examination of candidates for permanent positions be devised, and to ask that where candidates secure a first-class life from an insurance society they be accepted without further examination."

Mr. Wynne intimated that the various matters referred to would be fully considered.

On the same day the Postmaster-General entertained the following officers and delegates of the union at luncheon at Federal Parliament House:—Messrs. P. F. Power (president), E. F. Meier, T. Borrowdale, D. L. McWilliams, H. Nicholas (vice-presidents), J. M. Prout (general secretary), F. T. O'Hara, J. Bredemeyer, B. C. Richmond, W. Halion, L. Nickolds and W. R. Buck.

---

## DEFENCE DEPARTENT STORES.

The Acting Auditor-General to the Commonwealth, Mr. G. Gatehouse, has furnished a report to the Federal Treasurer, Sir John Forrest, with reference to the deficiencies alleged by Mr. Mathews, M.H.R., in the Defence Department Stores, mentioned in our last issue. Mr. Gatehouse says:—"In the time at my disposal half a dozen of the greatest deficiencies have been inquired into, with the result that it has been found that the book-keeping has been faulty, and the stock-taking unreliable. Consequent upon errors discovered in the storemen's journals and stock ledgers, these deficiencies have been reduced as under:—Shirts, from 6815 to 991; hats, 6658 to 1174; hat-bands, 1718 to 936. The senior ordnance officer states that complete stocks of the articles undermentioned not having been taken by the storemen, the following deficiencies practically disappear:—Straps (water bottle), 3984; hessian, 4099 yards; targets, 1542. In regard to the other items showing discrepancies, it is likely that error has also been made, but these will definitely be disclosed during further investigations."

This report certainly removes the unpleasant suspicion which Mr. Mathews' statement created; at the same time it shows clearly the necessity for a reorganisation of the staff at the stores. Careless stock-taking and bad bookkeeping are intolerable in any business, and unpardonable in a big Government where the variety of stock handled is very simple as compared with that of most ordinary traders who make any pretence at either stocktaking or bookkeeping.

---

## ENGINEDRIVERS' CERTIFICATES.

### Examination Results.

Certificates as enginedrivers and boiler attendants were granted as under at the recent examinations held by the board in Melbourne:—

First Class Mining.—J. Hayes, G. Jones.

Second Class Mining.—H. S. Ince, R. Gow, G. E. J. Rutherford.

First Class Factory.—D. J. Lennox, A. E. Auton, J. W. Collins, H. J. Beames, W. E. Bradshaw, C. Davidson, R. W. F. Frederickson, V. T. Leerson, W. C. Burley, J. M. Duncan, G. C. M. Grant, J. A. Reilly, P. Gill, S. Scott.

Second Class Factory.—N. B. McCall, J. J. Kennelly, T. W. S. Vickery, W. S. McKay, F. L. Cook, W. Fisher, E. J. Cook, F. Cunningham, H. A. Robins, O. C. Uebergang, C. R. Verdon, L. W. Allchin, W. L. Schwerkolt, I. T. Campbell, H. W. Flegg, P. A. H. Dunbar, A. A. Hoopell, A. Slorach, junr., H. Sloan, M. P. Weymouth, H. Arnott, C. A. Arthur, A. Yelland, H. J. Dorum, C. W. Watts, E. Clifford, F. E. Moore, T. McKay, A. R. Ditterich, B. Torpey, L. T. Collyer, W. H. Harris, J. C. Keepach, N. A. W. Ross, A. Kilborn, A. O. Archer, P. O'Dea, S. Abberton, L. T. Mankey, M. J. Monaghan, L. M. Robertson, R. D. Jeffers, J. B. Galbraith, A. C. Ricketts, J. F. Mitchell, E. P. Breheny, D. Walker, H. T. Ward, H. J. Arthur.

Third Class Factory.—E. B. Carter, W. J. Wilson, G. R. Abraham.

Boiler Attendant.—C. Bunker, V. Pamperin, J. Burke, M. O'Brien, G. W. Stewart, J. T. Hartley, J. W. Plunkett, W. A. Taylor, A. W. Bethune, R. T. Nankervis, R. Smith, W. Williams, J. F. Sayer, T. Ainsworth, V. E. Walker, A. E. Woolf, E. McRae, C. Matheson, G. J. Hill.

---

## AMALGAMATED ENGINEDRIVERS.

### Strikes Condemned.

The balance-sheet of the Amalgamated Enginedrivers' Association (V.) branch of the Federated Enginedrivers and Firemen's Association show receipts for the year ended on September 30 amounting to £1719, towards which Bendigo contributed £461 19s. 6d., Ballarat £202 12s. 3d., Eaglehawk £202 8s., Daylesford £162, and Powlett £124 14s. 6d. The expenditure totalled £1707 0s. 8d. There were 18 deaths, and £741 14s. 3d. was paid away on this account. Accident pay totalled £193 16s. 8d. A credit balance of £60 1s. 9d. remains, as compared with £48 2s. 3d. last year. The report shows that the Victorian branch made good progress during the last half-year, both numerically and financially. A large number of members gained substantial advantages in their wages and conditions through the efforts of the organisation. The average increase in the wages of the members as a result of the recent Arbitration Court award was 1s. 5d. per day, whilst 81 members in Bright and district obtained an increase of 2s. 6d. per day. During the six months 207 new members joined, and the total membership is now 1479. During the past three and a half years 1335 new members were enrolled.

On Thursday Mr. Mitchell, federal secretary, attended the meeting, and explained the award of Mr. Justic Higgins in so far as it affected the members of the A.E.D.A. branch. He said their main object was to make a powerful organisation, so as to ensure industrial peace. The strike weapon should be a last resort, owing to its disastrous effects. The Lithgow strike cost the men directly affected £120,000 in loss of wages, and the unions subscribed £18,000. The men were said to have gained a moral victory, but of the 480 who ceased work only 180 were re-employed. It had been said that the Labour leader who would use his influence for a strike was little short of a criminal. At Lithgow the enginedrivers had no grievance, but simply ceased work because the miners went on strike. They must say to the miners: "If you want our assistance you must consult us before you lay down your tools.'' More than nine-tenths of the strikes that had taken place in the past could have been avoided if the workers only got together and thrashed matters out. Frequently they had leaders who were not doing their best for the movement. It was a mistake to say there were no fair employers.

On Friday a proposed new log was considered and adopted, the chairman, Mr. E. Walters, remarking that the Federal award had been made for a five years' term, and that they desired to secure uniformity amongst Federal and State awards. An endeavour was made to secure the deletion of a rule of the federation under which engine-drivers and firemen who have no personal quarrel with employers are compelled to act in support of the claims of miners who have. The motion was negatived by 15 votes to 9, but it was stated that the executives of the two associations would consider the position shortly.

---

## BRITISH AND EUROPEAN DEVELOPMENTS.

(From Our Correspondent.)

London, Nov. 7.

The London and South-Western Railway Co. has just commenced operations at Teddington in connection with the scheme for electrification of its suburban lines, and by courtesy of the general manager, I am enabled to send the following particulars. The power station will be adjacent to the main line at Wimbledon, and the erection of the foundations has been so far completed that the steel structure will begin to rise before the year closes. There will be two main bays forming a boiler-house and turbine house, with a switch house attached, the whole building measuring 260 ft. x 210ft. There will be two chimney stacks, 236ft. high x 13ft. 6in. diameter internally. Coal will be dumped from the boiler-house roof, from waggons direct into bunkers, over the central firing floor. The scheme includes 24 boilers (20,000 lbs. of water per hour, normal evaporation, 200 lbs. steam pressure, super heat 200 deg. F.). The turbine equipment will consist of six 5000 kw. three phase turbo-alternators, generating at 11,000 volts and running at 1500 revs. per minute; also two auxiliary steam turbines coupled through gearing to 400 kw. direct current dynamos for supplying lighting and motor power. The switch house will have three floors, which will contain all the main generator and feeder controlling gear. The main oil switches will be controlled from a desk erected on a balcony on the first floor of the switch house overlooking the turbine house, and will be electrically operated. The surface condensers, pumps, ten hot-wells, etc., will be in a basement under the power house. The turbine room will have a 40 ton electric overhead travelling crane.

The 11,000 volt current will be transmitted to nine sub-stations by three-core cables, which will be paper insulated, lead sheathed and wire armoured. These cables will in most cases be supported on posts beside the line, and they will be so arranged as to afford a duplicate supply to every sub-station. The sub-stations, with one exception, will be 50ft. wide x 65 to 103ft. long, consisting of a machine bay and a switchgear bay. They will be at Waterloo, Clapham Junction, Raynes Park, Hampton Court Junction, Barnes, Twickenham, Kingston, Sunbury, and Isleworth. The Clapham Junction sub-station will be special in its buildings and apparatus, being on one of the platforms. The other sub-stations will contain static transformers and rotary converters, together with the necessary switchgear, for transforming the 3-phase H.T. current to direct current at 600 volts, in which form it will be used by the trains. Two sizes of converters will be used, the larger having a continuous capacity of 1875 kw., at Waterloo (four), Clapham Junction (three), Raynes Park (two), Barnes (two), and Twickenham (three); the smaller, having a continuous capacity of 1250 kw., will be at Hampton Court (two), Kingston (two), Sunbury (two), and Isleworth (two).

The 600 volt direct current conductor rail will be laid along the line 16 inches from gauge, and at such a height that the contact surface will be three inches above rail level. A special steel rail having a resistance of about 6¾ times that of copper of the same length and cross-sectional area is used, weighing 100 lbs. per lineal yard. It will be supported by insulators fixed on the sleepers, and will be bonded across the joints by four flexible copper bonds. The running rails forming the return will be bonded across the joints by two flexible copper bonds. The current will be collected by cast steel collector shoes hung from the trucks.

For the first section of the electrified lines, eighty-four train units are being provided. Each unit will consist of three compartment type coaches, and will be equipped with four 275 h.p. motors and control apparatus. It is stated that these motors will be the largest ever mounted on a passenger coach. A special motor truck, carrying two motors, will be fixed under each end of the train unit, the remaining trucks being of the Railway Company's standard pattern. The control apparatus will be of the relay automatic multiple-unit type, providing for uniform acceleration, and controlling from the front driving cab all the motors on a train of any length. Every train unit will have a driving cab, containing control apparatus for two motors at each end, two luggage vans and seating accommodation for 190 passengers. It is intended to commence working on the Kingston Roundabout line first, and it is hoped that this line will be in operation before the end of 1914. Electric services on the Hampton Court and Shepperton branches and on the Hounslow Loop line will follow soon thereafter.

The Postmaster-General has to-day issued notices inviting tenders for the construction of the second three out of the Imperial wireless stations. Contractors or syndicates who can practically demonstrate the efficiency of any system are invited to tender or to apply to demonstrate, their applications to be received by November 21st. Continuous communication, day and night, over 2000 miles will be required.

London, Nov. 14.

In furtherance of his wireless telegraph policy announced at the conclusion of the Parliamentary controversy respecting the Imperial wireless scheme, the Postmaster-General has appointed a committee to consider how far and by what methods the State should make provision for research work in the science of wireless telegraphy, and whether any organisation which may be established should include problems connected with ordinary telegraphy and telephony. The Rt. Hon. C. E. H. Hobhouse, M.P., will preside over the committee, which comprises the following gentlemen:—Lord Parker, of Waddington, who was chairman of the recent expert wireless committee; Sir Joseph Larmor, M.P., F.R.S.; Sir Henry Norman, M.P.; Dr. R. T. Glazebrook, of the National Physical Laboratory; Mr. W. Duddell, F.R.S., president of the Institution of Electrical Engineers; Sir Alexander King, Secretary to the G.P.O.; Mr. W. Slingo, Engineer-in-Chief to the G.P.O.; Commander F. Loring, R.N., Inspector of Wireless Telegraphy; Mr. R. Wilkins, C.B., Rear-Admiral Charlton; Commander Im. Thurn; and Major H. C. Guest, M.P.

On Wednesday an important meeting of the Royal Dominions Commission held a meeting in London, with Sir Edgar Vincent in the chair, at which evidence was given by Mr. Crabb, C.B., the second secretary to the General Post Office, respecting cable communication with the various parts of the Dominions. A number of the questions covered were on the proposals for a State-owned Atlantic cable. It had been stated, when the commissioners sat in Australia, that the reductions in cable rates had resulted in a very largely increased trade and more general use of cabling facilities by the public, and on this point Mr. Crabb agreed that the growth of traffic had been quite satisfactory; the increase lately was chiefly in deferred telegrams and cable letters. The Post Office authorities do not consider that a State-owned cable across the Atlantic is at present justifiable considered commercially, for there would be a loss of £20,000 per annum if the present Pacific traffic were handled at the present rates. A member of the committee put to Mr. Crabb the question whether there was any possibility of wireless completely superseding cable telegraphy, but the witness preferred to leave the question unanswered, as he said he was not a wireless expert, though he remarked that he considered the present position of wireless to be an argument against a State-owned cable. Wireless was developing by leaps and bounds, and while there was every desire to meet the wishes of the Dominions overseas it was imperative that in studying the proposals for an Imperial cable both the possibilities of cutting rates by wireless and of serious interruptions in submarine cables should be remembered. Sir Rider Haggard, a member of the committee, remarked that wireless could not be cut; he also asked a question relating to the progress of efforts to secure secrecy in wireless transmission. On the latter point Mr. Crabb said he knew that experts were experimenting with a view to remedying the present weakness due to waves going in all directions. A later witness before the commission was Sir Henry Primrose, the chairman of the Pacific Cable Board, who desired it to be understood that the present cable rates could not be reduced without loss. A State-owned cable was not desirable; the prevailing circumstances did not render increased facilities necessary. The Pacific Cable had a carrying capacity of 5¼ million words per annum, but it only carried three million at present.

Attention is being given at Oldham, as the result of a tramway accident in which life was lost, to the need for carrying jacks on tramcars in order that injured persons beneath may be released as expeditiously as possible. On the Oldham cars so far no such jacks have been carried, dependence being entirely placed upon an emergency waggon kept at a depot. Inquiries made into the practice adopted in a score of the leading cities and towns in the United Kingdom show that the majority follow the same practice as is in vogue at Oldham, but Glasgow, Manchester, Birmingham and four other places out of the twenty carry jacks on the cars and keep their drivers and conductors versed in their use. The upshot is that Oldham cars will all carry jacks in future.

As was anticipated would be the case, the Glasgow electrical exhibition has been a great success. About four thousand per day has been the average number of visitors. Apparatus for domestic heating and other uses seems to have made a particularly strong appeal with good business resulting. The corporation electricity department is about to experiment in electrically illuminated hoardings for advertisements to which current will be switched on when the heavy load falls off on winter evenings at about 6 o'clock. At Marylebone, in London, the electricity department is giving very cheap supply to local contractors who are making exhibits of heating, cooking and such like apparatus on their premises. The rate is 1d. per unit, less 50 per cent. rebate.

At the Birmingham meeting of the Institution of Electrical Engineers on Wednesday, Mr. S. H. Holden made a number of suggestions for improvements in the British standard specification No. 37 of 1907 relating to consumers' electric supply meters. A number of alterations and additions to certain clauses were put forward as a basis for discussion, the object being to ensure greater usefulness of the specification. Mr. Holden urged the publication as soon as possible by the Engineering Standards Committee of a revised and completed specification which could be purchased for a much smaller charge, say one shilling, enabling makers of meters to enclose same with their tenders. Purchasers of meters were urged to make full use of the specification without addition, especially when buying for export. Another point suggested by Mr. Holden was the marking of approved meters with a distinguishing mark.

Last night Mr. W. Duddell, F.R.S., president, delivered his address on ''Pressure Rises'' before the I.E.E. in London.

The inaugural address of Mr. J. A. Robertson to the Scottish Local Section of the I.E.E. on Tuesday fully maintained the high standard adopted in the other local addresses to which reference has already been made. A very wide area was traversed. He opened by saying that we are passing through a period of extremely rapid development in the multifarious applications of electricity, and questions which appeared but a few years ago to be in the domain of pure speculation are now claiming attention as practical problems waiting for solution in the near future. Efficient utilisation of the natural fuel resources of the country by concentrating the manufacture of power in large central stations and transmitting over areas extending to hundreds of square miles, the abolition of the smoke clouds which disfigure and pollute our cities and towns, the electrification of our railway systems, the possibility of replacing existing systems of motor transit in our streets by cheaper, cleaner and safer methods, the application of electricity on a large scale to chemical processes, and its employment in the production of steel and iron—these are some of the questions which will claim attention from the electrical engineer within the next few years. Mr. Robertson proceeded to discuss some of the recent developments which have brought these questions to the front, to indicate the existing limitations to further advancement, and to consider in what direction future progress lies. The possibility of concentrating power generation in large central stations was primarily due to (1) the improvements made in the steam turbine in recent years, and (2) the development of high tension multiphase systems of transmission. A modern power station equipped with water tube boilers and steam turbines represents practically the limit of economy so far as present knowledge goes. A 5000 kw. turbo-generator will deliver a unit of electricity at its terminals for about 13½ lb. of steam at 550 deg. Fahr. with 28in. vacuum at the condenser, while a 10,000 kw. set may bring the figure down to 12½ lb. This appears to be the limit of economy in the existing state of progress, and it is possible to supply energy from central stations under these conditions at rates cheaper than any private user could generate for himself. But with the best modern equipment, and with every care taken to prevent loss, we can only secure an overall thermal efficiency in the station of about 15 per cent. Thus there was 85 per cent. loss between the fuel entering the boiler fire and the electricity being delivered at the switchboard. Of this 85 per cent. 30 per cent. was attributable to the boiler house in the form of heat lost in the chimney, radiation from boilers and piping, and leakage in the boiler settings and flues. In the turbine 5 per cent. will be absorbed by friction and radiation, 4 per cent. in generator losses, while the remaining 46 per cent. is rejected in the form of heat to the condenser. To improve the efficiency of the turbine we require to increase its range of temperature, and the only practical way to do so at present is by additional superheating of the steam. The difficulty in using high superheating for turbines was purely one of construction calling for the use of special materials and improved methods of fixing and arranging the parts exposed to the higher temperatures. Bearing in mind the tremendous advance which had been made in recent years, there was good ground for believing that such difficulties would also be overcome. In the meantime they constituted the chief limitation to higher efficiency being obtained from the steam turbine.

Turning next to the Diesel engine, Mr. Robertson said that the high thermal efficiency of this engine might be taken at 30 per cent., or twice the efficiency of the water tube boiler steam turbine combination, and it constituted a strong claim for its adoption in central station work. The chief limitation was in our dependence on foreign countries for supplies of oil fuel. The speaker expressed the opinion that British engineers would do wisely in confining themselves to a type of plant for central station work which could be operated with coal—"our natural fuel, of which we have and are likely to have an abundant supply for many years." Gas producer plant was Mr. Robertson's next point. The producer gas engine can be operated with almost any kind of coal fuel, and it has a thermal efficiency considerably better than the steam turbine, although rather less than the Diesel engine. Its efficiency may be taken at about 27 per cent., or if producer losses are included there is a combined efficiency of about 24 per cent. Of these losses about 20 per cent. will be absorbed in the cooling jacket and about 30 per cent. ejected to the exhaust pipe. If it were possible to increase the range of temperature and construct gas engines of compound or triple expansion type, a much higher efficiency could be obtained, but the mechanical difficulties in the way of making compound gas engines are enormous, and these multiply, unfortunately, as the size of the engine is increased. The limit at present appears to be single stage engines of 4000 h.p. There is still room for improvement, and Mr. Robertson believes that the gas engine will play an important part in the central station of the future. He said that if we could combine the mechanical and operating advantages of the steam turbine with the thermal efficiency of the gas engine we should have a much improved combination. Gas engine efficiency is highest with a steady load, but it has practically no capacity for overload. The steam turbine, on the other hand, has a high capacity for overload, and is fairly efficient at light loads. If these two types of prime movers were combined in one generating station it would be possible also to recover a large portion of the heat now rejected to the gas engine exhaust for the purpose of raising steam in specially constructed boilers, while the heat absorbed in the cylinder water jackets could be recovered as feed water for the steam boiler. With a combination of this kind he thought we could raise station efficiency from the present figure of 15 per cent. to something like 25 per cent. With such an efficiency, and with the further advantages that concentration gives in the way of lower first cost and reduction of standing charges, there was no reason why electricity could not be sold under a scheme such as that put forward by Mr. Ferranti three years ago, at a price which would enable it to be used for every conceivable industrial and domestic purpose. Assuming, however, that the engineering problems were solved, there was still a serious defect in establishing any scheme for the generation and supply of electricity on a large scale, due to the existing interests which had been established under statutory authority. Mr. Robertson questioned the fairness of the charges against municipalities that they were obstructing electrical progress, and he said that while co-operation between various local authorities might have to be entered into as a temporary expedient, the ultimate solution must come from a scheme dealt with on broad national lines. Such a scheme was at least as important as the telephone service, and would justify the appointment of a commission of experts by the Government to investigate the whole question and report fully with special regard to such questions as suitable generating centres, the economic radius of supply, the standardisation of voltages and periodicities, and the purchase of existing interests. Brief reference to a number of questions followed, including transmission, developments in the manufacture and use of storage batteries, the limitations of storage batteries for automobile traction, the possibilities for commercial electric cars, etc. In regard to electric cooking, there was the difficulty of obtaining a heating element which was cheap, mechanically strong, and would work continuously in household use at a temperature corresponding to red heat for more than two or three years. Many firms were engaged upon this problem, but there was not the least doubt that it would be overcome in the near future.

## MISCELLANEOUS.

The Sydney tramways have killed 23 citizens during this year, including a woman who was knocked down last Friday and died next day.

* * *

The West Australian Legislative Council last week once more rejected the Esperance Railway Bill, which provides for the construction of a railway to connect the goldfields with the south coast at Esperance Bay. The second reading, on this occasion, was negatived only by 13 votes to 11; the majority, therefore, is steadily diminishing. All the goldfields members of the Council voted with the Government.

* * *

The employment of a non-unionist on the South Australian broad gauge railway between Mintaro and Farrell's Flat, and the refusal of the Government to remove him, led to the remainder of the men downing tools on the 8th inst. The Railway Commissioner was as prompt in his action as the strikers had been, and he immediately sent instructions that those who had ceased work should be paid off altogether. Seventy-eight men received their pay and left the camp. Only five remained. Of course, questions relating to the incident were asked in the House of Assembly, in reply to which Sir Richard Butler stated that the Government would not submit to dictation by the men, and would give no preference except to those who did good work.

* * *

Special efforts are being made by the South Australian Government to hasten the completion of the Millbrook reservoir, which, when completed, will double the water supply of Adelaide. Owing to the dryness of last winter, the water stored in the reservoirs serving Adelaide and suburbs is 720 million gallons short of the supply available at the same date last year, though settlement has extended rapidly in the metropolitan area. The daily consumption is 16½ million gallons, and more during heat waves. The Government has therefore decided to check the waste of water by increasing the price for excess supply to 1s. per 1000 gallons on the low levels, and 1s. 6d. per 1000 gallons on the high levels. It is estimated that the present supply in the reservoirs will last only to the end of May, but there is ample room for hope that good rains will fall in the intervening five months.

* * *

Something like 250 men are now working on excavations and other preparatory work on the site of the power station at Newport, from which the Melbourne suburban electrified railways will be operated, and 50 more are preparing for the loop line which will connect the power station with Newport. Two shifts are being worked daily. Other men are employed in removing portion of the existing car repair shed at the Jolimont end of the Flinders-street station yard to a temporary site, so as to make room for the rearrangement of tracks made necessary by electrification and the duplication of the Flinders-street viaduct. It was intended by the Watt Government to spend about £1,000,000 on the electrification scheme during next year, and provision was made accordingly in the Railways Loan Bill; this, however, has been blocked for the present by the political crisis. Many substantial progress payments have to be made shortly in respect of contracts already let, but at present money is not available to meet them.

* * *

According to a return laid on the table of the Victorian Legislative Assembly last Thursday, at the request of Mr. Prendergast, during the year 1912-13 there were 12,195 permanent and 10,757 casual employees in the department, and at the end of the year the totals were 13,173 permanent and 10,646 casual. Since 30th June 503 additional permanent employees had been appointed, most of whom had previously been engaged as supernumeraries. During the year £428,980 had been paid as salaries and £2,591,628 as wages, irrespective of the imbursement of the Commissioner's co-operative labour parties, employees in the construction branch, and at the State coal mine, and travelling and incidental expenses.

* * *

The first inland wireless telegraphic service to be installed will connect Casterton (V.) with Strathdownie, near Mt. Gambier (S. Aus.). The rates have not yet been fixed, but they will probably be the same as for ordinary telegrams. The development of an inland wireless service will depend largely upon the success of this first installation, which is therefore to be considered as experimental merely.

* * *

The Postmaster-General informed a deputation from Geelong (V.) last week that the department proposed to connect Geelong with three additional trunk telephone lines, which would pass through to Warrnambool and other centres. The work would be started almost immediately. Geelong will then have four trunk lines connecting with the metropolis. Mr. Wynne promised that Geelong and Lara would also be connected. The deputation, which included the mayors of Geelong and Newtown, as well as representatives of the Chamber of Manufactures, expressed the greatest satisfaction with the automatic telephone services, which the speakers said they would be very sorry to lose.

* * *

When asked last week, in the House of Representatives, whether, in view of the loss of the telephone service, he intended to alter the charge to subscribers, the Postmaster-General replied that first of all he was going to see what economies could be effected in the department. An increase in the number of subscribers, the use of automatic telephones, and the improvement of the system should very nearly make the telephone pay. The loss so far has amounted to £173,812, the heaviest losses per subscriber being incurred at exchanges serving populations of over 100,000 (approximately 42s. per subscriber), and at those having less than 50 exclusive services serving populations of under 10,000 (56s. per subscriber). Smaller exchanges, serving from 10,000 to 100,000 subscribers, lose only about 6s. per subscriber, while those which have more than 50 exclusive services and serving under 10,000 subscribers, lose approximately 15s. on each.

* * *

The large mill of the Western Milling Co. at Mudgee (N.S.W.), which was splendidly equipped with modern machinery, was completely destroyed by fire in the early morning of the 10th inst. The damage is estimated roundly at £20,000.

* * *

An extension of time to complete construction was granted by the Tasmanian Parliament last week to the Stanley-Balfour Railway Company. The extension, which is for two years, was conceded on the casting vote of the Speaker.

* * *

In connection with the description of the Monolyte house building process, which appeared in our issue of the 4th inst., we have been advised by Mr. E. D. Crellin that he has secured the whole of the world's rights for it, and not for Victoria only, as stated.

* * *

The profits of the Midland Railway Company of Western Australia for the year ended June 30, 1913, as made public last week, amounted to £49,549. From this £20,476 is carried to renewal and contingency account, £24,000 is applied to payment of interest on the second mortgage cumulative income debenture stock, and the balance, £5073, is carried forward.

* * *

Replying to a question in the House of Representatives last week respecting the causes of the slow progress now being made with the trans-Australian railway at the Kalgoorlie end, Mr. Kelly, the Assistant Minister of Home Affairs, stated that it was due to circumstances over which, unfortunately, the department has no control. Mr. Riley rejoined, "I believe no rails have been laid since May." Whatever the causes enigmatically referred to by the Minister may be, the progress of construction will be expedited shortly by regular supplies of sleepers from the West Australian Government, for last week the Governor, Sir Harry Barron, accompanied by the Premier, Mr. Scaddan, opened the No. 1 State saw mill at Manjimup. The cost of the mill was £65,000, with a capacity of two shifts a day of 90 loads. It is announced that the mill will immediately start cutting sleepers under contract with the Federal Government. The wages sheet is estimated at £1500 per month. A line four and a half miles long has ben built connecting the mill with the railway system. At the end of last week the line had been completed for 24 miles from Kalgoorlie, earthworks are finished for 67 miles, and the clearing gang is out 72 miles. Shortage of trucks for carrying rails forward appears to be a principal cause of delay in construction.

* * *

It having been decided to instal an electric plant at Canberra to facilitate the multifarious operations essential to the building of the capital city, contracts have been let for the erection of an engine and condensing plant, together with a boiler fitted with a chain grate stoker and superheater. Messrs. Belliss and Morcom Ltd., of Pitt-street, Sydney, have secured the contract for supplying and erecting the machinery, at a cost of £5512, and Messrs. Babcock and Wilcox Ltd., of Sussex-street, Sydney, are to instal the boiler and equipment for £1478. The weir at the Cotter River, which will provide the first water supply for the city, is practically completed, its height being 70ft. and its capacity approximately 800,000,000 gallons. From this basin the water will have to be lifted to a reservoir about 800 or 900ft. up a hill near Mount Stromlo, and for this purpose a pipe line will be carried across the Murrumbidgee, and an electric pump will do the rest. It is proposed that this reservoir, which is to be concrete lined, shall have a capacity of 3,000,000 gallons, the work being carried out by contract, for which tenders are now being called, and are to be at the office of the Secretary for Home Affairs by the morning of January 7.

# Invited and Accepted Tenders

It is particularly requested that the information regarding contracts open, and the successful tenderers, be forwarded to The Editor not later than Monday of each week.

The following contractions are used throughout:—S—supply; D—delivery; M—manufacture; C—construction; E—erection; P—purchase; I—installation; R—removal. Where no contractions appear, supply and delivery is understood. The date at the beginning of each paragraph refers to the closing of tenders.

## INVITED.

### Commonwealth.

Specifications, tender-forms, etc., for tenders invited for the Postmaster-General's Department of the various States under this heading may be had as follows:—Victoria—Various State G.P.O.'s. New South Wales—Departmental Stores, Sydney, and various G.P.O.'s in other States. South Australia—Adelaide, Melbourne, Sydney and Brisbane G.P.O.'s. Western Australia—Departmental Stores, Perth, and various G.P.O.'s in other States. Queensland—Various State G.P.O.'s. All States—Various G.P.O.'s. If the specifications, etc., may be had elsewhere, in addition, the places will be given in parentheses.

POSTMASTER-GENERAL'S DEPARTMENT, Melbourne.—30th December.—S. and D. of telephone material, as per schedule No. 976.

30th December.—S. and D. of 3 motor cycles, as per stores schedule No. 988.

6th January.—S. and D. of wooden cable junction boxes, as per schedule No. 983.

6th January.—Laying of conduits, Richmond, as per schedule No. 1006.

27th January.—S. and D. of switchboards, telephone, etc., as per schedule No. 990.

3rd February.—S. and D. of 2050 Lineman's safety belts, as per schedule No. 994.

10th February.—S. and D. of 1100 lead earth plates, as per schedule No. 993.

17th February.—S. and D. of cable boxes, as per schedule No. 986.

7th April.—S. and D. of 60 non-polarized relays, as per schedule No. 996.

7th April.—S. and D. of accumulator batteries, Tudor type, to Radio stations, as per schedule No. 991. (See advertising columns.)

POSTMASTER-GENERAL'S DEPARTMENT, Sydney.—7th January.—Laying about 1909 lineal feet 4-way E.W. conduit.

7th January.—Laying about 1978 lineal feet E.W. conduit.

7th January.—S. and D. of telephone and telegraph parts (23 items), as per stores schedule No. 355, and spindles (3 items), as per stores schedule No. 354.

18th March, 1914.—S., D. and E. at the Telephone Exchanges, Epping, Ryde, Hunter's Hill, Drummoyne, Wahroonga, Paddington and Waverley, Sydney, of seven (7) automatic switchboards, with associated equipment, as per schedule No. 179.

POSTMASTER-GENERAL'S DEPARTMENT, Brisbane.—31st December.—S. and D. of insulators, as per stores schedule No. 282.

7th January, 1914.—S. and D. of switchboards, as per schedule No. 274.

7th January, 1914.—S. and D. of telephone instruments, as per stores schedules Nos. 275, 276 and 277.

7th January, 1914.—S. and D. of protectors, parts, etc., as per schedule No. 278.

7th January.—S. and D. of protectors and parts, as per stores schedule No. 284.

POSTMASTER-GENERAL'S DEPARTMENT, Perth.—7th January.—S. and D. of porcelain tube insulators.

7th January.—S. and D. of bolts and nuts, washers and iron combiners, as per stores schedule No. 332.

14th January.—S. and D. of cords, keys, and switches, as per stores schedule No. 330.

14th January.—Repair and overhaul of Busselton-Karridale telegraph line.

21st January, 1914.—S. and D. of switches, telegraph line with plugs.

POSTMASTER-GENERAL'S DEPARTMENT, Adelaide.—7th January.—Laying conduits and iron pipes, and construction of manholes, Adelaide, as per schedule No. 314.

11th February.—S. and D. of 50 cable terminals, 26 pair, as per schedule No. 308.

POSTMASTER-GENERAL'S DEPARTMENT, Hobart.—22nd December.—S. and D. of conduits, as per stores schedule 103.

2nd March.—S. and D. of telephones, as per stores schedule No. T104.

DEPARTMENT OF DEFENCE—Small Arms Factory, Lithgow, N.S.W.—29th December.—P. of scrap steel, brass, jute bags, whale oil, etc.

25th February (extended from 12th January).—S. of iron and steel for manufacture of rifles.

DEPARTMENT OF HOME AFFAIRS.—30th December.—S. and D. of 75 tarpaulins 26 x 15ft. 7in. (50 to be delivered at Port Augusta and 25 at Kalgoorlie) for Kalgoorlie-Port Augusta railway. (See advertising columns.)

19th December.—S. and D. of 1 oil-driven road roller at Fremantle or Port Augusta. (See advertising columns.)

7th January.—Excavation and concrete lining of reservoir, capacity 3,000,000 gallons, Federal capital site. (See advertising columns.)

### States Invited.

### Victoria.

RAILWAY DEPARTMENT.—22nd December.—S. and D. of 200 tons pig iron.

22nd December.—Erection main workshops (steel and iron), Locomotive Depot, Bendigo.

31st December.—S. and D. of planished mild steel sheets (lead coated or galvanised).

7th January.—S. and D. of 10,000 porous pots for batteries.

7th January.—S. and D. of best steel boiler plates.

7th January.—S. and D. copper rod.

7th January.—S. and D. copper plates.

7th January.—S. and D. of cast steel wheel centres.

7th January.—S. and D. of steel blooms for crank pins.

7th Jan.—S. and D. of locomotive brass boiler tubes.

7th January.—S. and D. of best Yorkshire iron angles.

7th January.—S. and D. of locomotive seamless copper tubes.

7th January.—S. and D. of steel channel bars.

14th January.—S. and D. of five feed lubricators.

14th January.—S. and D. of 100,000 lineal yards tarpaulin canvas.

14th January.—S. and D. of high speed twist drills.

14th January.—S. and D. of one concrete mixer.

21st January.—S. and D. of one high axle speed lathe.

21st January.—S. of hydraulic jacks.

28th January.—S. and D. of 200 forged and rolled steel disc wheels.

28th January.—M., S., D. and E. of one three-phase alternator, complete, at Newport.

4th February.—S. and D. of 1500 felt body blocks.

4th February.—S. and D. of 25 five-feed lubricators.

11th February.—S. and D. 10 tons commercial sodium acetate.

18th February.—S. and D. of pig iron.

25th February.—S. and D. 20 tons galvanised telegraph wire No. 10½.

4th March.—S. and D. of gunmetal switch locks and keys.

4th March.—S. and D. of Yorkshire iron forged billets.

11th March.—S. and D. of transformers and fuses.

25th March.—S. and D. of hammer handles.

VICTORIAN RAILWAYS COMMISSIONERS—State Coal Mine.—22nd December.—S. and D. of insulating tape, electric insulated wire.

7th January.—One motor driven air compressor. (See advertising columns.)

PUBLIC WORKS DEPARTMENT.—18th December.—Refrigerating machinery.

8th January.—S. and D. of one 10-ton weighbridge for Sale.

DEPARTMENT OF PORTS AND HARBOURS.—S. and D. of eight 12in. sluice valves; two 12in. bends, fitted with sleeves and stuffing boxes; two 3in. sea suction valves; two 4in. sea suction valves; two 4in. discharge valves; one 4in. circulating discharge valve; one 2in. boiler blow-off cock; one 6in. main steam stop valve; one 2½in. auxiliary steam stop valve; one 3½in. double spring safety valve; two 1¼in. feed check valves; one 2in. blow-off cock; one water gauge, with stand pipe; one steam pressure gauge steel stay bars, washers and nuts.

### New South Wales.

PUBLIC WORKS DEPARTMENT.—22nd December.—M., S. and D. of twenty 20-ton cart weighbridges, ten 20-cwt., and forty 10-cwt. weighing machines for railway station yards.

22nd December.—C. of electric truck and goods lifts, New Public Abattoirs, Homebush.

5th January.—S. and D. of paper insulated and lead covered cable and accessories, at New Public Abattoirs, Homebush.

12th January.—S. and D. of wrought iron and steelwork for 2nd section, Dunedoo to Coonabarabran Railway.

12th January.—S. and D. of a 10-ton electric crane for State Quarry, Maroubra.

2nd February.—S. of 220 miles galvanised iron telegraph wire.

M., S. and D. of 14,000 tons steel rails and 800 tons fishplates for 60 lb. rails.

METROPOLITAN BOARD OF WATER SUPPLY AND SEWERAGE.—15th December.—M. and D. of one turbine centrifugal pumping plant for Crown-street Pumping Station.

22nd December.—C. and E. of a mild steel reservoir at Momm's Hill.

SYDNEY HARBOUR TRUST.—22nd December.—S. and D. of 4 sets of electrically operated freight conveyors for berths 6, 7, 8, and 9, Woolloomooloo Bay.

2nd March.—S. and E. of 3 electrically operated semi-portal travelling cranes for berths 1, 2, and 3, Woolloomooloo Bay.

RAILWAY DEPARTMENT.—7th January.—M. and E. of revolving screens for the circulating water at White Bay Power House. (See advertising columns.)

14th January.—S. of two electrically driven turbine pumps, 50 gallons per minute. (See advertising columns.)

14th January.—S. of worm gear, shafting, brackets and ball bearings for White Bay Power House. (See advertising columns.)

18th March.—S. of 24 direct current motor starters. (See advertising columns.)

25th March.—S. of five 1000kw. substation units. (See advertising columns.)

WATER CONSERVATION AND IRRIGATION COMMISSION, 29 Elizabeth-street, Sydney.—29th December.—M., S. and D. of 250 Dethridge meter wheels.

### Queensland.

TREASURY DEPARTMENT.—6th January.—S. and D. of 23 miles steel rails, 28 lb. per lineal yard, with all fastenings, to be delivered at Cairns wharf in July, 1914.

WATER SUPPLY DEPARTMENT.—Tambo Water Works.—5th January.—S. and D. of 85 tons cast-iron water pipes, special castings and valves.

**P & O** COMPANY'S ROYAL MAIL STEAMERS
FOR MARSEILLES, PLYMOUTH AND LONDON.

Leave Sydney on the subjoined dates, calling at usual ports.

FIRST AND SECOND SALOON ONLY.

| Steamer, | Tons. | Commander. | Noon. | Melb., 3 p.m. |
|---|---|---|---|---|
| MALWA | 11,000 | Thompson | Dec. 27 | Dec. 30 |
| MOOLTAN | 10,000 | Haddock | Jan. 10 | Jan. 13 |
| MOREA | 11,000 | Andrews | Jan. 24 | Jan. 27 |

PASSAGE MONEY TO LONDON—
Single, £41 16s. to £82 10s.
Return, £69 6s. and £123 4s.

Return Tickets between Inter-State Ports are available for return by Orient, Messageries Maritimes, and N.D.L. steamers having room.

SPECIAL HOLIDAY RETURN TICKETS to COLOMBO are now issued, available for two months. Fares from Sydney, £45 2s. first saloon, and £31 18s. second saloon.

A. GORDON WESCHE, Superintendent IN AUSTRALIA, 63 Pitt-street, Sydney.

**The COLONIAL MUTUAL FIRE Insurance Company Limited.**

Principal Office: 60 MARKET-ST., MELBOURNE.

Branches in all the States.
Transacts Fire, Guarantee, Employers' Liability, Marine, Burglary, and Plate Glass, Accident, Workers' Compensation and Live Stock Insurances.
Send for Prospectus.
W. TUCKER, General Manager.

**Harringtons LTD**

**ANALYTICAL & METALLURGICAL DEPT.**

Highest prices given for all gold, silver or platinum residues, etc.
Lowest fees for all kinds of Assay, Analytical, and Metallurgical work.
Expert Advice on Ore Treatment, Bullion Refining, Smelting, etc., etc., Directed by a qualified Analyst from Messrs. Johnson and Sons, London: Assayers and Refiners to Bank of England, H.M. Mint, The Council of India, etc.

**HARRINGTONS LTD.**
**386 George Street, Sydney.**

**A.U.S.N. Co. Ltd.**

*Fast, Regular, and Comfortable Passenger Steamers*
(also carrying cargo) from and to
MELBOURNE, SYDNEY, ADELAIDE, FREMANTLE, BRISBANE, and all QUEENSLAND PORTS.

Passage Tickets interchangeable, with other Inter State Companies, on certain conditions.

Full Particulars at
**COMPANY'S OFFICES**
**at all principal Australian Ports.**

**The Mount Lyell Mining & Railway**
CO. LIMITED.

Purchasers of Ores containing Copper, Gold and Silver. Rates obtainable on application to the Secretary.

Manufacturers of Coke for Smelting and Foundry Purposes, Acids, Etc.

HEAD OFFICE—
39 QUEEN-STREET, MELBOURNE.
D. G. LUMSDEN,
Secretary.

*An "Atlas" Engine runs in the Cheapest Oil Fuel obtainable.*

and runs effectively. An "Atlas" needs no ignition device—it is the only true internal combustion Engine.

The highest efficiency is obtained in the extremely low consumption of 0.55 lbs. per B.H.P. per hour.

Any man with ordinary common sense can run the "Atlas"—it starts at the first injection of the Fuel Oil—and what's more it does not require persistent attention.

Cut down your Engine room costs as other mine managers have done. Instal the "Atlas"—and benefit from the high efficiency that it will give from the very cheapest of fuel.

Call and see the Engine running or write for all particulars. Also ask for our complete Catalogue of mining and Machinery tools.

***STAWN LTD., Engineers,***
***343 Kent Street - - Sydney.***

### South Australia.

SUPPLY AND TENDER BOARD.—6th January.—S. and D. of 20,000 square feet of green leather; 5000 square feet of blue leather.

6th January.—S. and D. of chain iron, 1500 bars, various sizes.

6th January.—S. and D. of 2000 tons steel rails, 41 lb., and 33 tons steel fishplates for same.

13th January.—S. and D. of five 30-ton weighbridges for 3ft. 6in. gauge railway.

13th January.—C. of 12 bogie goods break vans, with passenger compartments, 3ft. 6in. gauge.

13th January.—C. of overhead way and approaches at Belair.

3rd February.—S. and D. of 10,000ft. swelled-joint bore casing.

10th March.—S. and D. of one testing machine.

10th March.—C. of 80 cattle vans, 5ft. 3in. gauge.

### Western Australia.

GOVERNMENT TENDER BOARD.—18th December.—S. and D. of copper plates, pipes, bars, and sheets, for Railway Department.

18th December.—Mill rolled plate glass for Railway Department.

18th December.—S. and D. of telephone material for P.W. Department.

18th December.—S. and D. of printing machinery, etc., for Lithographic Department.

8th January.—S. and D. 16 steel blooms for Railway Department.

8th January.—S. and D. of 4 tons copper line wire for Railway Department.

8th January.—P. of scrap, consisting of brass tube ends, borings and turnings, mixed white metal and brass borings and turnings, and copper plates, Midland Junction.

15th January.—S. and D. of 80 lb. steel rails and dog spikes.

### New Zealand.

TENDER BOARD.—Wellington.—12th January.—2 miles cable, D.C.L.C., air-space, 624 pairs; 3 miles cable, D.C.L.C., air-space, 520 pairs; 3 miles cable, D.C.L.C., air-space, 416 pairs; 6 miles cable, D.C.L.C., air-space, 312 pairs; 4 miles cable, D.C.L.C., air-space, 208 pairs; 18 miles cable, D.C.L.C., air-space, 104 pairs; 11½ miles cable, D.C.L.C., air-space, 78 pairs; 8 miles cable, D.C.L.C., air-space, 52 pairs.

### General.

PRAHRAN AND MALVERN TRAMWAYS TRUST.—13th January.—M., S. and D. of steel poles, contract No. 41.

GEELONG WATER WORKS AND SEWERAGE TRUST.—19th December.—S. of 60,000 lineal feet circular reinforced concrete pipes.

19th December.—S. of 150 cast iron manhole covers.

BRISBANE METROPOLITAN WATER AND SEWERAGE BOARD.—13th January.—S. and D. of material for aerial ropeway.

10th February.—S. and D. of steam crane excavator.

CITY OF TOOWOOMBA (Q.) (Frank H. Merritt, Town Clerk).—9th February.—1000 water meters. (See advertising columns.)

CHRISTCHURCH CITY COUNCIL (H. R. Smith, town clerk).—5th January, 1914.—S. and D. of series street lighting plant and accessories. Specifications may be seen Town Clerk's office, Melbourne.

CONRAD MINES LTD., Howell (N.S.W.), (C. F. W. Lloyd, Official Liquidator, 182 Phillip-st., Sydney).—22nd January.—P. of mining leases, machinery, etc. (See advertising columns.)

MUNICIPAL COUNCIL OF SYDNEY.—22nd December (extended from 8th December).— S. and D. of electrical castings (Part I.—cast-iron; Part II.—copper, brass). (See advertising columns.)

2nd February.—S. and D. of transformers and weatherproof switch fuses. (See advertising columns.)

CITY OF MELBOURNE.—19th December.—S. and D. of 2 light single-seated motor cars.

21st January.—S. and D. of bare hard-drawn copper cables. (See advertising columns.)

24th January.—S. and D. of house cut-out boxes. (See advertising columns.)

BROKEN HILL PROPY. CO. LTD.—10th January.—S. and D. of annual stores and mining requisites.

CATHCART VICTORY G.M., N.L. (P. P. Cook, Collins-street, Melbourne).—S. and D. of pumping engine, 20in. cylinder, drawing 14in.; 250ft. columns, with 14in. or 16in. workings, complete, new or secondhand.

THE METROPOLITAN WATER AND SEWERAGE BOARD, Brisbane (Q.).—23rd December.—10,000 tons of best steam coal.

ST. ARNAUD NORTH GOLD MINE (P. P. Cook, Collins-street, Melbourne).—18th December.—S. and D. of new or secondhand 38h.p. suction gas engine (48 h.p. producer), two Wilfley tables, 10-head battery (1000 lb. stamps).

GT. CARPENTARIA COPPER MINING CO. (N.T.) (30 Queen-street, Melbourne).—S. of pumping plant.

CITY OF BUNDABERG (Q.) (Herbert J. Layt, Town Clerk).—11th February.—Street lighting by gas, electricity or other lights.

W. F. VALE and CO., 285 Collins-steet, Melbourne.—S., laying and connecting 1000ft. 1½in. water pipes, at Brunswick East.

CITY OF PORT ADELAIDE.—18th December.—S. and D. of annual supplies, including tar, coal, ironmongery, disinfectant, cement, explosives, lubricating oil and benzine.

SHIRE OF TUNGAMAH (T. Kelly, C.E., Shire Engineer),—3rd January.—S. and E. of suction gas plant, or Diesel engine; dynamos, switchboard, booster, starting rheostat, centrifugal pump, electric wire and cables, buildings, etc., for Cobram Electric Lighting Station.

HEDDON GRETA COAL CO. (Lang, Wood and Co., Newcastle).—27th January.—P. of above mine, 640 acres freehold, free of royalty, with building, plant and machinery.

## ACCEPTED.

### Commonwealth.

POSTMASTER-GENERAL'S DEPARTMENT, Victoria.—252,000 insulators, porcelain, pattern "B" (New South Wales, 1913-14), 2.7267d. each; 108,000 insulators, porcelain, pattern "B" (Queensland, 1913-14), 2.7725d. each; 270,000 insulators, porcelain, pattern "B" (New South Wales, 1914-15), 2,7267d. each; 150,000 insulators, porcelain, pattern "B" (Victoria, 1914-15), 2.55d. each; 108,000 insulators, porcelain, pattern "B" (Queensland, 1914-15), 2,7725d. each; 90,000 insulators, porcelain, pattern "B" (South Australia), 2,7267d. each; 48,000 insulators, porcelain, pattern "B" (Western Australia, 1914-15), 2.875d. each; 14,400 insulators, porcelain, pattern "B" (Tasmania, 1914-15), 2.7267d. each; 288,000 insulators, porcelain, pattern "B" (New South Wales, 1915-16), 2.7267d. each; 150,000 insulators, porcelain, pattern "B" (Victoria, 1915-16), 2.55d. each; 108,000 insulators, porcelain, pattern "B" (Queensland, 1915-16), 2.7725d. each; 108,000 insulators, porcelain, pattern "B" (South Australia, 1915-16), 2.7267d. each; 60,000 insulators, porcelain, pattern "B" (Western Australia, 1915-16), 2.875d. each; 14,400 insulators, porcelain, pattern "B" (Tasmania, 1915-16), 2,7267d. each.—The Commonwealth Art Pottery and Insular Co. Pty. Ltd.

One common battery multiple switchboard, consisting of nine subscribers' sections and two junction sections, and other equipment necessary to increase the equipment of the existing common battery switchboard at the Telephone Exchange, Windsor, from 3360 to 7680 lines, £16,533 18s. 3d.—British General Electric Co. Ltd.

POSTMASTER-GENERAL'S DEPARTMENT, Queensland.—3 tons bronze wire, 100 lbs. per mile, £89 per ton—Messrs. Brabant and Co., Brisbane.

DEPARTMENT OF HOME AFFAIRS, Power Generating Plant, Federal Territory.—S. and E. of engine and condensing plant, £5512—Messrs. Belliss and Morcom Ltd.

S. and E. of steam boiler, with chain grate stoker and superheater, £1478—Messrs. Babcock and Wilcox Ltd.

### Victoria.

RAILWAY DEPARTMENT.—M., S. and D. of gas cylinders for motor coaches, £8 2s. 6d. each—J. H. Garbutt.

M., S. and D. of cutters for wood working machines, to various templates, 2s. to 2s. 9d. each—W. H. Blakely and Co.

S. and D. of best steel boiler plates for maintenance of locomotive boilers and construction of 15 A2 engines, £8 2s. 4½d. per ton—Stewarts and Lloyds (Aust.) Ltd.

S. and D. of ingot steel for foundry use, £13 15s. per ton—Briscoe and Co. Ltd.

C. and E. of platform verandahs, Spencer-street, £2611 4s. 9d.—M. Sorensen.

M., S. and D. of 7-8in. steel fishbolts and steel nuts, £24 19s. per ton—Victoria Iron Rolling Co. Pty. Ltd.

S. and D. of benzine (for McKeen motors), 1s. 8d. per gallon—Vacuum Oil Co. Pty. Ltd.

S. and D. of best Yorkshire iron angles and tees for maintenance of locomotive boilers and construction of 15 A2 engines, £25 18s. per ton—Royle and Co.

P. of spare parts for automatic telephones, £45—Automatic Telephones (Aust.) Ltd.

Dunlop Mining Goods
Are now used with satisfaction in most of the Leading Mines of Australasia – Their QUALITY & WEAR are UNSURPASSED.
Tenders & Samples submitted
Correspondence Invited
Send for Illustrated Catalogue

The DUNLOP RUBBER Co. of AUS. Ltd.
108 Flinders St., MELBOURNE.
& ALL STATES

Dunlop Rubber Belting
Is more efficient than Leather belting for Outdoor & Wet Work.
Sample & Price on application

**"FIBRO-CEMENT" Fireproofing**

Everyone about to build should obtain full particulars of this cool, acid-proof, ant-proof and fire-resisting material. The slates for roofs and the sheets for walls and ceilings are specially suited for the Australian climate. Used by the Federal and State Governments and by all the leading Architects and Builders.

**ECONOMICAL AND EVERLASTING.**

Full particulars, etc., from Sole Agents and Importers—
**JAMES HARDIE & CO. Melbourne & Sydney**

P. of spare parts for McKeen motor cars, £85 Mr. Beard.

P. of special armature coils and feed chains, £25 5s. 3d.—Sullivan Machinery Co.

MINES DEPARTMENT.—Fittings and connections for diamond and other drills and batteries—Goldfields Diamond Drilling Co.

PUBLIC WORKS.—Machinery for Lunatic Asylum, Beechworth, £271 13s. 9d.—J. Buncle and Son.

New cool stores, Tyab, £2570 11s. 6d.—T. Sly.

Foundations for machinery and power house of cool stores, West Melbourne, £1663 Reinforced Concrete and Monier Pipe Construction Co. Pty. Ltd.

PORTS AND HARBOURS.—6 Imperial beach lights and accessories for lifeboat stations, £149 12s.—Wm. Adams and Co. Ltd.

One hand windlass for shipyard, £65; two steam windlasses, £298—M. C. Coates.

One Denison suspended weigher, £31; one hydrostatic weighing machine, £25—Benson Bros.

One hydraulic pressure pump, £110—Thompson and Co.

One rivet and bolt heading machine, £251—Bevan and Edwards.

Three hydraulic lifting rams, £199—Austral Otis Engineering Co.

STATE FORESTS.—M. and E. of one multitubular boiler, 6ft. 6in. x 14ft., £540—Johnson and Sons Pty. Ltd.

STATE RIVERS AND WATER SUPPLY COMMISSION.—C. of reservoir on Werribee River, £52,520.

## South Australia.

SUPPLY AND TENDER BOARD.—5000 9 x 4½ sleepers, at 5s. 2d. each; 1000 N.G. sleepers, at 3s. each—J. E. Hood.

200 10 x 5 sleepers, at 6s. each; 300 N.G. sleepers, at 3s. 3d. each—E. Watkins.

1000 N.G. sleepers, at 3s. each—Wm. E. Sharp.

368 tons white cotton waste, at £32 per ton—C. Atkins and Co. Ltd.

130 tons moulders' blacking, at £5 10s. per ton—A. Noble and Son.

20 cwt. aluminium zinc alloy, at 11¼d. per lb.—C. Atkins and Co. Ltd.

18 indiarubber hosepipes, 50ft. long, at 2s. 3d. per ft.—Perdriau Rubber Co.

7 indiarubber hosepipes, 50ft. long, at 2s. 3d. per ft.—Barnet Glass Rubber Co. Ltd.

240 tons coarse sand, at 2s. 6d. per ton—Theodore Ey.

1137 bars soft rolled copper, at £83 6s. per ton—Geo. Wills and Co. Ltd.

210 tons No. 2 calcium carbide, at £13 14s. per ton—Dalgety and Co. Ltd.

100 miles 42 x 1½ x 18 wire netting, at £15 1s. 8d. per mile; 100 miles 36 x 1½ x 18 wire netting, at £12 16s. 11d. per mile—Harris, Scarfe and Co. Ltd.

4000 insulators, porcelain, 7¾d. each—Steele and Baker.

37,500 gallons high test kerosene oil, at 1s. per gallon—Chas. Atkins and Co. Ltd.

37,500 gallons high test kerosene oil, at 1s. per gallon—Vacuum Oil Co. Pty. Ltd.

Supply of S.A. Portland cement to June 15, 1915, 3s. 6d. bushel—S.A. Portland Cement Co. Ltd.

40 cwt. ingot tin (99 per cent. pure), £9 16s. 6d. per cwt.—Harris, Scarfe and Co. Ltd.

250 lin. turbine water meters, at 54s. 9d. each—Hitchcox Bros.

1000 ½in. boundary stopcocks, at 2s. 4d. each; 1000 ¾in. boundary stopcocks, at 3s. 1d. each—Wadham Bros.

500 1in. boundary stopcocks, at 5s. 3d. each—A. W. Dobbie and Co.

800 S.D. copper tubes, at 10¾d. per lb.—Geo. P. Harris, Scarfe and Co. Ltd.

6 jaw faces for rock crusher part, for £55 16s.—The McArthur Engineering Supply Co. Pty. Ltd.

3000 porcelain insulators, No. 5, at 6¾d. each—Steele and Baker.

12,000 gallons high test kerosene oil, at 11 8 10d. per gallon—C. Atkins and Co. Ltd.

2000 Parabo springs, at 8s. each, c.i.f. Port Adelaide—J. G. Black.

100 tons Goldendale No. 4 cylinder pig iron, at £6 4s. 11d. per ton; 500 tons No. 3 Cleveland pig iron, at £3 19s. 11d. per ton—Geo. Wills and Co. Ltd.

100 engine head lamps, at 17s. 6d. each—A. Simpson and Son. Ltd.

5000 9 x 4½ sleepers, at 5s. 3d. each; 5000 N.G. sleepers, at 3s. 3d. each—A. Holmes.

3000 9 x 4½ sleepers, at 5s. 6d. each; 3000 N.G. sleepers, at 3s. 3d. each—J. H. Gosden.

5000 9 x 4½ sleepers, at 5s. 6d. each—W. J. Wilson.

200 9 x 4½ sleepers, at 5s. 6d. each; 1000 N.G. sleepers, at 3s. 3d. each—F. Watkins.

760 10 x 5 sleepers, at 6s. each; 6000 N.G. sleepers, at 3s. 3d. each; 10,000 9 x 4½ sleepers, at 5s. 6d. each—E. Lane.

3000 9 x 4½ sleepers, at 5s. 6d. each; 4000 N.G. sleepers, at 3s. 3d. each—R. T. H. Garrett.

258 10 x 5 sleepers, at 6s. each—G. W. and B. W. Shepherdson.

200 10 x 5 sleepers, at 6s. each; 600 N.G. sleepers, at 3s. 3d. each; 400 9 x 4½ sleepers, at 5s. 6d. each—W. Parker.

## New South Wales.

PUBLIC WORKS DEPARTMENT.—S. and D. of steel pipes and specials for Broken Hill Water Supply, £38,700—Noyes Bros. Ltd.

MET. BOARD OF WATER SUPPLY AND SEWERAGE.—S. and D. of copper brass, steel and iron pipes for Ryde Pumping Station (office estimate, £145), £99 8s. 6d.—W. Robison.

S. and D. of one steel chimney for pumping station, Ryde (office estimate, £75), £65—R. L. Norman.

## Western Australia.

RAILWAY DEPARTMENT.—S. and D. of 100 tons Lithgow pig iron, £4 15s. per ton—G. C. Hoskins Ltd.

S. and D. of 12 cast iron tanks, £312 each—Leslie and Co.

## General.

PRAHRAN AND MALVERN TRAMWAYS TRUST.—Contract No. 46, Permanent way of High-street east and Caulfield loop, £7272 6s. 7d.—Bladen and Wallace.

Contract No. 40, 2760 tons rails, fishplates, fastenings and bonds, £7 16s. 9d. per ton—Noyes Bros. Pty. Ltd.

SHIRE OF NUNAWADING.—Electrical Equipment.—High tension oil switches; high tension isolating switches; low tension switches and fuse gear; time switches and testing sets, £153 1s. 6d.—Noyes Bros. (Melb.) Pty. Ltd.

Lightning arrestors and recording voltmeter, £37 7s.—Australian General Electric Co. Ltd.

High and low tension insulators and pins, £152 11s. 8d.—Warburton, Franki (Melbourne) Pty. Ltd.

High tension watt meter, testing set, consumers' meters and service fuses, £343 9s. 2d.—Australian Metal Co. (Electrical Dept.) Ltd.

Street brackets, £115 17s. 6d.—Wm. McLean and Co.

Transformers, £245—Union Electric Co. of Aust. Ltd.

---

# TASMANIAN MINING.

(From Our Correspondent.)

Queenstown, Dec. 5.

Operations at the Mount Lyell Company's North Lyell and Mount Lyell mines continue to proceed on lines which justify the opinion expressed in recent previous notes to the effect that both mines are in excellent condition for maintaining a large output for an indefinite period.

At the North Lyell mine they are sending out approximately 10,000 tons a month, and the mining of this tonnage is being accomplished without difficulty, and it is understood that the management is confident of being able in the near future to appreciably increase this output. Apart from underground work, a large number of men are constantly employed on the surface breaking overburden for filling. Immense quantities of material are being sent down every day, and strict attention is being paid to the important work of keeping the big excavations which are inseparable from the stoping out of large ore bodies such as those in the North Lyell mine thoroughly mullocked up. The crosscut at the 700ft. level, which is being driven to a point vertically under the Crown Lyell shaft at a depth of about 150ft. below it, is being pushed ahead, and as soon as the objective point is reached the question of deepening the shaft for the intervening distance will probably be considered. Should this work be carried out it will, in addition to providing a second exit from the 700ft. level of the North Lyell mine to the surface, facilitate exploration work in the country embraced by the Crown Lyell lease north-west of the North Lyell workings. At the Mount Lyell mine work generally is progressing as satisfactorily as at the North mine, or perhaps a bit more so. A diamond drill bore which has been put in at No. 8 level has proved the existence of what appears to be a separate body of pyrites about 60ft. wide, and practically lying between the Mount Lyell and South Lyell workings. It is understood that the material is only of the usual grade of Mount Lyell pyrites, so that as far as its metal value is concerned the development is not of any great importance. All the same, it is pretty sure to form an appreciable addition to the ore reserves of the mine.

Operations at the reduction works are going along just as satisfactorily as at the mines. Three furnaces have now been in continuous blast for about nine weeks, and it is almost certain that the order of things will be maintained right up to the holidays, when there will probably be the usual slight interruption for a copule of weeks. As forecasted in my last notes, the output of copper for the four-weekly period ending November 26 was over 600 tons, and consequently production may now be said to have regained standard figures. Regarding the smelting run for the current month, which closes on December 24, it is practically certain—bar accidents—that the return will be quite up to that for last month, and it is quite on the cards that it will exceed it. Going on this assumption, the copper production for the last four months of the year 1913 will reach something like 2325 tons. And when these figures are compared with those of the results of the first four months of the year, when the North Lyell mine was out of commission, it will be easy to realise the marvellous recovery which has been made by the Mount Lyell Company from the set-back caused by the North Lyell disaster.

Fair progress continues to be made with the Lake Margaret works, but the rough weather—the rainfall for November was nearly 20 inches—has naturally interfered with operations, and the climatic conditions will need to be a great deal more summerlike than they have been yet to allow of the same being completed by the end of the first half of next year.

---

# DIVIDENDS.

The following dividends and bonuses of mining companies in Australia have been declared, and are payable on the dates noted.—

December.

18th.—Ajax Central Co., Daylesford (V.), 2s., £3000.

18th.—Mararoa G.M. Co., Norseman (W.A.), 1/-, £5000.

18th.—Wandiligong G.D. Co., Bright (V.), 1/-, £300.

19th.—Campbell's Creek G.D. Co., Campbell's Creek (V.), 6d., £800.

19th.—North Broken Hill S.M. Co. (N.S.W.), 2s., £60,000.

19th.—Tongkah Compound, Siam, 1s. and bonus 1s., £5000.

19th.—Great Boulder Proprietary, Kalgoorlie (W.A.), 9d., £5625.

19th.—Broken Hill South S.M. Co., Broken Hill (N.S.W.), 8s., £80,000.

20th.—Sons of Gwalia Ltd., Mt. Leonora (W.A.), 1s., less income tax, £17,500.

22nd.—Hampden Cloncurry Copper Mines (Q.), 2s., £35,000.

22nd.—Mt. Elliott Ltd. (Q.), 5s., less English income tax, £37,500.

22nd.—Pioneer Tin Co., Bradshaw's Creek (T.), 1/6, £12,093.

22nd.—Bourke's Hill T.D. Co., Emmaville (N.S.W.), 6d., £1125.

22nd.—Johnson's Reef G.M. Co., Bendigo (V.), 1s., £2100.

23rd.—Llanberris No. 1 G.M. Co., Ballarat East (V.), 6d., £600.

23rd.—Buckland Star G.D. Co., Buckland River (V.), 1s., £300.

23rd.—Sulphide Corporation, Broken Hill (N.S.W.), preference 2s. and ordinary 1s. 6d., less English income tax, £96,250 (£90,635 net).

29th.—Mt. Bischoff T.M. Co. (T.), 10s., £6000.

29th.—Zinc Corporation, Broken Hill (N.S.W.), 1s. 6d., less English income tax, all shares, £67,400.

29th.—Lake View and Star G.M. Co., Kalgoorlie (W.A.), interim 6 per cent., less income tax 1s. 2d. in £, £6000.

30th.—Yuanmi G.M. Co., Mt. Magnet (W.A.), 1s., £17,500.

January, 1914.

2nd.—Mt. Morgan G.M. Co., Rockhampton (Q.), 1s., £50,000.

6th.—Broken Hill Water Supply (N.S.W.), 1s. 6d. and bonus 6d., £20,000.

6th.—Kalgurli G.M. Ltd., Kalgoorlie (W.A.), 4s., less English income tax, £24,000.

9th.—Edna May G.M. Co., Weston (W.A.), 2s., £4285.

14th.—Lake View and Oroya G.M. Co., Kalgoorlie (W.A.), 6d., less English income tax, £22,500 (£21,187 10s. net).

15th.—North Mt. Farrell S.L.M. Co. (T.), 6d., £2000.

---

During November the Mt. Bischoff T.M. Co. (T.) shipped 100 tons of tin oxide, and treated 19,766 tons of crude ore in the milling and concentrating plants.

The gold received at the Melbourne branch of the Royal Mint for the week ended with the 13th inst. amounted to 30,501.98 oz.

For the month of November the output of the Cadia Copper Mining Co., Orange (N.S.W.), was 247.65 tons of copper matte from 3037 tons of ore treated. In the last week of the run the average assay of the matte was 52.09 per cent., 71.65 tons being obtained from the treatment of 808 tons of ore.

## MIXED MEMS.

Mr. A. S. Carroll, legal manager of the New Salak South Tin Dredging Co., who is now in Malaya, has communicated with the Melbourne directors to the effect that negotiations have been completed with the vendors of the property, and that a new agreement has been entered into providing that the company purchases the property outright for £5000, on the following terms, viz.:—£500 deposit, £500 in February, and £500 per month thereafter until the £5000 is paid. Under the previous agreement the company had to pay the vendors £14,000 from profits. A development policy is being drawn up, and it is stated that an expenditure of £750 will open up a large amount of profitable ground. During November tributers won 5 tons of tin, of which the company's percentage was £180.

The November railway receipts of Chillagoe Ltd. (Q.) amounted to £8635, and for the eight months of the financial year ending November 30, £72,185. For the corresponding periods of the previous year the respective amounts were £10,259 and £72,060.

The November receipts of the Emu Bay Railway Co. (T.) amounted to £4968, as compared with £5504 for November, 1912, making the total receipts for the 11 months of 1913, £61,054, as against £60,262 for the same period last year.

The British Chamber of Commerce, 9 Rue des Pyramides, Paris, official representative of the Commonwealth in France, reports, on November 10, the following quotations for minerals on the French markets:—Copper (Havre), £73 14s.; tin (Havre), £198; lead (Havre or Rouen), £23 4s.; (Paris), £23 8s.; zinc (Paris), £23 2s.; nickel (Paris), £165 to £175.

It is proposed to reconstruct the New Zealand Crown Mines Co. Ltd. to enable a more vigorous working policy to be adopted. The new company which the directors propose will have a capital of £500,000 in shares of 4s. each. Present shareholders will receive one share paid up to 2s. for each share now held.

Messrs. E. L. and C. Baillieu have forwarded the December issue of the Monthly Official List of Quotations and Prices Current of the Stock Exchange of Melbourne.

The Victorian Railways Commissioners report that the receipts for the expired five months of the financial year ended on November 30 amounted to £2,166,918, or £106,929 more than for the corresponding period of last year. The principal increases were:—£61,128 from goods traffic, £29,324 from live stock, £14,142 from passengers, and £3763 from parcels. The receipts from the St. Kilda-Brighton electric line amounted to £7175, as compared with £6076 for the same period of 1912.

---

### MUNICIPAL COUNCIL OF SYDNEY.

ELECTRICAL CASTINGS.
ANNUAL CONTRACT.

Sealed and Endorsed Tenders will be received by the undersigned until 3 o'clock p.m. on Monday, December 22nd instant, for the Supply and Delivery of—

Electrical Castings—Part I., Cast Iron.
Electrical Castings—Part II., Copper, Brass, etc.

Copies of specifications, etc., may be seen upon application at the Office of the Comptroller of Assets, Town Hall, Sydney.

The lowest or any tender not necessarily accepted.

Tenderers, please note that they must pay their cash deposits direct into the City Treasury, and not enclose same with their tenders, otherwise their tenders will be rejected as informal.

THOMAS H. NESBITT,
Town Hall, Sydney, Town Clerk.
December 5, 1913.

---

### MUNICIPAL COUNCIL OF SYDNEY.

TO CONTRACTORS.

Sealed and Endorsed Tenders will be received by the undersigned until 3 o'clock p.m. on Monday, February 2, 1914, for the Supply and Delivery of the following:—

(a) Transformers.
(b) Weatherproof Switch Fuses.

Copies of Specifications in respect of (a) and (b) may be seen, or obtained upon application, at the Office of the City Electrical Engineer, Town Hall, Sydney, upon the payment of the sum of 10/6 in each case.

The lowest or any tender not necessarily accepted.

Tenderers, please note that they must pay their cash deposits direct into the City Treasury, and not enclose same with their tenders, otherwise their tenders will be rejected as informal.

THOMAS H. NESBITT,
Town Hall, Sydney, Town Clerk.
December 5, 1913.

---

### Commonwealth of Australia.

Department of Home Affairs,
Melbourne, Dec. 2, 1913.

KALGOORLIE TO PORT AUGUSTA RAILWAY

OIL DRIVEN ROAD ROLLERS.

Separate quotations, addressed to the Engineer-in-Chief for Commonwealth Railways, 84-88 William-street, Melbourne, will be received up to 11 a.m. on Friday, December 19, 1913, for the Supply and Delivery of—

1 Oil Driven Road Roller, 2½ to 4 tons, in ship's slings, Fremantle; and another in ship's slings, Port Augusta.

Persons quoting will be required to supply drawing and specification of the roller.

Quotations are to be endorsed ''Quotation for Oil Driven Road Roller.''

JOSEPH COOK,
Minister of State for Home Affairs.

---

Department of Home Affairs,
Melbourne, December 4, 1913.

KALGOORLIE TO PORT AUGUSTA RAILWAY.

TARPAULINS.

QUOTATIONS, addressed to the Engineer-in-Chief for Commonwealth Railways, 84-88 William-street, Melbourne, will be received up to 11 a.m. on Tuesday, December 30, 1913, for the Supply and Delivery of the following, on trucks at Port Augusta and Kalgoorlie, or alternatively in ship's slings at Port Augusta and Fremantle:—

75 Tarpaulins, 26ft. x 15ft. 5in. (50 to be delivered to Port Augusta, and 25 to Kalgoorlie).

Copies of specifications and plans can be obtained at the Commonwealth Railways Offices, 84-88 William-street, Melbourne; and also from the Commonwealth Works Director, Customs House, Sydney; Commonwealth Works Registrars, Brisbane, Adelaide, Perth, and Hobart.

Envelopes, containing quotations, are to be endorsed "Quotation for Tarpaulins."

JOSEPH COOK,
Minister of State for Home Affairs.

---

Department of Home Affairs,
Melbourne, December 1, 1913.

FEDERAL TERRITORY RESERVOIR.

TENDERS will be received until 11 a.m. on Wednesday, January 7, 1914, for the Excavation and Concrete Lining necessary for the Construction of a Pipe Head Reservoir, having a capacity of about three million (3,000,000) gallons, in the Federal Capital Site Territory, at a site near Mount Stromlo.

Specification and plans may be seen at the following offices:—

(a) Administrative Offices, Canberra.

(b) Works Director for New South Wales, 4th floor, Custom House, Sydney, N.S.W.

(c) Works Director, Victoria, 151 Collins-street, Melbourne, Victoria.

Tenders are to be addressed to ''The Secretary, Department of Home Affairs, Melbourne,'' and endorsed as above, and are to be accompanied by the necessary deposit as prescribed on back of official tender form.

The lowest or any tender will not necessarily be accepted.

W. H. KELLY,
For Minister for Home Affairs.

---

Department of Home Affairs, 1913.

BOILER PLANT, FEDERAL WOOLLEN MILLS, NORTH GEELONG.

TENDERS are invited, returnable at noon on Monday, January 19, 1914, for the supply of the above.

Tenders are to be addressed to "Secretary, Department of Home Affairs," and endorsed "Tender for Boiler Plant, Federal Woollen Mills."

Specifications may be seen at the office of the Works Director for Victoria, 151 Collins-street, Melbourne. No tender will necessarily be accepted.

JOSEPH COOK,
Minister for Home Affairs.

---

Postmaster-General's Department,
Melbourne, December 12, 1913.

TENDERS will be received at the office of the Deputy Postmaster-General, Melbourne, until 3 p.m., on April 7, 1914, for the Supply and Delivery of Accumulator Batteries (Sch. 991). See Commonwealth Gazette, December 13.

AGAR WYNNE,
(1286) Postmaster-General.

---

### Government Notice (V.).

VICTORIAN RAILWAYS COMMISSIONERS.

STATE COAL MINES.

MOTOR DRIVEN AIR COMPRESSOR.

TENDERS (endorsed ''Tender for Air Compressor'') to be addressed to the General Manager, State Coal Mines, Wonthaggi, and delivered at his office at Wonthaggi, not later than 12 noon on January 7, are invited for the Supply of One (1) Motor Driven Air Compressor. P.D., £2.

Particulars and forms of tender, at the Melbourne office of the State Coal Mines, Robb's Buildings, Collins-street, and at the office of the General Manager, Wonthaggi.

No tender will necessarily be accepted.

G. H. BROOME,
General Manager.

---

### Government Notices (N.S.W.).

NEW SOUTH WALES GOVERNMENT RAILWAYS AND TRAMWAYS.

Office of the Chief Commissioner,
Sydney, December 15, 1913.

TENDERS will be received at this office until 12 o'clock noon on the dates specified for the undermentioned Supplies, Works, etc., viz.:—

WEDNESDAY, JANUARY 7, 1914.

The Manufacture and Erection of Revolving Screens for the circulating water, White Bay Power House. Specification No. 438 (price 5/-).

WEDNESDAY, JANUARY 14, 1914.

The Supply of Two Electrically-Driven Turbine Pumps, 50 gallons per minute, to Specification No. 432 (price 2/6).

The Supply of Worm Gear, Shafting, Brackets and Ball Bearings for the White Bay Power House. Specification No. 437 (price 2/6).

WEDNESDAY, MARCH 18, 1914.

The Supply of 24 Direct Current Motor Starters. Specification No. 443 (price 2/6).

WEDNESDAY, MARCH 25, 1914.

The Supply of Five 1000kw. Substation Units, to Specification No. 434 (price 10/-).

All specifications are obtainable at the Electrical Engineer's Office, 61 Hunter-street, Sydney.

Tenders to be endorsed, "Tender for Roller Screens," or as the case may be.

The Chief Commissioner does not bind himself to accept the lowest or any tender.

By order,
J. S. SPURWAY,
Secretary.

---

Department of Public Works,
Sydney, December 15, 1913.

TENDERS FOR ELECTRIC CRANE, ETC.

Tenders, specified below, will be received at this Department until 2 o'clock p.m., on the dates mentioned:—

MONDAY, JANUARY 5, 1914.

Supply, etc., of Paper Insulated and Lead Covered Cable and Accessories at New Public Abattoirs, Homebush.

MONDAY, JANUARY 12, 1914.

Supply, etc., of Wrought Iron and Steel Work for 2nd Section, Dunedoo to Coonabarabran Railway.

MONDAY, JANUARY 19, 1914.

Supply, etc., of a 10-ton Electric Crane for State Quarry, Maroubra.

MONDAY, FEBRUARY 2, 1914.

Supply, etc., of 220 miles Galvanised Iron Telegraph Wire for Railway Construction Stock.

Further particulars may be obtained from N.S.W. "Government Gazette."

(6a133) ARTHUR GRIFFITH.

## Government Notice (T.).

State Mining Engineer's Office,
Zeehan, December 5, 1913.

### STATE PROSPECTING, TASMANIA.

Depots will be established by the Tasmanian Government during the coming summer from January 1 to April 30, at Point Hibbs and at Corinna, on the Pieman River.

Any persons desirous of working from these centres are requested to communicate with the State Mining Engineer, Zeehan, when arrangements may be made for the supply of stores at cost price, and the establishment of frequent communications.

Free assays will be made of minerals discovered, and all possible assistance given.

---

## CITY OF MELBOURNE.

TENDERS will be received until 12 o'clock noon on Wednesday, January 21, 1914, for Supply and Delivery of Bare Hard Drawn Copper Cables.

Specification may be seen at the office of the City Electrical Engineer, Town Hall.

JOHN CLAYTON,
Town Clerk's Office, Town Clerk.
Town Hall, Melbourne,
December 3, 1913.

---

## CITY OF MELBOURNE.

TENDERS will be received until 12 o'clock noon on Saturday, January 24, 1914, for Supply and Delivery of House Cut-out Boxes.

Specification may be seen at the office of the City Electrical Engineer, Town Hall.

JOHN CLAYTON,
Town Clerk's Office, Town Clerk.
Town Hall, Melbourne,
December 3, 1913.

---

## CITY OF TOOWOOMBA, QUEENSLAND.

### TENDERS FOR WATER METERS.

Sealed Tenders will be received up to 12 o'clock noon, on Monday, February 9, 1914, for 1000 Water Meters, to be delivered at the rate of 20 per month. Conditions of tender and further particulars may be obtained from the undersigned.

FRANK H. MERRITT,
Town Hall, Town Clerk.
November 19, 1913.

---

## SHIRE OF PRESTON.

### ELECTRIC SUPPLY UNDERTAKING.

TENDERS are hereby called for the following Works:—

Erection of Electrical Equipment, including fitting up of sub-stations and mains work.

Specifications on view at the office of the Consulting Engineers, from whom copies may be obtained on payment of 10/6 each, returnable on receipt of a bona fide tender.

Tenders returnable to the Shire Secretary, Preston, not later than Wednesday, January 7, 1914.

Gerald B. [illegible], A.M.I.E.E., J. Kenneth Macdougall, A.M.I.E.E., Consulting Engineers, Normanby chambers, 430 Little Collins-st., Melbourne.

ARNOLD DEAN, C.E., Shire Sec.
Shire Hall, Preston, 12/12/13.

---

WANTED.—A Certificated Mine Manager, for Silver Mine. Apply, with copies of credentials, to "A.B.M." c/o Gordon and Gotch, Ltd., Sydney.

---

FURTHER NOTICE is hereby given that the Patentees are prepared to grant licenses and to satisfy any demands and all requirements of the public respecting the undermentioned Australian patents, viz.:—No. 9722, September 9, 1907—"Improved Method of Raising or Forcing Water or Other Liquid and Apparatus Therefor"; No. 10800, February 10, 1908—"Improvements in or relating to Ignition Arrangements for Internal Combustion Engines and Other Purposes"; Nos. 12027, 12028 and 12029, each dated July 21, 1908, for "Improvements in Methods of Raising or Forcing Liquids and in Apparatus Therefor." Offers will also be received for the purchase of each patent outright. Further information and particulars obtainable from Edward Waters and Sons, Patent Attorneys, 411-413 Collins-street, Melbourne, and 7 Moore-street, Sydney.

---

## THE CONRAD MINES LIMITED, HOWELL, Near Inverell, In Liquidation.

TENDERS are hereby invited and will be received at my office up to THURSDAY, the 22nd day of January, 1914, at 12 o'clock noon, for the purchase of the undermentioned Assets, viz.:—

LOT 1.—Mining Leases to the total areas of 407 acres 1 rood 26 perches, situated in the Parish of Mayo, County of Hardinge, about 20 miles by coach road from the township of Inverell.

LOT 2.—Limestone Lease, containing 5 acres, situate in the Parish of Warialda, County of Burnett, having 20 years to run from the sixth day of August, 1912, at a yearly rental of £5 per annum.

LOT 3.—Lease for dam sites of 14 acres 2 roods, dated 6th April, 1905, for a term of 20 years; annual rental £7 10s.

LOT 4.—Machinery, consisting of Winding Engines, Boilers, Pumps, Blowers, Tanks, Scales, Weights, Buckets, Blast Furnaces, Trucks, Winches, Punching Machines, Tangye's Engines, and all the other necessary machinery required to work the mine, together with a quantity of stores, and a small quantity of Furniture. Also the necessary Manager's Residence, Offices, etc.

The rent of the Mining Leases is paid up till the end of December, 1913.

The Mine is situated at easy access from Inverell.

Water is plentiful, the average annual rainfall being 32 inches.

The Mine is situated at an elevation of about 3200ft.

The Ore contains Tin, Silver, Lead, and Copper.

The workings have demonstrated that the lode is very continuous, and contains a succession of rich shoots of ore, the chief of which is nearly 1000ft. long.

Statistics showing the yield of the Mine can be seen in a Special Report that I have obtained.

The Plant is a complete one, and could easily be put in good working order. It is estimated the plant is capable of treating at least 120 tons crude ore per day, without putting any fresh developments into the Mine.

The Mine has been producing large quantities of ARSENIC. I am informed from this source alone a profit of several thousand pounds sterling yearly could be realised.

The Mining Expert that I employed (Mr. W. T. Lee) reports that now the Mine has been so extensively opened up, disclosing vast quantities of payable ore, added to the fact that the treatment of the ore has been successfully solved, and that also taking into consideration the enormous sums paid for other properties not having a tithe of the advantage attaching to this property, the value of the machinery and leases is very considerable.

A copy of the Report of Mr. Lee, together with a list of the machinery, may be seen at my office, or at the mine; and Mr. Barnett, the caretaker in charge, will show prospective buyers over the Mine.

Owing to the want of capital, suspension of the Labour Conditions has been granted.

All information can be obtained at my office.

Lots may be tendered for separately or conjointly.

A deposit of 10 per cent. must accompany each tender.

The highest or any tender not necessarily accepted.

TERMS CASH.
C. F. W. LLOYD,
Official Liquidator.
182 Phillip-street,
Sydney, 26th November, 1913.

---

## JUNCTION DREDGING CO. NO LIABILITY.

NOTICE is hereby given that the 22nd Ordinary Half-yearly General Meeting of Shareholders of this Company will be held at the office of the Company, Normanby chambers, 430 Chancery lane, Melbourne, on Tuesday, December 23, 1913, at 12 noon, to receive the directors' report and balance-sheet, as on November 30, 1913; to elect auditors; and general. By order of the Board,

C. B. NORTON, Manager.

Brentnall, Norton & Co., Public Accountants, 430 Chancery lane, Melbourne.

---

## OLIVE BRANCH G.M. CO. NO LIABILITY.

The Half-yearly Meeting of Shareholders in the above-named Company will be held at Union Club Hotel, 425 Collins-street, Melbourne, on Tuesday, December 23, 1913, at 12.30 p.m. Business: To receive and adopt reports and balance-sheet; general.

WILLIAM RYALL, Manager.
407 Collins-street, Melbourne.

---

SAW MILLING PLANT, at Mount Buffalo, for Sale. Particulars from The Equity Trustees Co. Ltd., 85 Queen-street, Melbourne.

---

NOTICE is hereby given that the patentee of Australian Letters Patent No. 10609/08 for "Improvements in Devices for Mechanically and Simultaneously Shutting, Locking or Opening a Plurality of Doors, Hatchways, Bulkheads and the Like from a Distant Point," is prepared to satisfy any demands and all requirements of the public respecting the said invention. Further information from P. M. Newton, Patent Attorney, Fink's Buildings, Elizabeth-street, Melbourne.

---

TENDERS are invited for the Purchase or Working on Royalty of N. Tesla's "Improvements in Fluid Propulsion," covered by Commonwealth Letters Patent No. 20211, of December 15, 1910. The inventor will dispose of the whole or part interest in the Patent or will grant licenses to work the same to fulfil the full requirements of the public. Address: C/o Phillips, Ormonde & Co., Patent Attorneys & Consulting Engineers, 17 Queen-st., Melb.

---

## JOHNSON'S REEF G.M. CO. NO LIABILITY.

A DIVIDEND (the 153rd) of One Shilling per share has been declared payable at the registered office, 60 Queen-st., Melbourne, and at the office of Messrs. Petrie and Weddell, City-chambers, Bendigo, on Monday, December 22, 1913. Transfer books will close at the Company's office on Tuesday, December 16, 1913, at 11 o'clock a.m.

P. H. PULLMAN, Acting Manager.

---

## CHILLAGOE LIMITED.

NOTICE is hereby given that the Third Call of Sixpence per share (making the shares paid up to 9/6) has been made by the directors upon the members in respect of the shares held by them respectively, and that the same is payable to the Secretary, at the office of the Company, 39 Queen-st., Melbourne, on or before January 5, 1914. Dated at 39 Queen-st., Melbourne, December 4, 1913. By order of the Board, C. L. HEWITT, Secretary.

---

## MANAGER FOR BRICK WORKS.

APPLICATIONS, accompanied by copies of testimonials, will be received by the undersigned until January 10, 1914. Preference will be given to applicants with experience in handling men.

NEW NORTHCOTE BRICK CO. LTD.,
L. A. Cleveland, Secretary.
31 Queen-street, Melbourne.

---

An Associate Member Institution Civil Engineer, England, is OPEN TO AN ENGAGEMENT as Engineer in Charge of Construction. Experienced in carrying out construction of large works. Railways, Docks, and Harbours. Good organiser.

Address: A.M.I.C.E., "Mining Standard."

---

## CATHCART CENTRAL GOLD MINING CO., No Liability.

A DIVIDEND (6th) of Two Shillings per share has been made, payable on Monday, December 29, 1913. Books for transfer close from Saturday, December 20, 1913.

D. MURRAY, Manager.

---

TENDERS are invited for the Purchase or Working on Royalty of McKeen Motor-Car Co.'s "Improvements in the Frames of Trolley, Railway, or Other Cars," covered by Commonwealth Letters Patent No. 5139, of January 30, 1906; "Improvements in or connected with Railway, Trolley, or Like Car Frames, and the Doors Therein," covered by Commonwealth Letters Patent No. 5140, of January 30, 1906; "Improvements in and connected with Power Transmitting Mechanism," covered by Commonwealth Letters Patent No. 5779, of April 26, 1906; "Improvements in Railway or Like Cars," covered by Commonwealth Letters Patent No. 5780, of April 26, 1906; "Improvements in and connected with the Heating, Cooling, and Ventilating of Motor Vehicles and Parts Thereof," covered by Commonwealth Letters Patent No. 5781, of April 26, 1906; "Improvements in Power Controlling Mechanism," covered by Commonwealth Letters Patent No. 5782, of April 26, 1906; and "Improvements in Apparatus for the Transmission of Power," covered by Commonwealth Letters Patent No. 5783, of April 26, 1906. The Company will dispose of the whole or part interest in any one or all of the patents, or will grant licenses to work the same to fulfil the full requirements of the public.

Address: C/o Phillips, Ormonde and Co., Patent Attorneys and Consulting Engineers, 17 Queen-street, Melbourne.

---

The traffic receipts of the Brisbane Tramways Co. Ltd. for November amounted to £27,051, as compared with £24,307 for November, 1912, the increase being £2744, or 11.29 per cent.

# QUEENSLAND MINING.

## North Queensland Fields.

(From Our Correspondent.)

Mareeba, December 5th.

Klondyke, or Cardross, as it is now known, which is situated about 22 miles beyond Mungana, is a very busy township. It is here that the Mammoth Copper Mines are operating with conspicuous success. Mr. Alexander Macdonald, M.E., F.R.G.S., managing director of the company, who has been on a visit to England and Scotland to confer with his co-directors, returned to Cardross last week. He intends to hasten along development work at the mines, and will pursue a vigorous policy at the Clansman mine. The company also intend sinking the shaft at the Chieftain mine to a further depth. The township presents quite a busy aspect in comparison with the present condition of many like places, blessed with railway communication and similar modern conveniences which are generally considered necessary to growing communities. The tri-weekly coach service from Mungana is, however, expeditiously managed and so as to avoid the greater portion of the dusty trail, created by half-a-dozen traction engines and several ponderous looking horse teams. These latter carry supplies of coke, flux and other supplies to the mines, smelter and population of Cardross, returning mainly with copper matte which undergoes further reduction at Chillagoe. The water-jacketed smelter is now running two shifts, and expects more continuous employment as the mines are further developed. The principal supplies of ore are at present being derived from the Chieftain mine from depths somewhere between 100ft. and 160ft., but the main, straight shaft, now being sunk, will shortly be deep enough to crosscut for the lode at about 70ft. deeper.

An unfortunate accident to Mr. Callanan has delayed development in other mines owned by the Mammoth Co. Work in this direction is expected to be resumed shortly, and additional supplies thereby obtained for the smelter. When the development thus indicated is carried out Cardross should be able to take a foremost position amongst the prosperous mining townships of the district. Railway communication is badly needed, and this will be the next move on the part of the directors.

A little copper mining is being done in the neighbourhood of Williamstown, 12 or 14 miles southerly from Mungana, where some years ago a small syndicate attempted to locate payable ore.

Mining at Mungana is assuming slightly increased proportions owing to favourable developments at both the 250ft. and 710ft. in the Girofia mine. In the former the ore body has reached a size of 50ft. square and in the latter about 100ft. long by 50 or 60ft. wide. The company is short-handed, and is seeking for capable rock drill men for shaft-sinking and other work. A daily ore train is now leaving Mungana for Chillagoe, so that silver lead production will shortly be increased at the latter place, although the copper furnace. is at present closed down. Matters at Crooked Creek mine are apparently lively on the surface, but a serious diminution of ore-reserves underground is apparent. The ore body at 350ft. has pinched to between 2ft. and 3ft. thick, and much work must be done even as a preliminary to deepen the workings in search for a body of ore of payable size.

The strike, or rather "hold up," at Koorboora is still actively engaging the attention of its few partisans, and there appears no likelihood of a resumption of operations at present, although a few men are working here and there in the company's mines. Some activity is being displayed in different mines, one of which, the "Union Jack" (a lease of seven acres, held by James Horn), which lies about three-quarters of a mile south-westerly of the Koorboora railway station. Horn has sunk a shaft 35ft. deep, and has driven north-east and south-west on a valuable ore body up to 7ft. in width. Three crushings, aggregating 36 tons, have been treated, and about 80 tons are at grass. The "Titantic" tin lode claim is about three chains distant from Horn's lease, and is apparently a continuation of the same ore body. The shaft here is 25ft. deep, and there are about 4ft. of payable tin ore in the sink. The owners, Messrs. Johnson and Treverton, have about 30 tons at grass, estimated to go about 6 per cent. for black tin. The "Holiday" tin lode claim of two men's ground adjoins the "Tennyson" lease. The owners are sinking a straight shaft near its boundary, and expect to cut a payable ore body at about 40ft. The "Tennyson" mine is idle owing to the "holiday." The water is being kept under by means of a pump. As soon as men are available the lead shaft and a tin shaft next to the "Holiday" claim will be worked. The workings in each shaft look well for both minerals. Close to the "Tennyson" mine is the "Waratah" lease of 10 acres, held by Messrs. Pontin and Goodwin, who have also two wages men with them. They have a straight shaft 63ft. deep, from the bottom of which an underlay extends southwards a further distance of 27ft. on good tin ore associated with galena and a little iron and copper pyrites.

On a branch of Crooked Creek, Messrs. Crawford and Ford are working the "Armidale" show with fair results. Messrs. Coop and Conroy are working an old tin show in the "Sunrise" about half a mile north of the "Syd" copper mine. Messrs. D. Highes and party are baling out the "Syd" copper mine preparatory to exploratory work. On Bismarck Gully, R. Sheppard has three tons of 30 per cent. ore at grass, and the ore body is looking better and bigger. Dan Kilday is also on a fair shoot of ore close by. Ryan and Evans are working near the "Armidale" on a good show. At the "Two Jacks" mine three men only are at present employed, driving on an extensive and payable ore body to connect No. 1 and No. 3 shafts for air. The "King Edward" Syndicate shaft is the southern shaft of the old "Iolanthe" mine. It has been straightened up and sunk to 90ft. Shear legs and a single winder drum and boiler have been erected. It is intended to sink this shaft to 150ft. and crosscut for a very likely payable ore body. A new find of promise has been made in the old "Shakespeare" mine about 50 yards south-west of the main open cut. This shaft is now down about 20ft., and is being sunk in tin-bearing formation. The mill at Koorboora is idle owing to the "hold up" already referred to.

In the "Lass O'Gowrie" mine at Stannary Hills, a winze is sunk 58ft. from the 210ft. mark. At 50ft. deep in this winze, a level is driven 80ft., and the ore now being won is between this and the tunnel level. It averages 1ft. in thickness, and is of the usual high grade value of Lass O'Gowrie ore. A crushing of 100 tons of 30 per cent. (or so) ore will go through the Irvinebank mill before Christmas. The poorer finds from the mine are being jigged to payable quality by means of a 4 h.p. oil engine. At the Stannary Hills mines, owned by Messrs. John Darling and Sons, ore is still being won from stopes in the "Extended" mine. A new find of payable ore has been discovered in a shallow tunnel driven underneath an outcrop near the old "Eclipse" shaft. This shaft is being repaired and re-equipped in order to test 100ft. lower down. About 40 tons of good ore have already been sent to the mill from this place. Disappointed with the results of the developments in the "Dead Finish" mine, work there has been stopped and the pumps drawn. In consequence of the heavy water below, it is unlikely that work will again be resumed for some time, at any rate, in the deeper levels. In the "Victoria" mine the main shaft has been sunk a further distance of 35ft., and they are now opening out on about 1ft. in thickness of galena. Stoping is also being done above the bottom level on a silver lead lode of about the same thickness. In the opposite side of shaft a rise has disclosed a nice body of galena. The long bottom tunnel of "Governor Norman" has reached a length of about 600ft. and its position missed every ore body since discovered. The large one worked during the past two years has been altogether stoped out to the level of the tunnel. A winze has been sunk below these workings, and is now being equipped with a small winding plant for the purpose of exploring the ground below, for a continuation of this ore body. Further in the tunnel two new finds have been made, each of which is of considerable promise. The one above the face of the tunnel appears, at present, to be a continuation of the main ore body worked in the big open cut.

"Vulcan Hope" tributers have cleaned out an old shaft of about 60ft. below the surface of the crown of the ridge. They are now sinking on about 2ft. of good payable ore, and have about 10 tons at grass. As this shoot is dipping into ground never yet disturbed, it appears probable that it may prove a continuation of the good buches of ore worked formerly in this mine. If this is so, the present tunnel will be a considerable advantage to its future development. The stopes in the "Vulcan" still continue to look very well in the different levels, and as soon as men are available further work will be done in the low grade ore body existing in the 1050ft. level, where it is confidently expected that a further extensive payable ore body will be developed.

Quite a little stir has been caused in Irvinebank by the discovery of a promising tin shoot on the police reserve. A syndicate of 15 shares of £5 each has been formed to work the ground so soon as the necessary permission has been granted to break the surface of the reserve.

Mr. R. Leisner, manager of Leisner's Wolfram Block mine at Wolfram, who has been conferring with the directors of the above company at Charters Towers, has returned to Wolfram. He states that the directors of the company have decided to increase the capital of the company to £15,000 by the issue of 25,000 new shares of 6s. each, issued as paid-up to 4s. per share.

# BANK CLEARINGS.

The report of the Melbourne Clearing House for the week ended December 15 was:—

| | | |
|---|---|---|
| Total clearances . . . . . . . . . . . . | | £6,742,477 |
| Balances— | | |
| Settled by certificates . . | £411,500 | |
| Settled in coin . . . . . . | 291,335 | |
| | | £702,835 |
| Total clearance for the corresponding week, 1912 . . . . . . . . . . . . | | 6,393,919 |

Our Lithgow (N.S.W.) correspondent writes that a letter has been received by the authorities at Queanbeyan from the Department of Home Affairs, intimating that it is proposed to establish a cement factory on part of the town common known as "White Cliffs," and asking whether the trustees of the common had any objection to the Commonwealth acquiring the land. It was unanimously resolved not to place any opposition in the way of the Federal Government.

CARL WERNER & CO., OPHTHALMIC - OPTICIANS—

The Finest Illustrated Catalogue of Scientific Instruments in Australia mailed on request—comprising

THEODOLITES, LEVELS, LEVELLING STAVES, BRUNTON'S AND VERSCHOYLE TRANSITS, ETC., ETC.

All the Requirements for the Drawing Office in Stock.

336 COLLINS STREET - - MELBOURNE.

250 H.P. Turbine.
Showing Wheel and Guide Vanes.

G. Weymouth Pty. Ltd.

Electrical Engineers,

Neptune-street, RICHMOND, VIC.

Telephones:—
Office, 2651 Windsor.
Works: 2507 Central.

Manufacturers of all Classes of Electrical Machinery, Turbines, Pumps for Irrigation and Mining, Underground and Surface Mining Locos., Winches, Haulage and Winding Plants, Motors, Generators, etc.

Estimates submitted.

Correspondence invited.

## PROFESSIONAL CARDS.

**GERALD AHERN, A.O.S.M.,**
MANAGER COMET MINE,
DUNDAS, TASMANIA.
Mines Sampled and Reported On.

Tele. Address—Gerald Ahern, Zeehan, Tasmania.

**G. H. BLAKEMORE,**
CONSULTING METALLURGIST
For Copper and Lead,
MINING ENGINEER,
CASTLEREAGH CHAMBERS, 16 CASTLEREAGH ST
Telegraph Codes: Bedford McNeill 1908 Edition.
Moreing & Neal.
A.B.C. 5th Edition.
Cable Address, Radgarn. Telephone 7124 City

**MATTHEW C. COATES, A.M.I.E.E.**
CONSULTING MECHANICAL and ELECTRICAL ENGINEER. Expert Reports given for Power Generating Plants, Factory Installations, Steam, Gas and Electric.
99 QUEEN STREET, MELBOURNE.

**VALENTINE J. CROWLEY,**
CONSULTING ELECTRICAL ENGINEER.
Hydro-Electric Plants and Transmission Lines Designed and Supervised.
Austral Chambers, Telephone 7736.
97-99 QUEEN STREET, MELBOURNE.

**W. A. T. DAVIES,**
M. Amer. Inst. M.E., F.G.S. (Lond.)
CONSULTING ENGINEER—ALL METALS.
48 QUEEN STREET, MELBOURNE.
Code Used Moreing and Neal.
Telephone 4633 Central.

**T. J. GREENWAY, M.I.M.M., F.I.C.**
MINING AND METALLURGICAL ENGINEER
60 QUEEN STREET, MELBOURNE

**GOYDER & HALLETT,**
ASSAYERS AND ANALYSTS
110 Gawler Place, Adelaide.
Telephone 169
Metallurgical and Chemical Processes Investigated
Ores Sampled and Assayed

**HARGRAVES & DAGGAR,**
CONSULTING ENGINEERS & METALLURGISTS.
Broken Hill Chambers, 31 Queen Street, Melbourne, and at Bendigo, Vic., and Sydney, N.S.W.
Consultations, Examinations, Reports for Investors, Machinery Erection and Supervision.
Tel. Central 6964. Process Devisors, &c.

**KAY, MACNICOL & CO.,**
Mechanical, Mining & Electrical Engineers
BROKEN HILL CHAMBERS
31 QUEEN STREET, MELBOURNE
Cable Address "Engineer," Melbourne
Telephone No 4885

**McCARTY, UNDERWOOD & CO.,**

CONSULTING ELECTRICAL AND MECHANICAL ENGINEERS.

31 QUEEN STREET, MELBOURNE

Telephone, 7996

**J. D. AUDLEY SMITH,**
MINING ENGINEER,
9 Bridge-street, Sydney
Telegraphic Address—
Audley Smith,
Mining Engineer,
Sydney
Telephone No.—
City 2677

**WALTER F. SMITH,**
MANAGER FLOATER G.M.
Ravensthorpe, W.A.
Mines Sampled, Valued, and Reported on.
ASSAYS MADE
Code Bedford McNeill.
Reliable Information Furnished on the Phillips River Gold and Copper Field.

**E. A. WEINBERG,**
MINING AND METALLURGICAL ENGINEER,
19 QUEEN STREET, MELBOURNE.

## PUBLISHERS' ANNOUNCEMENTS.

**Cole's Book Arcade**
Melbourne
Sydney
Adelaide

—BOOKS Advertised—
—by Everybody are—
—SOLD AT COLE'S—

Send for **COLE'S BOOK BUYERS' GUIDE** or Catalogues on your Special Subject.

**MINE MANAGER'S** Book-keeping Manual and Office Companion, by Edwin R. Field. 3/6, postage 1d.

**ROUTLEDGE'S EVERYMAN'S CYCLOPAEDIA,** 50,000 items of literary, historical and useful knowledge. Cole's Price: 2/6, postage 4d.

**HEALTH, STRENGTH and HAPPINESS,** a Book of Practical Advice for Men and Women, by Dr. Saleeby. Cloth 3/6, paper 2/-, postage 3d.

**LIFE AND EVOLUTION,** by F. W. Headley, with 100 illustrations. Now 5/-, postage 4d.

**THE MAN FARTHEST DOWN,** a record of Observation and Study in Europe, by Booker Washington. Cole's Price: 3/6, postage 3d.

**BACKBLOCK BALLADS** and Other Verses, by Den (C. J. Dennis) from the "Bulletin" and other live papers. Paper 1/6, cloth 2/6.

**E. W. COLE, Book Arcade, Melbourne, Etc.**

THE
**University of Sydney.**
DEPARTMENT OF ENGINEERING.

The course for the degree of Bachelor of Engineering in Mining and Metallurgy extends over a period of four years, during which lectures and practical instruction are given in the following subjects:—

Chemistry, Physics, Mathematics, Descriptive Geometry, Geology, and Economic Geology, Mineralogy, Engineering Construction, Mechanical Engineering Materials and Structures, Electrical Engineering, Surveying, Building Construction, Mining, Metallurgy, Assaying, Engineering Design and Drawing.

The Chemical, Metallurgical, Physical, Geological, Mechanical and Electrical laboratories are thoroughly well equipped with modern plant and machinery.

The Academic year commences in March. The fees are nine guineas per term, or a total cost for graduation of £125 8s., including Matriculation and Degree Fees. Students, whether matriculated or unmatriculated, who do not wish to take up the full course may select individual subjects.

Full particulars will be found in the University Calendar published by Angus and Robertson, Castlereagh-street, and may be obtained upon application.

H. E. BARFF,
Registrar.

**BALLARAT School of Mines**

**DEPARTMENTS:**
CHEMISTRY and METALLURGY,
ENGINEERING and SURVEYING
ELECTRICAL ENGINEERING,
GEOLOGY and MINING
MATHEMATICS and PHYSICS.

Prospectus on Application.
F. J. MARTELL, Director.

**Critchley Parker Publications**

**Past and Present Metal Markets.** W. E. Figgis. Book and 2 Charts, 15/-. Posted, 16/3; foreign, 16/5.

**Coalfields and Collieries of Australia.** F. Danvers Power. 440 pages, 229 illustrations, demy octavo. 25/- nett. Posted, 25/3; foreign, 26/8. (Size, 9 x 6.)

**High Explosives.** W. R. Quinan. 224 pages, royal octavo, 21/-. Posted, 21/3; foreign, 22/4. (Size, 10 x 7.)

**Power.**
*(Issued under authority Sydney Municipal Council.)*
2/6 nett; post free.

**Australian Mining and Metallurgy.** Donald Clark. 600 pages, royal octavo. 21/- nett. Posted, 21/4; foreign, 22/9. (Size 10 x 7.)

**Gold Refining.** Donald Clark. 134 pages (plates), demy octavo. 12/6 nett. Posted, 12/7; foreign, 13/1. (Size, 9 x 6.)

**West Australian Mining Industry.**
*(By authority W.A. Government.)*
250 pages, crown folio. 10/- nett. Posted, 10/2; foreign, 10/8. (Size, 14½ x 10.)

**New South Wales Mines and Minerals.** 250 pages, crown quarto. 5/- nett. Posted, 5/1; foreign, 5/7. (Size, 10 x 7½.)

**Victoria, and its Mining Resources.**
*(By authority Victorian Government.)*
84 pages, crown quarto. 3/- nett; post free.

**Mining and Railway Map of Australia.** (In preparation.) Cloth, 21/-.

**Ventilation of Mines.** Johann Sarvaas. 60 pages. 2/7 post free.

**Australasian Joint Stock Coy's Year Book.** R. L. Nash (Financial Editor, "Daily Telegraph," Sydney). 600 pages, demy octavo, 10/6 nett. Posted, 10/8; foreign, 11/9. (Size, 9 x 6.)

**Australian Mining Standard.** Issued every Thursday 26/- per annum. British possessions, 32/6; foreign, 34/8; post free.

Size stated in inches.

Order through your Bookseller, or

***AUSTRALIAN MINING STANDARD,***
**Sydney: 12-14 O'Connell-street.**
**Melbourne: 376 Flinders Lane.**
**London:** Hill Publishing Co., 6 Bouverie St., Fleet St.

*Also published by us, but now out of print.*

**Tasmania and its Mineral Wealth.**
*(By authority Tasmanian Government.)*

**Metallurgy of Tin.** P. J. Thibault. Demy octavo. 12/6.

**Resourceful Queensland.**
*(By authority Queensland Government.)*

**Electrical Progress of Australasia.**

ESTABLISHED 1860.

**BONDHOLDERS' REGISTER**

Publishes the Actual Numbers of all Drawn Bonds Throughout the World.

PUBLISHED FORTNIGHTLY

**10s. PER AN**

73 FARRINGTON ST
Australian
376 FLINDERS LANE,

“Allen's”

IMPERIAL

Manganese Steel

FOR

Dredging Pins and Bushes, and all Wearing Parts of Rock-Crushing Machinery, Points, Crossings, Etc.

SOLE MAKERS OF

THE “STAG” TUBE MILL

For Grinding Grit, or Tailings, and Granular Materials, to any degree of Fineness.

THE OCTAGON MINING DRILL STEEL

“STAG” BRAND

EDGAR ALLEN & CO., LTD.,
Imperial Steel Works, SHEFFIELD.

Stocks on Hand
of
Mining and High Class Tool Steels.

AUSTRALIAN REPRESENTATIVES:
P. T. Taylor Ltd., 141 York Street, Sydney.

SIAM OFFERS

A splendid new field for Australian Business Enterprise.

SIAM WANTS

Mining and Agricultural Machinery, Seeds, Hides, Tallow, Meats, Jams, Butter, Cheese, Potatoes, General Manufactures, also Horses, Cattle and Sheep.

The Siam Observer (Daily),
The Siam Maitri
The Siam Weekly Mail (Weeklies.)

Siam's Leading Newspapers, which, with

The Siam Directory

are published at the Siam Observer Offices, Bangkok, will put you in touch with this market.
Rates and Particulars from
GORDON & GOTCH.

## COAL-DUST EXPLOSIONS.

While there is no well-defined border line between “inflammation” and “explosive combustion” in the case of gaseous mixtures, says the 4th Report of U.S. Explosions in Mines Committee, a distinction may be drawn in the case of mixtures of coal dust and air. During the “inflammation” of dust from bituminous coals the flame is largely propagated by the burning of gases distilled from the dust, but during “explosive combustion” the portion of each dust particle that aids in propagating the flame is burned as a whole. A coal dust containing 16 per cent. of volatile matter caused an explosion as violent as one caused by a dust containing 35 per cent. of volatile matter, while explosions of equal or greater violence were caused by wood charcoal. Experiments made by R. V. Wheeler in the Altofts gallery are described which confirm this conception of two distinct stages—“inflammation” and “explosive combustion”—in the combustion of mixtures of coal dust and air. The combustion of the mixture was of the nature of an “inflammation” until it had travelled some distance along the gallery, when it was suddenly converted into “explosive combustion,” marked by a sudden and considerable rise of pressure. Attention is drawn to the connection between these results and the view advanced by Blackett (Trans. Fed. Inst. Min. Eng., 1894, vii. 54) as to the effect of a “pioneering cloud” in dust explosions. The experiments show that, for a propagating inflammation to take place in a mine, the concussion of a blown-out or overcharged shot, or of a firedamp explosion, is not essential. A flame, without any concussion, can ignite a ready-formed dust cloud, and the inflammation will spread through the cloud with increasing velocity and, if the conditions remain favourable, will ultimately change to “explosive combustion.” Constrictions or obstructions cause the transition from inflammation to explosive combustion to take place at a much earlier period than in a smooth gallery, though they do not necessarily increase the ultimate violence of the explosion.

GREAT COBAR LIMITED,
COBAR, N.S.W.

MINE OWNERS, SMELTERS, COLLIERY PROPRIETORS, PURCHASERS OF COPPER ORES AND MATTES.

VACANCIES FOR COMPETENT MACHINE MINERS.

SYDNEY: Australasia Chambers, Martin Place, And at Lithgow and Singleton. LONDON: 65 New Broad Street, E.C.

T
pu
sha.
will
well t
mine i
by Mess

182in. diameter.

Between these two FANS

THE WHEELS OF WHICH ARE SHOWN HERE, THERE ARE 35 STANDARD SIZES. ONE OF THEM IS THE SIZE YOU NEED TO DO YOUR WORK EFFICIENTLY.

TRADE SIROCCO MARK

5in. diameter.

—— CENTRIFUGAL FANS ——

Are employed for every purpose for which a fan can be used. They are high in efficiency, low in power consumption, and small in size in comparison to their capacity. Write for Bulletin No. 2002.

DAVIDSON & CO. LIMITED, BELFAST, IRELAND.

AGENTS—

SYDNEY—FERRIER & DICKINSON, 12 Spring Street.
PERTH—SAUNDERS & STUART.
ADELAIDE—UNBEHAUN & JOHNSTONE, Currie Street.
MELBOURNE—FYVIE & STEWART, 362 Collins Street.
BRISBANE—ENGINEERING SUPPLY CO. OF AUSTRALIA LTD.
NEW ZEALAND—JOHN CHAMBERS & SONS LTD., Wellington.

Everything for Mining

SUPPLIED BY US.

CANDLES,
EXPLOSIVES,
CHERSEN ROCK DRILLS,
WINDING ENGINES,
STONE CRUSHERS,
ROAD MAKING PLANT.

CARD CONCENTRATOR, Sole Manufacturers
DORR THICKENER,
DORR CLASSIFIER,
B and M TANKS,
TILGHMAN'S AIR COMPRESSORS.

QUARRY BARS.
WELL BORING PLANTS. BLOW OFF VALVES, ETC.

Agents in all CAPITAL CITIES of Commonwealth and NEW ZEALAND

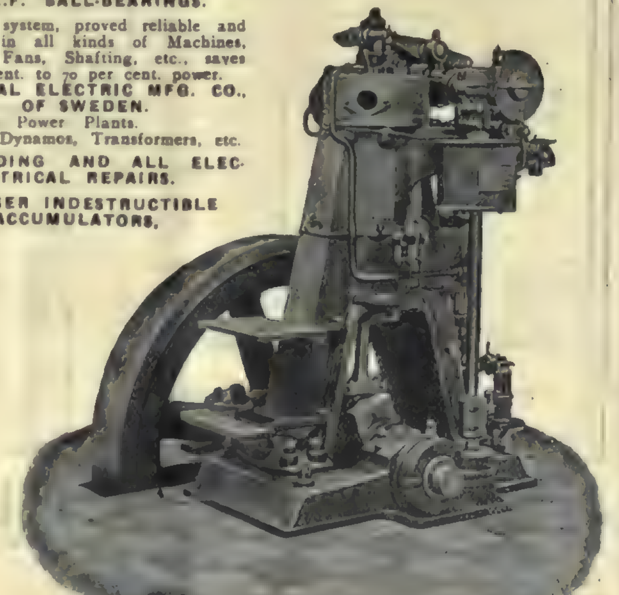
N. GUTHRIDGE LTD.

Offices and Stores—SYDNEY and MELBOURNE.

—SWEDISH—
Diesel Motors.

Cheapest and most reliable power. Under 6½oz., Crude Oil per b.h.p. hour.

SWEDISH HIGH QUALITY IRON AND STEEL.
Cast Steel Runners and Liners
S.K.F. BALL-BEARINGS.
A new system, proved reliable and durable in all kinds of Machines, Pumps, Fans, Shafting, etc., saves 40 per cent. to 70 per cent. power.
GENERAL ELECTRIC MFG. CO., OF SWEDEN.
Complete Power Plants.
Motors, Dynamos, Transformers, etc.
REWINDING AND ALL ELECTRICAL REPAIRS.
JUNGNER INDESTRUCTIBLE ACCUMULATORS,



GARDNER, WAERN & CO.,
57 Queen-street, MELBOURNE. 334 Kent-street, SYDNEY.
Stores and Showroom: 389 Flinders-street, Melbourne.

# COCKLE CREEK

SMELTING WORKS, N.S.W.

THE SULPHIDE CORPORATION LIMITED,

**Purchasers of:**

Ores, Concentrates, and Slags, carrying Gold, Silver or Lead, on specially favourable terms for net cash.

**THE WORKS** are situated only 9 miles from the Port of Newcastle, where the Corporation has every facility for taking delivery of consignments on behalf of shippers.

**Manufacturers of:**

Superphosphates, Sulphate of Ammonia, and other fertilisers, also Tar and Sulphuric Acid.

**Tariff and full particulars can be obtained on application to—**

**THE MANAGER, Cockle Creek, N.S.W.** **GIBBS, BRIGHT & CO., Agents.**

*OBTAINABLE FROM ALL BOOKSELLERS.*

**HIGH EXPLOSIVES**

By W. R. QUINAN.

224 PAGES, ROYAL OCTAVO. PRICE £1-1-0

AUSTRALIAN MINING STANDARD, Melbourne and Sydney.

In a paper contributed to the American Institute of Mining Engineers, and printed in the Transactions of that body, Mr. A. Eilers gives the quantities of rare metals found in various copper ores, and which are salvable by electrolytic refining. Selenium was present in all the varieties of copper examined, and nearly always in greater quantity than tellurium; indeed, some of the copper contained no tellurium. As an example, the copper from Garfield, Utah, may be cited. From 5000 tons of this the following metals were obtained:—Gold, 14,400 oz.; silver, 174,000 oz.; platinum, 17 oz.; palladium, 59 oz.; selenium, 2800 lb.; tellurium, 277 lb.; bismuth, 305 lb.; nickel, 2000 lb.

**Siegfried Pels,**
26-28 Neuerwall,
**Hamburg - - Germany.**

Argentiferous and Non-Argentiferous.
**Copper Ore & Matte.**

Leady Copper Ore and Matte.
Wolfram
Scheelite

A MARKET for all ORES and MATTES

Lead Ore
Lead Bullion
Tin
Vanadium
Tantalite
Bismuth

***Treatment of Complex Ores.***

***Cable Address: — Siegpels.***

CODES:
A.B.C. 4th and 5th Ed., A1, Liebers, Western-Union, Bedford McNeill.

All Australians visiting London should read the "British Australasian," 6d. weekly—an illustrated paper containing mail and cable news from Australia, and news of Australians in Europe and at home.

Australians are cordially invited to visit the "British Australasian" Reading Room at the offices, 115 High Holborn, London, W.C., where they can see the home papers, meet their friends, use the telephone, and obtain information without charge.

**H. B. Silberberg & Co.,**
*443 Bourke St.,*
Cor. Bourke and Queen Sts.,
*MELBOURNE.*
Tel. 1377. 8 O'CONNELL STREET, SYDNEY.

Large Stocks of—
Ainsworth's Balances, Morgan's Crucibles.
Braun's Laboratory Ore Crushers. Gasolene Furnaces.
Fluxes. Assayers' Requisites.
Jena Chemical Glassware, Etc., Etc.

**FRANCIS H. SNOW,**

Buyer of

ORES. MATTES. METALS, CONCENTRATES, & MINERALS

—of every description—

Australasian Representative of:
ELECTROLYTIC R. & SMELT'G Coy. of A'LIA Ltd., Pt. KEMBLA, N.S.W.
ARON HIRSCH & SOHN, HALBERSTADT, GERMANY.
L. VOGELSTEIN & Co., NEW YORK.

Head Office—KING WILLIAM-ST., ADELAIDE.
Sydney Office:—9 BRIDGE STREET.
Perth Office:—ST. GEORGE'S TERRACE.
Broken Hill:—F. G. WHITE, P.O. Box 76.
Zeehan:—A. J. SPOTSWOOD.

**JOHN A. ROEBLING'S SONS CO.**
**New York,**

ELECTRICAL COPPER WIRE AND CABLES.

HIGH QUALITY FLEXIBLE

STOCKS ON HAND.
ANY LENGTH CUT.

**WIRE ROPES**

Representative:

**ALEX. FRASER PTY. LTD.** Cobden Buildings, 368 Flinders-street, Melbourne. FOR MINES, HAULAGE, ELEVATORS, ETC.

**COALFIELDS AND COLLIERIES OF AUSTRALIA.**

440 pages, 229 illustrations. 25/- nett. Posted, 25/3. Foreign, 26/8.

***LIQUID FUEL for Diesel & all Crude Oil Engines.***

"SHELL" SPIRIT, "SHELL" BENZINE, LUBRICATING OILS AND GREASES.

Prices and particulars on application to

**THE BRITISH IMPERIAL OIL CO. LTD.** Adelaide, Brisbane, Fremantle, Melbourne, Sydney and New Zealand

## CONTENTS

### WEDNESDAY, DECEMBER 24.

EDITORIAL—

Parliamentary Ethics . . . . . . . . . . 563
Leaderettes . . . . . . . . . . . . . . . 563-4
News and Notes . . . . . . . . . . . . . 565
Personal . . . . . . . . . . . . . . . . 566
Books Reviewed . . . . . . . . . . . . . 566
The Investor's Column . . . . . . . . . 567
Brief Comment . . . . . . . . . . . . . 567
**Victorian Mining Activities** . . . . . . **568**
Tasmanian Mining . . . . . . . . . . . 569
**Queensland Mining** . . . . . . . . . . **569**
Western Australian Mining . . . . . . 570
**Mining in South Australia** . . . . . . . **570**
**Answer to Correspondent** . . . . . . . **570**
Mineral Returns . . . . . . . . . . . . 570
New South Wales Mining . . . . . . . . 571
New Zealand Mining . . . . . . . . . . 571
**The Daylesford Field (V.)** . . . . . . . **571**
**Hodgkinson Goldfield (Q.)** . . . . . . . **572**
**Commonwealth Oil Corporation** . . . . **572**
**Postmaster-General's Report** . . . . . **573**
Australian Road Rollers . . . . . . . . 573
**Technical Education (V.)** . . . . . . . **573**
The Charcoal Industry . . . . . . . . . 574
Municipal Council of Sydney . . . . . 574
Northern Territory Railways . . . . . 574
**Federal Railways** . . . . . . . . . . . **574**
Miscellaneous . . . . . . . . . . . . . 575
New Zealand Mining Law . . . . . . . 576
**Invited and Accepted Tenders** . . . . . **576**
The Coal Mining Industry . . . . . . . 578
Dividends . . . . . . . . . . . . . . . 578
Metal Quotations . . . . . . . . . . . 580

CASUAL ADVERTISEMENTS.

The rate for this class of advertisement is governed by the position it occupies.

If it appears on leader page or amongst or next to reading matter, the rate is 15s. per inch (nonpareil) per insertion.

Towards end of reading section—

Brevier, 16 ems width, 6s. per inch per insertion.

Nonpareil, 5s. per inch per insertion.

For the convenience of advertisers, we might state that Brevier has approximately 7 words to a line, and [illegible] lines to the inch—6s. Nonpareil has approximately 8 words to the line, and 11 lines to the inch—5s.

ALTERATION TO ADVERTISEMENTS.

As our publishing arrangements necessitate the "Mining Standard" being issued simultaneously in Sydney, Melbourne and Adelaide on the same day each week, advertisers wishing to change their advertising matter must supply same ten days in advance of publication.

ADVERTISEMENT PROOFS.

Proofs are submitted to advertisers in order to give them an opportunity of going over the advertisements before printing.

Advertising copy must be typed and so arranged as to clearly indicate the display required for the more important features of the advertisement.

Any departure from the original copy will be charged for. Advertisers are specially requested to instruct their publicity departments to give us clear and definite instructions respecting changes of matter or new copy in order to avoid incurring unnecessary charges.

BACK NUMBERS OF THE "MINING STANDARD."

The following is the rate for back copies more than a month old. Applications by post must be accompanied with cash and postage added. In no case can we guarantee to supply copies, as our storage accommodation is limited.

A postcard will be sent if the number required is out of print.

For copies three months old, ninepence; six months, one shilling; and beyond that period, one penny per month per copy.

As there is a regular demand for back copies of the "Mining Standard," newsagents are requested to send back all returns uncut and in good condition, otherwise they will not be accepted.

All Returns from Newsagents must reach us by the end of each month (the whole paper must be sent). No credit will be allowed beyond this term.

Postage—British, 1d.; Foreign, 1½d.; Australasia, ½d. per copy.

Stamps will be accepted as pre-payment.

Address communications: Publishing Department, "Mining Standard."

**FIRE . . BRICK**

Our Products have proved their Superiority.

FIRE CLAY GOODS For Every Purpose.

Darley Fire Bricks will withstand the most intense heat and will not shrink. Our bricks are made near Bacchus Marsh, Victoria, and we supply all the States.

Specialities—

High-Grade Firebricks and Retorts.

*Prompt Delivery.* *For Prices, etc., write to—*

**DARLEY F. B. CO.,**
**Oliver's Lane, Flinders St., Melbourne.**

**MINING STANDARD.**
PUBLISHED EVERY THURSDAY.
Forwarded Post Free to any Address.

| | Per annum |
|---|---|
| Australasia | 26/- |
| British Possessions | 32/6 |
| Foreign | 34/8 |

Payable half-yearly or yearly, in advance.
All amounts should be made payable to order of "CRITCHLEY PARKER, Bank of Australasia."

12 O'Connell-street,
Sydney.
Tel. City 8103
P.O. Box 331.

376 Flinders-lane,
Melbourne.
Central 7931 & 1838
P.O. Box 253.

AUSTRALIAN
MINING STANDARD.
PUBLISHED EVERY THURSDAY.
ESTABLISHED 1888

It is requested that all business communications be Addressed to Critchley Parker.

WEDNESDAY, DECEMBER 24, 1913.

## PARLIAMENTARY ETHICS.

Dr. Bryce, who was at one time a member of the present British Government, and was afterwards His Majesty's Ambassador to the United States of America, recently paid Australia the compliment of applauding the apparent cleanness of its politics. The compliment is a pleasant one from a gentleman of the high personal standing of Dr. Bryce; but it has to be considered in the light of the tremendous degradation of the old standard of honesty which ruled in British Parliaments before the Government of which Dr. Bryce was a member took office. A member of a party which so very recently has whitewashed the country's Chancellor of the Exchequer and its Attorney-General for conduct that would probably in any previous British Parliament for a century or more have led to the resignation of those individuals, and has even rewarded one of the two delinquents by elevating him to the onerous position of Lord Chief Justice, is hardly one to whom we would look for a certificate of political or any other sort of honesty. These matters are to be judged in the light of facts and not in the light of opinions; and the facts are that, although Australian politics, like English politics, have been free from such instances of wholesale corruption as have brought disgrace upon both France and the United States, they have yet by no means given evidence of the possession of a really high moral standard of conduct. There have been, during the past four or five years, some very unpleasant occurrences in more than one of the Australian Parliaments. There are suspicions, and more than suspicions, of abuse of opportunity in Western Australia. In New South Wales there was the deplorable action of the McGowen Government in regard to Mr. Nielsen; and there has also been a good deal of talk, not perhaps without reason, of certain other matters which need not be more specifically referred to. But there is one matter which calls for special remark; that is, the growing and unpardonable habit of the members of all Parliaments to vote themselves higher salaries than those which they were sent into Parliament to receive. This has been done under circumstances that cannot be considered either honest or straightforward in both the New South Wales Parliament and the Commonwealth Parliament. In neither case was any hint given at the precedent general election that any increase of remuneration was intended. What would we think of a man who was appointed cashier at a salary of £300 or £400 per annum, and who, when he had obtained control of the finances of the institution whose interests he was being paid to conserve, increased his emolument to £500 or £600? For such an action by such a person we should have a very unpleasant name, but for such action by members of Parliament we have no unpleasant name at all. Yet this is what both the New South Wales and the Commonwealth Parliamentarians have done, and what the Commonwealth gentry and Victorian politicians are proposing to do; but doubtless conduct of this sort does not seem very bad to one who is in such close touch as is Dr. Bryce with a Parliament which has voted its members allowances which the people of the United Kingdom never intended them to have. We have compared our Australian politicians to cashiers who take more for their duties than the price at which they were engaged to perform them. Their fellow politicians in the United Kingdom may be likened to a secretary who undertakes to perform his duties in an entirely honorary capacity, and who, when he has obtained the position, calmly appropriates unto himself a large proportion of the funds at his disposal. We are well aware that the members of the English Liberal Party were not anxious to make this raid on the Treasury for the benefit of their own pockets; they were forced into it to oblige their Labour allies and their Nationalist allies, the former of whom were already being paid by those whom they represented, while the latter, unable to obtain the money from their constituents, were being financed by subscriptions obtained in the self-governing dominions and the United States; but the action of the Liberal majority was none the less on that account a glaring breach of trust. Similarly with all the suggestions now being made both in New Zealand and in Australia for the payment of pensions to retired members of Parliament, it will be a piece of downright dishonesty for any such action to be taken without a direct reference to the electors. We repeat now what we said in our issue of October the 2nd, that it ought to be in the power of the Judicature to prohibit any alteration of the remuneration of members of Parliament and of Ministers of the Crown without a direct reference to the electors; or, better still, such power might be given to the "statutive" body the formation of which we suggested in our issue of Oct. 9—a body without the consent of which no acts passed by Parliament could find their way into the Statute Book.

---

Had the remarks made last Thursday in the Sydney Town Hall by Sir George Reid on the restricted outlook of Australians generally been made by a stranger, they might have caused "the judicious" to reflect, if not to grieve, but they would assuredly have been resented by the multitude, as the utterance of a globe-trotter, and not a very friendly one, either. As a matter of fact, it is this very globe-trotting which Sir George Reid recommends as a cure for a very prominent trait of Australian character. Perhaps it would be unfair to suggest that Australians are the only people who are "self-centred," and it is not unlikely that Sir George would repudiate such a suggestion. But he was addressing Australians about themselves; he did not compare them as a nation with any other nation, neither did he say that other nations were blameless in this regard. And who can deny the truth of his declaration? "We have been altogether too self-centred in Australia," he said, "we have not sufficiently observed the rising and spreading tides which are bringing us ever nearer the restless storm centres of the world. The wonderful developments in Europe and the East have put a different complexion on our position. We must remember that we have risks of our own, which will require infinite statesmanship and marvellous progress in order to make us equal to meeting the future with a spirit of confidence." Australia certainly has the makings of a wonderful country, a great country, but it is not a great country yet, in any but a purely geographical sense. It is big; it will some day be great, but not for years to come, and Sir George Reid suggests the very best way in which young Australia can help to bring about that desirable achievement, namely, by giving more intelligent study to the world movements outside our own shores. The forces which make for progress are not only such as now and again come to the surface in wars and revolutions; they are constantly evolving in the minds and habits of the people. The storm centres to which Sir George probably referred are the scenes of commercial rivalry rather than those of political disturbances; and back of commercial and agricultural activity lie the spacious fields of scientific research and inventive genius, and the incorporation of the best results of these in the institutions which every progressive nation builds up for itself, which embody its life and become its corporate self. And there is no other way in which these things can be so well studied as by travelling. Nothing will so speedily convince a man of the incompleteness of his present outlook on the life as a few months spent in intelligently observing the doings of others, their aspirations, and the means they are adopting to achieve them. Hence one of the most entirely hopeful movements ever started in Australia is the Young Australia League, created in 1905 by Mr. J. J. Simons, of Perth, which has already sent one party of 40 youths on a world's tour to gather information and inspiration, has organised many trips from the Western to the Eastern States, and is projecting another world's tour to commence in the middle of next year, ending with the Panama Exhibition at San Francisco in February, 1915. And, be it noted, all this is being done without seeking Government aid or private charity. The nobler a sentiment or a virtue, the more easily it is degraded to unworthiness, and that which we call patriotism is very apt to become something not far removed from narrow-mindedness, conceit, and priggishness. But patriotism of the type which the Y.A.L. is seeking to create is likely to be of the highest type and free from parochialism.

* * *

It is admitted by the Minister of External Affairs, Mr. Glynn, that the annual loss on the management of the Northern Territory is greater now than when the Commonwealth took control by £148,000, and, looked at without regard to the nature of the expenditure, this has the appearance of very bad business. It must be remembered, however, that South Australia's heavy annual loss was due in part to lack of the enterprise which was necessary for the task of opening up 335,000,000 acres. In fact, the work of developing that huge area was too much for any single State to be charged with, and even the more progressive Eastern States would have found the Territory an incubus. With the Commonwealth, things are very different, and it was recognised that if the Territory was to be retained by Australia money would have to be spent in its development. There is no real objection to money being spent on this necessary work, provided it is spent wisely—provided, also, it be an investment and not a mere speculation or a free grant from which not even interest is to be derived. It is necessary that roads and railways should be made, that water should be searched for, that settlement should be encouraged, that industries already in their infancy there should be given reasonable assistance, and all this means expense, with no immediate sign of return therefrom. And in order to carry out all this preparatory work, a small army of men must be there in Government employment. The outcry against the large proportion of Government servants to European residents is a very ill-considered one, after all. The European population is said to number 1931, of whom 481, or 25 per cent., are Government employees. But it must be remembered that the latter are not there to wait upon the settlers; they are there to carry out necessary work having a direct bearing upon the opening up of the country and securing a future return from present outlay. Take a parallel case. The resident population of the Canberra district was small, but, presumably, as large as it would have been for many years to come, until it was decided to build the capital city there. But no one ever dreamt that the capital would be built without sending an army of men in varied Government employ to carry out the work, and no one dreams now of complaining that there are too many Government employees there in proportion to the established population. At Canberra they are making ready for Parliament and Government; in the Northern Territory they are making ready for farmers, graziers, fruit-growers, miners, and other country industries as forerunners of commercial life in towns to be built later on. And, after all, the said 25 per cent. of Government servants is really an exaggeration, for of the total of 481, only 120 are permanent employees, the remaining 361 being only temporarily employed. But if the new railway is to be built with anything like expedition, a great many more men will be required there, and whether the Government add to its own temporary staff and do the work itself, or let it on contract, matters very little.

* * *

Once more the impossibility of citizens knowing in all cases whether or not they are "within the law" has been vividly illustrated, and, with all our law-making, which costs Australia many thousands of pounds every year and appears likely to cost still more, there seems no hope of escape from that unsatisfactory position. In its justifiable endeavour to prevent the formation of commercial trusts, Parliament, three years ago, amended the Royal Commissions Act, giving such Commission powers largely in excess of those conferred by the original Act of 1902, and going so far as to enable them to compel witnesses to attend, to produce the private books of firms and companies, and to answer whatever questions might be put to them, even to the extent of disclosing every business operation in which they were engaged. It was in these circumstances that the Royal Commission was appointed to inquire into the affairs of the Colonial Sugar Company, and the Commission's summons ordered the attendance of the company's general manager, Mr. E. W. Knox, with the books of the company. Acting on advice, Mr. Knox declined to appear or to produce certain books mentioned in the summons, learned counsel contending that the Federal Parliament had exceeded its powers under the Constitution in passing the Acts. Mr. Knox went further. Without waiting for the Commission to do as the Act empowered and impose a fine of £500 or under, he promptly commenced an action against the Attorney-General seeking an injunction to restrain the Royal Commission from pursuing him in the matter. Even their Honors the Judges of the High Court differed as to the full Constitutionality of the Acts as interpreted by the Commissioners, and the Court finally granted the injunction sought. This led to an appeal to the Privy Council, the question to be submitted by the Attorney-General being:—"Whether the Federal Parliament has power to make laws for the compulsory examination of witnesses by Royal Commissions touching matters which are not within the ambit of the existing legislative powers of the Commonwealth—that is, such powers as may now be exercised without an amendment of the Constitution." The decision of the Privy Council was given towards the end of last week. In the opinion of the judges, the "authority over the individual sought to be established by the Commissions Acts, or the new offences created thereby, or the drastic powers conferred thereby, cannot be said to be incidental to any power at present existing by statue or common law. English law gives Royal Commissions no title to compel answers from witnesses. Until the Commonwealth Parliament has entrusted a Royal Commission with the statutory duty to inquire into a specific subject, legislation regarding which has been assigned to Parliament by the Federal Constitution, that Parliament cannot confer such powers as the Acts contain on the footing that they are incidental to inquiries which it may some day direct." Later in his remarks, the Lord Chancellor, Lord Haldane, who delivered the judgment, said:—"If the company were compelled to answer certain questions, particularly questions relating to business, it would be a serious interference with liberty, but we are neither at liberty, nor are we competent, to express an opinion regarding the policy of doing so." The appeal of the Crown has, therefore, failed, and citizens have the satisfaction of knowing that even Parliament has still only limited powers to encroach upon their liberty and privacy. It behoves them to be very chary about any such amendment of the Constitution as will unduly increase those powers.

* * *

The fire which destroyed the seven-storey building occupied by the Canadian Cycle Co. and others, in George-street, Sydney, last week, suggests that there are many hitherto unrevealed dangers in structures of the skyscraper type. The probability of fire causing a fall of the upper stories en bloc is certainly an alarming one. But that is not all. Latterly, in New York (U.S.A.), there has been a growing feeling that the forest of massive, armoured concrete buildings in that city contains serious hidden dangers, and a jury of specialists is now in session in New York to thoroughly examine the situation and to frame proposals for the limitation of such structures. The greatest danger, apparently, is believed to lie in the electrolysis of the steel framework. The unlimited use of electric installations in these buildings is, therefore, a probable source of danger, as it is feared that the escape of current cannot be avoided, and that the effect of it on the steel supports will inevitably lead to the destruction of some of these buildings at some time or other. Indeed, so much interest has been taken in the matter by specialists that exhaustive investigations have caused some of them to express the opinion that the destruction of steel in skyscraper buildings proceeds at the rate of one pound per hour. By what process the gradual destruction of the steel is taking place is not made clear, and, therefore, need not be taken seriously. In other quarters it is considered that there is very little risk of damage to reinforced concrete by electrolysis, except in the case of damp situations and where stray currents have direct access to the reinforcing rods. This is just the point, as it need not be supposed that in every case electric installations are effected with such care and certainty as to render the possibility remote. Like most other things, time alone will apply the true test to man's theory in this connection. For the man who dares to contend that steel or metal does not reinforce concrete, except for a time, is actually detri-

**mental to it in the long run, there is awaiting a storm of hostile criticism and abuse. It must not be forgotten that the name "concrete" has been applied to the resultant mass of a mixture of certain materials which develops a peculiar hardening quality with time. One only has to ask the same question with regard to the effect of time and atmosphere on steel, to realise that to fortify concrete with steel is like fortifying life with death. Apart from all this, however, probably the greatest danger in the skyscraper is that of which we have just had evidence in Sydney. Fortunately, the only occupants of the building at the time were able to escape. But the very height of these buildings, in spite of escape appliances and precautions, is the cut off to safety, and the road to safety can very speedily be closed. And imagine the base of one of these structures being weakened—on one hypothesis only—by an outbreak of fire! It does not follow there would be a mere collapse within the area of the building itself. It may (and probably would) carve out destruction along a path equivalent to its own height.**

## NEWS AND NOTES.

Amongst other important positions in the Federal Public Service now vacant are two for assistants in the electrical engineer's branch, in Sydney, of the Postmaster-General's Department, Class C, the salaries ranging from a minimum of £432 to a maximum of £504 per annum. An assistant is also wanted for the Melbourne branch, but the salary, Class D., is from £336 to £408. In all these cases applications must be in by the 27th inst.

The Tongkah Compound N.L., Puket, Siam, will pay its twentieth dividend, 1s. per share, and bonus of 1s., on January 16th, the total amount being £5000, bringing the sum returned to shareholders to date up to £102,000, or 41s. per share.

The A1 G.M. Co., Gaffney's Creek (V.), last week cleaned up from a crushing of 300 tons of stone, recovering 400 oz. of gold, exclusive of mineral. The last previous crushing gave 180 oz. from 220 tons.

It is expected that this month new regulations for the conduct of mining in China will be issued by the Minister of Mines. In an interview recently, the Minister expressed the hope that foreigners would unite with the Chinese in investing capital in the development of mines, with which object the regulations would be framed.

Recognising that the republic's mineral resources are the principal attractions for the investment of foreign capital, and determined that the country shall benefit as largely as possible from such investments instead of letting the gains go into the pockets of speculators who "denounce" or take up claims merely for the purpose of selling out to the first wealthy syndicate which will pay the price asked, the Chilean congress recently passed a law suspending the old mining code, giving the Government the sole right of "denouncing" iron mines. The present mining code considers all metals, wherever found, the property of the State, but grants the privilege of denouncing and staking out claims to individuals. The recent discoveries of rich extensive deposits of iron ores suitable for export in their primitive form, led to the filing of many claims, in the hopes of being able to pass them on later to foreign capitalists. Large tracts of valuable lands were thus being taken possession of by individuals who had no intention of themselves working the mines. It is said that during 1912 and 1913 American capital which, the mining plants having been erected, will amount to between 15,000,000 and 20,000,000 dollars, was invested in this manner in Chilean mines, and the speculators have been doing remarkably well. Even when iron deposits are discovered on private land, the State may claim them on payment in the usual terms of the surface value of the ground.

The flotation on the London market of the Goodrich copper mine (N.S.W.), should it be effected, will have a most unusual incident associated with its initiation. The mine in question forms part of the assets in the insolvent estate of James Dent Oswald, of Caulfield (V.), and last week Judge Moule, of the Victorian Insolvency Court, was asked for the permission of the Court to float a company, in which the vendors shall receive 20,000 paid up shares out of every 100,000 shares in the company, out of which 20,000 shares the Oswald estate is to receive 15,000 for the benefit of its creditors. In insolvent's schedule the assets are set down at £11,185, but Mr. J. W. Danby, a trustee in the estate, informed the Court that they were largely illusory; for example, certain mining concessions in the Northern Territory were put down at £5000, although he was trying to sell them for £600. The Goodrich property was also put down at £5000. The proposal put before the Court emanated from Mr. G. A. S. Griffin, and the permission of the Court to accept it was given on condition that, before dealing with any shares that the estate might obtain in the event of flotation of the company, the trustee must come to the Court for further advice or direction.

"If half the auditors' allegations be correct," said the judge who heard the preceedings for winding up the Credit Bank of India, "the company was an organised attempt to swindle the public." The manager of the bank, Jaffer Gooaub, was arrested last week on a charge of breach of trust.

A dividend of 6d. and a bonus of 6d. per share will be paid by the Williams's Fancy G.M. Co., Berringa (V.), on the 29th inst., amounting in all to £1200. The reserve fund will be increased by £500, making its total £1500, and a cash balance of £950 remains to carry forward.

For about on hour on the 16th inst. a fierce fire burned at the power station of the Mt. Morgan G.M. Co., Rockhampton (Q.), defying the combined efforts of over 100 men to extinguish it. Smoke was first seen issuing from the store room, and large quantities of electrical apparatus housed there were destroyed. Fortunately the papers and records in the office were saved, but the office and the storeroom were completely gutted. The boiler-room also was damaged, as also was the main engine-room, while water and heat did a good deal of injury to the machinery, although the full extent of this could not be ascertained readily The misfortune resulted in some delay in operations, but the whole plant was running again last Saturday.

Mr. A. H. Miles, general manager of the Deebook Dredging Company, leftby the R.M.S. "Macedonia" last week for Colombo, en route to Siam, where he will superintend the construction of the dredge recently manufactured for the company by the Chas. Ruwolt Pty. Ltd., of Richmond (V.), and shipped on December 13 for Penang. It is to be hoped that the Deebook Company will have a highly successful career, which there is very little reason to doubt, as, according to the report of Capt. E. T. Miles, who conducted the prospecting of the area held, the company has fully 300 acres estimated to contain about 2 lb. of tin per cubic yard. With an additional area of 52 acres just acquired for 5000 fully-paid £1 shares, the company now holds a total area of 462 acres.

The announcement made by Mr. Charles L. Parsons (chief of the technologic division of the U.S. Bureau of Mines) at the meeting of the American Mining Congress recently held at Philadelphia, of the establishment of a Radium Institute, whereby such quantities of radium as may be produced in America may be held for the benefit of humanity, has caused widespread comment in American journals. The proposal is popular. It is contended with considerable energy that America will have to be looked to for the major portion of the world's supply of radium in future; and, indeed, that America is mainly responsible for what quantities of that element have already been produced. Unfortunately, too little of this mysterious and valuable element has as yet been produced to enable any exhaustive scientific research being made as to its qualities, and the action of the Austrian Government in closing down on its production at Joachimsthal, in order to preserve the popularity of that place as a health resort, is the subject of much comment. The Americans are firmly convinced that in the carnolite deposits of Colorado they have the chief source of the world's future supply of radium. With regard to Australia as a probable contributer, nothing is said, but this is probably due to the fact that the deposits we have so far discovered, and which may be a source of supply, are by no means extensive. In this connection the search is more for the scientist than for the average prospector, whose knowledge runs to only those indications which lead to the discovery of the common minerals.

The Argyle Slate Quarries has been registered in Sydney with a capital of £100,000 in £1 shares to carry on business at Chatsbury (N.S.W.) and elsewhere as slate quarry owners. The directors are Messrs. D. T. Morrow, Daniel Stewart, and J. J. Anderson.

During November the Brilliant Extended Co., Charters Towers (Q.), crushed 1820 tons of ore, which yielded £4225 of gold, and cyanided 1600 tons of sands for a return of £929. The working profit was £919.

It is expected that active productive work will be commenced by the New Zealand Sulphur Co. immediately after the New Year holiday. For five months 20 men have been busy in erecting buildings and plant on White Island, in the Bay of Plenty, amongst the valuable sulphur deposits. The retorts, boilers, and heavy plant have been erected and housed in a building some 30ft. high, and the pipeline to carry the water from the 30,000 gallon reservoir to the tanks which will supply the boilers have been completed. The "old cut," which was abandoned by the old company, has been found to contain 1500 tons of 60 per cent. material, and other valuable deposits. At one spot a deposit of 92 per cent. sulphur in the form of globules has been located on the shores of the boiling lake. Rafts will be used to cross the boiling lake so that the fumaroles of molten sulphur may be tapped, and a compressed air pump will be used to bring up the extensive deposits at the bottom of the lake.

During November the Kyarra G.M. Co., Meekatharra (W.A.), crushed 920 tons for a yield of £1978. Working costs absorbed £1268. Expenditure on capital account, buildings, plant and machinery, was £238, and development £427, or a total of £1933.

There is a possibility that the New Zealand Arbitration Court will shortly be deprived of the services of Mr. Justice Sim, its president. A rumour that such would be the case having been mentioned to the Minister of Justice, Mr. A. L. Herdman, he said that when the Judicature Bill is passed by the Legislative Council it will be necessary to make two appointments, one to fill the vacancy created by the departure of Sir Joshua Williams, and another to fill the additional seat which the Bill will create. The matter of the new appointments has not yet been considered by the Cabinet, "but," added the Minister, "no doubt if Mr. Justice Sim desires to be relieved of the responsibilities of Arbitration Court work one of the positions will be offered to him." In any case, the Judicature Act will not come into force before February.

It will be remembered that when the New Zealand waterside workers' strike was at its height, an old man, 75 years of age, stated that he had found gelignite on the rails on the Main Trunk railway just before the Wellington express was due. The old fellow, Joseph Davis by name, was subsequently arrested and charged with having placed the gelignite, with fuse and detonators attached, on the line. In the Supreme Court, at Wellington, he pleaded guilty. In sentencing him, Mr. Justice Edwards said he recognised that the accused had hitherto borne a good character. No doubt the offence was due entirely to the weakening of his mind with advancing years, but that very circumstance made him the more dangerous to the community. His Honour sentenced Davis to reformative treatment not exceeding five years.

For some time past there has been great dissatisfaction amongst Victorian miners' associations which belong to the F.M.E.A. at the slackness of unions in other States (notably in New South Wales) in responding to levies, and the suggestion was made recently that Victoria would do better to withdraw from the Federation rather than continue carrying all the States on its back. At last week's meeting of the Bendigo Miners' Association a letter was received from the secretary of the Ararat and Beaufort branch, in which it was suggested that the New South Wales section of the federated union should be asked to either withdraw from the association or fulfil its financial obligations. The letter also expressed the opinion that a change should be made in the officers of the federated body, and the request was made that a special meeting of the executive should be convened to deal with the matter. The Bendigo branch referred the communication to the adjourned half-yearly meeting.

The decision of the owners of a mining lease at Tallandoon, about 20 miles from Tallangatta (V.), to rework their claim, led last week to their breaking out, amongst a lot of other quartz, one piece which was almost a mass of gold and weighed 50 oz. This, when treated, gave a return of 44 oz. of smelted gold. The lucky finders were Messrs. Ellis and Jones.

The resolutions of shareholders necessary to authorise the winding-up of the Burnt Creek G.M. Co., Dunolly (V.), were passed on the 18th inst. It is anticipated that realisation of the assets of the company may enable a return of 3s. 6d., or perhaps 3s. 9d., per share to be made during next month.

The directors of the Mt. Bonnie Mining Co., Northern Territory, have been authorised to float a company with not less than £30,000, in order to secure funds for the purchase and erection of a concentrating plant and for mine development. Shareholders in the present company are each to receive 100 shares fully paid to 10s. for each share now held. The present company is in 230 shares full paid to £10 each.

The monthly dividend of 2s. per share will be paid by the Cathcart Central G.M. Co., Ararat (V.), on the 29th inst., and will amount to £5000, making the total return to shareholders £25,000.

The Ivanhoe Gold Corporation, Kalgoorlie (W.A.), will pay a dividend of 3s. 6d. per share less English income tax of 1s. 2d. in £) on January 28, amounting to £35,000 (less tax £2041, leaving £32,959).

A Zeehan (T.) correspondent writes:—"One of the remaining regions which has not as yet participated in the vigorous search for minerals which has prevailed throughout the Commonwealth of recent years will this summer be made available to prospectors. The area comprises that uninhabited portion of the West Coast of Tasmania which lies between Macquarie Harbour and Port Davey. In the past, this country has only been rushed over owing to the difficulty of obtaining supplies, which, by the absence of boat harbours on the Coast, had to be packed long distances through the scrub on men's backs. Tracks there were none. Hence systematic and sustained prospecting of the interior mountains was quite impossible. A few years ago the community was shocked to learn that several wrecks had occurred on the wild coast of this "No Man's Land"; that survivors reached the shore, and perished miserably from starvation, was proved by the finding of the remains of some of the unfortunates. As a guard against such a happening in the future, a track is being made from Macquarie Harbour to Port Davey, and subsequently the two places will be connected by telephone. The track is now about half way toward completion, and here a Government depot will be erected, and stores dispensed at cost price to prospectors. The country is known to be mineral bearing; copper is found on the beach at Point Hibbs, silver-lead in the near range, and gold and tin is known to exist in the vicinity of Port Davey.

## PERSONAL.

Mr. C. Barnard Evans, the Commissioner of Queensland Railways, proposes in about a couple of months' time, with the concurrence of the Government, to take a trip to England and America in order to obtain the very latest information on railway working and management available in those countries. Mr. Evans will probably leave Brisbane at the end of February or early in March, and expects to be absent about six months.

Mr. James Mayne, who is approaching the completion of his 24th year of service at the Broken Hill South mine (N.S.W.), and will in future live near Adelaide, was recently entertained by a large body of the mine officials, Mr. W. E. Wainwright presiding. Mr. Mayne was first engaged as a miner in February, 1890, and took his first official position as underground shift boss in June, 1891. He became underground manager in 1903, at which time the weekly output was 2400 tons of crude ore; now it is 7500 tons; the ore reserves were then 1,000,000 tons; now they are 3,250,000 tons; there were then 600 employees, now there are 1400; in 1903 there were two underground foremen and six shift bosses, now there are six foremen and 18 shift bosses, and in the interval the working expenses grew from £114,200 to £361,400, the profits from £46,800 to £337,700, and the dividends from £20,000 to £300,000. Mr. Wainwright congratulated Mr. Mayne on his wisdom in retiring now instead of waiting until he was too old to take an interest in anything else; he then presented him with a cheque for £520 on behalf of the company, and with a gold watch on behalf of the officials of the mine, and wished him health and long life.

At the invitation of the directors of B. K. Morton Proprietary Ltd., Melbourne and Sydney, Mr. J. O. Thomson has accepted a seat on the board, and the appointment takes effect on January 1.

Mr. J. McKenzie, surveyor-general of New Zealand, has been appointed Under-Secretary for Lands in the Dominion, in succession to Mr. J. Strauchon, retired.

Mr. G. C. Grosse, J.P., manager of the Yerranderie silver mine, Picton (N.S.W.), for many years (writes our Lithgow correspondent), is about to tender his resignation owing to ill-health.

Victorian members of the Institute of Civil Engineers (London) last Saturday entertained Sir Maurice Fitzmaurice at dinner at the Oriental Hotel, Melbourne. Sir Maurice is visiting Australia under engagement to the Federal Government, for the purpose of inspecting the naval harbours of the Commonwealth. Last Saturday's function was presided over by Mr. H. C. Mais, the senior member of the committee of the Victorian members of the Institute, and he was supported by Messrs. W. Davidson, late Chief Inspector of Public Works, Victoria, and Henry Deane, chief engineer of Commonwealth railways. Responding to the toast of his health, Sir Maurice Fitzmaurice expressed regret that his stay in Australia would be too short for him to pay a visit to other important engineering works in the State.

Mr. H. C. Bellinger, for nearly five years general manager of the Great Cobar Ltd., Cobar and Lithgow (writes our Lithgow correspondent), has tendered his resignation, but will remain in control until about February next.

Mr. W. Fitzpatrick, Victoria's Chief Commissioner of Railways, returned to Melbourne by the R.M.S. "Mooltan" last Monday, from his European and American mission, the purpose of which was to investigate the working of electric railways.

Mr. A. Noellat, a graduate of the Sydney Technical College, is proceeding to New Caledonia by the s.s. "Pacifique," and while there intends to look into the question of nickel smelting. Mr. Noellat accompanied the members of the Institute of Mining Engineers on their visit to Broken Hill in June last, and is the winner of the two out of three prizes offered on that occasion by Mr. Jas. Hibbard, manager of the Central mine. The two subjects in which Mr. Noellat was successful were "Mining Practice" and "Milling Practice (including flotation)." He will also visit some copper and gold propositions in New Caledonia.

## BOOKS REVIEWED.

### By Alter Idem.

CYANIDE PRACTICE, 1910-1913. Edited by M. W. von Bernewitz. Published by the Mining and Scientific Press, San Francisco and the "Mining Magazine," London. 732 pp.

"This is the third of a series of books that began with 'Recent Cyanide Practice,' edited by Mr. I. A. Rickard and printed in 1907, and which was continued by 'More Recent Cyanide Practice,' edited by Mr. H. Foster Bain and printed in 1910. They include articles on all phases of current cyanide practice based on experience in all parts of the world. In the main the papers here reprinted were first published in the 'Mining and Scientific Press.'" The foregoing description is given by the editor in the preface to the work.

Technical literature grows at such a rate that it is not possible for the busy man to keep in touch with all that is going on, even in one section of an industry. So much also is written that is either valueless or is mere repetition of work and processes already known that much time is wasted and much irritation aroused in the seeker after fresh knowledge. Magazines and journals supply the mining world with so much information that some system of classification of subject matter and also of boiling down is necessary if sections of work, such as that indicated on the title, are reproduced..

The editor is to be congratulated on the manner in which he has classified the articles, the care with which he has selected them and on those which he himself has written. Many technical books written on special subjects are found to be exceedingly disappointing to the men who are actually working processes of which descriptions are attempted. This criticism does not apply to the present work so far as Australasian descriptions are concerned, and presumably the descriptions given of mills and methods in other centres are equally reliable.

Although the author indicates that he has used the pruning knife freely, yet there is no item of interest in either plant or method which has been overlooked, and the information given is quite full enough for the reader familiar with modern cyanide processes.

Summaries of the progress in treatment of gold and silver ores during 1910-11-12 are given by Mr. Alfred James, yet a single article giving a critical summary of the miscellaneous subject matter in this work would have enhanced its value. As it is, some of the information given appears to be contradictory. For instance, dealing with the chemistry of cyanidation, certain well-known authorities precipitate copper, gold and silver cyanides with sulphuric acid. On the other hand, we have the Gitsham process described, which seems to indicate that solution of gold takes place with an acid solution.

It is evident that finality has not been reached with regard to improvements in methods of cyaniding. Each field must work out its own destiny. Kalgoorlie, after strenuous years of experimental work, has reduced its method to routine. Older fields in the same way become conservative, but there are so many problems in refractory ore districts still awaiting solution or partial solution that the last has not been said on the subject. The intelligent metallurgist will find the present work informative and stimulative. The subjects dealt with include the chemistry of cyanidation, special problems, crushing, concentration and treatment of concentrates, roasting, agitation, decantation, filtration, precipitation, disposal of residues, estimation of tonnages, recent cyanide practice, recent notable mills.

The work is necessary for mill men, teachers and students. Every reader will gain something new from it.

PORTLAND CEMENT: ITS MANUFACTURE, TESTING AND USE. By D. B. Butler, 3rd edition, E. and F, Spin. 458 pp.

This well-known book has been enlarged and brought up-to-date. The book deals with the manufacture, tests and use of Portland cement. It is somewhat remarkable that the term Portland cement owes its origin to a Leeds bricklayer, who noticed a fancied resemblance of an artificial cement he patented to the Portland building stone.

The fact that certain limestones were hydraulic was long known, but it was not until the chemists' assistance was procured that it became possible to blend a limestone from one place and a clay from another and produce an article vastly superior to the natural mixtures previously sought for.

The author gives a clear description of the raw materials used, their chemical and physical composition, and also the composition of the final product. Cement is really a basic slag containing about 22 per cent. to 25 per cent. of silica and 62 per cent. to 64 per cent. of lime, 9 to 12 per cent. alumina, with small quantities of sulphates, carbonates and bases.

The mixture of limestone and clay is strongly heated and sintered and the resulting product ground to fine powder. The necessity for intimately mixing the ingredient is strongly insisted upon, and the methods in use, both wet and dry, are fully described.

The interdependence of certain industries is obvious from the descriptions given of the mixers, crushers and grinding appliances, as well as for the heating furnaces in use. The ball mill, the Griffin mill, the tube mill, mixers, elevators and conveyors are all familiar to the modern gold metallurgist. Some of these appliances have been introduced from the cement industry for the reduction of gold ores. The main improvement in the industry is due to the successful use of the rotary kiln, which is in reality a modification of the cylindrical roasters and driers used on some of the goldfields. This type of kiln were first successfully used in America, but now is almost universally adopted. The author has given an excellent chapter on the methods for testing the soundness of cement, and a highly interesting chapter, containing a considerable amount of original matter, on the influence of the fineness of the cement. The method of testing for tensile strength, setting properties, weight and specific gravity are dealt with fully and clearly. The theories as to the chemical composition of cement, embodying some of the results of Le Chateleir and others, is generally discussed and commented upon. Cement is not always above suspicion. It is a comparatively easy matter to adulterate it with ground blast furnace slag or even inert rock, and the author gives some information regarding the detection of such adulterants. He also deals with specifications for cement from his own and many other points of view.

One of the most instructive sections of the book deals with the use of Portland cement and the failures due to expansion, cracking, want of setting, action of sea water and other causes. The use of cement for Monier construction is briefly alluded to, and also the method of cement washing applied through a nozzle under pressure.

The appendices to the book contain the British, German, French and American Government specifications for cement. The last is very complete, and is indispensable to the cement tester. The book is of much value to the engineer, manufacturer, teacher and technical student.

"Dynamo and Motor Attendants and Their Machines." By Frank Broadbent, M.I.E.E., etc. Seventh edition, enlarged and brought up-to-date. (S. Rentell and Co. Ltd., Maiden-lane, London. Price, 1s. 9d. post free.) The fact that six editions of this book have already been exhausted is sufficient to show that it supplies a want and supplies it well. Originally it treated only of dynamos; the scope has now been enlarged to include motors, and the author suggests that it may be necessary to still further amplify it to bring accumulator, management and other matters pertaining to installation work within its compass. The book does not pretend to be a scientific text-book, but a practical book for practical men in charge of electrical machinery.

* * *

"Mine Surveying." By Edward B. Durham, E.M., Associate Professor of Mining, University of Calofornia. (McGraw-Hill Book Co., New York and London, 1913. Limp Morocco. Price, 17s. 6d.) In this handy pocket volume the author has economised his space and minimised the tax on the patience of his readers by taking for granted that they are already familiar with ordinary mining methods. Only such general matter as was necessary to establish a common ground for discussion, at the same time avoiding repetitions later on, has been included. Similarly in the subsequent chapters, each of which is devoted to a special subject, the general methods of procedure are first stated, in order to make what follows more readily digested by engineers and students already familiar with general surveying, but who are taking up mine surveying for the first time. The topics separately dealt with are: Equipment for underground surveying; underground traversing; surveying for details; traverse calculations; maps and projections; special mine surveys; special problems in mine surveying; various mine surveying instruments; steep transit sights; shaft plumbing, tunnel surveys; surface and mine models, explanatory surveys; magnetic surveys. One feature of Professor Durham's otherwise very useful volume will be regretted by his students. They will forgive his decision that, as instrument makers' catalogues supply drawings and descriptions of the commonest instruments in use, it was unnecessary to illustrate them in his manual, but they will regret that "an attempt to be impartial to the various instrument makers" has led him, in the case of special fittings, to abstain from any particular recommendations, which certainly would have been welcomed by the men to whom mining surveying is a new subject. Even in his selection of types for illustration, Professor Durham says "the choice . . . . was settled by the quality and instructive value of the cut that was available," which obviously means that, although illustrated, these special fittings are not necessarily recommended. The book is well and clearly printed and well indexed and illustrated, and although comprising 390 pages it is only half-an-inch thick.

* * *

Owing to an unexpectedly large demand, it has been found necessary to issue a second edition of the Sydney Harbour Trust Commissioners' official handbook, "The Port of Sydney." The publication, well bound in cloth and printed in good style, contains much matter of general interest as to Sydney Harbor as well as full information and tables concerning the progress of the port in shipping matters, its capabilities in the matter of wharfage, and the charges and dues payable. The illustrations, embodying various views of harbor scenes, are well selected and executed, and special mention should be made of the two excellent bird's-eye view maps of the port and the new wharfage scheme, which were designed by Mr. Walsh, the chief engineer of the Trust. The book reflects great credit upon all concerned in its production.

## THE INVESTOR'S COLUMN.

### Some Companies Attracting Attention To-day.

(By our Sydney and Melbourne Exchange Reporters.)

### Melbourne.

A1 Gold Mines (V.).—A very pronounced rise in the price of shares in this company has taken place during the last half year, for whereas they were obtainable at 3s. or 3s. 6d. in May and 7s. in August, there were sales this week at 17s., and although a sharp decline has since taken place they are still worth about 14s. The improvement in value was gradual and well maintained until the last few days, when some keen buying caused a rise in value of nearly 6s. per share. As the shareholders have been paying calls very consistently for the last two or three years, no one will grudge them the brighter market outlook which has just been disclosed, for whatever success they may achieve will be well deserved. The proposition is a very interesting one in several respects, as will be gathered from a brief account of its operations. Towards the end of the year 1909 [illegible] the present company was examined for the purpose of acquiring and floating the A1 and A1 South mines, which had been owned and worked by two different English companies. The two properties, which adjoin one another, and have now been connected underground, are situated at Gaffney's Creek, a rather inaccessible place in the [illegible] mining district, Mansfield, the nearest railway station, being 50 miles away. The work done on the two leases by their former owners had been fairly extensive, and since the discovery of the reef in 1861 by some prospectors the value of the gold produced is estimated at not far short of one million sterling, from which dividends of approximately £206,000 have been paid. In the first instance the property was worked from an open cutting, then, as the bodies of stone at the upper levels became exhausted, by means of tunnels. The formation is described as an "altered dyke," and in it the gold-bearing quartz veins and floors occur. In one place the dyke bulges to a width of 150ft., and it has been in this bulge that the best bodies of stone have been found. Some idea of the size of these floors, which are composed of hard quartz, may be formed from the following figures:—One of them above the No. 4 tunnel was stoped for a length of 120ft. by a width of 100ft. and for a height of 20ft. Another of these floors was stoped for a length of 300ft. by a width of 100ft. and up to 20ft. in height, and as these two floors would give bodies of 18,000 and 90,000 tons of stone respectively, it can be seen that the quartz occurrences in the mine are on a very extensive scale. Under the ownership of the English companies, the A1 mine was worked by means of a shaft, which was put down from the No. 4 tunnel, at a point about 350ft. from the entrance, to a depth of 330 feet. Five different levels were put in from the shaft, the deepest being at 250ft. below the tunnel level, and the result of the last two and a half years' work was that 7282 tons of stone were mined and crushed, for a yield, including concentrates, of 1750 oz. of gold, which is at the rate of about 13½ dwt. per ton. Stone of this value should have been decidedly payable, but under the inconvenient working conditions the profit came to under £3000. The second property, the South A1, was worked from a shaft which was put down only 30ft. from the A1 boundary, and at the date of the consolidation of the two mines it had attained a depth of 700ft., and was in good order, and equipped with good winding plant, and 12 head battery, which was driven by pelton wheel, with water power. The operations were carried on in the same dyke as those of the adjoining company, but with the difference that, in the South A1 lease, the dyke was only 40ft. across at the widest point, while the reefs which occurred in it were small, sometimes only an inch thick, and, in addition, were patchy, although occasionally rich. Some good returns were obtained, but this result was, apparently, brought about by sorting or picking the stone; the working costs, however, were much lower, being about 20s. per ton, as against 44s. Although this mine had not put up a very successful record there was reason for believing that the wide bulge in the dyke would eventually dip into the property, and probably reach the boundary at a depth of about 800ft. On the whole, the prospects of the two mines were decidedly promising, but, owing to want of funds for development work, together with expensive management, the companies got into difficulties, and the properties passed into other hands. The present company, which was formed with the object of securing the leases and working them as one mine, has a capital of £15,000, in 30,000 shares of 10s. each, of which 20,000 were offered to the public at 2s., the balance to be called up as required, and 10,000 went to the vendor syndicate, together with £2500 in payment for the valuable mining plant, £650 of this sum being payable immediately on flotation, and £1850 at the rate of 5 per cent. out of the gross proceeds of the gold to be won. As the contributing shares are now paid up to 8s. 3d., it will be seen that since flotation 6s. 3d. per share has been called up. The plan of operations, as originally decided on, was to drive the No. 8 level of the South A1 mine northerly, under the workings of the A1 mine, in order to prospect the main dyke bulge at this depth; and, secondly, to connect this level, by rises, with the A1 workings overhead. The South A1 shaft was very well situated, and it has been since deepened to 850ft., the No. 9 level in the mine, and largely used in carrying on the operations. The work done has undoubtedly been attended with very satisfactory results, as will now be described. The level which was put in at 687ft. was continued for a distance of 307ft., when a rise was put up to connect with the 250ft. level in the A1 mine. At 218ft. from the shaft this drive met a floor of quartz, known as the No. 1, which, although at first not carrying much gold, afterwards improved, and gave good payable returns. Above the level—at about 60 feet—the rise which was put up intersected another floor, the No. 2, which was about 3ft. in thickness, and of good payable quality. In addition to deepening the shaft, a connection has been made with the No. 4 adit level, and the drainage and working conditions have, consequently, been greatly improved. The main development has, however, taken place at the No. 9 level, which had been driven north, like its predecessor at No. 8, in order to get under the main bulge of the dyke. At 147ft. from the shaft, this drive encountered a number of gold-bearing leaders, and at about 20ft. further in, a well defined body of quartz was met. This floor, No. 4, was at first from 1 to 4ft. thick, but it has increased in size, and now varies from 2 to 7ft. It has been driven on for a distance of 200ft. and stoped across for a width of 100ft. The manager considers this one of the most consistent bodies of stone yet met with in the mine. In addition to this development, another floor, or formation, No. 3, was passed through at about 80ft. below the No. 8 level, in a winze which was being put down to connect with the No. 9. This connection has now been completed, and stoping will be commenced immediately on both these floors, and a considerably increased tonnage will be put through the battery. Up to the present the stone treated from them and obtained from the development work has been of decidedly payable quality, 1000 tons having been crushed for a return of 917 oz. 5 dwt. of gold. While altogether, since the formation of the new company, 5077 tons have been treated, for a total yield of 2760 oz. There is something very interesting, from a geological as well as a mining point of view, in the consistent manner in which these great floors re-appear at regular intervals, and the igneous nature of the formation or dyke, once a molten mass, justifies a hope that these occurrences of gold-bearing quartz will continue downward until they reach a depth which will render them unpayable to work. It may safely be assumed, however, that in the A1, as in other mines, especially those working dyke or saddle formations, that the different bodies of stone which are met with will vary considerably in value, and while some may be barely payable, if that, others will give good profitable returns. The two floors now being opened up at the lowest level in this mine appear to be the best encountered for some hundred feet, and should reward the shareholders with dividends when stoping operations are commenced in a comprehensive manner. Part of the profits will, however, be expended in keeping the development work well advanced, as it was owing to a departure from this policy that the previous companies got into difficulties. Some of the opinions recently expressed "On 'Change" regarding this stock have, apparently, been on the optimistic side, and the market has, perhaps, gone a little too fast: nevertheless, the shares must be regarded as a promising mining investment.

Swallow and Ariell. — In commenting on the better support which has recently been forthcoming for the two classes of shares in this company, it should have been pointed out that those of the new issue, which carry a six per cent. cumulative preference dividend, afterwards ranking alike with the ordinary shares in any increased disbursement, are now paid up to 15s. The rate of dividend has recently been 7½, and the fact that these shares are worth about 19s. is a good evidence of their popularity with investors in this class of security. The reserves and undivided profits of the company are substantial, amounting to over £94,000.

## BRIEF COMMENT.

Probably enough criticism has been expended on the promiscuous use of the terms "payable" and "unpayable" as applied to Victorian mining to have caused some modification of its application. Apparently it has not; though the directors of the North Nuggety Ajax, Daylesford (V.), ought to know better. The half-yearly meeting of shareholders of that company was held at 125 Queen-street, Melbourne, last week, and Mr. W. A. Rain (the chairman) stated that the stoping of the flat make of ore above No. 6 level had proved to be the mainstay of the mine. During the term, the shaft had been sunk a further 120ft. to a total depth of 828ft., and lateral development to the extent of 853ft. had been carried out. At 810ft. in the shaft a plat is now being cut preparatory to opening out at No. 9 level. Regarding the Ajax lode, the chairman stated that values had been proved, by means of a rise from the 550ft. level in the Ajax Central property, to extend upwards (about 40ft. inside the boundary) to within 10ft. of No. 6 level. These values were described as payable. At No. 8 level a crosscut intersected the lode, which was followed north for a distance of 180ft., in values described as unpayable. It is intended to continue this drive for the remaining 180ft. to the Ajax Central boundary, in order to ascertain if as much of the lode as is left to the Ajax Co. at that level is—payable. It is to be hoped that the extension of No. 9 level will give more encouraging results than those described, at least encouraging enough to warrant the definite statement of values.

It is really very questionable if the Marvel Loch Co. has acquired a good asset in the Comet lease, the option on which has been exercised. The report of the manager on this property appears with the directors' report and statement of accounts to the 31st October. The general characteristics of the ore occurrences in this lease are ably described, and it is a wonder that in the face of that the property was ever acquired, because there can be very little doubt that with it the Marvel Loch Co. has bought trouble. It is evident that the granite intrusions have not materially affected the continuity of the lode so far as the latter has been proved, but the difficulty which the manager asserts has attended its development may be considered a permanent and abiding one. Values, however, appear to be good. It is noteworthy that the manager recommends the appointment of Dr. Maclaren to make a geological examtion. The suggestion is obviously ill timed, as is rather late to seek an expert's opinion now that the mischief, of having paid for the property, has been done. Of course it is desired to make this property pay for itself. On this account the gold won from it realised £4078, which, less the expenditure of £3543, showed a profit of £535. Otherwise, the financial results for the period were just so-so, the total expenditure for the period, £12,929, which included £1500 for the Comet lease, being balanced by £1766 in the shape of calls, in addition to receipts from other sources, the main item being bullion from Marvel Loch and Comet mines, which realised £9926.

Shareholders in the Bullrush Estates Co. have received something of a shock on being notified that the ore reserves in the Royal Standard mine, Yuin (W.A.), are not of the value they were led to believe by the last report. Mr. V. F. Shallcross (managing director), upon returning to W.A., was advised by the mine manager that he (the manager) had altered his estimatte of the value of the 41,000 tons of ore in reserve from 36s. to 29s. per ton. This betrays either lamentable blundering or callous indifference to the interests of shareholders, who should energetically demand an explanation. The alteration has led to the Gold Industry of W.A. Ltd. declining to carry out its agreement to guarantee the payment of calls whereby the development of the mine may be carried on, and, upon Mr. Shallcross' advice, the board has decided to suspend work pending Mr. Shallcross visiting the mine and making an investigation. On the face of it, the business looks ugly, because there can be no possible excuse for making an estimate which was liable to such sweeping revision. On the basis of 29s. per ton, the mine is worthless when its situation, working costs, and administration charges are taken into consideration. There was some hope for the property with the ore conclusively proved to be worth 36s. per ton; but there is obviously not any now, in addition to which the confidence of shareholders will have been shaken to such an extent that it is questionable if they will accept even Mr. Shallcross' assurance that the property is worth further consideration, should he believe it to be.

No further progress was made at the adjourned meeting of shareholders of the Mt. Balfour Co. (T.) held at 31 Queen-street, Melbourne, on Thursday last, although sufficient shares were represented by proxy, not enough shareholders were present to enable business to be proceeded with, and the meeting therefore lapsed into an informal one. The chairman read a telegram from Mr. K. Laughton, the company's representative in Tasmania, to the effect that Parliament had agreed to the extension of time sought, believing in the authenticity of the statements and telegram; but that the assent of the Executive Council would be withheld until indisputable proof of the flotation was forthcoming. If satisfied on this point, the Government stipulates that the company must spend £900 per month on the railway until the end of March next, after which the monthly expenditure must be £2000 until completed. It will be remembered that in the Tasmanian Legislative Assembly last week, the Minister of Lands (Mr. E. Mulcahy) stated that, until the Government was satisfied that the company could raise the capital not only to fulfil its obligation with regard to the railway, but to wipe off the amount it was in default, the extension of time sought would not be granted. In view of this extension having been granted, as per the telegram quoted, the condition regarding the amount in arrear has apparently been waived. In connection with this matter, the chairman of the company (Mr. J. E. Taylor) informed shareholders that the point with regard to its being a liability was one of interpretation, and that, personally, he was of opinion that it was not one. However, it may be assumed that the position of the company with regard to the railway is by no means in jeopardy, and that the time-honoured process of killing time is being advantageously applied to carry it through its present difficulties. Shareholders were given to understand that, as far as the alleged Brussels Co. was concerned, the Mt. Balfour Co. had given no option, and that it was under no obligation whatever to accept the terms under which that company is stated to have been registered. It was finally decided to further adjourn proceedings until the 6th January, so that shareholders might judge better what the position is from the report and balance-sheet, which would be available by then.

In the first annual report of the directors of the Eleanora Mines Ltd. (N.S.W.), a very unsatisfactory state of affairs is revealed. It is said that, owing to an adverse set of circumstances, the sum of £9900 raised by the issue of first mortgage debentures had been found inadequate to carry out the work outlined in the debenture prospectus. The trouble is attributed to the fact that the work of enlarging and retimbering the main shaft considerably exceeded the original estimate, it being found that decayed timber and rotten ground caused delay through great care having to be exercised on account of the dangerous nature of the work. Further, the cost of removing, repairing and improving the old plant and buildings was found to be unexpectedly high. There is really no excuse for this kind of thing. The cost of the work could, and should, have been accurately ascertained prior to its being undertaken. To make matters worse, other reasons are offered, in which the increased cost of timber, day labour, etc., are held partly responsible. As a result, in September last the directors suspended work, and the Eleanora Syndicate Ltd. was formed to take over the share and debenture interests of Messrs. Percy Tarbutt and Co. in the Eleanora Mines Ltd., and to advance the sum of £7500 on second mortgage debentures. The Eleanora Syndicate therefore practically owns the entire outfit. The Eleanora Mines Ltd. (formerly the New Hillgrove Proprietary) seems to have some prospects, as a good quantity of ore has been opened up in the Eleanora lease, no attention having yet been given to the Hillgrove and Golden Gate leases. During 1912 the company won 1598 tons of ore, which yielded 1266 oz. of gold, valued at £4431, and it only wants to recover from the effects of that decidedly misleading estimate to show what it can do.

Contrary to expectations, the Adelong Gold Estates (N.S.W.) was unable sufficiently to improve the gold recovery to show anything like a satisfactory state of affairs in the last half-yearly balance-sheet just issued. During the six months ended October 31, 428,864 cubic yards were treated for a return of 1189 oz., on which a loss of £2256 was sustained. The general liabilities amount to £5192, in addition to the debenture debt of £15,000. Assets, in the shape of fuel stores, sundry debtors and cash, amount to £3747. The situation of the company is rendered worse by the fact that further extensive alterations to the dredges have been found necessary. The outlook is not comforting, in spite of the fact that the results for some time past have shown gradual improvement. So far, it seems that the work of the company is chiefly a species of colossal experiment, the end of which is not yet in sight, unless it be precipitated by further losses which shareholders will decline to stand.

Briefly, the Austral Malay Tin Ltd. is a promoting company, and a sort of glorified prospector. If its present rate of progress be maintained, its ramifications promise to be far-reaching and profitable. In his first annual report the managing director (Mr. H. E. Pratten) states that about 82,000 acres of tin-bearing country, in various centres, has been inspected, of which over 7000 acres were considered worth testing. Of this area only 1000 acres proved to be payable, with the result that two companies have been formed, and a third (the Larnt) is now in the process of formation. Of the two companies already launched, the share consideration of only one, the Kampong (a London company), figures in the balance-sheet. This shows the Austral Malay Co. to have benefited by 21,000 fully paid, and 5000 contributing shares, less 7s. 6d. unpaid, the equivalent in cash being £25,540, which, all things considered, is a very satisfactory performance. The company also holds 49,000 shares in the Kampong Kanninting Co., Sydney, together with its interest in the Larnt. The balance-sheet for the current term should therefore be a very satisfactory document, although it is not safe to predict that any dividends will figure in it. These things take a long time to get moving, and twelve months is easily absorbed in the preliminary work of a dredging enterprise. So far, the object of the Austral-Malay Co. has been to secure and prove tin-bearing country for the purposes of company promotion, although it hopes ultimately to secure a property for its own exclusive control, no doubt from the proceeds of its several flotations.

Pyrites Ltd. has been registered in Sydney with a capital of £5000, in £10 shares, and has been formed to acquire the Kangiara and Breadalbane mines, and to carry on the business of dealers in superphosphates, pyrites, etc. The subscribers to the company's articles of association are:—Messrs. Charles Jackson Taylor, J. E. Cocker, A. A. Hollander, W. A. Gordon, H. A. Coldham, J. Currie Elles, and B. Keith Cohen. It will be recollected that the Kangiara mine was closed down some time ago, and most of the equipment sold. This was a very queer procedure in the face of the fact that during 1912 the mine produced silver, gold, lead and copper of a gross value of £45,536 from 7943 tons of ore. The Breadalbane mine was closed down about a year ago, the last return being £630 from 400 tons of copper ore despatched for treatment. Apparently, this property was closed down for want of funds, as it is quite evident the return on 400 tons of ore was insufficient to show a profit. The plant and machinery on the mine at the time of ceasing operations was estimated to be worth £3000.

Some time ago it was discovered that the lode in Speakman's find, on the Hampton Plains Estate, near Kalgoorlie (W.A.), carried mineral with appreciable values in gold, and it was then determined that a crushing would be made of another parcel which would be concentrated with the object of ascertaining, as far as possible, the average percentage and value of the mineral. A parcel of 25 tons, taken from a depth of 50 feet, is now ready for treatment, and the result should enable some forecast to be made of the future possibilities of the mine. At the present moment this is largely a matter of conjecture, but that it is of a sanguine nature is apparently warranted by the evidence so far available. Since the discovery of the value of the mineral, considerable attention has been devoted to the appearance of the ore as development proceeded. A sample taken over a width of about 10ft. at the 100ft. level has given rather an astonishing result, averaging 3 oz. free gold per ton and concentrating about 3 per cent. of mineral, which assayed 15 oz. of gold per ton. For all practical purposes, the free gold contents may be ignored, the important point at this juncture being confirmation from W.A. of the value of the mineral which, by a mere chance, was ascertained from some samples received in Melbourne. On the face of it, Speakman's is undoubtedly a good, big, low-grade proposition; but hope may be entertained for it developing into something better when the sulphide zone is opened up.

## VICTORIAN MINING ACTIVITIES.

### Malmsbury and District

(From Our Correspondent.)

A busy time is being experienced in the vicinity of the Premier mine (late Beer's Rainbow), at South Kynéton. This mine itself has lodged an application for an additional ten-acre lease, which adjoins the original ground on the east. The stone being broken out by the tribute party is said to be as rich as any got previously. About 70 tons is now being crushed at Beer's Taradale battery.

Mr. Beer, vendor of the Rainbow mine, has taken up a lease to the south-east of his old claim.

Watson Bros. have what is regarded as a fine show to the north-west. About 20ft. down a reef is showing gold in the solid stone. Mr. Thos. Welch has a lease adjoining, which is traversed by the Rainbow lode. Other leases have been pegged out.

This is not an unusual happening in this district. The supply of alluring discoveries seems inexhaustible, and it remains to be seen what South Kyneton will do. Lauriston and Drummond have during the past few years been promising fabulous yields from spurs and reefs that have been "streaks of gold." A circumstance of discouragement is the fact that the Mines Department last week auctioned off the No. 1 South Russell's plant, consisting of battery, hauling engine, housing, pans and other sundries. It is only about a year since it was acquired by the department and reserved for the use of the neighbourhood as a result of very special pleading. It was the only crushing plant in the Lauriston district. The whole outfit was put up in one lot, and only brought £210, Mr. Miller, the well-known machinery buyer, being the successful bidder. Various lots were then submitted. The housing was bought for the Premier mine, and Mr. J. D. Jones, a contractor, got the immense chimney stack. The sundries also sold well.

### Maldon.

(From Our Correspondent.)

During the past fortnight the South German Co. has extended the intermediate drive north to 277ft., and the stone showing in the end is more than the full width of the drive, with 1½ft. of laminated stone on the east wall. Samples taken from it give improved values. At the 2000ft. level, the rise over the back, 815ft. north of the shaft, has been advanced to 56ft., with 4ft. of stone showing in the back of rise, and a new splice of laminated stone making on the east wall. It is expected that the good shoot of stone passed through in driving the intermediate level north will be again met with. Grigg and party cleaned up 176 tons of stone for 54 oz. 5 dwt., with sand and pyrites yet to treat. Baxter and party have been stoping north and south of the winze below 1750ft east, and they crushed 198 tons for 82 oz. 5 dwt. (battery only).

The Golden Horse Syndicate, that recently started operations near the Butts at the mount, sent 10 tons taken from the 80ft. level to the South German battery, and it returned 3 oz. from the battery only.

Maloney's Reef, White and Blue have a party of tributers breaking out stone, and they crushed 52 tons for 12 oz. 10 dwt. smelted gold.

Oswald's Gold Mine Co. had another good clean-up. Battery crushed 380 tons for 175 oz. 5 dwt., and the chlorination plant treated 13 tons for 172 oz. 1 dwt. The state of the workings at the end of last week were: The 400ft. level is being stoped and risen from on leaders worth up to

5 dwt.; 400ft. intermediate, reef 5ft. to 7ft. wide being stoped, and worth up to 15 dwt. per ton; 500ft. stopes, reef 4ft. wide, worth 1 oz. per ton; 500ft. intermediate, drive south off south winze 15ft., leaders in face dipping south and showing traces of gold. 600ft. stopes, reef 7ft. wide, worth 4 to 5 dwt.; 600ft. intermediate, driven 52ft., reef narrowed right down, stopped driving, and in rising south some good quality stone has been passed through; 800ft. level and 1100ft. level both uneventful.

New Day Dawn is sinking from the surface at a point to meet a rise put up from the No. 1 level, 175ft. in, where more stone is coming in and carrying a little gold. The rise is expected to intersect a continuation of a shoot of gold in its northerly pitch from the prospecting shaft. Payable prospects are being maintained in the north drive of the prospecting shaft. The north drive in the Cricketer's reef is in 27ft., and is a lode mixture carrying slight gold.

## Bendigo and District.

(From Our Correspondent.)

Central Red, White and Blue have uncovered the top of another new centre reef in the 800ft. west crosscut. In starting a winze the quartz increased from 3ft. to 6ft. in width with the first firing. Though well mineralised, the formation failed to show gold. The east back of this reef is at the 880ft. plat and 26ft. outside the massive formation just passed through in the latter cross cut. Operations at 800ft. are evidently high in the stone, and there is a strong probability of it proving auriferous as the saddle is approached. The quartz in the winze is encompassed between two dykes and of a more favourable character than the cap of the 880ft. reef. Faulting is very prevalent at these depths, and both formations give every indication of permanency. The 880ft. cross cut should reach the west back of the 800ft. reef in a few days, when a level will be driven south on the west back of the bottom cap and the lava.

Tributers are opening up the most encouraging prospects for the Victoria Consols with the south stopes at 25ft. to 35ft. from the boundary, gold showing freely in the 660ft. reef. The first stope was opened to the boundary on 12ft. of crushing material, including the spurs in the saddle, the whole proving of profitable quality. The east leg in this stope has been left standing to 12ft. from the end of the lease, where it also is of a profitable character. The best prospects, however, are in the two upper stopes. In taking the cap stone for a width of 8ft. to 10ft. Gold is showing very freely here and the reef worth upwards of 1 oz. per ton. This portion is extending strongly southward. The east leg is intact for 100ft. from the boundary below 660ft. In the end of the intermediate level it affords a few inches to 3ft. of crushing material, including a decomposed lava. This dyke appears to have played an important part in the gold deposition, for the stone has a fair show of gold where the lava finishes out. The bulk of the stone broken in the south stopes during the past three weeks will not be milled till January, when it will be blended with the comparatively low grade neck stone in the 512ft. north stopes. In the latter direction operations are confined to stoping to 80ft. north of the new shaft for the present; but the level will be continued shortly. At 20ft. deeper a crosscut was put out east off the winze from the west leg, opening up 2ft. to 3ft. of irregular quartz along the east back at the intersection of the eastern fault. The stone shows gold, and the leg will be picked up later by crosscutting off the new shaft at 636ft. The present depth is 610ft., and sinking is in progress.

Victoria Consols contemplate starting work on the Ironbark reef from the latter company's end early in the new year. A level would be driven just below the turnover, and payable results seem assured from the outset. This portion of the formation is known for 100ft. in length in the north end of the Victoria Consols' lease, from where the south rise is now going up on the east leg. The leg is 8in. to 10in. thick in the top, and has lately shown a colour of gold. There is 13ft. of ground to penetrate from the rise to the 512ft. stope, in which the outlook is expected to further improve. Stoping was almost suspended above 512ft. for some weeks, the returns from the mill being deemed of too low average. On cleaning the copper plates last week a return of 99 oz. 10 dwt. was obtained, which puts quite a different complexion on the battery results. In view of this plate gold it is intended to again extend the range of stoping. At 250ft. in the 512ft. north level there is a rise going up in the neck, traversing 6ft. to 8ft. of quartz without revealing gold.

Hustler's Reef, in advancing the 1605ft. east crosscut in search of the Great Extended Hustler's trough reef, have uncovered a gold-bearing spur. Before reaching this spur a couple of east backs and some irregular quartz were passed through. The last back is likely to prove the continuation of that seen in Great Extended Hustler's 1326ft. workings, but the auriferous shoot worked by the latter company may not extend so far north.

# TASMANIAN MINING.

## Mount Lyell District.

(From Our Correspondent.)

Queenstown, Dec. 16.

At the North Lyell mine operations generally continue to progress with very satisfactory results, especially in regard to ore production, and in this connection it may be mentioned that the output last week reached 2750 tons, equal to 11,000 tons a month. This is exceptionally good work, and affords indisputable proof of the excellent working condition the mine is now in. Of course, this was a particularly good accomplishment in the way of an extraction, and shows what can be done when the mine is fully manned, but the interruption due to the holiday season will naturally prevent this tonnage being maintained during the next three or four weeks. As usual, ore-breaking is in active operation at the 850, 1000 and 1100ft. levels, which continues, as heretofore, to provide the bulk of the output. The extension of the north drive at the 1100ft. towards the Comstock lease is being continued along the contact of the schist or quartzite with the conglomerate, and the work is understood to be giving satisfactorily results. The ground floor of No. 41 stope at this level is still producing some very fair ore as it is beaten out on its northerly course, and apparently its limit in this direction is a considerable distance ahead. At the 1000ft. level five stopes are being regularly attacked, producing a big tonnage of average grade ore. At the 850ft. level the progress of ore-breaking continues to increase the aggregate area of the ground floor of the stopes. The principal sources of production at this level are Nos. 19, 20 and 22 stopes, all of which are yielding big tonnages of excellent ore. The last mentioned stope—No. 22—it may be remarked, is the one which has extended into the Comstock lease, where it is still going good and strong on the ground floor. In addition to ore production the customary large amount of incidental underground and surface work is in regular progress.

At the Mount Lyell mine similar satisfactory conditions to those obtaining at the North Lyell mine continue to prevail. The mine is now so well opened up underground that with the small quantity won from the open cut an output of 1000 tons a day can be maintained. This tonnage is well up to all smelting requirements, as well as to those of the company's acid works in Melbourne. Regarding the open cut, which for so many years supplied practically the whole of the material for the smelters, the ore benches have nearly all been worked back to the "batter" line, and the bottom of the huge excavation now presents a very constricted appearance. There is yet, however, something like 400,000 tons of pyrites standing above the floor of No. 5 tunnel level, which forms the limit depth of the open cut workings, and although when calculating the tonnage available for extraction from the open cut an allowance has always been made for a certain quantity of material which would have to be left, the management does not anticipate any difficulty in extracting practically the whole of the estimated 400,000 tons referred to. Any way, if they don't get it all what is left is not likely to be of any value to anybody else.

At the Reduction Works they have now had three furnaces in constant operation for the past ten weeks constituting easily the best smelting campaign since the North Lyell disaster last year. It is probable, however, that one of the furnaces will be shut down during the last week of the current four weekly period which closes on December 24, as it is necessary to have a certain amount of ore on hand in the bins on the date mentioned to provide for the shortage caused by the stoppage of work at the mines during the holidays, which will be four days at least. Under these circumstances, therefore, the copper output for the current month's run is not likely to reach that for last month, which was 602 tons, but it is pretty certain to be over 550 tons, and this will make a very satisfactory termination to the year's smelting operations.

The labour supply in all departments of the company have been fairly adequate for several months past, but there will now be a shortage until the holiday season is over. The approximate number of men at present employed—exclusive of the staff—is 1950, made up of 775 at and in connection with the Reduction Works, 1025 at the mines, and 150 on the railways; while the amount paid in wages to the 1800 employees in the Reduction Works and mining departments on Saturday last (the fortnightly pay day) totalled about £12,500. The number of employees given includes contractors, some of whom are earning big money, but the average works out at the rate of £3 10s. per employee per week, a scale which proves beyond contradiction that the Mount Lyell Company pays its employees both fair and liberal wages.

At Lyell Blocks they have pretty well reached the required dpeth at which it has been decided to open out and search for the ore body or bodies which the management believes, or hopes, exists in the locality. The shaft is down about 1220ft., and opening out will be started at about 1226ft. There is a difference of about 26ft. between the working levels of the North Lyell mine and the Blocks, so that 1226ft. in the Blocks shaft corresponds with 1200ft. in the North Lyell mine. The Blocks, therefore, by opening out at the depth of 1226ft., will start their exploratory work at a point practically 100ft. below the 1100ft. or lowest level of the North Lyell mine. It is expected to have the preliminary work of cutting the chamber completed during the next three weeks, and a fair start with driving to locate the presumed existing ore bodies should be made early in the new year.

# QUEENSLAND MINING.

## North Queensland Fields.

(From Our Correspondent.)

Mareeba, Dec. 13.

The Vulcan tin mine, which paid its 125th dividend last week, is attracting a good deal of attention, and justly so, as the mine is looking extremely well at the present time, and is likely to return to its shareholders many more dividends. Mr. Rolfe, the manager of the mine, has prepared, on an elaborate scale, cross sections and plans of the mine workings. These plans disclose many interesting features of the mine, one of the principal being that the shoot of tin invariably goes southwards. The ore body which has been worked from the surface to the 1220ft. level is practically continuous. At the 1400ft. level, black magnetic ironstone was struck in the drive about 216ft. from the shaft. This is a good indication, and the manager estimates that another 100ft. of driving will disclose a continuation of the above-mentioned ore body. The ore body at present being worked is a distinct body to the above, and really overlaps it. The new make of ore was first met with at the 600ft. level, and has been risen on for about 120ft., and tin has been left solid underfoot and overhead. From this stope dividends equal to 1s. per share have been paid, and yet this is really only development work. The further development programme for next year will consist of driving from the 1050, 1140 and 1220ft. levels for this lode. There is sufficient ore developed and in sight to enable stoping to be carried on in the upper levels for a long time to come, and there is no doubt as to the future of this mine, as in addition to the ore bodies above mentioned there are payable stopes in the other levels. The last five months' returns make interesting reading, and are as follows:—July, 21 tons 16 cwt. of concentrates, valued at £1860; August, 33 tons 9 cwt., value £2803; September, 40 tons 2 cwt., value £3588; October, 40 tons 17 cwt., value £3488; November, 50 tons 16 cwt., value £4377; and to December 8th, 48 tons 11 cwt., value £3648. The last three months' returns constitute a record since Mr. Rolfe took charge of the mine in 1909. For the three months 2963 tons of stone were treated for 140 tons 6 cwt. of tin concentrates, value £11,514 3s. 5d., the ore averaging about 4¾ per cent. The previous quarter 2153 tons of stone were treated for 100½ tons of concentrates, value £8529 18s. 5d. With the ore bodies now exposed there is every possibility of the above record being beaten next year. On the 8th December, after the payment of dividend, the company had a credit balance of £4624. The aerial tramway is nearing completion, and will be in operation soon after the Xmas holidays. The standards are all erected, the concrete work completed, the hoppers in position at both the mine and the battery, and all the heavy work finished. Progress payments have been made to the constructors, so the company has no great liability to meet on this account. Shareholders have every reason to congratulate themselves on the sound position of this mine.

There have been recent improvements in the mines owned by Messrs. John Darling and Sons at Stannary Hills. These properties once belonged to the old Stannary Hills Co. At the Eclipse mine the lode recently unearthed on the surface is opening up very well indeed. A tunnel has been driven a distance of 100ft. on the lode, which averages 5ft. in width. Nearly 70 tons of ore from this development work have been treated at the mill, and have given a return worth 3 per cent. The mangaer is now baling out the old vertical shaft, which has not been touched for the past seven or eight years. This shaft is down 150ft., and in the past a drive was put in from the 100ft. level a distance of 70ft. in the direction of this new make of ore. The manager estimates that another 80ft. of driving will connect with the lode, that is, if the lode goes down. From present appearances the lode is a very strong one, and there is no doubt but that the drive above mentioned will meet the ore body. The manager expects to have this work completed about February.

Good ore is being mined in the Extended. This ore, which is worth about 3 per cent., was first struck in the stope at about the 150ft. level. This work has resulted in about 100 tons of ore being sent per week to the Rocky Bluff's battery, which is working one shift at present owing to the scarcity of water. Thunderstorms have made their appearance now, and this difficulty may be overcome shortly.

The Lass O'Gowrie ore is being carted to the Loudon Mill, Irvinebank. On Monday last 40 tons were at the battery, and Mr. Campbell expects to have a further 70 tons here this week. This crushing will give the shareholders a substantial Xmas dividend.

The Vulcan Hope mine is situated on the Vulcan Hill, above the Irvinebank Hospital, in a northerly direction from the town. The mine was worked last some seven years ago, when an underlay shaft was sunk and connected with a tunnel driven into the hill. The present prospectors, Messrs. C. E. Ortt and C. Arbouin, cleaned out an old straight shaft which was previously sunk to a depth of 50ft. After continuing the sink a further 10ft. a vugh was met, and this vugh is situated in tin-bearing material. The lode is about 2ft. wide of (estimated) 10 per cent. ore, and is dipping in a westerly direction towards the Vulcan mine. The lode certainly looks very promising, and it is going down strong. The owners have about 10 tons of ore at grass towards a trial crushing.

Mr. Lionel C. Ball, Assistant Government Geologist, who has just completed a survey of the above field, returned south last week. He had a splendid trip, assisted in every way by the mining men of the Etheridge. He was piloted by Mr. Horsburgh to Percyville, where they picked up Mr.. Colley, the Chillagoe Company's local manager, and with him went on through Mt. Hogan and Gilberton to the 8 and 12-mile mines at the Gilbert and Ortona on the Percy River. At the 8-mile they saw some fine large outcrops of a tempting character, the testing of which will require a large outlay. At Ortona, Mr. Linedale has been doing some fine development work on a number of lodes. The Ortona (Percy) and Gilbert mines are separated by a sandstone range, but really belong to one large belt of schist country, intruded by diorites, with which the copper ore deposits are closely associated. At Forsayth, Mr. Ball was taken in hand by Mr. de Latour, manager Etheridge mines, and during a short stay at Georgetown Warden Curtis took him out to the mines in the vicinity, and as a consequence of his visit to these centres he is convinced that the low-grade complex sulphide formations of the Etheridge will, in the future, be a source of great wealth. On his way back he spent a week at Einasleigh, under the guidance of Mr. Smith, the manager Einasleigh copper mines, with whom and Mr. Horsburgh he had a most interesting time working out the genesis of the large low-grade deposits now being opened up by the Chillagoe Company.

## WESTERN AUSTRALIAN MINING.

(From Our Correspondent.)

Kalgoorlie, Dec. 12.

The south drive on the west branch of No. 3 lode at No. 16 level of Chaffers' has passed out of ore at a distance of 40ft. from Hannan's Star boundary. The ore shoot is 181ft. long, and averages 109s. 9d. per ton over a width of 60in. The ore shoot in No. 4 lode at the same level is 326ft. long, and assays 29s. per ton for a width of 77in. The west crosscuts at No. 4, 15 and 17 levels are still in country. The crosscut at No. 15 level is out 436ft., or 9ft. further than the point at which the west branch of No. 3 lode was cut at No. 16 level. The outlook does not appear promising, as the Horseshoe's Nos. 2, 3 and 4 lodes all appear to be unpayable in Chaffers'.

Mr. Frank Boyd, who secured the Edna May for Melbourne, has taken an option on the Luck at Last at Kanowna for the same investors, and it is said that a company with a nominal capital of £30,000 in 10s. shares will shortly be formed to work the property, which is situated at the head of the once famous Fitzroy lead. This is traversed by a big porphyry dyke, from which 500 tons have been treated for a return of 23 dwt. per ton. The property has been favourably reported on by Dr. Malcolm MacLaren. Mr. I. S. Hartrick, the first manager of the Edna May, is to report on the property, and, if satisfied, will take the management. There is a shaft on the mine 130ft. deep, and the rock is so hard that it is only possible for machine work to make the mine a payable proposition.

Messrs. Bewick, Moreing and Co. have abandoned the option they took on the Great Victoria mine on behalf of the Mountain Queen Co. The price asked—£100,000—is stated to have been the stumbling block to the deal. The lode on the property is 120ft. wide, and has been tested at three levels, and the stone treated has averaged 12s. per ton by amalgamation, with 15s. per ton in the residues. There is a 10-head mill on the mine, but, owing to scarcity of water, it only runs at intervals. The adjoining Bronco-Horseshoe mine is under option to Melbourne investors.

During November the Corinthian North's output was £5186 from 2877 tons, an average of 36s. per ton. No costs are given, but it is rumoured that they are less than 10s. per ton. The ore is being broken in a big open cut, so that the cost of mining is very low. When in full swing the plant is expected to treat 5000 to 6000 tons a month. Since the mill started 17,957 tons have been treated for a return of £14,813, and there are 15,000 tons of accumulated residues on the mine containing £13,250. At the time of the company's flotation by Mr. Richard Hamilton, manager of the Great Boulder, estimated the ore reserves at 108,000 tons, worth 23s. 2d. per ton recoverable value, and the costs at 15s. per ton. This estimate was fully borne out by Mr. R. B. Nicolson, manager of the Ivanhoe, and the late Mr. F. W. Morgan, of the Bullfinch.

Diamond drill boring on Fraser's mine at Southern Cross is still proceeding under Government supervision. Four bore-holes have been completed, and a fifth has been started, which is expected to cut the lode between 400 and 500ft. The various bore-holes have cut lodes, in places carrying visible gold, but no details have so far been published. To the end of September Government had spent £6000 odd, so are deeply interested in the final success of the venture. The Fraser's group of mines includes 180 acres, on which the deepest shaft is only down 375ft., and the deepest level 366ft. Out of the shallow workings £730,000 have been recovered from 334,000 tons, so that there appear to be great possibilities if capital is invested in the proposition.

## MINING IN SOUTH AUSTRALIA.

(From Our Correspondent.)

Adelaide, Dec. 20.

The revenue of the Deloraine gold mines (South Australia) for the half-year ending October 31st was £2739, inclusive of £35 surplus unrealised on concentrates on April 30th last. Mine expenses (£2118) and office charges, etc. (£240) deducted, left a net profit of £381. Generally speaking, the result of the six months' developmental work was of a satisfactory nature. The reef at the bottom level has been proved for a length of 140ft., with the face still in ore. The battery, which worked full time, crushed 959 tons, the bullion extracted being worth £1893, and the concentrates £946. The total value of production from this mine has been £9147. The Government Geologist (Mr. L. Keith Ward), acting under instructions from the Minister of Mines, recently inspected the property, reporting that the lode matter as far it has been exposed is of payable grade. The average width, however, is small, and the total amount of ore blocked out is consequently not large enough to justify the erection of a large battery. The Government Geologist considers that the present rate of mining might be increased, and also advises the preparation of accurate survey of the existing workings.

## ANSWER TO CORRESPONDENT.

**P. L. Sim (N.Z.).**—The chief commercial use to which molybdenum is put is in steel making in electric furnaces, the steel so produced being used in making high-speed machine tools; the tools used for boring British navy guns contain a large percentage of molybdenum. The result of the addition of a small proportion of metallic molybdenum to steel is very similar to that obtained by the use of tungsten, but the former metal being far more potent than tungsten only about half as much of it is required to produce the same effect. Molybdenum steel is also used for rifle barrels, propeller shafts, guns and wire; it contains from 8 to 10 per cent. of molybdenum, and besides being of great hardness, it retains its temper when heated to a high degree, enabling extremely heavy cuts to be taken at high speed, so that the tool is frequently heated to a dull red heat, without impairing its usefulness. Lesser uses for the metal, and until a few years ago the only uses, are in the manufacture of ammonium molybdate, used in determining phosphoric acid, for fire-proofing and as a disinfectant for cloth used in railway carriages; molybdic acid is used as a blue pigment for porcelain and for dyeing silks and woollens, and various molybdenum compounds are used for dyeing leather and rubber. The metal is found in various forms in many countries, including the United States, but in that country no deposits have been worked on a commercial basis for some years. Statistics of the world's output are not available, but a large proportion of it is supplied by New South Wales and Queensland, and in 1912 the former exported 56.55 tons, valued at £3706, while the latter produced 102 tons 6 cwt., valued at £17,349. Ore from 50 per cent. to 90 per cent. fine will find a good market, but the price fluctuates; speaking generally, 60 per cent. molybdenite is now worth £343 per ton, and molybdenum about £600 per ton. London quotations for molybdenite are given each week in our "Metal Quotations."

## MINERAL RETURNS.

The usual return furnished by the New South Wales Under Secretary for Mines shows that the gold yield recorded for the State for the month of November is 15,879 oz. crude, equal to 12,677 oz. fine, valued at £53,849, as compared with 16,880 oz. crude, equal to 12,377 oz. fine, valued at £52,575, for the same month in 1912. The yield for the first eleven months of this year amounts to 168,544 oz. crude, equal to 136,023 oz. fine, valued at £577,789, as compared with 182,448 oz. crude, equal to 149,743 oz. fine, valued at £636,070, for the same period in 1912, showing a decrease of 13,720 oz. fine and £58,281 in value.

The Victorian yield of gold for November was 38,545 oz. gross, or 36,349 oz. fine, valued at £154,400. Compared with the yield for November of last year, a decrease of 4459 oz. fine has occurred. The yield for the last 11 months was 423,919 oz. gross, or 394,617 oz. fine, valued at £1,676,225. This shows a decrease of 33,082 oz. fine, compared with the quantity won during the corresponding period of last year.

The West Australian output of gold for November amounted to 117,911 fine oz., the value being £500,856, as compared with 111,508 fine oz., valued at £473,658 for October, and with 107,219 fine oz., valued at £455,439, for November, 1912. The export values of other minerals from the State for October (the figures for October last year being added in parentheses) was as follows:—Copper, £1761 (£12,706); tin, £6710 (£6725); silver, £4917 (£6160); silver-lead ore, £4532 (£3520); other minerals, £3161 (£1603), including bunker coal, £2776 (£1600); total, £21,081 (£30,714).

Queensland's production of gold for November amounted to 20,894 fine oz., valued at £88,752. as compared with 28,675 fine oz., valued at £121,803, for the same month last year, the decrease being 7781 oz., of the value of £33,051. The output for 11 months was 240,947 fine oz., valued at £1,023,477, as against 319,356 fine oz., valued at £1,356,537, for the corresponding period in 1912, showing a decline of 78,409 oz., of the value of £333,060. Dividends paid for the 11 months of this year amounted to £201,133, against £211,293 last year.

The gold exported from New Zealand during November amounted to 4195 oz. gross, or 3478½ oz. fine, of the value of £14,776, as compared with 27,275 oz. gross, or 24,874 oz. fine, valued at £105,659, for the same month yast year. This deplorable drop is undoubtedly attributable to the recent strike. The total gold exports for the 11 months have amounted to 318,914 oz. gross, or 292,173 oz. fine, valued at £1,241,071, compared with 326,980 oz. gross, or 301,585 oz. fine, valued at £1,281,051, for the same period last year. The export of silver for November amounted to 7291 oz., of the value of £802, as compared with 29,015 oz., worth £3341, in November, 1912, while that for the 11 months was 842,350 oz., valued at £89,791, against 779,840 oz., valued at £82,283, for the corresponding period last year.

The Under Secretary for Mines for New South Wales has furnished a return showing the quantity and value of silver, silver-lead, zinc concentrates, copper, tin and coal exported from that State during the first nine months of this year, as follows:—Silver, ingots and matte, 1,340,844 oz., £146,135; silver-lead, concentrates, etc., 291,011 tons, £2,631,929; lead (in matte), 9409 tons, £140,785; zinc concentrates, 343,592 tons, £1,041,910; copper, ingots, ore, etc., 16,070 tons, £1,084,529; tin, ingots, ore, etc., 2501 tons, £369,377; coal to Australasian and other ports, 4,494,943 tons, £2,422,501. Total value, £7,837,166. These figures indicate a net increase for the nine months of £106,612, when compared with those for the corresponding period last year. The silver-lead products show a comparative increase of £283,164 in value, due to the larger output of silver-lead, concentrates, etc. The value of zinc concentrates shows a decrease of £110,999. The exports of copper, obtained largely from matte, etc., imported from other States, exhibit a decrease of £248,466 in value. The quantity of tin (ingots, ore and concentrates) exported discloses an increase of 715 tons and £72,240 in value. The coal exports during the nine months show an increase of £153,760 in value.

# NEW SOUTH WALES MINING.

## Broken Hill.

(From Our Correspondent.)

Broken Hill, Dec. 17.

The conflict between the Water Supply Co. and the mines over the water service to the mines continues. The Water Supply Co., in obedience to the agitation of the people and the press, rightly decided that the householders should have first call on the supply. The terrible heat and want of rain had made the public more than ever dependent on the Stephen's Creek service (most of the rainwater tanks had been emptied), so from time to time the supply to mines has had to be cut off while the city mains and service reservoir have been filled. This, all agree, has been a great inconvenience to the mines, which, owing to no rain, had no reserves to fall back on; but though without the mines here would be no Broken Hill, without the people there would be no mines. The position, admittedly, is a serious one, but the Water Company seems to be doing all it can, and some of the mines seem to be harassing the company as much as they can.

As I write light rain is falling, and if this should develop into a good fall the situation will be saved.

The Junction is the only mine to absolutely close down. Well, the water trouble is as good an excuse as any.

The South particularly complains about its water shortage and a lively argument has started between the mine management and the Water Co. The latter, as it happens, has figures to prove its case.

During all the water turmoil developmental work has been on the minor scale. Still the North and the South have both proved considerably more ore than they were sure they had a week or so ago. The British, too, is shaping O.K., notwithstanding the rhodonitic intrusion on the No. 11 level; the new plant is moving very nicely, but is not yet in full work.

## Bathurst District.

(From Our Correspondent.)

Bathurst, Dec. 17th.

The Big Oakey mine at Wattle Flat is looking exceptionally well at the present time, and very rich ore is being broken. This mine for years past has turned out steady yields of gold, returning handsome profits to the owners. Unfortunately no proper scheme of mining was ever laid down, the gold being followed wherever it went, and at the present time it resembles a big rabbit warren. The expense of raising ore must be very heavy, allowing for the many times the ore is handled before it reaches the mill. Tempting offers have been made from time to time without acceptance, and it is understood another nibble is on the board now, and may possibly lead to business. Local people are anxious for it to go through and see a mine made of it that will employ a lot of hands and benefit the district.

The first crushing from Graham's reef in the Rowley's reef property has given 7 oz. from 9 tons. The vein is widening out as it is sunk on, and the gold is showing more in the solid stone. A short distance north is an old-timer shaft, and from this a crosscut would intersect the reef at a fair depth.

The northern drive at Hawkins' Hill Reward mine, now approaching the Robert Emmett crosscourse, is being watched with keen interest by Hill Enders. All the heavy gold on Hawkins' Hill is got at the intersection of an indicator or crosscourse coming in at right angles to the reef, and old hands are asking what is likely to happen, when the Frenchman's reef, the biggest reef on the field, encounters the Emmett crosscourse, the biggest crosscourse on the field? Time will tell, but Marshall Bros. unhesitatingly affirm that the heaviest gold ever got there will be the outcome of the contact.

Considerable doubt exists as to the permanency of McKellar's reef, near Trunkey. The top stone is good enough, but the failure of the owners to keep their shaft going down looks suspicious, seeing that the deepest is only sunk a shade over 20ft. Prospecting on the adjoining block north of the prospectors shows nothing of value, so far as it has gone. Trunkey district was ever a patchy one, and it rather looks as if it is going to keep up its unenviable reputation.

## Lithgow and District.

(From Our Correspondent.)

Lithgow, Dec. 19.

Mining operations continue to move along satisfactorily on the Yerranderie silver fields. Work is in full swing at the Bore Block mine, and the same may be said of the position at Bartlett's mine. As a result of this, the concentrate mills at both mines are working two shifts during the 24 hours.

The Lithgow manager of Great Cobar Works states that owing to the water supply giving out the Chesney copper mine—one of the Great Cobar group—has closed down. About 350 men are in consequence thrown out of employment.

Mr. A. L. Cadogan and party are now engaged in actively working their recently-acquired gold-bearing areas at Sofala. The party intend to push forward with development work, in view of the encouraging prospects obtained at several points on the property. Having both capital and experience at its command, the syndicate should be able to give a good account of its operations in two or three months. At Kempfield, Messrs. F. Davis and Co. have just been able to tack on an additional 25 acres to their promising gold-bearing leases; while Mr. R. Cowlishaw, of Yerranderie, has arranged for 80 of gold-bearing country at The Peaks and Colong. Mr. A. Cunoe, backed by a strong syndicate, is about to make inroads on a new 60-acre silver proposition at The Peaks.

The quantity of ore brought to the surface at the Lloyd copper mine, Burraga, during the last fortnight was 1454 tons. The mills ran 264 hours, during which period 1466 tons of ore were treated, producing 289 tons of concentrates of an average value of 13¾ per cent. The furnaces dealt with 248 tons of concentrates, and produced 46 tons of matte, assaying 59.74 per cent. copper, 8.82 dwt. gold, and 15.42 oz. of silver. The fire which recently occurred at the works delayed work at the furnace for some days. The damage totalled about £2000, but with the exception of a few hundred pounds, the loss was covered by insurance, claim for which has been paid. Two tube mills for the re-grinding of the jig-tailings are on the mine, and will be installed during the close down for the Christmas holidays. With these mills at work there will be a considerable improvement in the recovery of the concentrating mills, since all tailings and slime will be treated by the mineral separation plant.

# NEW ZEALAND MINING.

In the four weeks ended on November 15 the Waihi Paeroa Gold Extraction Co. treated 10,200 tons of tailings for a return of £3050. A flood and a slight accident to the river plant account for the reduced tonnage for the month. The company has now treated 219,700 tons of tailings for a total return of £71,761, and has paid £12,500 in dividends.

A recent inspection of the low level workings of the Waihi Grand Junction mine in company with the manager (Mr. W. McConachie) showed that the mine continues to open up most satisfactorily, both as regards widths and values of the known lodes, and also disclosed the existence of two new makes of ore. In the drive east on the Royal reef a cross lode has been intersected at 780ft. east of the main south crosscut, and has been driven upon for about 60ft. The lode averages 4ft. in width, and is of milling grade. A crosscut is being projected north-west from the Royal drive to connect with the Empire reef at No. 18 rise, and a new body of quartz of payable quality is showing in the face with only one wall exposed. A crosscut west through the Royal lode at 570ft. exposed 26ft. of quartz worth £1 12s. 6d. per ton, and a second crosscut at 630ft. proved the lode to be 34ft., with the average value of the ore £1 18s. 3d. per ton. Promising developments were also noted in the workings on the Empire reef, the width at the bottom of the main shaft, now 80ft. below the No. 6 level, being 9ft., the whole of the stone broken out going to the mill. It is confidently stated that, as the pumps are now lifting 450 gallons of water per minute, it will not be long before sinking the shaft for No. 7 level can be resumed. There are 400,000 shares in the company, consequently the payment of the third dividend, 1/- per share, late last month meant an absorption of £20,000, and brought the total dividends paid to date to £60,000. There are at present 1136 shareholders on the colonial register of the company, holding 175,886 shares, and they will receive £8794.

The management of the Ross Goldfields Ltd. are satisfied that results recently obtained show that they are now on the old Cassius workings.

During October the New Zealand Crown Mines Company crushed and treated 1312 tons of ore for a total return of £2067, including £31 for concentrates. The total working cost (exclusive of development but including gold tax) was £2269, equal to 34.57s. per ton; milling, 10.06s. per ton; miscellaneous mine development, £339, equal to 5.17s. per ton. The total amount of bullion won from the mine to date is £867,452.

The recent Arbitration Court decision in the Reefton Goldfields dispute was for the most part based on the old award. A memorandum to the new award states that both parties desired various alterations in the clause relating to working hammer drills, and it has been redrawn. It is hoped to enable work to be carried on without further friction. The clause as to contracting has also been redrawn, and made declaratory merely of the company's right to agree to have any work done by contractors outside the award, and there is no jurisdiction to restrict or interfere with that right. Overtime and quarter double time have been fixed for any work done on Sunday after a full shift has been worked. A new clause has been framed, dealing with the subject of matters not provided for in the award. The wages of workers affected by the award have been carefully considered. An increase has been granted in most cases, and no distinction been made between wages to be paid by the New Big River company and other companies, although the conditions of life on the Big River field might have justified a difference being made. The Court is of opinion that the Big River company should do something to ameliorate the lot of the workers on that field by providing suitable houses for them to live in, and by arranging for prompt medical assistance when required.

# THE DAYLESFORD FIELD (V.)

The following is a precis of a report by Mr. H. S. Whitelaw, geological surveyor in the Victorian Mines Department, on the Lord Roberts and the North Lord Roberts mines, near Daylesford:—

Lord Roberts Mine.—The reef worked by Stevens, some 35 years ago, and later by Naples, was cut by the present company 100ft. east from the shaft at the No. 1 (107ft.) crosscut. This shoot is less than 20ft. in height, and pitches about 1 in 4 to the south. A crosscut has been put out west from No. 2 level (161ft.) to intersect a west dipping leader cut in the shaft above the No. 1 plat, but it has not been seen, although the crosscut is out beyond the point of its anticipated intersection. What is said to be the Lord Roberts' lode-track is at 80ft. from the shaft in the eastern crosscut from No. 2 level, but as the footwall rock is here different in character to that exposed in the crosscut above, Mr. Whitelaw is in doubt on the point, and to settle it advises an extension of the lower crosscut into centre country. The cap of an auriferous saddle reef, outcropping 800ft. to the north of the shaft, may be found a few feet below the depth of the present bottom level. The supposition that the Lord Roberts' reef is the west leg of this saddle is improbable. Although the former is also a bedded reef, it is associated with a dyke with which it and the accompanying spurs are probably genetically connected; consequently it may extend to any depth, while it seems probable that the leg of the saddle will become attenuated and thin out before it reaches the syncline. Pending the erection of more powerful machinery for deeper sinking, Mr. Whitelaw recommends the extension of No. 1 south level far enough to command the system of promising spurs or "flat makes" between Frenchman's and Old Dick's gullies, the driving of No. 2 level south on the Lord Roberts' reef to the continuation of the shoot of gold which pitched underfoot at the No. 1 south level, and a rise on the west leg in No. 1 crosscut. Experience tends to show that a shaft near the crown of the fold—that point on the anticline from which the beds fall away in every direction—is the best position for a main shaft. Indications point to the anticline being the main reef channel, and the expediency is suggested of making a main shaft of the prospecting shaft, now down about 37ft. near the crown of the fold.

North Lord Roberts Mine.—The main shaft of the North Lord Roberts is about 35 chains north of the Lord Roberts Co., and about 100ft. west of an anticline probably identical with that proved in the latter company's workings. Bell's reef, by which name the lode is known, was remarkably rich when first opened up, but it does not appear to have been worked below 40ft. Mr. Whitelaw considers that the present shaft is in a good position for testing Bell's reef (possibly a west leg) or any payable formation that may be discovered in the anticline. That payable reefs occur here is probable, considering that the reef channel is on the southward continuation of the Eganstown auriferous belt, where stratigraphically lower levels were highly productive. To the east there are several parallel deposits of quartz, some of which have been worked with good results to water level. From their persistency and regularity they should allow of systematic and continuous deeper mining. Operations in the North Lord Roberts mine have been suspended pending the erection of machinery.

''The Conduct of Gases through Electricity'' was the title of a thesis by Mr. F. W. Wheatley, late headmaster of the Rockhampton (Q.) Grammar School, for which the University of Oxford has awarded him the degree of Bachelor of Science. Mr. Wheatley returns to Australia next month.

## HODGKINSON GOLDFIELDS (Q.)

(From Our Mareeba Correspondent.)

In view of the great interest at present being taken in the Hodgkinson Goldfield, owing to the success which has attended the efforts of the Tyrconnel and New Minnie Moxham Cos., some information concerning other mines on the field will be acceptable to readers of the "Mining Standard." The Hodgkinson Goldfield consists of a long, narrow strip of country, two miles wide, running from Cattle Creek in a westerly direction for about 50 miles. A great number of claims in this belt were worked in the past, and the quantity of gold produced warrants the belief that they are worthy of further attention.

Starting from Cattle Creek, the first claim is the "Belfast," which paid the original owners very well, notwitstanding heavy freights, crushing charges and the primitive methods in vogue. Next there is the "Gladstone," and then nearer to New Northcote "The Disraeli," a mine worthy of attention. A little further on, in a north westerly direction, three-quarters of a mile distant from the Disraeli, is the "Possibility," which gave very good returns, but unfortunately heavy water beat the owners.

To the right of this mine, and in an easterly direction, is the "New Minnie Moxham," which gave such splendid returns to the Moxham family, and which in the hands of the present company promises to give even better results in the future. In the vicinity of New Northcote are several reefs which do not run in the exact course of the main reefs, but some of which gave very good returns, and not one of which has been sunk to any depth. About 1¾ miles in a north westerly direction is "the gap," and on the right hand side of this gap stands a very high ridge, estimated to be about 500ft. high, and along the top of which runs a very large reef called the "Northcote." A Mareeba syndicate has taken up a 20-acre lease on this line of reef, and as the side of this ridge next to the watercourse is very steep, it is proposed to pierce the large ore body by means of a tunnel. A little further on this line of reef is situated "The Just-in-Time" mine, a lease of 12 acres, which includes three lines of reefs, namely, the "Just-in-Time," "The Monkland," and the "Same-as-usual." In the vicinity of this one-time very rich mine, there are 20 or more lines of reef within an area of five or six miles. Travelling along the road leading to Kingsborough, and to the right of which, and situated on a very high pinnacle, stands the "Mountaineer," a reef very much mineralised and carrying high silver values. The ore is difficult to treat on account of its refractory nature. The ore body is so big that it seems strange that some enterprising syndicate has not tried to overcome the difficulty.

A little further on is the celebrated "Monarch" mine, which, under Mr. Bull's management and ownership, gave very good returns in the early days. It then passed into the hands of a company. The majority of the directors had little or no knowledge of practical mining, and were too confident of the value of the mine, and instead of sinking in the deeper ground to a depth of, say, 600 or 700ft., and putting in levels as circumstances warranted, they spent their capital in storing a large quantity of firewood for a battery, and an expensive dam was constructed. The work was placed in the hands of incompetent men, and the dam was greatly damaged by the first heavy rainfall, necessitating extensive repairs. Next a battery was purchased, but its erection was faulty, and it had to be pulled down and reerected. The capital of the company was then nearly exhausted, and a start was made crushing stone from the old faces. (An attempt was made to sink one of the shafts a further distance of 40 or 50ft., and this was practically all the development work done). The crushings did not yield sufficient gold to pay expenses, and the shareholders were called upon, the company reconstructing. Again operations failed, and again the shareholders came to the rescue. There was a change of management, but no better results were obtained. Ultimately the mine was abandoned, and the crushing plant was purchased by the Oaks Rush G.M. Co., and removed by Mr. T. A. Waters, of Oaks Rush fame, to Kidston. Were this property taken up again and tested in a practical manner it would yield good results. There are several other reefs or leaders which run along in the direction of Kingsborough, but a break in the continuity of the main line of reefs occurs at about the crossing of the Hodgkinson River, though gold-bearing quartz can be found in the direction of the Tyrconnel, about two miles ahead. The next claim of any importance is the "Star of the South," which paid handsomely, although not equal to some of the others mentioned. Crossing the head of the Tyrconnel Creek and there occurs a group of reefs too numerous to enumerate, but amongst them is the "Resolute," which only a few years past gave returns of 19 oz. of gold per ton. A little further on is the 30-acre lease latterly taken up by a Melbourne syndicate. This lease includes the following reefs:—"The Hero," "Lizzie Redmond," "Columbia," "Contest" and "Commodore." The "Hero" and the "Lizzie Redmond" paid handsomely, but were not sunk to any depth. These reefs run parallel to one another.

The "Tyrconnel" (of which little may be said here, as the reports recently published speak for themselves) may be seen from here, and this lease includes the "Henry Grattan," which one time celebrated mine crushed as high as 14 oz. to the ton, the lowest crushing going 7 oz. for the original owners. (The "Tyrconnel" mine produced one ton of gold before Mr. Keating became the owner). A break seems to occur again here, and the next reefs on the line are "Rob Roy" and "Great Britain." This latter gave returns up to 6 oz. to the ton on the surface. As the reef went down the walls opened out, and the reef became so jumbled up that the shoot of gold was lost and has not been again located, although several attempts have been made by parties of hardworking miners. The road from Kingsborough to Thornborough divides this Great Britain Hill from a high ridge, on which the town of Kingsborough stands, and on the side of which there are several one-time good mines, notably the "General Grant," the "Caledonian," the "Homeward Bound," the "North Australian" and the "Blackball." Over the cap of this high ridge, and on the westerly slope, is situated the "Mark Twain." This is a mine of which too much cannot be said. It paid consistently in old times, and very fair gold was left in the bottom. The mine has been idle for a number of years, but has recently been taken up by Mr. F. Gielis, of Thornborough, and it can be confidently recommended to mining investors. Close to this reef is the Lady Mary, owned originally by Dillon and Minogue, who got splendid returns. On the western slope of the Hill there are several other good reefs. Closer to Thornborough stands the celebrated Pig Hill, on which there are several good lines of reefs, amongst them are the "Hope," "Tichborne," "Kingsborough" or "Flying Pig," and one or two others. The "Pig" gave sensational returns, but the owners engaged in litigation, and the lawyers got a very fair share of the gold produced. Getting down towards Woodville one encounters the one-time good producer, "The Home Rule," which latterly, however, has been worked with not the best of results, although the owners were hard grafters. Around this locality there are other reefs, the principal being the "Dagworth," which has given good results, but the shoot of gold has been lost. The next great claim is the "Union," but without the list of crushings it is not possible to say how many thousands of ounces of gold were taken from this very rich mine. The gold was worth from £3 18s. to £4 per oz., and the late Mr. J. Crowley, father of Mr. W. P. Crowley, chairman Woothakata Shire Council, netted several thousand from it. Sufficient has been said to give practical men an idea of the great possibilities of the Hodgkinson Goldfield. No systematic attempt has been made to test the reefs in the deeper ground. but judging by the present mining activity, there is every reason to hope that the long neglected Hodgkinson field is at last coming into its own.

---

## COMMONWEALTH OIL CORPORATION.

### Further Application For Suspension.

(From Our Correspondent.)

Lithgow (N.S.W.), Dec. 19.

A further application for the total suspension of labour conditions on their mineral leases in and around Newnes was made by the Commonwealth Oil Corporation to Mr. A. B. C. Burke, Mining Warden, at Lithgow Courthouse, on the 12th inst. Mr. Pilcher appeared for Messrs. Minter, Simpson and Co., attorneys for the corporation, and there were no objectors.

The Warden reminded Mr. Pilcher that the application must stand on its merits, as, although he had cognisance of the difficulties of the corporation, yet he could not take that into consideration. Mr. Pilcher agreed, but said that under the Act they were entitled to a holiday from December 20th to January 7th, which must be considered when the suspension was granted. The present suspension expired on December 5th.

Mr. Martin Zobel, estate agent for the corporation, said that 15 persons had been employed in and about the leases, including the railway to the main western line, during the suspension. There were about 55 adults at Newnes township at the present time, and the same number of children.

Mr. Henry C. Colman, acting manager for the corporation in Sydney, gave a summary of the operations of the corporation and the suspensions granted up to the present time. Wages paid during the last suspension amounted to £643 5s. 9d. The entire expenditure at Newnes during the last five years was £1,450,779. The area of the leases now held was 10,968 acres. The present conditions were that 120 men had to be employed on the leases.

Mr. David Fell, receiver for the corporation in Australia, deposed that at the last application he stated that £60,000 was the approximate guarantee to be underwritten in connection with the scheme. He regretted to say that up to the present no progress had been made with that scheme. The tightness of the money market and the fact that investors could now get a high rate of interest with good security, also that the oil industry had proved somewhat disastrous in Australia, had had a lot to do with this. He had very grave doubts himself as to whether the scheme would go through, but there were factors which would be likely to assist the scheme in other directions—probably modified. One of the most progressive and practical men in the oil industry had been in England at his (Mr. Fell's) request, and certain proposals would be made to amalgamate interests, which, if brought about, would certainly improve the position of the corporation. Nothing had, however, been definitely settled. The gentleman to whom he referred would be in Australia in January next. He was a scientist and the patentee of retorts which, it was thought, would be able to deal more effectively with the high-grade shale obtained in the Wolgan Valley. He would make a test at the Valley when he returned, and this would only require about a couple of months. He wished to impress upon his Worship that something was being done which might assist the scheme to ultimate success. The Inter-State Commission had inspected the works, and if they made a pronouncement to assist the industry it would indeed be of great assistance, while the progress of the British-Australian Company would also be watched with interest. The re-construction scheme was under the jurisdiction of the Court at home, and unless some progress was made, the Court would not allow the corporation to continue. In the meantime they were holding their own; that was to say, they were not using English capital. As a matter of fact, they had exhausted this. He could not say positively that the scheme would be carried through; in fact, he did not think it would be. But, if the new retorts were put in, and the gentleman mentioned co-operated, it would mean that the C.O.C. would be saved. The whole prospects of being able to continue depended, in his opinion, on the effectiveness of the proposed new retorts. He thought there was hope of co-operation. If the present reconstruction scheme was not carried through, it would only be wasting the money of the debenture holders to proceed with another.

The Warden: And the time of the Court? It appears to me that we should be enlightened on the point. We do not know what the people in London are doing. If this scheme is not carried through, and another is proceeded with, then I am afraid it will be past my endurance.

Mr. Fell: If this scheme is not carried through, then the debenture holders will be compelled to assist in some arrangement to get out of their difficulties. No further application will be made to the Court in England—at least, as far as I know.

The Warden said that though he had tried to show consideration to the C.O.C., which had spent an enormous amount of money on the leases, yet it might be necessary to give someone else a chance to see what they could do. These suspensions could not go on for ever, and he understood there were some people who thought they would work the leases successfully, and it might be advisable to give them an opportunity. He was not there to help one particular private industry, but mining as a whole, and it was not in the best interests of mining that these leases should not be worked.

Mr. Fell said he would be proceeding to England in March next, after he had interviewed the gentleman mentioned before. He would then submit a scheme which must either be accepted or rejected, in which latter case the end would be reached. In February he would be able to give a tentative proposal, but after he arrived in England he could submit a definite scheme, provided it was accepted, of course. In his opinion, they were nearer a practical solution now than they had been for some time.

The Warden said the information he had been given was very vague indeed, and he thought something of a more definite character should have been placed before him. If the English people had been as frank with him as Mr. Fell had, that information would have been forthcoming. If they desired the consideration of the Court, definite information must be placed before him. He would not grope in the dark any longer, and if at the end of the suspension there were not reasonable indications that the corporation would ever be able to work the leases he would have to consider the advisability of allowing someone else to come in. He could not keep on granting adjournments for ever. He would take into consideration the holiday from December the 20th to January the 7th, and grant a suspension for two months, to terminate on February 10th.

# ENGINEERING AND ELECTRICAL SECTION

Australian
General Electric Co.
217 Clarence Street, Sydney.
Tel.—Central, 3495, 4397; City, 2381
"Penfold House," Cr. Queen and Little Collins Sts., Melbourne.
Tel.—Central, 2647.
Representing—
GENERAL ELECTRIC CO., U.S.A.
The
BRITISH THOMSON-HOUSTON CO. LTD., of Rugby, England.
The GUARANTEE of EXCELLENCE on GOODS ELECTRICAL

## POSTMASTER-GENERAL'S REPORT.

The annual report of the Postmaster-General's department was laid on the table of the House of Representatives on the 10th inst. Mr. Wynne says:—"The expenditure shows a material increase as compared with the previous year, due principally to new works, the creation of new positions, and increases in salaries to officers, the increased scale of allowances to non-official postmasters, additional mail services, and the higher prices paid for the conveyance of mails generally. Approval has been given to the establishment of classes of instruction for junior mechanics, in order that a six months' trial of the system may be made. The proposal is that such classes be established in each of the States, instructors being selected from the most competent officers of the department. The classes are to be open to both permanent and temporary officers, and no fee is to be charged for the instruction given. Classes have already been established in Melbourne and Adelaide." Mr. Wynne also states that, with a view to obtaining more adequate supplies of officers for mechanical work, he is endeavouring to arrange for a comprehensive system by which officers of the department may be trained for the specialised branches.

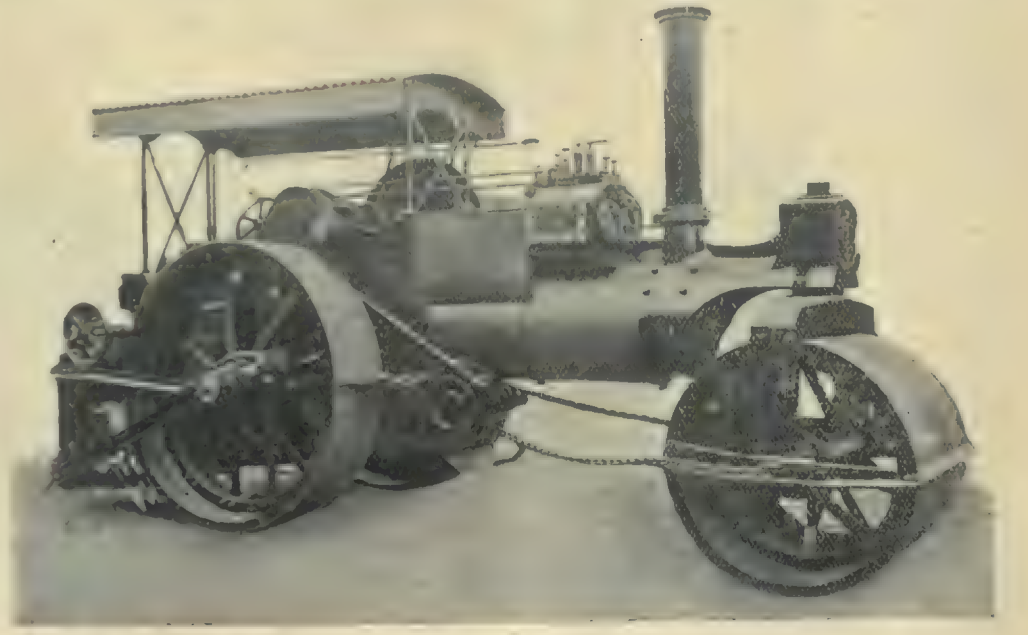
The total length of conduits for telephone and telegraph wires throughout the Commonwealth is given as 1072.41 duct miles at the end of 1912, as against 781.48 duct miles at the end of 1911. The total length of wire in use for telegraph purposes in December, 1912, was 101,218 miles, as compared with 97,053 miles on December, 1911. The number of telephone instruments connected in the Commonwealth in December, 1912, was 116,479, as compared with 102,654 in 1911, an increase of about 13.5 per cent. The number of exchanges increased in the same period from 927 to 1032. If the growth of the telephone system continues to develop at the same rate as during the past three years—namely, about 15 per cent. annually—the system will be more than doubled in size in the next five years. The number of telephone lines erected in country districts during the year was 237, as against 199 in 1911; and the number of public telephones on the same date was 2904, as against 2526.

Mr. J. Oxenham, the departmental secretary for the postal branch, states that the number of new post offices opened during the last year in various States was 455, as against 456 in 1911; and of offices closed 276, as against 309 in 1911, the net increase being 179 offices. The postal articles dealt with during the year comprised 4,860,691 registered articles, 531,813,158 letters and postcards, 79,710,823 packets, 173,222,716 newspapers, and 4,574,256 parcels. The number of packets dealt with in 1912 was 9,006,914 less than in 1911. During the past ten years the average number of letters and postcards posted per head of population has increased by 58.40 per cent. During the last ten years the number of mail services in the Commonwealth had increased by 26.39 per cent., and the cost by 39.32 per cent. There were now 1519 services, the total cost of which last year was £985,105. The number of money orders issued during the year was 1,822,341, for a total amount of £7,417,006—an increase of 239,189 in number, and of £833,143 in value. The number of postal notes sold during the year was 8,608,013, of the value of £3,258,506—an increase in number of 566,108, and in value of £241,189. The number of permanent employees was 16,054, an increase of 1524 over those of 1911. In addition, there were in the department 4985 non-official postmasters, 2453 receiving office-keepers, and 4458 mail contractors. To provide for the increased salaries prescribed by the award of the Arbitration Court in connection with the plaint of the Postal Electricians' Union, it had been necessary to place upon the Estimates for 1913-14 a sum of £25,100, to cover the increases to be paid to permanent officers only. Of this amount, £10,000 would go to New South Wales, £7500 to Victoria, £2900 to Queensland, £1800 to South Australia, £1900 to Western Australia, and £1000 to Tasmania.

## AUSTRALIAN ROAD ROLLERS.

The illustration below is of a road roller made by the Austral Otis Engineering Co., South Melbourne, for the Port Melbourne Council. In view of the controversey which has taken place recently with regard to the quality of the locally manufactured in comparison with the imported article, an inspection of this roller should allay all doubt on that score. The workmanship and finish of this machine is, beyond question, equal, if not superior, to any we have seen, irrespective of country of origin. It is, moreover, a combination of all that is best in machines of like description, and with the exception of certain valves only, the whole of the parts are locally made. The forecarriage and yoke is made of mild cast steel, and is of very powerful design and structure. The machine is fitted with compound steam cylinders, surrounded by a steam jacket, the valve chests being arranged on the sides with the object of rendering them easily accessible. The advantages of the compound steam cylinders are undoubtedly economy in fuel, greater expansion of steam, silence in working owing to the lower pressure at which steam is discharged into the atmosphere (a point which should commend itself on account of these rollers having to work on roads where there is often considerable traffic); steadiness and ease in working, as the roller can be started while the crank is in any position; and, owing to the work being equally distributed between the low and high press cylinders, the roller operates without any jerks or shocks. The boiler is constructed of the highest quality mild steel plates, and is designed for a working pressure of 180 lbs. per square inch. The cylinders are mounted on to the boiler by means of a mild cast steel saddle rivetted thereto, thus doing away with the troublesome joint between the boiler shell and the cylinders. The crankshaft is fitted with balanced cranks. The gear for transmitting the power from the crankshaft to the road wheels is of steel with machine cut teeth, reducing to two speeds. A clutch is provided to enable the roller being worked as a stationary engine if required at any time to drive any other machine. The main rollers or driving wheels are fitted with renewable tires or rims, which is a feature, as in the event of a break, not only may new rims be attached, but any of the other sections may be renewed.

The company has been manufacturing road rollers for the past six or seven years for various councils, and, in addition to the one now complete, have in hand the construction of a similar one for the Country Roads Board, which will be fitted with cast steel rollers and spraying apparatus.



## TECHNICAL EDUCATION (V.)

The following results were obtained in the recent technical college examinations:—

Swinburne Technical College.—Engineering Drawing.—Machines, Grade 2—Pass: Nil.

Melbourne Working Men's College.—Engineering Drawing—Machines, Grade 2—Pass (credit): Jas. A. Chambers, 90 per cent.; Neil Macdonald, 65. Pass: George W. Smith, 55 per cent.; Con. Deane, 45; Andrew R. Anderson, 50; Fredk. W. Kuhn, 50; Chas. S. Drescher, 50; Neil C. E. Black, 40; Albert L. Taylor, 43; John C. Jebb, 55; Gelson Engel, 50; Leslie Fitterer, 50; Harold Williams, 40; Derwent P. Flockart, 45; Norman H. Sheperd, 50; John H. Pittard, 45; Fred. G, Thorpe, 50; Martin Bruell, 45; Alwyn H. Stones, 60; Fredk. C. Warneke, 55; Bruce Neilson, 65. Structures—Pass: Fred. Sutcliffe, 40; Harold P. Taylor, 50.

Castlemaine Technical School.—Engineering Drawing.—Machines, Grade 2—Pass: Hubert Cameron, 50 per cent. Structures—Pass: Alfred Hogarth, 60 per cent.; Alexr. Griffiths, 50; Alexr, Hoy, 55; John Fleming, 55.

Bendigo School of Mines.—Engineering Drawing.—Machines, Grade 2—Pass: Wm. A. Williams, 50 per cent.; Alfred A. F. Horbury, 55; Fredk. L. Roberts, 40; Harold E. Ogilvie, 40.

Bairnsdale School of Mines.—Engineering Drawing.—Machines, Grade 2—Pass: Eric H. D. White, 40 per cent.; Herbert F. Winson, 40; John Hopkins, 50; John D. McLeod, 45; Joseph P. Currey, 50; John J. Fischer, 40. Structures—Pass: Alexr. C. Hossack, 50 per cent.; Harry D. Hopkins, 50.

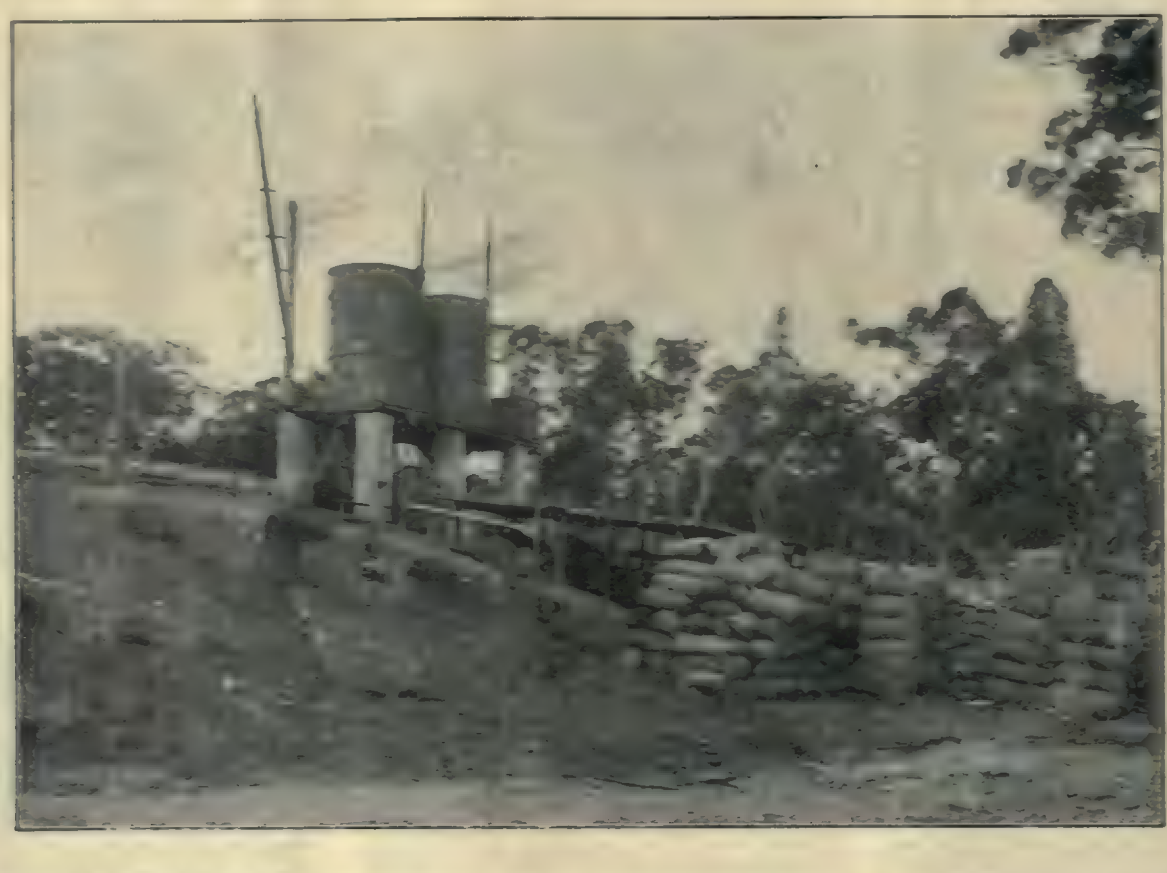
Ballarat School of Mines, No. 10.—Engineering Drawing.—Machines, Grade 2—Pass: Wm. J. Hawker, 60 per cent.; Norman C. Tinworth, 50; Sydney M. Power, 50; John F. W. Sporn, 65; Herbert Rich, 50; Thos. L. Simpson, 55; Robt. M. Serjeant, 55. Structures—Pass: Charles W. Joy, 55 per cent.

## THE CHARCOAL INDUSTRY.

Charcoal is a subject of vital interest to all users of suction gas engines. Charcoal has been used for a variety of purposes for centuries past, but the methods of making in small quantities have been crude, slow and costly. Within the past few years various types of charcoal retorts have been put on the market, but the results have been far from satisfactory. It is now twelve months since the Australian Patents Ltd., of 308 Collins-street, Melbourne, the patentees and manufacturers of the "Brisbane" Charcoal Retort, commenced operations in Victoria, and this company are in the fore in the manufacture of high-grade charcoal. The "Brisbane" retort possesses many potent features. With it charcoal can be produced from any class of bush timber—green or dry. Owing to the skilful arrangement of the vent holes in the retort, which provides for the admission of oxygen to various parts of the retort, the burning process is carried out with great rapidity and an even temperature is maintained, which is essential. These vent holes can be regulated so that there is no danger of the fire getting out of hand and burning the wood to ash. It is now an accepted fact that charcoal for suction gas plants is the ideal fuel, and has come to stay. As evidence of this the company have sold over 100 plants in the Commonwealth, and upwards of 25,000 tons of charcoal is being manufactured annually with "Brisbane" retorts. This is not surprising when it is remembered that the carbon contents of charcoal far exceed that of any other class of fuel. Another important factor is the absence of ash and tarry compounds. The use of a high grade charcoal eliminates tar troubles in engine valves and pipes, and the formation of clinker in the generator, and permits of long periods of running without attention owing to the small ash contents.

The company claim that with the "Brisbane" retort charcoal can be manufactured in any part of Victoria for under 20s. per ton. The Australian Patents Ltd. are the largest users of "Brisbane" retorts in the Commonwealth. They find it more profitable to make charcoal for public sale than to sell retorts in and round the large cities. The retorts are made in various sizes from a capacity of 6 bags per day upwards. An advantage to gas engine users is that one of these retorts can be purchased and placed alongside the engine, and the engineer can, with a small amount of time in the morning, turn out sufficient fuel for running the engine for 24 or 48 hours, according to the size used. It takes approximately 2½ tons of average dry bush hard wood to make one ton of high-grade charcoal, so that by having the retort placed alongside the engine the cost of the charcoal is practically very little more than the value of the wood used to produce such charcoal. With this retort gas engine users can now entirely overcome the fuel problem, and make a gas engine available in isolated places, where previously the question of securing supplies of fuel was one of great importance. The reason of the high efficiency of the "Brisbane" retort is that volatile gases given off during the course of burning are consumed inside the retort, providing the necessary heat to do the charring, thus nearly all the carbon can be saved.

Accompanying is an illustration of the plant installed in New South Wales. This plant supplies part of the New South Wales demand, and is at the present time being duplicated. The company's plant is situated at Maiden, and is built on very up-to-date lines. A large number of testimonials from users have been received, and they express themselves in very glowing terms of the efficiency of the retorts and the high standard of charcoal manufactured.



---

## MUNICIPAL COUNCIL OF SYDNEY.

The following recommendations of the Electric Light Committee were adopted at last week's meeting of the above:—

That, with regard to a letter from Mr. C. Brodrick, who has taken over the business of Messrs. Buchanan and Ifield, applying for an assignment of the contract between the council and Messrs. Buchanan and Ifield for repairs to electric motors, a report by the City Electrical Engineer be adopted, such report stating that he is still of opinion that it would be to the council's interests to award the contract for repairs of motors to the Standard, Waygood, Hercules Ltd., in accordance with their letter of November 25, 1913.

That the City Electrical Engineer be empowered to negotiate for the sale of the two motor generators at the town hall substation without bedplates or bearings (of which the motor portions were hired to the Sydney Harbour Trust), at the price of £140 each.

That two hundred of the "Angold" enclosed lamps held in stock and for which there is now small demand, be disposed of by the Town Clerk, City Electrical Engineer, and Comptroller of Assets at the best price that can be obtained for them.

That authority be given for the payment of the sum of £166 19s. 5d. to Messrs. Dick, Kerr and Co. for material supplied to the council to maintain "Beck" arc lamps against ordinary wear and tear, as set out in schedule attached to a report of the City Electrical Engineer dated December 5, 1913.

That eight 5-amp. 240 volts and sixty-five 5-amp 240 volts maximum demand indicators be purchased from Messrs. W. G. Watson and Co., as an extension order under their existing contract at an estimated cost of £65 14s.

That the Australian General Electric Co. be instructed to increase the capacity of the high tension and low tension switchgear to be supplied for the town hall substation by 50 per cent., and to supply, in addition to the instruments specified, one power factor indicator, one rheostat control handle, and one field switch and one field ammeter, at an additional estimated cost of £58, or the amount of £262 already authorised.

Numerous extensions of electricity mains and sundry work at various substations were also authorised.

## NORTHERN TERRITORY RAILWAYS.

The action of the Senate, mentioned in our last issue, in rejecting the proposed vote for building the Pine Creek—Katherine River railway, is not regarded by the Minister of External Affairs, Mr. Glynn, as the final word of that Chamber on the proposal. Mr. Glynn said last week: "I would not accept the striking out of the loan bill for £400,000 for the construction of the railway as the deliberate verdict of the Senate upon the policy of construction which was endorsed by the Fisher Government. I think the Senate is likely to restore the item. There was a small attendance in the Senate last week, and I do not think the vote was a deliberate one against the measure. The policy for which I think I have the assent of my colleagues is one to link up Oodnadatta and Pine Creek through Alice Springs, a distance of 1068 miles, with a connection between Camooweal and Newcastle Waters, a distance of 300 miles, thus linking the territorial system with Queensland, and eventually with New South Wales, via Cloncurry, and, when the lines are constructed, via Bourke to Sydney and to South Australia by the north and south line. There will also be a railway from Newcastle Waters to the Victoria River, and thence on to Sturt's Creek on the West Australian border. Next year it is hoped that a policy of transcontinental railway construction along these lines will be submitted to and accepted by Parliament."

## FEDERAL RAILWAYS.

As Mr. Glynn, Minister of External Affairs, anticipated, the Senate has thought better of its refusal to pass the vote of £400,000 for the railway from Pine Creek to the Katherine River, in the Northern Territory, and has withdrawn its veto. The reminder that the late Ministry had sanctioned the work being done made it impossible for any other course to be adopted if the Senate was not to "turn dog" on the party to which nearly all its members belong. Then Senator Clemons moved the second reading of the Bill, authorising the construction of the line, which will be 54 miles long, and is estimated to cost £442,000, averaging £8200 per mile. The first 40 miles, however, will cost £9000 per mile, and the remaining 14 miles only £7857. The country which this section of the line would span was admittedly poor, but it had to be crossed, and once Katherine River was reached, a vast stretch of fine country would be easily accessible. Already, said Senator Clemons, the Ministry was considering the expediency of a further extension of the line to Bitter Springs. The second reading debate was spun out for several hours, and it was then agreed to by 19 votes to 9. In committee, quite a number of amendments were made and some new clauses were added, without the concurrence of the representative of the Government. It is interesting to note that, while Labour Senators were making up their minds whether to vote the money or not, a colleague in that "other place," namely, Mr. Josiah Thomas, was com plaining of the delay in the construction of the line.

On the 17th inst., Senator McColl made a statement in the Senate respecting the progress of the work on the Port Augusta-Kalgoorlie line since the present Government came into power, which showed that, whereas only 9 miles 33 chains of the main line rails had been put down up to June 26, there were, on December 16, 56 miles 46 chains of line laid at the Kalgoorlie end, and other features compared as follows:—

| | At 26/6/1913. Miles | Chains. | At 15/12/1913. Miles | Chains. |
|---|---|---|---|---|
| Main Line— | | | | |
| Survey .. | 45 | 0 | 100 | 0 |
| Preliminary survey .. | — | | 160 | 0 |
| Earthworks | 31 | 0 | 66 | 20 |

Mr. Deane reported that there was a very heavy cutting at Kalgoorlie between the 40 chain post and the 2 mile 10 chain post, and the earth gangs had been concentrated on that since October. Platelaying had been suspended at the end of May, and had not been recommenced until November 16. At the South Australian end of the line the main route survey had advanced from the 45-mile mark to the 165-mile mark since June last, and the comparison in the other matters was as shown below:—

| | At 26/6/1913. Miles | Chains. | At 15/12/1913. Miles | Chains. |
|---|---|---|---|---|
| Main Line— | | | | |
| Preliminary survey .. | 46 | 0 | 165 | 0 |
| Clearing .. | 10 | 0 | 66 | 40 |
| Earthworks .. | 8 | 40 | 57 | 0 |
| Rails laid .. | 6 | 0 | 56 | 66 |

The Federal Government has declined to accede to the request of the West Australian Government for an extension of time for the completion of its contract to supply sleepers of Powellised karri for the trans-Australian east to west railway, considering it to be in the interests of the public not to do so. On the other hand, Mr. Scaddan, the Premier of Western Australia, states that there are an enormous number of sleepers stacked at Kalgoorlie, so that no delay in construction is being caused by want of sleepers for laying; in fact, he is of opinion that when the Commonwealth Government was in possession of all the facts they would say that it was really in the public interest that his request should be granted. It would be found that, when the new sawmills are completely going, they will supply 12,000 more sleepers per month than the contract required, and that, by April, 1915, they would be fully up to contract requirements, and these would be completely filled by the contract time—July, 1916. Meantime, Mr. Cook says it is useless to go on until a continuous supply can be relied upon. Contracts were let by the last Government for the supply of 2,250,000 sleepers altogether, and of these Western Australia contracted to supply 1,700,000, or over 60 per cent. of the whole, and now (to use the "language of the publican") finds that it has bitten off more than it can chew.

The select committee of the House of Representatives appointed to inquire into the merits of Powell wood-preserving process for railway purposes has been converted into a Royal Commission, inasmuch as its task has proved a long one, and it was considered inadvisable to run the risk of its labours being thrown away by the automatic extinction of the committee with the end of the session. The committee comprises Mr. Bamford, Mr. Burchell, Mr. Gregory, Mr. McWilliams, Mr. O'Malley, Mr. Patten, and Mr. Sinclair. The alteration will enable evidence to be taken during the recess, and many important witnesses have yet to be examined.

---

## MISCELLANEOUS.

Sir Maurice Fitzmaurice, the eminent English engineer who is now in Australia, has approved generally of the sewerage scheme adopted for Perth, viz., septic tanks and filter beds, though he has suggested certain improvements in them, and would have preferred a more isolated spot for the works. The work now in progress, he states, with the improvements suggested, will secure the disposal of Perth sewage at a reasonable expenditure without an appreciable pollution of Swan River. A sewage farm, Sir Maurice thinks, would have been unsuitable for Perth on account of the large area required.

• • •

There has been a good deal of dissatisfaction amongst shareholders in the Woods-Gilbert Rail Planer Ltd for some time past with the management of the company's business, and at a recent meeting a committee was appointed to investigate affairs. The adjourned meeting was held on the 16th inst., and the committee's report was received and adopted. In it regret was expressed that there should be dissension at the present juncture, but the committee believed that the motive in criticism had been the good of the company. Many of the mistakes in policy were due to the protracted nature of negotiations for disposing of their patent rights, which had strained the resources of the company, increased the difficulties of the board, and provoked impatience amongst shareholders. Negotiations had now reached a point which called for complete unanimity and confidence if success were to be attained. The committee recommended that a director be appointed in place of a member of the board absent in England, and that the board consider whether the addition of another member was practicable. Mr. Michael Woods insisted that his criticism of the board was true, and that unless a change in it were made immediately the company would not last six months. The Melbourne board had written to England as a matter of opinion advising that a certain man should not be employed. The chairman, Mr. G. T. Bell, challenged a want of confidence motion, as recommendations could not be enforced. The directors had a full answer to all the ex parte statements made against them. The want of confidence motion was supported by only six shareholders, and was lost. The chairman said that the board, as suggested by the committee, had already invited Mr. A. Jackson to join them. Mr. Jackson said that he was not anxious to serve on the board, but would do so if they elected him in due course. Mr. W. R. Kimble was re-elected as a director. The retiring auditors were also re-elected.

• • •

A dividend and a bonus, each of 6d. per share, will be paid by the Melbourne Tramway and Omnibus Co. on January 2.

• • •

Some controversy has arisen in connection with the action of the W.A. Government in accepting a German tender for the supply of 11,000ft. of piping for the Coolgardie water scheme. It appears that Messrs. Mephan Ferguson submitted a tender, but it was rejected in favour of the German one, on the grounds that delivery would be commenced in eleven weeks, and that the Government did not want to put Mr. Ferguson to the expense of reopening the works at Maylands. In reply to this, Mr. Ferguson states that the engineer for the Coolgardie water scheme stated that the first delivery was not required before six months, which he therefore figured on; otherwise, had he known it was desired, he could have commenced delivery of pipes manufactured at the Footscray works inside three weeks, which would dispose of the necessity for utilising the works at Maylands, except for dipping the pipes, for which purpose there is a plant there.

• • •

That there should be some delay in the carrying out of such a large scheme as the electrification of the Melbourne suburban railways is not at all surprising, particularly as the forecasting of the date for opening the first line was done before the first shovelful of earth had been moved. The first delay was caused by the discovery that a new site would have to be chosen for the power station, and the subsequent negotiations for making the change from Yarraville to Newport. Preparations for the power house are now progressing rapidly, but the steelwork for the building will not arrive until next May, and the machinery is expected shortly afterwards. Mr. Merz is now preparing plans, etc., for the sub-stations, three of which will be required in working order before the first line, that from Broadmeadows, through Melbourne, to Sandringham, can be operated. The bonding of rails, to ensure a complete circuit for the electric current, will be commenced in July, and tenders are being called in England for the supply of several hundred tons of copper bonds. The building of motor coaches will not be commenced for some time. Altogether 100 sliding door motor coaches will be built, while about 170 swing door cars, now in use, are to be converted into motor coaches, and it is believed that 75 of these and the same number of trailers will be ready by next July, even if the line be delayed beyond that date. Another thing in connection with the work at the station site, which can hardly be called a surprise, is that already there is discontent amongst the labourers, who complain of the hours they work, their distance from home, the rate of payment, the rockiness of the ground, etc., and a meeting has been called to consider the position.

• • •

It is quite proper that when it is proposed to build a new railway, a somewhat conservative estimate of the traffic which may be looked for should be made. Certainly it is better to have to confess that traffic has surpassed expectations than to find, after all the expense has been incurred, that the line was unwarranted. The New South Wales Railways Commissioner is in that position just now in connection with the branch line from Lockhart to Oaklands, in the Riverina. Last year a grain shed and loop line were constructed at Boree Creek, but as 60,000 bags were stacked there, with the assurance of many more thousands of bags this year, the accommodation has already proved totally inadequate. At the present time new loop lines and grain sheds are being erected at Oaklands, Cullivel, Tootool, and Freens Park, with further improved facilities at Urana and other places. With railway facilities offered, wheat growing has increased enormously, and fully justifies the construction of the line.

• • •

In the West Australian Legislative Assembly last week Mr. Scaddan explained that the item in the schedule of the Loan Bill "Steamships £[illegible]" was to complete the purchase of steamers for which sufficient money had not been voted, and that he disagreed with the auditor-general's criticism on State enterprises. On the same day the Colonial Secretary, Mr. Drew, in the Legislative Council, tabled a balance-sheet of the State steamers, which had not yet been passed by the auditor-general. It showed liabilities, £[illegible]; assets, £107,708; debit balance, £[illegible]. The debit balance represents loss on trading £[illegible], interest £3715, depreciation and replacements £[illegible].

• • •

Our Lithgow (N.S.W.) correspondent writes:—A large number of steel rails for the transcontinental railway line have been completed and stacked on the rail bank at Lithgow Iron and Steel Rolling Mills, ready for loading on to the trucks. Two or three of the mills—particularly the "guide" and the 18in. mills—have been working very constantly lately. The new 40-ton steel furnace is now having the finishing touches put on to it, and should be lighted up within a fortnight, as the gas-producers for the furnace are now in readiness. Mr. C. H. Hoskins states that the second new blast furnace is working well, and that operations generally through the works are proceeding smoothly.

• • •

The rapid growth of a great industrial concern was referred to at the end of October by Sir Robert Hadfield, at a luncheon accorded by the directors of Hadfields Ltd., at the company's East Hecla works, Sheffield, to a distinguished company, which included the American Ambassador to London, Admiral Sir Wilmot H. Fawkes, Brigadier-General S. B. von Donop and the High Commissioner of New Zealand, Mr. T. Mackenzie. Twelve years ago, Sir Robert said, East Hecla was a bare field; now it had £700,000 capital and some 6000 workmen. Naturally, the exchange of trade between the United Kingdom and the United States formed material for some of the speeches, as well as the international amity which has endured for so many years. The Master Cutler, in proposing the health of Sir Robert and Lady Hadfield, said that Sir Robert was famous for many other things besides wonderful projectiles. He was the Pure Science of these works, and in the works they had the Applied Science. The world over Sir Robert was famous for his manganese steel, and Sheffield had proved its worth. As an instance, he said that at one of the most important tram crossings in the city they could not get points to last more than a few months. But five years ago they tried Hadfield's Era manganese steel, and it still had years of wear in it, which, he added, was good for the city though not for Hadfields. When going through the works after the luncheon special interest was shown in the armour-piercing shells, for which the firm recently completed a contract on behalf of the United States Navy, and some of which, weighing three-quarters of a ton, are capable of piercing 12 inches of Krupp Cemented armour at a range of eight miles, the projectiles remaining unbroken.

• • •

A strike was begun last Thursday at the shipyards of Messrs. Forman and Co., of Melbourne, in connection with repairs to the Melbourne Harbour Trust's hopper-barge "Fawkner," which was recently sunk in the Yarra by a collision. The contract for the repairs was let to Forman and Co., and on Thursday some of the Trust's men were instructed to give assistance, whereupon a number of shipwrights refused to work with non-unionists and were at once paid off. This, of course, at once brought union officials into the matter, and the chairman of the Harbor Trust, Mr. G. F. Holden, was asked to receive representatives of the shipwrights, harbour and river employees, ironworkers, boilermakers, engineers and carpenters and joiners. The reply was that the Trust would not negotiate with the unions' secretaries, but that the men themselves, if they felt they had a grievance, could appeal to the Trust if they chose. Mr. Holden says that the Harbour Trust Commissioners are determined not to allow any interference in their business by union officials. "That boat is going to be repaired, and take up her work again," he said last Saturday. "Our men are now at work on her, and there should be no misunderstanding on the matter. We are not awaiting developments. We are simply going on with our work. The strike that has occurred is not one of our employees, but of the employees of a contractor."

**P. & O.** COMPANY'S ROYAL MAIL STEAMERS
FOR MARSEILLES, PLYMOUTH AND LONDON.

Leave Sydney on the subjoined dates, calling at usual ports.

FIRST AND SECOND SALOON ONLY.

| Steamer, | Tons. | Commander. | Noon. | Melb., 3 p.m. |
|---|---|---|---|---|
| MALWA | 11,000 | Thompson | Dec. 27 | Dec. 30 |
| MOOLTAN | 10,000 | Haddock | Jan. 10 | Jan. 13 |
| MOREA | 11,000 | Andrews | Jan. 24 | Jan. 27 |

PASSAGE MONEY TO LONDON—
Single, £41 16s. to £82 10s.
Return, £69 6s. and £123 4s.

Return Tickets between Inter-State Ports are available for return by Orient, Messageries Maritimes, and N.D.L. steamers having room.

SPECIAL HOLIDAY RETURN TICKETS to COLOMBO are now issued, available for two months. Fares from Sydney, £45 2s. first saloon, and £31 18s. second saloon.

A. GORDON WESCHE, Superintendent IN AUSTRALIA, 63 Pitt-street, Sydney.

---

**The COLONIAL MUTUAL FIRE Insurance Company Limited.**

Principal Office: 60 MARKET-ST., MELBOURNE.

Branches in all the States.
Transacts Fire, Guarantee, Employers' Liability, Marine, Burglary, and Plate Glass, Accident, Workers' Compensation and Live Stock Insurances.
Send for Prospectus.
W. TUCKER, General Manager.

---

**Harringtons LTD**

**ANALYTICAL & METALLURGICAL DEPT.**

Highest prices given for all gold, silver or platinum residues, etc.
Lowest fees for all kinds of Assay, Analytical, and Metallurgical work.
Expert Advice on Ore Treatment, Bullion Refining, Smelting, etc., etc., Directed by a qualified Analyst from Messrs. Johnson and Sons, London: Assayers and Refiners to Bank of England, H.M. Mint, The Council of India, etc.

**HARRINGTONS LTD.**
**386 George Street, Sydney.**

## NEW ZEALAND MINING LAW.

The Mining Act Amendment Bill introduced last month in the Dominion House of Representatives proposes to give effect to the recommendations of the Miners' Commission relating to ventilation in mines and the safety of workers. There are provisions intended to ensure the safety of the ropes used for the raising and lowering of the cages. Another provision enjoins the fitting in all shafts where a cage is used of safety devices to prevent the fall of the cage when detached from the rope. There are also provisions relating to ventilation, machinery, the use of explosives, and the supply of water for the laying of the dust raised by the drills or explosives. It is proposed that there shall be attached to all mines, other than open alluvial mines, at which more than 10 men are employed, houses supplied with hot and cold water; but the owner of a mine shall not be compelled to erect a house unless such is demanded by a percentage of the men, varying with the number of workers. If the baths are not used by 20 per cent. of the workers it shall be optional with the manager whether he keeps the bathhouse open or not. Additional powers are to be given to the workmen's inspectors employed by any miners' union at the expense of the union. If these inspectors, of which there must be two for each inspection area, declare that the mine or any portion of it is dangerous to life, the manager must forthwith forward a copy of the report to the inspector for the district. Failure to comply with the workmen's inspectors' direction as to dangerous workings or dangerous practices may constitute an offence. The penalties fixed are fines not exceeding £100 for every day on which the offence is continued. Another clause provides that the men must be at once withdrawn from workings where noxious gases are known to exist. The area shall then be inspected, and until the workings are reported as not dangerous no workmen shall be allowed to re-enter those workings. The Minister of Finance is to be empowered to borrow on the security of the public revenues a sum not exceeding £20,000 a year wherewith to make advances to companies for the development of mining. Miners who have contracted the disease of pneumoniconiosis shall be entitled to benefit from the Miners' Relief Fund equally with miners who have suffered injuries from accident. Winding engine-drivers must be examined annually by a medical man. An engine-driver may not be employed unless he is free from health weakness, liability to fits, or defective hearing or vision.

# *Invited and Accepted Tenders*

It is particularly requested that the information regarding contracts open, and the successful tenderers, be forwarded to The Editor not later than Monday of each week.

The following contractions are used throughout:—S—supply; D—delivery; M—manufacture; C—construction; E—erection; P—purchase; I—installation; R—removal. Where no contractions appear, supply and delivery is understood. The date at the beginning of each paragraph refers to the closing of tenders.

## INVITED.

### Commonwealth.

Specifications, tender-forms, etc., for tenders invited for the Postmaster-General's Department of the various States under this heading may be had as follows:—Victoria—Various State G.P.O.'s. New South Wales—Departmental Stores, Sydney, and various G.P.O.'s in other States. South Australia—Adelaide, Melbourne, Sydney and Brisbane G.P.O.'s. Western Australia—Departmental Stores, Perth, and various G.P.O.'s in other States. Queensland—Various State G.P.O.'s. All States—Various G.P.O.'s. If the specifications, etc., may be had elsewhere, in addition, the places will be given in parentheses.

POSTMASTER-GENERAL'S DEPARTMENT, Melbourne.—30th December.—S. and D. of telephone material, as per schedule No. 976.

30th December.—S. and D. of 3 motor cycles, as per stores schedule No. 988.

6th January.—S. and D. of wooden cable junction boxes, as per schedule No. 983.

6th January.—Laying of conduits, Richmond, as per schedule No. 1006.

13th January.—S. and D. of 200 round wooden poles, schedule No. 998.

13th January.—S. and D. of 500 leaden earth-plates, schedule No. 1004. (See advertising columns.)

27th January.—S. and D. of switchboards, telephone, etc., as per schedule No. 990.

3rd February.—S. and D. of 2050 Lineman's safety belts, as per schedule No. 994.

10th February.—S. and D. of 1100 lead earth plates, as per schedule No. 993.

17th February.—S. and D. of cable boxes, as per schedule No. 986.

17th March.—S. and D. of one portable direct-coupled internal combustion engine and dynamo, schedule No. 995. (See advertising columns.)

7th April.—S. and D. of 60 non-polarized relays, as per schedule No. 996.

7th April.—S. and D. of accumulator batteries, Tudor type, to Radio stations, as per schedule No. 991.

POSTMASTER-GENERAL'S DEPARTMENT, Sydney.—7th January.—Laying about 1909 lineal feet 4-way E.W. conduit.

7th January.—Laying about 1978 lineal feet E.W. conduit.

7th January.—S. and D. of telephone and telegraph parts (23 items), as per stores schedule No. 355; and spindles (3 items), as per stores schedule No. 354.

18th March, 1914.—S., D. and E. at the Telephone Exchanges, Epping, Ryde, Hunter's Hill, Drummoyne, Wahroonga, Paddington and Waverley, Sydney, of seven (7) automatic switchboards, with associated equipment, as per schedule No. 179.

POSTMASTER-GENERAL'S DEPARTMENT, Brisbane.—31st December.—S. and D. of insulators, as per stores schedule No. 282.

7th January, 1914.—S. and D. of switchboards, as per schedule No. 274.

7th January, 1914.—S. and D. of telephone instruments, as per stores schedules Nos. 275, 276 and 277.

7th January, 1914.—S. and D. of protectors, parts, etc., as per schedule No. 278.

7th January.—S. and D. of protectors and parts, as per stores schedule No. 284.

POSTMASTER-GENERAL'S DEPARTMENT, Perth.—7th January.—S. and D. of porcelain tube insulators.

7th January.—S. and D. of bolts and nuts, washers and iron combiners, as per stores schedule No. 332.

14th January.—S. and D. of cords, keys, and switches, as per stores schedule No. 330.

14th January.—Repair and overhaul of Busselton-Karridale telegraph line.

21st January, 1914.—S. and D. of switches, telegraph line with plugs.

POSTMASTER-GENERAL'S DEPARTMENT, Adelaide.—7th January.—Laying conduits and iron pipes, and construction of manholes, Adelaide, as per schedule No. 314.

11th February.—S. and D. of 50 cable terminals, 26 pair, as per schedule No. 308.

POSTMASTER-GENERAL'S DEPARTMENT, Hobart.—2nd March.—S. and D. of telephones, as per stores schedule No. T104.

DEPARTMENT OF DEFENCE—Small Arms Factory, Lithgow, N.S.W.—29th December.—P. of scrap steel, brass, jute bags, whale oil, etc.

5th January.—S. and D. of tinware and aluminium (boxes, discs, kettles, tins, etc.).

25th February (extended from 12th January).—S. of iron and steel for manufacture of rifles. (See advertising columns.)

DEPARTMENT OF HOME AFFAIRS.—30th December.—S. and D. of 75 tarpaulins 26 x 15ft. 5in. (50 to be delivered at Port Augusta and 25 at Kalgoorlie) for Kalgoorlie-Port Augusta railway. (See advertising columns.)

7th January.—Excavation and concrete lining of reservoir, capacity 3,000,000 gallons, Federal capital site.

19th January.—Boiler plant for Federal woollen mills, Geelong. (See advertising columns.)

### States Invited.

### Victoria.

RAILWAY DEPARTMENT.—29th December.—S. and D. of 48 Navy wheelbarrows.

31st December.—S. and D. of mild steel bars.

31st December.—S. and D. of planished mild steel sheets (lead coated or galvanised).

7th January.—M., S. and D. of 5-8in. dogspikes for 60 lb. rails.

7th January.—S. and D. of 100 mild steel angles.

7th January.—C. and E. of verandah at Mentone station.

7th January.—P. and removal of one 120kw. turbo alternator and superheater pipes.

7th January.—S. and D. of 10,000 porous pots for batteries.

7th January.—S. and D. of best steel boiler plates.

7th January.—S. and D. copper rod.

7th January.—S. and D. copper plates.

7th January.—S. and D. of cast steel wheel centres.

7th January.—S. and D. of steel blooms for crank pins.

7th Jan.—S. and D. of locomotive brass boiler tubes.

7th January.—S. and D. of best Yorkshire iron angles.

7th January.—S. and D. of locomotive seamless copper tubes.

7th January.—S. and D. of steel channel bars.

14th January.—S. and D. of copper rod.

14th January.—S. and D. of five feed lubricators.

14th January.—S. and D. of 100,000 lineal yards tarpaulin canvas.

14th January.—S. and D. of high speed twist drills.

14th January.—S. and D. of one concrete mixer.

21st January.—S. and D. of one high axle speed lathe.

21st January.—S. of hydraulic jacks.

28th January.—S. and D. of 200 forged and rolled steel disc wheels.

28th January.—M., S., D. and E. of one three-phase alternator, complete, at Newport.

**SPECIAL NOTICE !**

**The Mount Morgan Gold Mining Co. Ltd.**

**ARE PREPARED TO PURCHASE** Ores, Concentrates and Furnace Products, containing Gold and Copper, at most favourable rates.

**ALSO TO INSPECT MINING PROPERTIES** with a view to Developing, Financing, or Purchasing same.

Address:—**MR. B. MAGNUS,** GENERAL MANAGER, MOUNT MORGAN, QUEENSLAND.

4th February.—S. and D. of 1500 felt body blocks.

4th February.—S. and D. of 25 five-feed lubricators.

11th February.—S. and D. 10 tons commercial sodium acetate.

18th February.—S. and D. of pig iron.

25th February.—S. and D. 20 tons galvanised telegraph wire No. 10½.

25th February.—S. and D. of stores for 2 years—cotton waste, mineral oils, augers, hammers, machine saws, tapes, vyces, emery, etc., grindstones, split pins, screws, rivets, crucibles, filters and candles, ovens and stoves.

4th March.—S. and D. of gunmetal switch locks and keys.

4th March.—S. and D. of Yorkshire iron forged billets.

11th March.—S. and D. of transformers and fuses.

25th March.—S. and D. of hammer handles.

VICTORIAN RAILWAYS COMMISSIONERS—State Coal Mine. 30th December.—S. of one shunt motor driven electric breast drill.

30th December.—S. of solenoid for brake, wet tool grinder.

7th January.—One motor driven air compressor.

PUBLIC WORKS DEPARTMENT. 8th January.—S. and D. of one 10-ton weighbridge, for Sale.

## New South Wales.

PUBLIC WORKS DEPARTMENT.—5th January.—S. and D. of paper insulated and lead covered cable and accessories at New Public Abattoirs, Homebush.

12th January.—S. and D. of wrought iron and steelwork for 2nd section, Dunedoo to Coonabarabran Railway.

12th January.—S. and D. of a 10-ton electric crane for State Quarry, Maroubra.

2nd February.—S. of 220 miles galvanised iron telegraph wire.

M., S. and D. of 14,000 tons steel rails and 800 tons fishplates for 60 lb. rails.

SYDNEY HARBOUR TRUST. 2nd March.—S. and E. of 3 electrically operated semi-portal travelling cranes for berths 1, 2, and 3, Woolloomooloo Bay.

RAILWAY DEPARTMENT.—7th January.—M. and E. of revolving screens for the circulating water at White Bay Power House. (See advertising columns.)

14th January.—S. of two electrically driven turbine pumps, 50 gallons per minute. (See advertising columns.)

14th January.—S. of worm gear, shafting, brackets and ball bearings for White Bay Power House. (See advertising columns.)

18th March.—S. of 24 direct current motor starters. (See advertising columns.)

25th March.—S. of five 1000kw. sub-station units. (See advertising columns.)

WATER CONSERVATION AND IRRIGATION COMMISSION, 29 Elizabeth-street, Sydney. —29th December.—M., S. and D. of 250 Dethridge meter wheels.

## Queensland.

TREASURY DEPARTMENT.—6th January.—S. and D. of 23 miles steel rails, 28 lb. per lineal yard, with all fastenings, to be delivered at Cairns wharf in July, 1914.

CAIRNS, SOUTHERN, CENTRAL AND TOWNSVILLE DIVISIONS.—S. and D. of iron and steel for 1914.

WATER SUPPLY DEPARTMENT.—Tambo Water Works.—5th January.—S. and D. of 85 tons cast-iron water pipes, special castings and valves.

## South Australia.

SUPPLY AND TENDER BOARD.—6th January.—S. and D. of 20,000 square feet of green leather; 5000 square feet of blue leather.

6th January.—S. and D. of chain iron, 1500 bars, various sizes.

6th January.—S. and D. of 2000 tons steel rails, 41 lb., and 32 tons steel fishplates for same.

13th January.—S. and D. of five 30-ton weigh bridges for 3ft. 6in. gauge railway.

13th January.—C. of 12 bogie goods break vans, with passenger compartments, 3ft. 6in. gauge.

13th January.—C. of overhead way and approaches at Belair.

20th January.—S. and D. of 47,000 gallons cylinder oil.

3rd February.—S. and D. of 10,000ft. swelled-joint bore casing.

3rd March.—C. of a breakwater at Glenelg, either of timber or reinforced concrete. (See advertising columns.)

10th March.—S. and D. of one testing machine.

10th March.—C. of 80 cattle vans, 5ft. 3in. gauge.

## Western Australia.

GOVERNMENT TENDER BOARD. — 8th January.—S. and D. 16 steel blooms for Railway Department.

8th January.—S. and D. of 4 tons copper line wire for Railway Department.

8th January.—P. of scrap, consisting of brass tube ends, borings and turnings, mixed white metal and brass borings and turnings, and copper plates, Midland Junction.

15th January.—S. and D. of 80 lb. steel rails and dog spikes.

## New Zealand.

TENDER BOARD.—Wellington.—12th January. —2 miles cable, D.C.L.C., air-space, 624 pairs; 3 miles cable, D.C.L.C., air-space, 520 pairs; 3 miles cable, D.C.L.C., air-space, 416 pairs; 6 miles cable, D.C.L.C., air-space, 312 pairs; 4 miles cable, D.C.L.C., air-space, 208 pairs; 18 miles cable, D.C.L.C., air-space, 104 pairs; 11½ miles cable, D.C.L.C., air-space, 78 pairs; 8 miles cable, D.C.L.C., air-space, 52 pairs.

## General.

PRAHRAN AND MALVERN TRAMWAYS TRUST.—13th January.—M., S. and D. of steel poles, contract No. 41.

BRISBANE METROPOLITAN WATER AND SEWERAGE BOARD.—13th January.—S. and D. of material for aerial ropeway.

10th February.—S. and D. of steam crane excavator.

CITY OF TOOWOOMBA (Q.) (Frank H. Merritt, Town Clerk).—9th February.—1000 water meters. (See advertising columns.)

CHRISTCHURCH CITY COUNCIL (H. R. Smith, town clerk).—5th January, 1914.—S. and D. of series street lighting plant and accessories. Specifications may be seen Town Clerk's office, Melbourne.

CONRAD MINES LTD., Howell (N.S.W.), (C. F. W. Lloyd, Official Liquidator, 182 Phillip-st., Sydney).—22nd January.—P. of mining leases, machinery, etc. (See advertising columns, 18th December.)

MUNICIPAL COUNCIL OF SYDNEY.—2nd February.—S. and D. of transformers and weatherproof switch fuses.

CITY OF MELBOURNE.—21st January.—S. and D. of bare hard-drawn copper cables.

24th January.—S. and D. of house cut-out boxes.

BROKEN HILL PROPY. CO. LTD.—10th January.—S. and D. of annual stores and mining requisites.

CITY OF BUNDABERG (Q.) (Herbert J. Layt, Town Clerk).—11th February.—Street lighting by gas, electricity or other lights.

SHIRE OF TUNGAMAH (T. Kelly, C.E., Shire Engineer),—3rd January.—S. and E. of suction gas plant, or Diesel engine: dynamos, switchboard, booster, starting rheostat, centrifugal pump, electric wire and cables, buildings, etc., for Cobram Electric Lighting Station.

HEDDON GRETA COAL CO. (Lang, Wood and Co., Newcastle).—27th January.—P. of above mine, 640 acres freehold, free of royalty, with building, plant and machinery.

MELBOURNE HARBOUR TRUST.—6th January.—S. of 258 weatherproof electric light lanterns.

HAMILTON WATERWORKS (Frank Hammond, secretary).—7th January.—S. and D. of 20 tons of cast iron pipes and fittings, and 12 cwt. pig lead.

A.U.S.N. Co. Ltd.
*Fast, Regular, and Comfortable Passenger Steamers*
(also carrying cargo) from and to
MELBOURNE, SYDNEY, ADELAIDE, FREMANTLE, BRISBANE, and all QUEENSLAND PORTS.
Passage Tickets interchangeable, with other Inter State Companies, on certain conditions.
Full Particulars at
COMPANY'S OFFICES
at all principal Australian Ports.

The Mount Lyell Mining & Railway
CO. LIMITED.
Purchasers of Ores containing Copper, Gold and Silver. Rates obtainable on application to the Secretary.
Manufacturers of Coke for Smelting and Foundry Purposes, Acids, Etc.
HEAD OFFICE—
39 QUEEN-STREET, MELBOURNE.
D. G. LUMSDEN,
Secretary.

THE
-PACIFIC CABLE BOARD-
Best route to Great Britain, Canada, New Zealand, Germany, etc.
New Direct Cable to Auckland from Board's Sydney Office opened December, 1912.
A Week End rate is now available between Great Britain and Australasia.—Rate 9d. per word, with minimum of 18/- (24 words). Week End Cable Letters are accepted up to midnight on Saturday for delivery in Great Britain on the following Tuesday morning.
TARIFF PER WORD "VIA PACIFIC."

| | Ordinary. | Daily Deferred. |
|---|---|---|
| GREAT BRITAIN .. .. .. .. | 3/- | 1/6 |
| GERMANY .. .. .. .. .. .. | 3/- | 1/6 |
| NEW ZEALAND .. .. .. .. | 4½d. | — |
| CANADA .. .. .. .. .. .. | 2/4 | 1/2 |
| U.S.A. .. .. .. .. .. .. .. .. | 2/4 to 2/8 | 1/2 to 1/4 |
| ARGENTINE, BRAZIL, CHILI and PERU .. .. .. | 5/8½ | 2/10¼ |

West Indies, Central America, and other rates, on application.
Cable forms, Deferred and Week End Regulations, may be obtained at—
THE PACIFIC CABLE BOARD,
77 Pitt Street, Sydney. Tel., City 1346 (3 Lines).
408 Collins Street, Melbourne. Tel., 2588.
J. Milward, Manager in the Pacific, 77 Pitt Street, Sydney.

SHIRE OF WARANGA (W. H. Geyle, secretary, Rushworth).—24th January.—Contract No. 1—S., D. and E. of one suction gas engine and producer plant, complete; contract No. 2—S. and D. of electric generators; contract No. 3, S. and D. of electric storage battery; contract No. 4—S. and D. of electric light poles; contract No. 5—E. of electric light poles; contract No. 6—E. of supply station; contract No. 7—S. and D. of wires, cables, street fittings, insulators, etc.; contract No. 8—E. of electric generating plant and outside distribution.

MELBOURNE AND METROPOLITAN BOARD OF WORKS.—13th January.—S., storage and D. of 5500 casks of Portland cement, or equivalent in bags.

## ACCEPTED.

## Commonwealth.

POSTMASTER-GENERAL'S DEPARTMENT, New South Wales.—S. and D. of 3000 caps with guard, for supervisory lamp, 3d. each; 500 fuses, 3 ampere, for fuse panel automatic alarm, with glass

Dunlop Mining Goods
Are now used with satisfaction in most of the leading Mines of Australasia — Their QUALITY & WEAR are Unsurpassed
Tenders & Samples submitted
Correspondence Invited
Send for Illustrated Catalogue
The DUNLOP RUBBER CO.
108 Flinders St. MELBOURNE.
Dunlop Rubber Belting
Is more efficient than Leather belting for Outdoor & Wet Work.
Sample & Price on application

Be sure you get
"DICK'S"
We know there are numerous imitations. Dick's maintains its high reputation for strength and efficiency. Every belt guaranteed. Sole agents:
JAMES HARDIE & CO.
Melbourne and Sydney.

indicator, to mount on 1½in. centres, 1s. 3d. each; 250 telephonometers, with mechanical attachment for electrical alarm circuit, £1 4s. 9d. each—The Western Electric Co. (Australia) Ltd.

S. and D. of 4500 cords, 3-steel conductors, 10ft. long, with connecting lugs, 1s. 11.4d. each—The Lawrence and Hanson Electrical Co. Ltd.

POSTMASTER-GENERAL'S DEPARTMENT, Queensland.—6000 dry cells, 6¾in. x 2⅝in., 2s. 9d. each—Brisbane Electrical Co.

POSTMASTER-GENERAL'S DEPARTMENT, West Australia.—10,000ft. conduit steel, plain, light gauge, enamelled, ⅝in., 3s. 2¼d. per 100ft.; 20,000ft. conduit steel, plain, light gauge, enamelled, ½in., 3s. 2¼d. per 100ft.; 10,000ft. conduit steel, plain, light gauge, enamelled, ⅝in., 3s. 8d. per 100ft.; 5000ft. conduit steel, plain, light gauge, enamelled, ¾in. 4s. 10d. per 100ft.; 1000ft. conduit steel, plain, light gauge, enamelled, 1in., 8s. 6d. per 100ft.; 1000ft. conduit steel, plain, light gauge, enamelled, 1¼in., 12s. 8d. per 100ft.; 1000ft. conduit steel, plain, light gauge, enamelled, 1½in., 18s. per 100ft.; 1 gross couplings, plain, enamelled, ⅜in., 6s. 3d. per gross; 2 gross couplings, plain, enamelled, ½in., 6s. 3d. per gross; 1 gross couplings, plain, enamelled, ⅝in., 7s. 11d. per gross; ½ gross couplings, plain, enamelled, ¾in., 9s. per gross; ¼ gross couplings, plain, enamelled, 1in., 14s. 8d. per gross; ¼ gross couplings, plain, enamelled, 1¼in., 31s. 6d. per gross; ¼ gross couplings, plain, enamelled, 1½in., 44s. per gross; 3 gross elbows, plain, enamelled, ⅜in., 11s. 3d. per gross; 3 gross elbows, plain, enamelled, ½in., 11s. 3d. per gross; 1 gross elbows, plain, enamelled, ⅝in., 13s. per gross; 12 gross elbows, split, enamelled, ½in., 39s. 3d. per gross; 6 gross elbows, split, enamelled, ⅝in., 42s. per gross; 1 gross elbows, split, enamelled, ¾in., 48s. per gross; 1 gross elbows, split, enamelled, 1in., 73s. 6d. per gross; 3 gross tees, inspection, enamelled, ½in., 39s. 3d. per gross; 2 gross tees, inspection, enamelled, ⅝in., 42s. per gross; 1 gross tees, inspection, enamelled, ¾in., 60s. per gross; 1 gross tees, inspection, enamelled, 1in., 95s. 6d. per gross; 6 gross tees, split, enamelled, ½in., 44s. 3d. per gross; 4 gross tees, split, enamelled, ⅝in., 48s. per gross; ½ gross tees, split, enamelled, ¾in., 59s. per gross; ½ gross tees, split, enamelled, 1in., 92s. per gross; 12 gross saddles, enamelled, ⅜in., 1s. 3¼d. per gross; 24 gross saddles, enamelled, ½in., 1s. 3¾d. per gross; 6 gross saddles, enamelled, ⅝in., 1s. 5¼d. per gross; 2 gross saddles, enamelled, ¾in., 1s. 11d. per gross; 2 gross saddles, enamelled, 1in., 2s. 6d. per gross; 1 gross saddles, enamelled, 1¼in., 3s. 1¼d. per gross; 1 gross saddles, enamelled, 1½in., 4s. 1½d. per gross; 12 gross clips, enamelled, ⅜in., 11¼d. per gross; 24 gross clips, enamelled, ½in., 11½d. per gross; 6 gross clips, enamelled, ⅝in., 1s. 1¼d. per gross; 2 gross clips, enamelled, ¾in., 1s. 5d. per gross; 2 gross clips, enamelled, 1in., 1s. 9d. per gross; 1 gross clips, enamelled, 1¼in, 2s. 1¼d. per gross; 1 gross clips, enamelled, 1½in., 3s. 1½d. per gross; 6 gross bushes, ebonite, ⅜in., 3s. 3¼d. per gross; 6 gross bushes, ebonite, ½in., 3s. 3¾d. per gross; 6 gross bushes, ebonite, ⅝in., 3s. 8d. per gross; 3 gross bushes, ebonite, ¾in., 5s. 0¼d. per gross; 3 gross bushes, ebonite, 1in., 6s. 9½d. per gross—W. G. Watson and Co. Ltd.

500 pipes, cast iron, 9ft. x 3in., spigot and socket, 10s. 8d. each—John Danks and Son Pty. Ltd.

50 bends, split, for 3in. cast iron pipe, length 2ft., to turn through 90 degrees of arc, radius of circle, 10½in., 13s. 8d. each; 25 bends, split, for 3in. cast iron pipe, length 4ft., to turn through 22½ degrees of arc, radius of circle, 8ft. 6in., 16s. 3d. each; 25 bends, split, for 3in. cast iron pipe, length 4ft., to turn through 45 degrees of arc, radius of circle 5ft., 16s. 3d. each—George Kent Ltd.

20 tons wire, hard-drawn copper, 200 lbs. per mile, £85 2s. 3d. per ton—Gibbs, Bright and Co.

DEPARTMENT OF DEFENCE.—S. of 70,000 yards black duck, 1s. 6⅝d. per yard f.o.b., London—Robertson & Moffat Pty. Ltd.

### Victoria.

VICTORIAN RAILWAYS.—M., S. and D. of railway tricycles, at £11 each—Drury and Co.

M., S. and D. of railway tricycles, at £11 each—Orton and Burns.

M., S. and D. of mild steel—Item No. 1, Mild steel channel, 8ft. 8in. x 1¼in. x 5-16in. x ½in. x ¼in., at £13 10s. per ton: item No. 2, mild steel bevel, 8ft. 10in. x 1in. x 3-16in., at £18 per ton—The Lion Rolling Mills Pty. Ltd.

Purchase of a number of patent automatic shut-off valves, £100 (including duty)—Alfred Adams and Co.

Purchase of certain spare parts for coal-cutting machines in use at the State Coal Mine, £277 15s. 1d.—Sullivan Machinery Co.

WORKS—S. of storage battery, Hospital for Insane, Mont Park—£256 10s.—Messrs. Sutherland and Ashman.

### Western Australia.

GOVERNMENT TENDER BOARD.—S. and D. of deep well pump, £100—F. R. Perrot.

S. and D. of ovalo guttering, 4in. 1s. 6d. per length, 5in. 1s. 8d. per length—McLean Bros. and Rigg Ltd.

Machinery for North Fremantle Abattoirs—Item 12, Western Engineering Co.; item 20, Leslie and Co.; items 11 and 13, Adams and Co. Ltd.; items 9 and 17, Sutherland and Son; items 8 and 22, Eilbeck and Co.; items 1, 3, 4, 7, 16 and 18, Atlas Engineering Co.

600 12in. cast iron pipes, £4 2s. 6d. each—Monteath and Co.

---

## THE COAL MINING INDUSTRY.

### New South Wales.

### Northern District.

(From Our Correspondent.)

Newcastle, Dec. 20.

Some concern was caused in mining circles early this week owing to a report being circulated that the miners on the Maitland field, in those pits where the afternoon shift is still being worked, would not draw the cavils next week if they were not given a guarantee that the shift would be done away with. However, there appears to be no foundation for the report, for the executive officers of the Miners' Federation have heard nothing, officially or otherwise, that would confirm the report, and nothing has come officially to the Associated Proprietors. On their part, some of the men say they are willing to await the decision of the wages board on the matter, but they do not wish that decision to be long delayed. The officers of the federation recognise that just here lies the chief risk of trouble. If the afternoon shift question comes before the wages board prior to the Christmas holidays, and the men have some idea as to when it will be dealt with, they will be satisfied; but if consideration of it is put back until the new year, there is the possibility that the men may become dissatisfied, and when work has to be resumed after the holidays they may refuse to go in. There are only four mines on the South Maitland field now working the shift, and it is said that the management of one of these is in favour of doing away with it. This means that the others will have to do the same, and so, in any case, the shift cannot be worked much longer.

The South Maitland miners have lodged a claim with the wages board for payment on the basis of 11s. as the selling price per ton of coal, the same as the Newcastle miners are paid. The Maitland men have been paid on the basis of a declared selling price of 10s. for some years now, and yet in a number of cases Maitlad coal has been selling up to 10s. 10d. per ton; and in this way they consider they have lost many thousands of pounds in wages. Coupled with the claim is one that the sliding scale now in operation in the Maitland district shall be continued. Probably, the proprietors will meet this demand with a counter one that the ascertained selling price be the basis on which the men in that district shall be paid. They were so paid from the opening of the field until the dog-watch conference in 1906, when Peter Bowling, who was then miners' president, managed to get from the proprietors a promise that the Maitland men should be paid on the basis of the declared selling price. The men had objected to the ascertained rate, and they regarded the concession of the proprietors at that time as a victory. However, they have paid dearly for it, for no one has dared since then to claim for them payment on the full price obtained by Maitland coal, lest the proprietors should at once seek to have the payment based again on the ascertained price. Now the matter will be fought out before the wages board.

The Miners' Federation asked some time ago that the Colliery Proprietors' Association should meet them in conference with regard to the abolition of the second shift in the mines where it is now worked. They have now received a reply to the effect that the proprietors think it would be useless to hold such a conference. The matter will therefore have to go on to the wages board.

Serious congestion was caused this week in the shipping of coal in Newcastle Harbour, through the lack of a sufficient number of berths for vessels. On Monday there were 20 Interstate and foreign vessels waiting for coal, and eleven of these were loading, while the other nine had to remain idle, two cranes being out of use owing to dredging operations. During the remaining days of the week, the position was not much improved, for nearly 40 more vessels from foreign and Interstate ports arrived up till to-day. The rush of shipping has been unusually heavy for this time of the year, and it augurs well for the trade during the opening weeks of 1914.

The shipments of coal this week have been very heavy, and have almost established a record for the week preceding Christmas. The congestion already referred has had a good effect, for Government officials have paid a visit to Newcastle during the week, and it is the intention of the Works and Railway Departments to carry out certain improvements that will give additional loading facilities for the shipment of coal. It is stated that the Chief Commissioner of Railways has accepted a tender for ten 15-ton cranes, and these will begin to come to hand by next March. They will at once be erected and will give very necessary relief.

There will be no change in the selling price of Newcastle coal for the first part of 1914. Best round coal has been selling f.o.b. Newcastle at 11s. for the past three or four years, and that rate will be continued. Some of the proprietors are desirous of seeing the price raised to 12s., but others are opposed to it, and so no move will be made. There will probably be some complaint from the miners over the matter, as they have been asking for the last two years for the price to be raised, as it would mean about 12 per cent. increase in their wages.

### Western District.

(From Our Correspondent.)

Lithgow, Dec. 20.

For some time past a dispute has been pending at the Oakey Park colliery, Lithgow, on the abolition of the second shift, and in connection with this matter the Western Colliery District Committee met at Lithgow for the purpose of dealing with it, the miners strongly objecting to its retention. It was then unanimously agreed that an opportunity be given to a deputation from the miners to interview Mr. W. Barbour, manager of the colliery, on the understanding that if no agreement were reached, the matter might again be referred to the committee. Mr. F. Gregory, the western miners' general secretary, then informed the chairman that as a result of the conference between the manager and the miners, as well as correspondence on the subject, the manager had promised, if possible, to discontinue the afternoon shift at the end of this quarter, while retaining the right to work it, if he thought it necessary, when trade was other than normal. A comparatively small number of men are employed on this shift. It is now stated that a few days ago the manager of the colliery received fourteen days' notification from the miners that after the end of the present quarter they would not, in any circumstances, continue to work the afternoon shift. No reply to that communication has yet been received by the lodge secretary. It is stated, in support of the miners' view, that the other associated mines in the Lithgow Valley have not worked the second shift for a considerable time, and that the trade of the Oakey Park Colliery does not justify the second shift. The number of miners employed there is about the same as that employed at other collieries and the output is about the same. The Oakey Park miners think that in the four or five months during which the matter has been pending, arrangements could have been made by the manager for a discontinuance of this shift. Sixteen miners employed at the colliery have now received fourteen days' notice. A meeting of the men concerned will be held in a day or two to consider the position. Mr. Barbour, manager, states that he has received a request from the Oakey Park lodge for suspension of the afternoon shift until such time as the coal trade warranted such shift. No action has up to the present been taken by the company, the matter having not been considered.

---

## DIVIDENDS.

The following dividends and bonuses of mining companies in Australia have been declared, and are payable on the dates noted:—

December.

29th.—Cathcart Central G.M. Co., Ararat (V.), 2s., £5000.

29th.—Williams' Fancy G.M. Co., Berringa (V.), 6d. and bonus 6d., £1200.

29th.—Zinc Corporation, Broken Hill (N.S.W.), 1s. 6d., less English income tax, all shares, £67,400.

29th.—Lake View and Star G.M. Co., Kalgoorlie (W.A.), interim 6 per cent., less income tax 1s. 2d. in £, £6000.

30th.—Yuanmi G.M. Co., Mt. Magnet (W.A.), 1s., £17,500.

January, 1914.

2nd.—Mt. Morgan G.M. Co., Rockhampton (Q.), 1s., £50,000.

6th.—Broken Hill Water Supply (N.S.W.), 1s. 6d. and bonus 6d., £20,000.

6th.—Kalgurli G.M. Ltd., Kalgoorlie (W.A.), 4s., less English income tax, £24,000.

9th.—Edna May G.M. Co., Weston (W.A.), 2s., £4285.

14th.—Lake View and Oroya G.M. Co., Kalgoorlie (W.A.), 6d., less English income tax, £22,500 (£21,187 10s. net).

15th.—North Mt. Farrell S.L.M. Co. (T.), 6d., £2000.

16th.—Tongkah Compound, Siam, 1s. and bonus 1s., £5000.

22nd.—Tongkah Harbour T.D. Co., Siam, 2s., £25,000.

28th.—Ivanhoe Gold Corporation, Kalgoorlie (W.A.), 3s. 6d., less English income tax, £35,000 (£32,960 net).

## Commonwealth of Australia.

Department of Home Affairs,
Melbourne, December 4, 1913.

### KALGOORLIE TO PORT AUGUSTA RAILWAY.

### TARPAULINS.

QUOTATIONS, addressed to the Engineer-in-Chief for Commonwealth Railways, 84-88 William-street, Melbourne, will be received up to 11 a.m. on Tuesday, December 30, 1913, for the Supply and Delivery of the following, on trucks at Port Augusta and Kalgoorlie, or alternatively in ship's slings at Port Augusta and Fremantle:—

75 Tarpaulins, 26ft. x 15ft. 5in. (50 to be delivered to Port Augusta, and 25 to Kalgoorlie).

Copies of specifications and plans can be obtained at the Commonwealth Railways Offices, 84-88 William-street, Melbourne; and also from the Commonwealth Works Director, Customs House, Sydney; Commonwealth Works Registrars, Brisbane, Adelaide, Perth, and Hobart.

Envelopes, containing quotations, are to be endorsed "Quotation for Tarpaulins."

JOSEPH COOK,
Minister of State for Home Affairs.

---

## Department of Home Affairs, 1913.

### BOILER PLANT, FEDERAL WOOLLEN MILLS, NORTH GEELONG.

TENDERS are invited, returnable at noon on Monday, January 19, 1914 for the supply of the above.

Tenders are to be addressed to "Secretary, Department of Home Affairs," and endorsed "Tender for Boiler Plant, Federal Woollen Mills."

Specifications may be seen at the office of the Works Director for Victoria, 151 Collins-street, Melbourne. No tender will necessarily be accepted

JOSEPH COOK,
Minister for Home Affairs.

---

Postmaster-General's Department,
Melbourne, December 19, 1913.

TENDERS will be received at the office of the Deputy Postmaster-General, Melbourne, until 3 p.m., on the undermentioned dates:—

January 13, 1914—500 Lead Earthplates (Sch. 1004).

March 17, 1914—Portable Engine and Dynamo (Sch. 995).

See Commonwealth Gazette, December 20.

AGAR WYNNE,
(1293) Postmaster-General.

---

Department of Defence,
Melbourne, December 22, 1913.

### MILITARY FORCES OF THE COMMONWEALTH

TENDERS are invited for the undermentioned Supplies:—

On Wednesday, February 25, 1914 (*extended from January* 12, 1914).—Iron and Steel, for the use of the Commonwealth Small Arms Factory, Lithgow, N.S.W., for the Manufacture of Rifles.

**Iron.**—Wrought British Standard Specification No. 51, Grade "A," rolled black, wrought B.S.S., No. 51, Grade "B," bright rolled or drawn.

**Steel.**—Black cast, black mild, mild, black rolled cast, bright cold drawn mild; crucible or Siemens-Martin; bright cold-rolled cast and bright cold-rolled mild.

Tenders will be received until 3 o'clock p.m. on the date shown at the office of the Superintendent of Contracts, Department of Defence, Victoria Barracks, Melbourne; the Senior Ordnance Officer, Ordnance Stores, Circular Quay, Sydney; the Senior Ordnance Officer, Ordnance Stores, Petrie-terrace, Brisbane; the Senior Ordnance Officer, Ordnance Stores, Adelaide; the Senior Ordnance Officer, Ordnance Stores, Perth; the Senior Ordnance Officer, Ordnance Stores, Hobart.

Tender forms, specifications, and all information may be obtained at the offices of the above-mentioned Senior Ordnance Officers, and at the office of the Senior Ordnance Officer, Victoria Barracks, Melbourne.

The lowest or any tender will not necessarily be accepted.

E. D. MILLEN,
Minister of State for Defence.

---

## Government Notice (T.).

State Mining Engineer's Office,
Zeehan, December 5, 1913.

### STATE PROSPECTING, TASMANIA.

Depots will be established by the Tasmanian Government during the coming summer from January 1 to April 30, at Point Hibbs and at Corinna, on the Pieman River.

Any persons desirous of working from these centres are requested to communicate with the State Mining Engineer, Zeehan, when arrangements may be made for the supply of stores at cost price, and the establishment of frequent communications.

Free assays will be made of minerals discovered, and all possible assistance given.

---

## Government Notice (N.S.W.).

New South Wales Government Railways,
Office of the Chief Commissioner,
Sydney, December 19, 1913.

TENDERS will be received at this office until 12 o'clock noon on the dates specified for the undermentioned Works, etc., viz.:—

### WEDNESDAY, JANUARY 7, 1914.

The Manufacture and Erection of Revolving Screens for the circulating water, White Bay Power House. Specification No. 438 (price 5/-).

Supply of Two 100k.v.a. 3-phase Transformers. Specification No. 444 (price 2/6).

Supply of One 3000 lb. Battery Lorry Chassis. Specification No. 442 (price 2/6).

### WEDNESDAY, JANUARY 14, 1914.

The Supply of Two Electrically-Driven Turbine Pumps, 50 gallons per minute. Specification No. 432 (price 2/6).

The Supply of Worm Gear, Shafting, Brackets and Ball Bearings. Specification No. 437 (price 2/6).

### WEDNESDAY, MARCH 18, 1914.

The Supply of 24 Direct Current Motor Starters. Specification No. 443 (price 2/6).

### WEDNESDAY, MARCH 25, 1914.

The Supply of Five 1000kw. Substation Units. Specification No. 434 (price 10/-).

All specifications are obtainable at the Electrical Engineer's Office, 61 Hunter-street, Sydney.

Tenders are to be endorsed, "Tender for Supply of Revolving Screens," or as the case may be.

The Chief Commissioner does not bind himself to accept the lowest or any tender.

By order,
J. S. SPURWAY,
Secretary.

---

## CITY OF TOOWOOMBA, QUEENSLAND.

### TENDERS FOR WATER METERS.

Sealed Tenders will be received up to 12 o'clock noon, on Monday, February 9, 1914, for 1000 Water Meters, to be delivered at the rate of 20 per month. Conditions of tender and further particulars may be obtained from the undersigned.

FRANK H. MERRITT,
Town Hall, Town Clerk.
November 19, 1913.

---

## FOR SALE—A BARGAIN.

Traction Engine, 7h.p., compound, by John Fowler, in splendid order, only in use 3 years, and done very little work. Price, £500, quick sale. We can recommend this engine a bargain—the same article new to-day will cost about £900. Apply:—

LANDERS & CANTRELL, Tamworth.

---

## WILLIAMS' FANCY G.M. CO., BERRINGA, N.L.

The Ordinary Half-yearly Meeting of shareholders will be held at the George Hotel, Lydiard-st., Ballarat, at 12.30 o'clock p.m. on Wednesday, December 31, 1913.

Business.—(a) To receive and deal with reports and financial statements; (b) to elect directors (3) and auditor; (c) general.

S. STRETCH, Manager.
Ballarat, December 22, 1913.

Note.—Nominations for the Board must be lodged with the manager three clear days before the day of election. Proxies must be in the hands of the manager 24 hours at least before the day of meeting.

---

## Government Notice (W.A.).

### SCHOOL OF MINES OF WESTERN AUSTRALIA

### LECTURESHIP, £320.

APPLICATIONS, accompanied with testimonials, for the combined position of Lecturer in Mathematics, and Assistant in Engineering Subjects, at a commencing salary of £320, will be received at Kalgoorlie up to January 15, 1914.

F. B. ALLEN,
Director.

---

## MUNICIPAL COUNCIL OF SYDNEY.

### TO CONTRACTORS.

Sealed and Endorsed Tenders will be received by the undersigned until 3 o'clock p.m. on Wednesday, January 7, 1914, for Alterations and Additions to Haymarket Shops, George-street.

A bill of quantities may be obtained upon application at the office of the City Building Surveyor, Town Hall, Sydney, upon payment of the sum of £5/5/-.

The lowest or any tender not necessarily accepted.

Tenderers, please note that they must pay their cash deposits direct into the City Treasury, and not enclose same with their tenders, otherwise their tenders will be rejected as informal.

THOMAS H. NESBITT,
Town Hall, Sydney, Town Clerk.
December 19, 1913.

---

## MUNICIPAL COUNCIL OF SYDNEY.

### LEASE OF THE BASEMENT OF THE QUEEN VICTORIA MARKETS.

Sealed and Endorsed Tenders will be received by the undersigned until 3 o'clock p.m. on Wednesday, January 7, 1914, for the Lease of the Basement of the Queen Victoria Market Buildings for a term of fifteen years.

Conditions of tendering and full information may be had upon application at the Office of the Comptroller of Assets, Town, Hall, Sydney.

The highest or any tender not necessarily accepted.

Tenders please note that they must pay their cash deposits direct into the City Treasury, and not enclose same with their tenders, otherwise their tenders will be rejected as informal.

THOMAS H. NESBITT,
Town Hall, Sydney, Town Clerk.
December 17, 1913.

---

## MUNICIPAL COUNCIL OF SYDNEY.

### TO CONTRACTORS.

Sealed and Endorsed Tenders will be received by the undersigned until 3 o'clock p.m. on Monday, February 2, 1914, for the Supply and Delivery of the following:—

(a) Transformers.
(b) Weatherproof Switch Fuses.

Copies of Specifications in respect of (a) and (b) may be seen, or obtained upon application, at the Office of the City Electrical Engineer, Town Hall, Sydney, upon the payment of the sum of 10/6 in each case.

The lowest or any tender not necessarily accepted.

Tenderers, please note that they must pay their cash deposits direct into the City Treasury, and not enclose same with their tenders, otherwise their tenders will be rejected as informal.

THOMAS H. NESBITT,
Town Hall, Sydney, Town Clerk.
December 5, 1913.

---

## WILLIAMS' FANCY G.M. CO., BERRINGA, N.L.

A DIVIDEND (the 46th) of 6d. per share, with a BONUS of 6d. per share, has this day been declared, payable at the office of the Company, Lydiard-street, Ballarat, on Monday, December 29, 1913. The transfer books will close on 23rd.

S. STRETCH, Manager.
Ballarat, December 19, 1913.

---

## TONGKAH HARBOUR TIN DREDGING CO. N.L.

NOTICE OF DIVIDEND.—Notice is hereby given that a Dividend (the 13th) of 10 per cent., or 2s. per share, amounting to £15,000, be declared, payable on January 22, 1914, and for this purpose the share register be closed from Jan. 15 to Jan. 22, inclusive. Dated at Hobart, December 12, 1913.
By order of the directors, H. J. WISE, Manager.

## METAL QUOTATIONS.

(From Our Correspondent.)

### By Cable.

**London, Tuesday.**

Copper did not long retain its recovery of the previous week, the market easing again considerably, but tin took an upward turn, and maintained it for a few days, until the bears got to work and brought the rates down somewhat. On the whole, lead was better than in the previous week, and spelter was still firm, and if it be true that the convention has been renewed for two years producers will have no cause for loud complaint for some time.

COPPER.—Monday's quotation for spot metal was £65 10s., or 2s. 6d. per ton lower than that of the previous Friday, and this was followed successively by £65 2s. 6d., £65 5s., £64 5s. and £63 15s.

For three months the rates were £65 2s. 6d. (a rise of 2s. 6d.), £65, £65, £64 5s., and £63 17s. 6d.

Electrolytic brought £67 on Monday, and the market was unchanged until Friday, when a fall to £66 5s. occurred. Yesterday brought a recovery to £66 10s.

TIN.—Monday's rate for spot delivery was £172, showing a rise of 5s., and a further rise brought the rate to £173 on Tuesday, after which there was a fall to £172 10s., followed by £169 15s. and £168 15s.

For three months' supplies the quotes were £173 5s., £174 10s., £174, £171 10s., and £170 10s.

LEAD rose by 2s. 6d. to £17 15s., then dropped to £17 12s. 6d., but advanced again to £17 15s. and £17 16s. 3d.

SPELTER was unchanged at £21 15s.

SILVER eased 26 5-8d. on Monday, or 3-16d. below the previous Saturday's quote, but went to 26 11-16d. on Wednesday, and 26 13-16d. on Friday.

ANTIMONY.—The quotation for Star antimony was again £28, and 50 per cent. ore was firm at £6 5s. per ton.

WOLFRAM (70 per cent. ore) fell to 32s. per unit, or £113 per ton.

MOLYBDENITE rose to 3s. 2d. per lb., equal to £354 13s. 4d. per ton.

MANGANESE (50 per cent. ore) again brought 9d. per unit, or £1 17s. 6d. per ton.

---

The British Chamber of Commerce, 9 Rue des Pyramides, Paris, the commercial representative of the Commonwealth in France, reports, under date November 17, the following prices quoted for minerals on the French markets.—Copper (Havre), £76 12s.; tin (Havre), £195 12s.; lead (Havre and Rouen) £23 8s., (Paris) £23 12s.; zinc (Paris) £23 2s.; nickel (Paris), £165 to £175.

---

## LARGEST DIRECT CURRENT GENERATORS EVER BUILT.

At the present time, when we have hardly recovered from the surprise occasioned by the announcement of the manufacturer of the size of a new alternating current turbo generator before the machine is eclipsed by a still larger one, it is interesting (says the Mexican Mining Journal) to learn of the largest direct current generators ever built. They are now installed in the Canal Road plant of the Cleveland Illuminating Company, and were manufactured by the Westinghouse Electric and Manufacturing Co., of Pittsburg, Pa.

The generators referred to are two 3750kw., 275 volt, 180r.p.m. shunt wound generators driven by steam turbines through Westinghouse reduction gears with a 10 to 1 ratio. Each of these generators, exclusive of the turbine and reduction gear, occupied six cars. The armature was shipped on a flat car with the platform removed. The windings of the armature extended down to within four inches of the ballast on the railroad track. A sheet steel plate, 3-8in. thick, was placed beneath the armature to protect it from stones or any projection on the road bed. Even with the armature at this level, there was only one routing between East Pittsburg and Cleveland where the clearance was sufficient to permit the armature to pass.

As it was impossible in the present state of the art to build a direct-current generator of this size for high speed, use has been made of the Westinghouse reduction gear which has achieved such an excellent reputation in marine work, and is now being used extensively in D.C. generators and steam turbines.

The large gear of this speed-reducing mechanism is 100in. in diameter and has 259 teeth. The pinion has 26 teeth, and the ratio of 26 to 259 gives the "hunting tooth" feature which has been recognised as desirable in the design of toothed gearing. The speed of this gear at the pitch line is approximately 54 miles per hour. At full rated load of the generator the gear transmits 5350 brake h.p. without giving any indications that its ultimate safe output has been reached.

The dynamometer feature of the floating frame construction provides a check upon the accuracy of the electrical instruments that measure the generator output. In this station a considerable error in the calibration of the wattmeter was detected by comparing its readings with those of the power indicator on the floating frame.

These two machines will supply light and power for the business section of Cleveland. The Illuminating Company's system was originally 3-wire Edison, but as the business increased alternating current was distributed to the outlying districts. The downtown congested business district, however, was never changed, and is still fed from a 3-wire Edison system. The company also furnishes steam heat to this district.

The power company located on Canal Road on the banks of the Cuyahoga River was a combination A.C.—D.C. station. The direct current part of the station consisted of engine driven D.C. generators, aggregating in capacity about 8000 kilowatts. The alternating current end of the station consisted of about 22,000 kilowatts in turbo-generators. Due to the rapid growth of the station and also to the fact that the condensing water obtained from the river was exceedingly bad, the Illuminating Company selected a location at the foot of 71st Street along the lake front, and a new A.C. generating station that will have an ultimate capacity of 200,000 kilowatts was built. Obviously, it was not possible to abandon the Canal Street station entirely, due to the fact that steam heat had to be supplied. It was decided, therefore, to make the Canal Street station strictly a direct-current generating station, from which steam could be supplied, inasmuch as the Canal Street station is only about two blocks from the centre of the thickly populated business portion of the city.

After the removal of the A.C. turbo-generators from the Canal Street station to the new station, nothing was left but reciprocating engines to furnish steam to the heating system, and the maintenance cost and trouble encountered in running these engines against a back pressure become excessive. Also some trouble was experienced with oil getting into the heating system. The question of new equipment then resolved itself into the selection of D.C. turbo generators or A.C. turbo generators and rotary converters, in either case the turbines to run non-condensing so as to supply the exhaust steam for heating. The D.C. outfit was found to be decidedly more efficient, and was chosen. The size of the outfit was chosen rather from the standpoint of the amount of exhaust steam required than from the generator capacity necessary. It is the intention of the Illuminating Company to run these generators only during the months in which the exhaust steam is required, the A.C. station supplying the Edison system through rotary converters during the other months.

**MAX GORLER**

Buyer of—

**ORES, METALS, CONCENTRATES.**

**HEAD OFFICE—**

**60 Queen St., Melbourne.**

**And at Castlereagh House, SYDNEY.**
**Argent Street, BROKEN HILL.**
**FRIEZLAND (Cloncurry District), Aubrey C. Waight.**

Sole Agency Australasia—
**C.E.A.G. MINER'S ELECTRIC SAFETY LAMP.**

**ENGINEERS!**

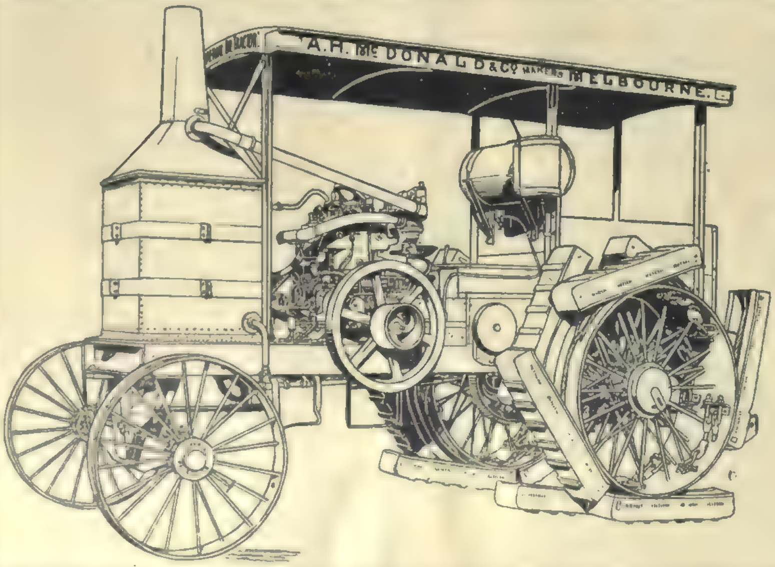
EDUCATE YOUR CHILDREN AT

**THE WORKING MEN'S COLLEGE,**

**MELBOURNE.**

HIGH GRADE INSTRUCTORS. UP-TO-DATE TUITION.
MODERATE FEES.

Illustrated Prospectus Free—By Post, Two Pence. FIRST TERM FEB. 1.


A. H. McDONALD & Co. MAKERS MELBOURNE.

**Transport Difficulties are Solved**

by

**The "IMPERIAL" Patent Pedrail Tractor**

(as illustrated)

**Travels over Loose, Sandy, Unmade Roads. Made in various Sizes and Types. Hauling from 7 to 30 tons—costs as Low as 3d. per Ton Mile. Carries fuel and water to last extended periods. Uses Cheap Kerosene Fuel. State your requirements, and write us To-day for Details. Made in Australia for Australian requirements.**

**A. H. McDonald & Co.,**

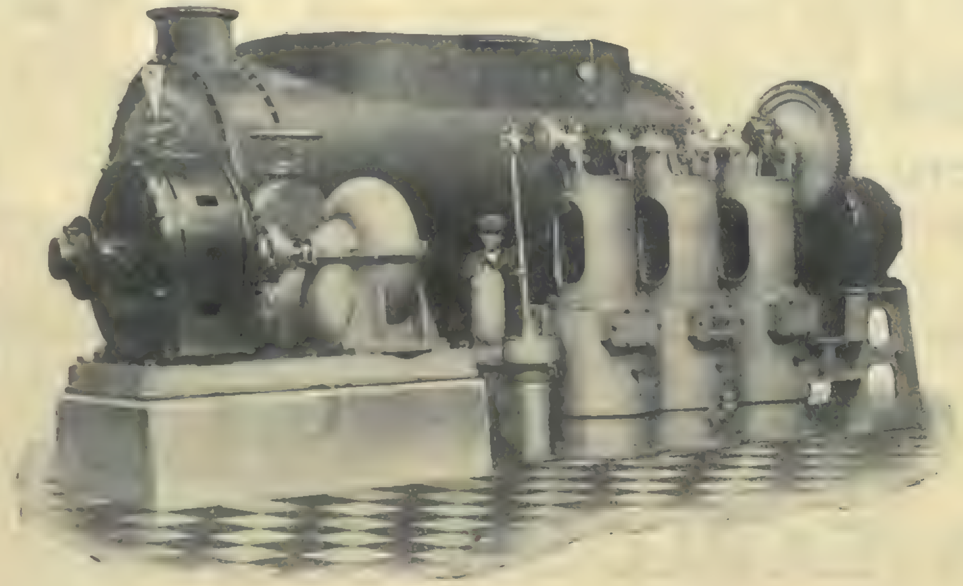
**"Imperial" Engine Works, Stawell-st., Burnley, Melbourne.**
(Adjoining Bridge Road.) Tel. Hawthorn 744.

**W. H. ALLEN, SON and CO. LTD.,**

Queen's Engineering Works, Bedford.
Queen Anne's Chambers, Westminster, London, S. W., ENGLAND.

The 'Conqueror' Surface Condensing Plant

High Efficiency :
Counter - current
Surface or Jet
Condensers : :



'Allen - Edwards'
Air Pumps : :
"Conqueror"
: Centrifugal :
: Pumps :

PARTICULARS and PRICES may be obtained from the above or their Representatives:—

**FYVIE & STEWART,**
Collins House, 360-366 Collins Street, Melbourne.
Australasia Chambers, 2 Martin Place Sydney.

**Everything for Mining**

SUPPLIED BY US.

CANDLES,
EXPLOSIVES,
OHERSEN ROCK DRILLS,
WINDING ENGINES,
STONE CRUSHERS,
ROAD MAKING PLANT.

CARD CONCENTRATOR, Sole Manufacturers.
DORR THICKENER,
DORR CLASSIFIER,
B and M TANKS,
TILGHMAN'S AIR COMPRESSORS.

QUARRY BARS.
WELL BORING PLANTS. BLOW OFF VALVES, ETC.

Agents in all CAPITAL CITIES of Commonwealth and NEW ZEALAND

**N. GUTHRIDGE LTD.**

Offices and Stores—SYDNEY and MELBOURNE.

**A. S. E. A.**

MOTORS, POWER PLANTS,
ETC.
(GENERAL ELECTRIC CO. OF SWEDEN).
LARGE STOCKS. ESTIMATES FOR PLANTS.

18,600 K.W. Alternator.

S.K.F.
Ball Bearings,
Double Row,
Self Aligning.

DIESEL
POLAR
ENGINES.

AGA Oxy Acetylene Welding with compressed Acetylene.
Jungner Indestructible Accumulators.

**Gardner, Wærn & Co.**
37 QUEEN ST., MELBOURNE; 334 KENT ST., SYDNEY.
Stores and Showroom, 369 Flinders Street, Melbourne.

**COCKLE CREEK**

**SMELTING WORKS, N.S.W.**

THE SULPHIDE CORPORATION LIMITED,

**Purchasers of:**

Ores, Concentrates, and Slags, carrying Gold, Silver or Lead, on specially favourable terms for net cash.

**THE WORKS** are situated only 9 miles from the Port of Newcastle, where the Corporation has every facility for taking delivery of consignments on behalf of shippers.

**Manufacturers of:**

Superphosphates, Sulphate of Ammonia, and other fertilisers, also Tar and Sulphuric Acid.

**Tariff and full particulars can be obtained on application to—**

**THE MANAGER, Cockle Creek, N.S.W.** **GIBBS, BRIGHT & CO., Agents.**

*OBTAINABLE FROM ALL BOOKSELLERS.*

**HIGH EXPLOSIVES**

**By W. R. QUINAN.**

224 PAGES, ROYAL OCTAVO. **PRICE—£1-1-0**

**AUSTRALIAN MINING STANDARD, Melbourne and Sydney.**

The De Beer's Consolidated Mines Ltd., of South Africa, during the year ended on June 30 last, paid dividends and bonuses as follows:—Preference shareholders, £800,000; deferred shareholders, dividends £1,500,000, and bonus £250,000; while a sum of £513,521 was carried forward. The return per share to deferred shareholders was 35s. for the financial year, while the preference holders received the fixed dividend of 20s. In addition to making these distributions, which absorbed altogether £2,550,000, or £625,000 more than the amounts paid the previous year, a substantial addition was made to the permanent reserve fund, raising its total to £1,800,000. The annual report shows that the diamonds sold, plus the increase of stocks taken at cost, amounted to £6,297,782, as compared with £5,465,888 for the previous year. With other receipts, and including the balance of £807,388 brought forward, a total of £7,248,239 is arrived at.

**Siegfried Pels,**
26-28 Neuerwall,
**Hamburg - - Germany.**

**Wolfram-Scheelite**

**Bismuth** **Tin.**
**Tantalite.** **Lead.**

A
**MARKET**
for all
**—ORES—**
and
**MINERALS**

**Molybdenite** **Copper.**
**Vanadium.** **Silver.**

**Argentiferous — Auriferous.**

**ASHES and SWEEPS.**

***Cable Address: — Siegpels.***

CODES:
**A.B.C. 4th and 5th Ed., A1, Liebers, Western-Union, Bedford McNeill.**

All Australians visiting London should read the **"British Australasian," 6d. weekly**—an illustrated paper containing mail and cable news from Australia, and news of Australians in Europe and at home.

Australians are cordially invited to visit the **"British Australasian" Reading Room at the offices, 115 High Holborn, London, W.C.,** where they can see the home papers, meet their friends, use the telephone, and obtain information without charge.

**H. B. Silberberg & Co.,**
***443 Bourke St.,***
Cor. Bourke and Queen Sts.,
***MELBOURNE.***
Tel. 1377. **8 O'CONNELL STREET, SYDNEY.**

Large Stocks of—
**Ainsworth's Balances, Morgan's Crucibles. Braun's Laboratory Ore Crushers. Gasolene Furnaces. Fluxes. Assayers' Requisites. Jena Chemical Glassware, Etc., Etc.**

**FRANCIS H. SNOW,**

**Buyer of**

ORES, MATTES, METALS, CONCENTRATES, & MINERALS

—of every description—

**Australasian Representative of:**
**ELECTROLYTIC R. & SMELT'G Coy. of A'LIA Ltd., Pt. KEMBLA, N.S.W.**
**ARON HIRSCH & SOHN, HALBERSTADT, GERMANY.**
**L. VOGELSTEIN & Co., NEW YORK.**

**Head Office—KING WILLIAM-ST., ADELAIDE.**
**Sydney Office:—8 BRIDGE STREET.**
**Perth Office:—ST. GEORGE'S TERRACE.**
**Broken Hill:—F. G WHITE, P.O. Box 78.**
**Zeehan:—A. J. SPOTSWOOD.**

**JOHN A. ROEBLING'S SONS CO.**
**New York,**

ELECTRICAL COPPER WIRE AND CABLES.

HIGH QUALITY FLEXIBLE

**WIRE ROPES**

STOCKS ON HAND.
ANY LENGTH CUT.

**Representative:**

**ALEX. FRASER PTY. LTD.**
Cobden Buildings,
368 Flinders-street,
**Melbourne.**

FOR MINES, HAULAGE, ELEVATORS, ETC.

**COALFIELDS AND COLLIERIES OF AUSTRALIA.**

440 pages, 229 illustrations. 25/- nett. Posted, 25/3. Foreign, 26/8.

***LIQUID FUEL for Diesel & all Crude Oil Engines.***

**"SHELL" SPIRIT, "SHELL" BENZINE, LUBRICATING OILS AND GREASES.**

**Prices and particulars on application to**

**THE BRITISH IMPERIAL OIL CO. LTD.** **Adelaide, Brisbane, Fremantle, Melbourne, Sydney and New Zealand**

COCKLE CREEK

SMELTING WORKS [illegible]

THE SULPHIDE CORPORATION LIMITED

[illegible] EXPLOSIVES

[illegible] CORPORATION LIMITED

[illegible] WIRE ROPE

HG Financial standard
51
F5
v.49-50

PLEASE DO NOT REMOVE
SLIPS FROM THIS POCKET

UNIVERSITY OF TORONTO
LIBRARY